Dynamic Complementarity
APPENDIX*

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A Tests of Initial Conditions

A.1 Tests of Baseline Years of Education and HOME-Environment Scores

Table A.1: Tests of Baseline Years of Education and HOME-Environment Scores

	Years of Education			Home Score					
Age Group	Mother	Father	Grandmother	Warmth	Verbal Skills	Hostility	Learning Literacy	Outings	Total
				Fast Ability Group					
Mean (Age 10-15)	6.898	8.237	2.607	4.794	2.604	4.746	6.531	1.804	23.876
Mean (Age 16-20)	6.610	7.548	2.976	4.971	2.638	4.692	6.617	1.830	24.129
two side p-value	0.678	0.156	0.602	0.080	0.340	0.232	0.670	0.631	0.326
two side step down p-value	0.933	0.404	0.933	0.206	0.698	0.550	0.933	0.933	0.695
p-value (Age 10-15 > Age 16-20)	0.339	0.078	0.699	0.960	0.830	0.116	0.665	0.685	0.837
step down p-value (Age 10-15 > Age 16-20)	0.824	0.247	0.993	0.997	0.994	0.364	0.993	0.993	0.994
N	100	101	97	104	104	104	104	104	104
				Enroll (10-15) vs. (21-25)					
Mean (Age 10-15)	6.898	8.237	2.607	4.794	2.604	4.746	6.531	1.804	23.876
Mean (Age 21-25)	6.462	6.974	2.385	4.750	2.550	4.751	6.599	1.726	23.773
two side p-value	0.421	0.014	0.783	0.729	0.205	0.923	0.784	0.307	0.767
two side step down p-value	0.788	0.017	0.985	0.985	0.447	0.985	0.985	0.633	0.985
p-value (Age 10-15 > Age 21-25)	0.210	0.007	0.391	0.365	0.103	0.539	0.608	0.153	0.383
step down p-value (Age 10-15 > Age 21-25)	0.497	0.011	0.732	0.732	0.257	0.833	0.833	0.386	0.732
N	98	98	95	103	103	103	103	103	103
				Enroll (16-20) vs. (21-25)					
Mean	6.610	7.548	2.976	4.971	2.638	4.692	6.617	1.830	24.129
Mean	6.462	6.974	2.385	4.750	2.550	4.751	6.599	1.726	23.773
two side p-value	0.835	0.222	0.405	0.018	0.028	0.353	0.949	0.078	0.271
two side step down p-value	0.953	0.447	0.594	0.036	0.048	0.594	0.953	0.151	0.482
p-value (Age 16-20 > Age 21-25)	0.418	0.111	0.203	0.009	0.014	0.824	0.474	0.039	0.135
step down p-value (Age 16-20 > Age 21-25)	0.778	0.254	0.427	0.019	0.022	0.927	0.778	0.079	0.279
N	80	81	80	83	83	83	83	83	83

1. Age (10–15) represents children whose monthly ages are between 10 and 15 at enrollment. Age (16–20) represents children whose monthly ages are between 16 and 20 at enrollment. Age (21–25) represents children whose monthly ages are between 21 and 25 at enrollment.

2. High ability group: the children who pass the first task at over 80% of the difficulty levels with an average passing rate greater than 80%. Normal ability group: the children who do not pass the first task with an average passing rate greater than 80%; or the children pass the first task, and the passing rate is between 50% and 80%. Low ability group: the average passing rate is less than 50%.

2. Step down p-values are conducted by 5000 times of bootstrap and cluster at the village level.

Table A.2: Tests of Baseline Years of Education and HOME-Environment Scores by Ability Groups, Continued

Age Group	Years of Education			Home Score					
	Mother	Father	Grandmother	Warmth	Verbal Skills	Hostility	Learning Literacy	Outings	Total
				Normal Ability Group					
					Enroll (10-15) vs. (16-20)				
Mean (Age 10-15)	7.167	8.000	3.032	4.906	2.611	4.757	6.344	1.780	23.855
Mean (Age 16-20)	7.313	7.965	2.839	4.910	2.587	4.737	6.316	1.878	23.929
two side p-value	0.730	0.928	0.616	0.964	0.476	0.594	0.863	0.024	0.779
two side step down p-value	0.980	0.992	0.964	0.992	0.895	0.964	0.992	0.013	0.980
p-value (Age 10-15 > Age 16-20)	0.635	0.464	0.308	0.518	0.238	0.297	0.431	0.988	0.610
step down p-value (Age 10-15 > Age 16-20)	0.932	0.882	0.765	0.895	0.655	0.765	0.864	1.000	0.932
N	241	241	237	252	252	252	252	252	252
					Enroll (10-15) vs. (21-25)				
Mean (Age 10-15)	7.167	8.000	3.032	4.906	2.611	4.757	6.344	1.780	23.855
Mean (Age 21-25)	6.244	7.477	2.929	4.805	2.615	4.700	6.429	1.867	23.856
two side p-value	0.025	0.302	0.826	0.372	0.935	0.162	0.639	0.131	0.998
two side step down p-value	0.009	0.436	0.981	0.495	0.987	0.172	0.873	0.133	0.996
p-value (Age 10-15 > Age 21-25)	0.013	0.151	0.413	0.186	0.532	0.081	0.681	0.934	0.501
step down p-value (Age 10-15 > Age 21-25)	0.005	0.264	0.794	0.320	0.861	0.102	0.920	0.993	0.829
N	212	212	210	225	225	225	225	225	225
					Enroll (16-20) vs. (21-25)				
Mean	7.313	7.965	2.839	4.910	2.587	4.737	6.316	1.878	23.929
Mean	6.244	7.477	2.929	4.805	2.615	4.700	6.429	1.867	23.856
two side p-value	0.016	0.261	0.861	0.178	0.325	0.299	0.463	0.810	0.723
two side step down p-value	0.011	0.547	0.943	0.371	0.573	0.573	0.708	0.943	0.943
p-value (Age 16-20 > Age 21-25)	0.008	0.131	0.570	0.089	0.838	0.150	0.768	0.405	0.361
step down p-value (Age 16-20 > Age 21-25)	0.004	0.303	0.899	0.192	0.959	0.325	0.959	0.790	0.730
N	201	201	197	209	209	209	209	209	209

1. Age (10–15) represents children whose monthly ages are between 10 and 15 at enrollment. Age (16–20) represents children whose monthly ages are between 16 and 20 at enrollment. Age (21–25) represents children whose monthly ages are between 21 and 25 at enrollment.

2. High ability group: the children who pass the first task at over 80% of the difficulty levels with an average passing rate greater than 80%. Normal ability group: the children who do not pass the first task with an average passing rate greater than 80%; or the children pass the first task, and the passing rate is between 50% and 80%. Low ability group: the average passing rate is less than 50%.

3. Step down p-values are conducted by 5000 times of bootstrap and cluster at the village level.

Table A.3: Tests of Baseline Years of Education and HOME-Environment Scores by Ability Groups, Continued

Age Group	Years of Education			Home Score					
	Mother	Father	Grandmother	Warmth	Verbal Skills	Hostility	Learning Literacy	Outings	Total
Low Ability Group									
Enroll (10-15) vs. (16-20)									
Mean (Age 10-15)	6.793	8.103	2.828	4.518	2.449	4.752	6.070	1.738	22.816
Mean (Age 16-20)	8.257	8.314	3.848	4.662	2.547	4.788	6.245	1.759	23.334
two side p-value	0.021	0.740	0.323	0.313	0.070	0.521	0.444	0.703	0.144
two side step down p-value	0.041	0.861	0.701	0.701	0.142	0.814	0.805	0.861	0.328
p-value (Age 10-15 > Age 16-20)	0.989	0.630	0.839	0.844	0.965	0.739	0.778	0.648	0.928
step down p-value (Age 10-15 > Age 16-20)	1.000	0.999	1.000	1.000	1.000	1.000	1.000	0.999	1.000
N	64	64	62	71	71	71	71	71	71
Enroll (10-15) vs. (21-25)									
Mean (Age 10-15)	6.793	8.103	2.828	4.518	2.449	4.752	6.070	1.738	22.816
Mean (Age 21-25)	7.828	8.966	2.929	4.727	2.525	4.800	6.187	1.787	23.523
two side p-value	0.180	0.160	0.894	0.251	0.240	0.565	0.728	0.626	0.202
two side step down p-value	0.378	0.378	0.861	0.435	0.435	0.853	0.853	0.853	0.378
p-value (Age 10-15 > Age 21-25)	0.910	0.920	0.553	0.874	0.880	0.717	0.636	0.687	0.899
step down p-value (Age 10-15 > Age 21-25)	1.000	1.000	0.998	1.000	1.000	1.000	1.000	1.000	1.000
N	58	58	57	62	62	62	62	62	62
Enroll (16-20) vs. (21-25)									
Mean	8.257	8.314	3.848	4.662	2.547	4.788	6.245	1.759	23.334
Mean	7.828	8.966	2.929	4.727	2.525	4.800	6.187	1.787	23.523
two side p-value	0.630	0.337	0.303	0.594	0.706	0.790	0.777	0.782	0.622
two side step down p-value	0.976	0.779	0.756	0.976	0.976	0.976	0.976	0.976	0.976
p-value (Age 16-20 > Age 21-25)	0.315	0.831	0.151	0.703	0.353	0.605	0.389	0.609	0.689
step down p-value (Age 16-20 > Age 21-25)	0.852	0.988	0.514	0.988	0.868	0.988	0.882	0.988	0.988
N	64	64	61	69	69	69	69	69	69

1. Age (10–15) represents children whose monthly ages are between 10 and 15 at enrollment. Age (16–20) represents children whose monthly ages are between 16 and 20 at enrollment. Age (21–25) represents children whose monthly ages are between 21 and 25 at enrollment.

2. High ability group: the children who pass the first task at over 80% of the difficulty levels with an average passing rate greater than 80%. Normal ability group: the children who do not pass the first task with an average passing rate greater than 80%; or the children pass the first task, and the passing rate is between 50% and 80%. Low ability group: the average passing rate is less than 50%.

3. Step down p-values are conducted by 5000 times of bootstrap and cluster at the village level.

Table A.4: Tests of Baseline Years of Education and HOME-Environment Scores by Ability Groups and Enrollment Exposure

Age Group	Years of Education			Home Score					
	Mother	Father	Grandmother	Warmth	Verbal Skills	Hostility	Learning Literacy	Outings	Total
Fast Ability Group									
Mean (Enrolled at Level 6)	6.849	7.446	2.554	4.801	2.602	4.775	6.523	1.752	23.834
Mean (Enrolled before Level 6)	6.701	7.766	2.918	4.840	2.613	4.700	6.580	1.807	23.918
two side p-value	0.772	0.476	0.486	0.629	0.761	0.097	0.676	0.263	0.702
two side step down p-value	0.956	0.913	0.913	0.956	0.956	0.217	0.956	0.626	0.956
p-value (Enrolled at Level 6 > Enrolled before Level 6)	0.386	0.762	0.757	0.685	0.619	0.048	0.662	0.869	0.649
step down p-value (Enrolled at Level 6 > Enrolled before Level 6)	0.888	0.992	0.992	0.992	0.989	0.100	0.991	0.992	0.989
N	150	151	147	157	157	157	157	157	157
Normal Ability Group									
Mean (Enrolled at Level 6)	6.742	7.884	2.822	4.804	2.600	4.729	6.361	1.848	23.817
Mean (Enrolled before Level 6)	7.086	7.805	2.995	4.949	2.611	4.743	6.346	1.819	23.916
two side p-value	0.325	0.835	0.644	0.140	0.735	0.656	0.908	0.445	0.698
two side step down p-value	0.631	0.962	0.962	0.177	0.962	0.962	0.962	0.803	0.962
p-value (Enrolled at Level 6 > Enrolled before Level 6)	0.837	0.418	0.678	0.930	0.632	0.672	0.454	0.222	0.651
step down p-value (Enrolled at Level 6 > Enrolled before Level 6)	0.997	0.925	0.997	0.997	0.997	0.997	0.945	0.578	0.997
N	340	340	334	357	357	357	357	357	357
Low Ability Group									
Mean (Enrolled at Level 6)	8.250	8.662	3.197	4.703	2.553	4.785	6.123	1.749	23.316
Mean (Enrolled before Level 6)	6.689	7.667	3.136	4.548	2.475	4.755	6.208	1.769	23.085
two side p-value	0.006	0.081	0.916	0.237	0.133	0.672	0.705	0.800	0.485
two side step down p-value	0.008	0.124	0.938	0.372	0.197	0.938	0.938	0.938	0.769
p-value (Enrolled at Level 6 > Enrolled before Level 6)	0.003	0.041	0.458	0.119	0.067	0.336	0.647	0.600	0.243
step down p-value (Enrolled at Level 6 > Enrolled before Level 6)	0.001	0.034	0.787	0.145	0.066	0.670	0.842	0.842	0.426
N	109	110	105	118	118	118	118	118	118

1. Children enrolled before Level 6 stands for children who enrolled before difficulty level 6. Children enrolled at level 6 stands for children who skipped all UHP levels prior than level 6

2. Fast ability group: the children who pass the first task at over 80% of the difficulty levels with an average passing rate greater than 80%. Normal ability group: the children who do not pass the first task with an average passing rate greater than 80%; or the children pass the first task, and the passing rate is between 50% and 80%. Low ability group: the average passing rate is less than 50%.

3. Step down p-values are conducted by 5000 times of bootstrap and cluster at the village level.

B Curriculum

B.1 Fine Motor Skill

Fine motor skill involves finger movements, such as grasping, releasing and stitching, and drawing and writing skills. Here we consider two types of fine motor skills: (1) finger movements related to grasping, releasing, stitching; and (2) the movements related to drawing and writing ability. This task evaluates whether a child can grasp the writing instrument and make marks, scribbles, and shapes. It is not writing ability as in letters or words.

The first category is related to finger movements regarding grasping, releasing, stitching.[1] In Table B.1, tasks progress from basic activities like holding and moving an object that require limited precision with the fine muscles of the hands to manipulating the object with movements that need incrementally more dexterity (like rotating the object) to complex tasks requiring finer and finer finger control, like unscrewing the top. Finally, tasks that require the most hand dexterity, as well as hand-eye coordination, come last.

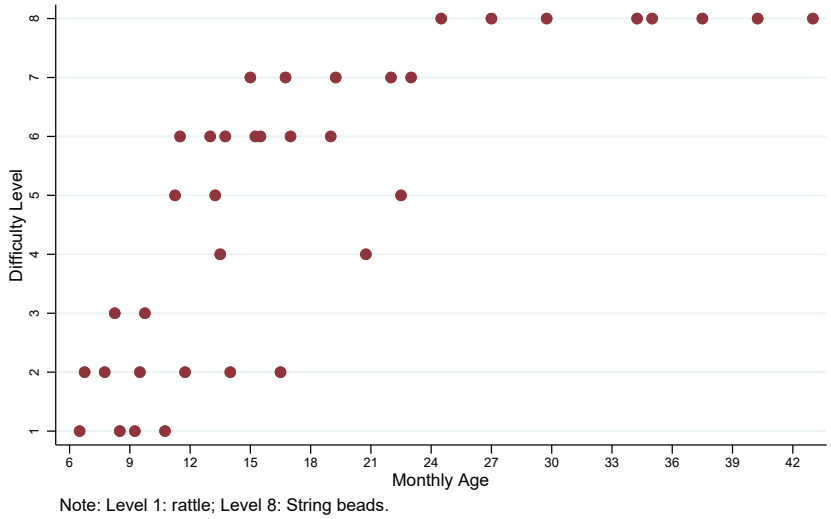
[1]These milestones are justified at https://www.chrichmond.org/therapy-services/occupational-therapy/developmental-milestones/fine-motor-skills-birth-to-2-years and http://www.kamloopschildrenstherapy.org/fine-motor-skills-infant-milestons.

Table B.1: Difficulty Level List for Finger Movement Tasks

Level 1	Rattle the bottle
Level 2	Shake and beat the drum with two hands
Level 3	Pull strings to get toy
Level 4	Rotate, push
Level 5	Place small objects into the bottle, shake it, and unscrew the lid
Level 6	Put small container into a larger container
Level 7	Take the ring off and slip the ring onto the bottle
Level 8	String beads

Figure B.1 gives the timing of each finger movement tasks in the curriculum.

Figure B.1: The Timing of Fine Motor Skill (Grasping, Releasing Actions) Tasks across Difficulty Levels



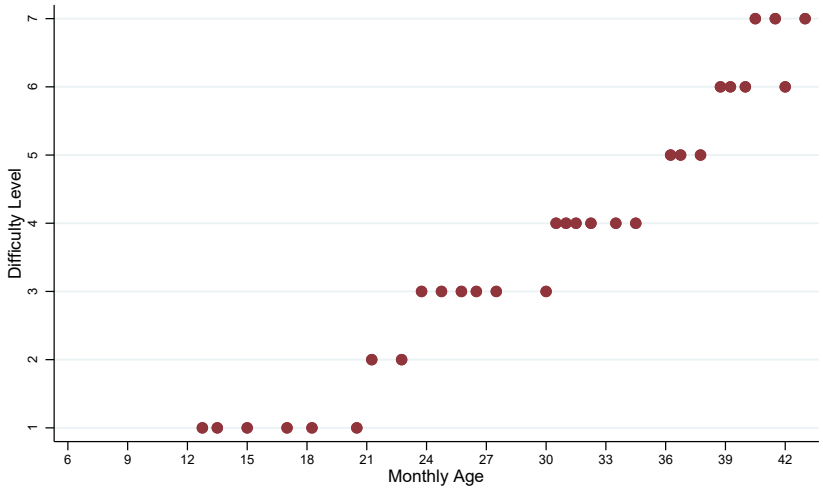
The second category is related to drawing and manual writing ability. The fine motor drawing tasks in Table B.2 focus on a child's ability to use a writing tool with increasing skills. First, a child must be able to hold the tool to make markings. Next, the child must incorporate increasingly complex cognitive skills to complete

the tasks. They start by imitating markings made by an adult. Then, when skill levels progress, they must make the marking after only a verbal command from the adult. Finally, the child progresses from abstract shapes to representative drawings.

Table B.2: Difficulty Level List for Fine Motor Drawing Tasks

Level 1	Doodle using crayons
Level 2	Mimic draw circles
Level 3	Mimic circles and draw straight lines
Level 4	Draw a circle, vertical line, and horizontal line
Level 5	Draw circles, many lines, and crossed lines
Level 6	Draw a cross (or T), curves, and zigzag curves
Level 7	Draw caterpillars

Figure B.2: The Timing of Fine Motor Skill (Drawing) Tasks across Difficulty Levels



Note: Level 1: Doodle using crayons; Level 7: Draw caterpillars.

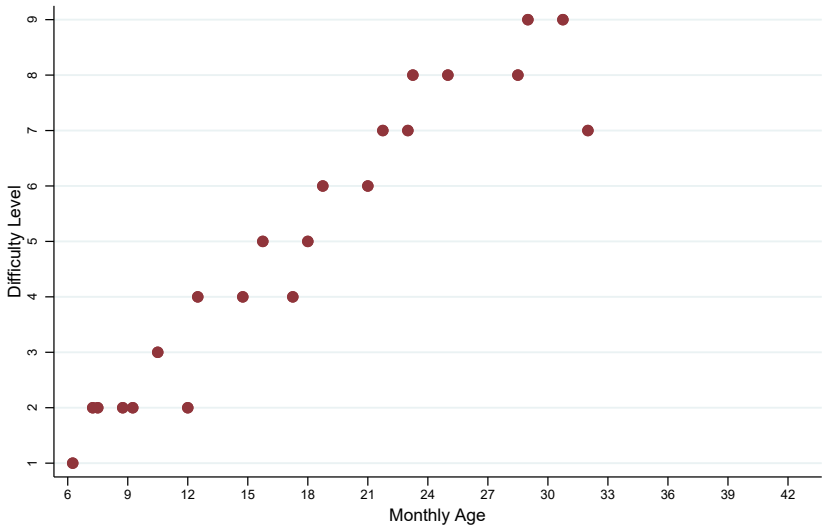
B.2 Gross Motor Skill

Gross motor skill is any skill that requires movement and precision of large body muscles. Crawling, creeping, walking, throwing and dancing are all examples of gross motor skills. The designated gross motor tasks start with a relatively simple activity, touching the ball, requiring the child only to move one hand to the object. Next, the child must be able to move his or her entire body to interact with the toy. After mastery over those tasks, the child uses both gross motor skills and newly found cognitive ability to interact with the toy in increasingly complex ways. Pushing a toy requires coordination, standing, and walking skills. However, the child is still using the toy as a walking aid at this point. To progress to the next tasks, not only will the child have to master walking independently, but will also use the toy in a way that suggests intentionality (e.g., pulling, throwing). The final tasks require the child to integrate cognitive knowledge of direction, descriptive words, and gross motor mastery of balance.

Table B.3: Difficulty Level List for Gross Motor Tasks

Level 1	Let the child touch the ball
Level 2	The child moves (crawls) and follows the ball
Level 3	Roll the ball
Level 4	Push the toy when walking
Level 5	Pull the toy
Level 6	Pull and walk forward or backward
Level 7	Throw ball backward, forward, upward and into a target
Level 8	Move forward or backward. Child can understand “upward,” “downward,” “inside of,” “outside of,” “stop,” “go,” “fast,” “slow.”
Level 9	Hold the soft ball on his or her head stably while walking

Figure B.3: The Timing of Gross Motor Skill Tasks across Difficulty Levels



Note: Level 1: Let the child touch the ball, Level 9: Hold the soft cloth ball on his head stably while walking.

B.3 Cognitive Skill

Cognitive skill is broadly defined as a child's ability to apply what they have learned previously for new situations. This skill involves logic, problem-solving ability, memory, attention, and so on.

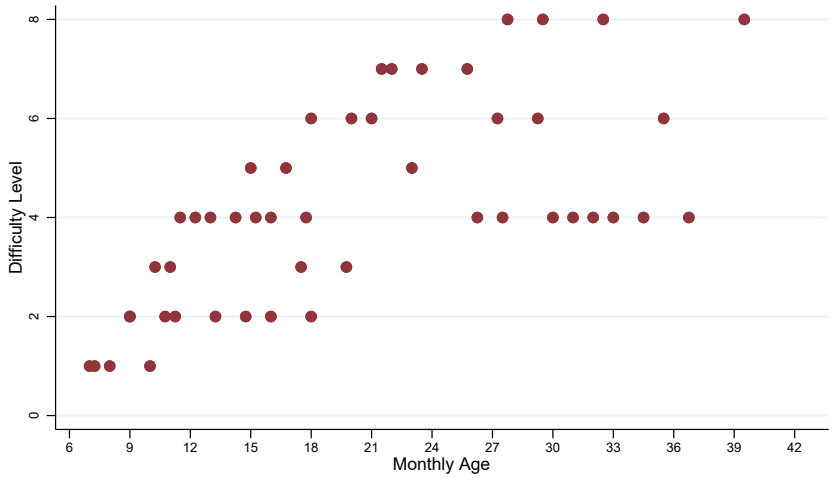
B.3.1 Spatial Skill

Spatial skill relies on a child's understanding of the three dimensional world. Comprehending concepts of relative positioning—"inside of," "around," and "next to" are the basics of this skill. The progression of these skills follows the child as he or she learns concepts that are more and more abstract. Beginning with "in" and "out" and progressing to "underneath," "around," "up," "next to," and "close to." As the tasks become more difficult, the child is expected to manipulate objects to demonstrate knowledge and understanding of these concepts.

Table B.4: Difficulty Level List for Cognitive (Spatial) Tasks

Level 1	Understand the concept of "getting out"
Level 2	Understand the meaning of "in" and "out"
Level 3	Understand the concepts of "go in," "come out," and "under"
Level 4	Understand "inside," "outside," "underneath," and "on top of"
Level 5	Understand the meanings of "put it around" and "take it off"
Level 6	Besides what was learned before, understand one more meaning of "up"
Level 7	Besides what was learned before, understand one more meaning of "next to"
Level 8	Besides what was learned before, understand the meanings of "close to," "behind"

Figure B.4: The Timing of Cognitive Skill (Spatial) Tasks across Difficulty Levels



Notes: Level 1: Underdtand the concept of "getting out", Level 8: Besides what was learned before, understand the meanings of "close to", "behind."

B.3.2 Knowing Objects and Objects' Functions

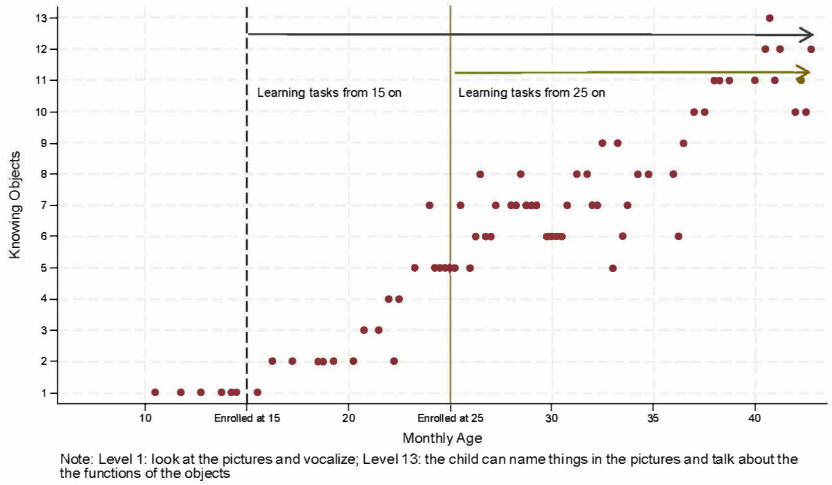
The knowing objects task set introduces preliteracy skills. It involves progressing interaction with pictures of objects and elements of storytelling. The tasks in the Cognitive Knowing Objects progress from a simple understanding of the concept of pictures by acknowledging with vocalizations, to using receptive (heard) language to identify certain pictures. Receptive language is a skill developed prior to an expressive language where a child forms words to communicate. The children must use their expressive language to complete the following tasks that increase with difficulty as they must develop more and more language to identify an increasing number of images. To progress through level 7 and beyond, the child must display an increasingly sophisticated understanding of the stories presented, first simply naming actions, then answering questions, then talking abstractly about the story.

Levels 10, 11, 12, and 13 ask the child to take the information presented and build on it by discussing the uses of objects presented and making connections with other images.

Table B.5: Difficulty Level List for Cognitive (Understanding Objects) Tasks

Level 1	The child can look at the pictures and vocalize
Level 2	Name the objects and ask the child to point to the pictures accordingly
Level 3	The child can name the objects in one picture, and point to the named picture
Level 4	The child can name the objects in two or more pictures, and point to the named picture
Level 5	The child can point out named pictures, and say names of three or more
Level 6	The child can point out the picture mentioned, and correctly name the name of 6 or more pictures
Level 7	The child can talk about the pictures, answer questions, understand or names the verbs (eat, play, etc.)
Level 8	The child can follow the storyline, name actions and answer question
Level 9	The child can understand stories, and talk about the content in the pictures
Level 10	The child can keep up with the development of story
Level 11	The child can say the name of each graphic, discuss the role of each item, and then link the graphics in the card together
Level 12	The child can name the items in the picture, link the different pictures together, and discuss some of the activities in the pictures
Level 13	The child can name the things in the picture and talk about the function of objects

Figure B.5: The Timing of Cognitive Skill (Understanding Objects) Tasks across Difficulty Levels



B.3.3 Color

In the color skill set, tasks progress from passive interactions (child hearing about color) to actively naming colors, to finally making connections with colors.

Table B.6: Difficulty Level List for Cognitive (Color) Tasks

Level 1	Caregiver talks about the color
Level 2	The child can identify the color
Level 3	Understand color and match different colors

Figure B.6: The Timing of Cognitive Skill (Understanding Color) Tasks across Difficulty Levels

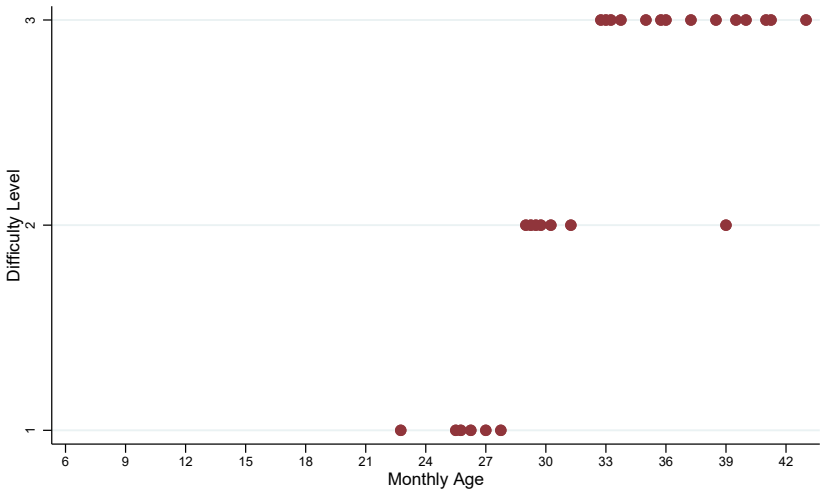


Table B.7: Difficulty Level List for Cognitive (Order: Understanding Upward, Forward, First, Some, All, Next, and Last) Tasks

Level 1	Child learns how to string beads and understands the meanings of "upward" and "downward"
Level 2	Understand the meanings of "upward," "downward," "first," and "then"
Level 3	Understand the concepts of "first," "finally," "in front of," and "behind"

Cognitive ability progresses into more abstract concepts of direction "upward" and "downward." Then, relative concepts of "first," "last," or "behind" are introduced.

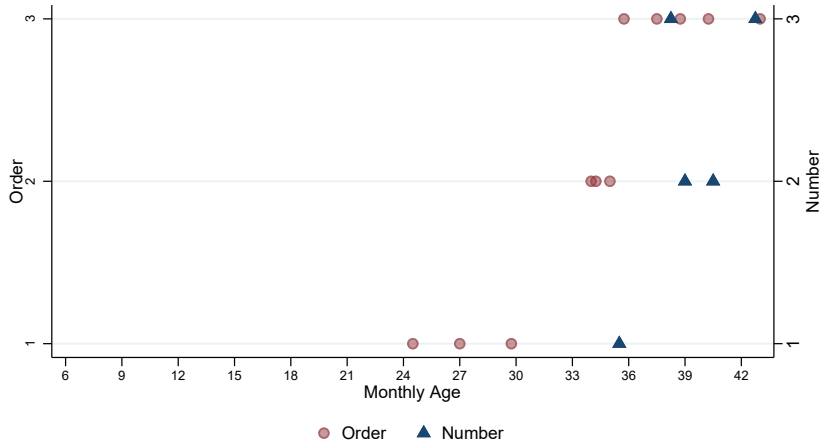
B.3.4 Number

Table B.8: Difficulty Level List for Cognitive (Number) Tasks

Level 1	Child learns how to count, can count up to 4
Level 2	Counting from 1 to 4, and then count two objects: 1, 2
Level 3	Children can count from 1 to 4 and sort the card by the number of points on each card

Number tasks progress from the learning of numbers in order to understanding one-to-one relationships of numbers to objects when counting. Finally, the concept of number representation is introduced.

Figure B.7: The Timing of Cognitive Skill (Understanding Order and Numbers) Tasks across Difficulty Levels



Note: Order level 1: Understanding "upward and downward"; level 3: Understanding the concepts of "first, finally, in front of, and behind."
Number level 1: learn how to count; level 3: Sorting the card by the number of points on each card.

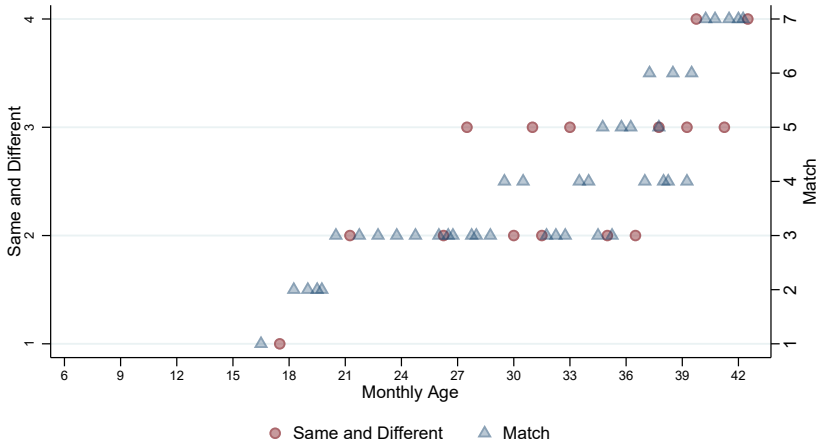
B.3.5 Match

These tasks consist of matching different pieces from simple puzzles to complicated puzzles. This set of tasks builds on the child's spatial awareness skills. The ability to fill in missing objects and understand how objects fit together is important in developing spatial awareness. The individual tasks progress from simply placing 1-2 puzzle pieces, completing the puzzle, making patterns, and using emerging language skills to describe pieces. As the children gain proficiency in these skills, they can complete puzzles of increasing complexity and restore the jumbled pieces to the original puzzle.

Table B.9: Difficulty Level List for Cognitive (Match) Tasks

Level 1	Put one piece into the puzzle
Level 2	The child is able to put at least two pieces in the puzzle
Level 3	The child can complete the simple puzzle
Level 4	The child can complete the puzzle and name different pieces
Level 5	The child learns to put together puzzle pieces to form the complete pattern
Level 6	With the caregiver's help, the child can complete the puzzle with more pieces
Level 7	The child can restore the puzzle to the original

Figure B.8: The Timing of Cognitive Skill (Matching and Understanding) Tasks across Difficulty Levels



Note: Same and Different level 1: teaching the meaning of "same", level 4 the child understands the concept of "same" and "different."
Match level 1: teaching one shape puzzle; level 7: match different shape pieces.

B.4 Language Skill

Language skill is the ability of children to communicate their needs, thoughts, feelings and ideas in a way that the caregiver can understand. It includes vocalizations, gestures, spoken words, and other signals.

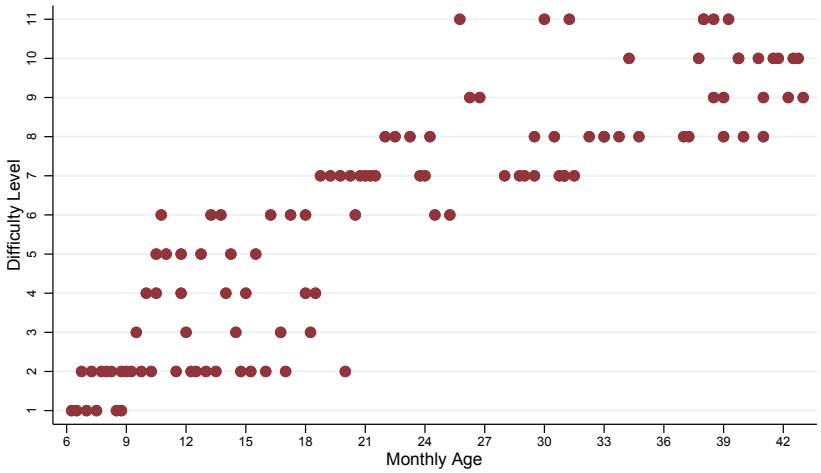
B.4.1 Learn words

Table B.10: Difficulty Level List for Language (Knowing Objects and Understanding Their Functions) Tasks

Level 1	Caregiver and baby make sounds to each other to interact
Level 2	Caregiver tells baby the things she does in the house
Level 3	To teach baby to recognize people's names
Level 4	Baby learns movements that show intimacy: clapping, bye-bye, and thank you
Level 5	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures
Level 6	Baby is to recognize at least one body part
Level 7	The child identifies and/or names ordinary objects
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects
Level 9	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects
Level 10	The child points at 7 or more than 7 pictures and talk about them
Level 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects

The language skill tasks increase in difficulty with the expectation that the child will learn to identify and use expressive language to indicate understanding. The tasks begin with the baby passively listening as the caregiver makes sounds and speaks. The child then plays a more active role, expected to indicate understanding (receptive language) and use simple gestures to indicate meaning. As understanding and vocabulary increase, the child will name more pictures and learn to describe them. Finally, the child will learn the names and uses of objects in the child's everyday environment.

Figure B.9: The Timing of Language Skill (Knowing Objects) Tasks across Difficulty Levels



Note: level 1: Teach some new sounds; level 11: The child can name, discuss objects and mimic their sounds.

B.4.2 Dialogue

In this set of tasks, the caregiver talks to the children.

Table B.11: Difficulty Level List for Language (Dialogue) Tasks

Level 1	Caregiver talks to the baby when doing housework
Level 2	Use words that child learned to answer or create a new conversation

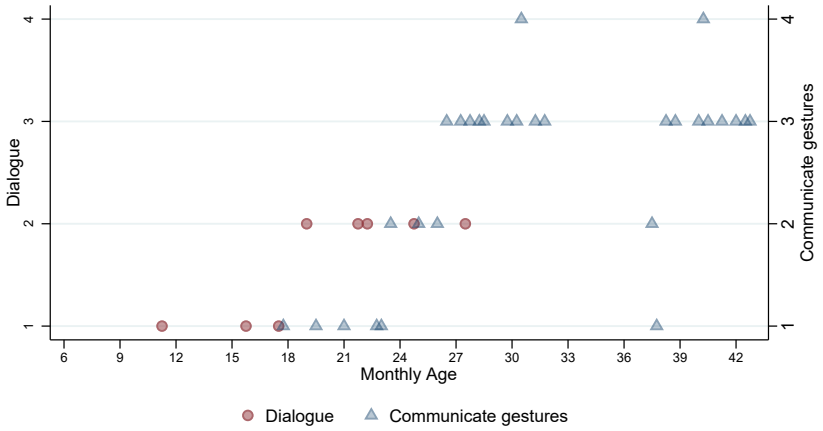
As the child grows, the caregiver progresses from simply narrating events to building on words the child has learned to scaffolding language development.

B.4.3 Communicate Gestures

Table B.12: Difficulty Level List for Language (Communicate Gestures) Tasks

Level 1	The baby listens to simple instructions given by the caregiver
Level 2	Caregiver performs some activities with the child
Level 3	Let the child learn to talk about the pictures, act according to the pictures, answer questions, and name related actions

Figure B.10: The Timing of Language Skill (Communicate Gestures) Tasks across Difficulty Levels



Note: Dialogue level 1: Talking to the child; level 2: Using the words the child learned to create conversation.
Communicate gestures level 1: the child listens to simple instructions; and level 4: the child can act as other roles, e.g., father, mother.

C Task Content within Each Difficulty Level

C.1 Language Skill

Table C.1: Language Task Content (Learning Words) I

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 1	Caregiver and baby make sounds to each other to interact	6	1	Language repeat baby's sound	Caregiver and baby make sounds to each other to interact: Mother makes some sounds that the baby produces repeatedly and makes conversations with baby
Level 1	Caregiver and baby make sounds to each other to interact	6	2	Language repeat baby's sound	Caregiver and baby make sounds to each other to interact: Mother teaches baby some new sounds
Level 1	Caregiver and baby make sounds to each other to interact	6	4	Language repeat baby's sound	Caregiver and baby make sounds to each other to interact: Mother responds baby through vocalization or establishes new conversations
Level 1	Caregiver and baby make sounds to each other to interact	7	2	Language repeat baby's sound	Mother and baby make sounds to each other to interact
Level 1	Caregiver and baby make sounds to each other to interact	8	2	Language: new sound	Caregiver and baby make sounds to each other to interact: Mother helps baby imitate new sounds
Level 1	Caregiver and baby make sounds to each other to interact	8	3	Mirror game	Caregiver and baby make sounds to each other to interact: Mother and baby look into the mirror together, let baby touch the mirror image of him/herself and make sounds to the mirror.
Level 2	Caregiver tells baby the things she does in the house	6	3	language: talking with the child	Caregiver tells baby the things she does in the house: Mother tells baby the things she does in the house
Level 2	Caregiver tells baby the things she does in the house	7	1	Language: bathing	Caregiver tells baby the things she does in the house: Mother interacts with baby when bathing baby, and fills a container with water
Level 2	Caregiver tells baby the things she does in the house	7	3	language: dressing	Caregiver tells baby the things she does in the house: Mother talks to baby when dressing him
Level 2	Caregiver tells baby the things she does in the house	7	4	language: talking with the child	Caregiver tells baby the things she does in the house: Mother tells baby the things she does in the house

Table C.2: Language Task Content (Learning Words) II

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 2	Caregiver tells baby the things she does in the house	8	1	language: feeding	Caregiver tells baby the things she does in the house: Mother talks to baby when feeding him
Level 2	Caregiver tells baby the things she does in the house	8	3	Language: bathing	Caregiver tells baby the things she does in the house: Mother communicates with baby during bathing time, and fills an empty container with water.
Level 2	Caregiver tells baby the things she does in the house	8	4	language: talking with the child	Caregiver tells baby the things she does in the house: Mother tells baby what she is doing in the house
Level 2	Caregiver tells baby the things she does in the house	9	1	language: dressing	Caregiver tells baby the things she does in the house: Mother talks to baby when dressing him/her
Level 2	Caregiver tells baby the things she does in the house	9	3	language: talking with the child	Caregiver tells baby the things she does in the house: Mother tells baby what she is doing around the house
Level 2	Caregiver tells baby the things she does in the house	10	1	language: feeding	Caregiver tells baby the things she does in the house: Mother talks to baby when feeding him
Level 2	Caregiver tells baby the things she does in the house	11	2	language: talking with the child	Caregiver tells baby the things she does in the house: Mother talks to baby about what she is doing in the house
Level 2	Caregiver tells baby the things she does in the house	12	1	language: talking with the child	Caregiver tells baby the things she does in the house: Mother talks to the child about the things they do in the house
Level 2	Caregiver tells baby the things she does in the house	12	2	Language: bathing	Caregiver tells baby the things she does in the house: Mother talks to child while bathing the child
Level 2	Caregiver tells baby the things she does in the house	12	4	language: dressing	Caregiver tells baby the things she does in the house: Mother talks to the child when dressing him
Level 2	Caregiver tells baby the things she does in the house	13	2	language: talking with the child	Caregiver tells baby the things she does in the house: Mother talks to child about what they are doing in the house
Level 2	Caregiver tells baby the things she does in the house	14	3	language: feeding	Caregiver tells baby the things she does in the house: Mother talks to child when feeding him
Level 2	Caregiver tells baby the things she does in the house	15	1	language: talking with the child	Caregiver tells baby the things she does in the house: Mom tells the child their daily routine in family
Level 2	Caregiver tells baby the things she does in the house	15	4	Language: bathing	Caregiver tells baby the things she does in the house: Mom talks with the child at home
Level 2	Caregiver tells baby the things she does in the house	16	4	language: dressing	Caregiver tells baby the things she does in the house: Mother teaches the child to speak while dressing the child.
Level 2	Caregiver tells baby the things she does in the house	19	4	language: feeding	Caregiver tells baby the things she does in the house: Mother talks to child while feeding the child

Table C.3: Language Task Content (Learning Words) III

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 3	To teach baby to recognize people's names	9	2	Language – correct nouns:	To teach baby to recognize people's names: Mother teaches baby the names of family members
Level 3	To teach baby to recognize people's names	11	4	Language – correct nouns:	To teach baby to recognize people's names
Level 3	To teach baby to recognize people's names	14	2	Language – correct nouns:	To teach baby to recognize people's names: Mother teaches baby to say the names of the family members
Level 3	To teach baby to recognize people's names	16	3	Language – correct nouns:	To teach baby to recognize people's names: Mother teaches the child to identify the names of family members.
Level 3	To teach baby to recognize people's names	18	1	Language – correct nouns:	To teach baby to recognize people's names: Mother teaches the child AC:AC the names of family members.
Level 4	Baby learns movements that show intimacy: clapping, bye-bye, and thank you	9	4	language: movement wocabulary	Baby learns movements that show intimacy: clapping, bye-bye, and thank you
Level 4	Baby learns movements that show intimacy: clapping, bye-bye, and thank you	10	2	language: movement wocabulary	Baby learns movements that show intimacy: clapping, bye-bye, and thank you
Level 4	Baby learns movements that show intimacy: clapping, bye-bye, and thank you	11	3	language: movement wocabulary	Baby learns to imitate a move: no-no, up-up and lip games
Level 4	Baby learns movements that show intimacy: clapping, bye-bye, and thank you	13	4	language: movement wocabulary	Baby learns to imitate a move: no-no, up-up and lip games
Level 4	Baby learns movements that show intimacy: clapping, bye-bye, and thank you	14	4	language: movement wocabulary	Baby learns to imitate a move: no-no, up-up and lip games
Level 4	Baby learns movements that show intimacy: clapping, bye-bye, and thank you	17	4	language: movement wocabulary	Baby learns to imitate a move: no-no, up-up and lip games
Level 4	Baby learns movements that show intimacy: clapping, bye-bye, and thank you	18	2	language: movement wocabulary	Baby learns to imitate a move: no-no, up-up and lip games

Table C.4: Language Task Content (Learning Words) IV

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 5	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures	10	2	Picture book A	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures: Book: baby makes sound when looking at the pictures
Level 5	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures	10	4	Dialogue (walking):	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures: Mother takes baby outdoor, and tells baby the names of outdoor objects and introduces them
Level 5	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures	11	3	Picture book B	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures: Book: baby looks at the pictures and vocalize
Level 5	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures	12	3	Picture book A	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures: Child makes sound looking at the pictures
Level 5	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures	14	1	Picture book A	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures: mother and child look at the pictures together, and let the child vocalize and touch the pictures
Level 5	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures	15	2	Picture book B	Caregiver and child look at the pictures together, and let the child vocalize and touch the pictures: The child pronounces while looking at the pictures
Level 6	Baby is to recognize at least one body part	10	3	language: body part	Baby is to recognize at least one body part: Baby is to recognize at least one body part (not names) (language G)
Level 6	Baby is to recognize at least one body part	13	1	language: body part	Baby is to recognize at least one body part: Mother teaches child to know at least one facial organs (eye, nose, mouth), (language – introducing body parts)
Level 6	Baby is to recognize at least one body part	13	3	Picture book B	Baby is to recognize at least one body part: face
Level 6	Baby is to recognize at least one body part	16	1	picture book 1	Baby is to recognize at least one body part: the child points out in the book the object body part and make sound.

Table C.5: Language Task Content (Learning Words) V

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 6	Baby is to recognize at least one body part	17	1	picture book 2	Name the objects and ask the baby to point to the pictures accordingly. Ask the baby to help the mother turn the pages.
Level 6	Baby is to recognize at least one body part	17	4	language: commonly used noun	Mother helps the baby identify and/or point to the name of ordinary objects (language—Common Nouns)
Level 6	Baby is to recognize at least one body part	18	3	picture book 1	Baby is to recognize at least one body part: the child points out in the book the object body part and make sound.
Level 6	Baby is to recognize at least one body part	20	2	language: body part	Baby is to recognize at least one body part: The child can identify parts of the face and the body (Language—Body Parts)
Level 6	Baby is to recognize at least one body part	24	2	Picture Talk3	Baby is to recognize at least one body part: Mother imitates the actions in the pictures with the child, talks about the content of the pictures, and lets the child point to the corresponding pictures when hears the names of the objects
Level 6	Baby is to recognize at least one body part	25	1	language: clothes	Baby is to recognize at least one body part: The child can recognize/identify the body part and clothes he/she is wearing
Level 7	The child identifies and/or names ordinary objects	19	1	picture book 2	The child identifies and/or names ordinary objects: Mother and child read the book together, name the objects in the book, flip pages, act out the movements in the book, and to match the objects in the book to the object in reality.
Level 7	The child identifies and/or names ordinary objects	19	3	language: commonly used noun	Child identifies and/or name common objects (language-commonly used noun)
Level 7	The child identifies and/or names ordinary objects	20	1	language: commonly used noun	Child identifies and/or names ordinary objects (Language—Common Nouns)
Level 7	The child identifies and/or names ordinary objects	20	3	picture book 3	The child identifies and/or names ordinary objects: animal—chicken, goat, horse, dog, pig, cow
Level 7	The child identifies and/or names ordinary objects	20	4	Sock, Doll, Hat, and Little Car	The child identifies and/or names ordinary objects: mother and child talk about the doll and the car while playing with them; the child understands the meaning of inside, outside, come down, on, and go; the child can pull the car forward and backward while walking.
Level 7	The child identifies and/or names ordinary objects	21	1	language: commonly used noun	Child identifies/or names common objects

Table C.6: Language Task Content (Learning Words) VI

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects	21	2	picture book 1	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects: child points to the picture in the book (one or multiple), names the objects in the picture(s), makes noises, and associates the objects in the book to the object in reality.
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects	23	3	language: clothes	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects: Ask the child to recognize clothes he or she is wearing and to say the name of one or more of them. (Language- clothes)
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects	23	4	Picture talk 2	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects: child reads book with mother, says one or more objects in the picture.
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects	27	4	Picture talk 2	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects: mother asks child to point to a picture and name the object in the picture; mother then asks questions. Child names the object, discusses it, and answers the questions.
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects	28	3	language: food names	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects: The child can say names of food (language – food names)
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects	28	4	Picture talk 3	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects: mother talks about the picture, raises questions, brings up new topics, introduces color. Child talks about picture and names the object in the picture, answers the questions.

Table C.7: Language Task Content (Learning Words) VII

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects	29	2	language: touches and names	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects: Child touches one or more objects and names these objects.
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects	30	3	Picture Talk4	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects: Child names the picture and some small parts of the picture, talks about them and answers the questions.
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects	30	4	Sorting and matching 3	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects: child pair single card with the pattern on the board; child can name the picture and understand concepts of "on" and "same as".
Level 8	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects	30	4	language: Acting as Mother/Father	The child points to the pictures which are being named, names one or more pictures, mimic the sound of the objects: Ask the child to tell his/her name and age.
Level 9	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects	21	4	picture book 2	child names the objects in two or more pictures, points to the named pictures, and associates the pictures to the objects in reality.
Level 9	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects	22	2	Picture talk 1	the child points to the pictures which are being named, names two or more pictures, make the sound of the objects or animals in the pictures, and match the objects in the pictures with the actual ones.
Level 9	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects	23	1	picture book 3	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects: the child points out named pictures, says names of three or more animals, and imitates the sound of animals.
Level 9	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects	24	1	picture book 2	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects: Child can name the pictures (four or more), point to the corresponding pictures when hears the names of objects, imitate the sounds that the objects in the pictures can make, and connect with the material objects in real environment.

Table C.8: Language Task Content (Learning Words) VIII

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 9	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects	29	2	Puzzle4	The child points to the pictures which are being named, names two or more pictures, mimics the sound of the objects: Child can name different parts of the house
Level 9	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects	30	2	Puzzle7	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects: child can name eye, nose, ear, and mouth.
Level 9	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects	39	4	snake shape bottle cap ring	The child points to the pictures which are being named, names two or more pictures, mimic the sound of the objects: The child can put the cap in a circle on the cardboard according to colors, complete the caterpillar pattern and indicate or say the name of each color.
Level 10	The child points at 7 or more than 7 pictures and talk about them	26	1	Picture talk 5	The child points at 7 or more than 7 pictures and talk about them: mother and child talk about picture and colors in the picture. Child points at 7 or more than 7 pictures and talk about them.
Level 10	The child points at 7 or more than 7 pictures and talk about them	26	3	Picture talk 1	The child points at 7 or more than 7 pictures and talk about them: mother asks child to say the name of objects (7 or more) in the pictures and talks about the picture.
Level 10	The child points at 7 or more than 7 pictures and talk about them	38	2	language: clothes	The child points at 7 or more than 7 pictures and talk about them: The child can distinguish and say the different types of clothes.(7 or more)
Level 10	The child points at 7 or more than 7 pictures and talk about them	38	4	language: body part	The child points at 7 or more than 7 pictures and talk about them: The child can tell a relatively small part of the body, such as: toes, fingers, elbows, etc.(7 or more)
Level 10	The child points at 7 or more than 7 pictures and talk about them	40	4	picture talk 7	The child points at 7 or more than 7 pictures and talk about them: Mom and child talk about pictures. The child can name the name and color of the things in the picture. (7 or more)

Table C.9: Language Task Content (Learning Words) IX

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects	25	3	language: name and usage	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects: Child names objects at home, and tells the usage of those objects.
Level 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects	29	4	language: name and usage	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects: Child learns to name the objects in the house. And let the mother tell how to use them.
Level 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects	31	1	Picture talk 2	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects: Child can name animals, discuss them, and mimic their sounds
Level 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects	34	1	Picture Talk4	Child can name the pictures and talk about them. Child can name the details and answer questions.
Level 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects	37	4	Blocks and Animal	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects: Children learn to usel blocks to build animal fences and bridges, tell the names of animals, and discuss What theanimals are doing and imitate the sound of the animal. Understand the concept of "wide" and "narrow", "all" and "partial".
Level 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects	37	4	picture talk 7	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects: The child can say put the name of each graphics, discuss the role of each item, and then linkthe graphics in the card together. Mom and the child discuss the picture and come up with something else to discuss.
Level 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects	38	2	Puzzle 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects: The child can complete the puzzle and discuss the truck with the mother.
Level 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects	39	1	language: name and usage	Child names objects at home, and tells the usage of those objects
Level 11	Teach the child some simple descriptive words and the child names objects at home, and tells the usage of those objects	39	3	language: descriptive words	Teach the child some simple descriptive words.

C.2 Cognitive Skill Tasks

Table C.10: Cognitive Task Content (Understanding Objects) I

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 1	Look at the pictures and vocalize	10	2	Picture book A	Look at the pictures and vocalize: baby makes sound when looking at the pictures
Level 1	Look at the pictures and vocalize	11	3	Picture book B	Look at the pictures and vocalize: baby looks at the pictures and vocalize
Level 1	Look at the pictures and vocalize	12	3	Picture book A	Look at the pictures and vocalize: baby makes sound when looking at the pictures
Level 1	Look at the pictures and vocalize	13	3	Picture book B	Look at the pictures and vocalize: baby looks at the pictures and vocalize
Level 1	Look at the pictures and vocalize	14	1	Picture book A	Look at the pictures and vocalize: baby makes sound when looking at the pictures
Level 1	Look at the pictures and vocalize	14	2	Baby doll	Look at the pictures and vocalize: baby makes sound when holding a baby doll
Level 1	Look at the pictures and vocalize	15	2	Picture book B	Look at the pictures and vocalize: The child pronounces while looking at the pictures
Level 2	Name the objects and ask the baby to point to the pictures accordingly	16	1	picture book 1	Name the objects and ask the baby to point to the pictures accordingly: Child points to the objects in the book that the family visitor named, and learns how to turn pages.
Level 2	Name the objects and ask the baby to point to the pictures accordingly	17	1	picture book 2	Name the objects and ask the baby to point to the pictures accordingly
Level 2	Name the objects and ask the baby to point to the pictures accordingly	18	3	picture book 1	Name the objects and ask the baby to point to the pictures accordingly: Child points to the objects in the book that the family visitor named, and learns how to turn pages.
Level 2	Name the objects and ask the baby to point to the pictures accordingly	19	1	picture book 2	Name the objects and ask the baby to point to the pictures accordingly

Table C.11: Cognitive Task Content (Understanding Objects) II

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 2	Name the objects and ask the baby to point to the pictures accordingly	20	1	Baby doll	Name the objects and ask the baby to point to the pictures accordingly:start naming body parts.
Level 2	Name the objects and ask the baby to point to the pictures accordingly	22	1	Baby doll	Name the objects and ask the baby to point to the pictures accordingly: name individual parts of its body
Level 2	Name the objects and ask the baby to point to the pictures accordingly	22	1	Baby doll	Name the objects and ask the baby to point to the pictures accordingly: name individual parts of its body
Level 3	The child can name the objects in one picture, and point to the named picture	20	3	picture book 3	Child can name the objects in one picture, and point to the named picture.
Level 3	The child can name the objects in one picture, and point to the named picture	21	2	picture book 1	Child points to the picture in the book (one or multiple), names the objects in the picture(s), makes noises, and associates the objects in the book to the object in reality.
Level 4	The child can name the objects in two or more pictures, and point to the named picture	21	4	picture book 2	Child names the objects in two or more pictures, points to the named picture make noises, and associates the pictures to the objects in reality.
Level 4	The child can name the objects in two or more pictures, and point to the named picture	22	2	Picture talk 1	Child points to the pictures which are being named, names two or more pictures, make the sound of the objects or animals in the pictures, and match the objects in the pictures with the actual ones.
Level 5	The child can point out named pictures, and say names of three or more	23	1	picture book 3	Child points out named pictures, says names of three or more animals, and imitates the sound of animals.
Level 5	The child can point out named pictures, and say names of three or more	24	1	Sorting and matching 1	Child to match pictures and names with material objects (3 or more), or point to the corresponding object when names.
Level 5	The child can point out named pictures, and say names of three or more	24	1	picture book 2	Child can name the pictures (four or more), point to the corresponding pictures when hears the names of objects, imitate the sounds that the objects in the pictures can make, and connect with the material objects in real environment.
Level 5	The child can point out named pictures, and say names of three or more	24	2	Picture Talk3	The child can point out named pictures, and say names of three or more: the child point to the corresponding pictures when hears the names of the objects (3 or more)

Table C.12: Cognitive Task Content (Understanding Objects) III

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 5	The child can point out named pictures, and say names of three or more	24	3	Puzzle4	The child can point out named pictures, and say names of three or more: Child names and points to each part of the house (3 or more)
Level 5	The child can point out named pictures, and say names of three or more	24	4	Picture Book 4	Child and the mother talk about the pictures in the picture book, perform the scenes and name the objects and details of the objects in those pictures.
Level 5	The child can point out named pictures, and say names of three or more	25	1	Cap House	The child can point out named pictures, and say names of three or more: let the child identify window, door, roof, and wall, and learn to name some of them if possible;
Level 5	The child can point out named pictures, and say names of three or more	25	1	language: clothes	The child can point out named pictures, and say names of three or more: The child can recognize/identify the clothes he/she is wearing (3 or more)
Level 5	The child can point out named pictures, and say names of three or more	25	4	Picture book 3	Picture Book: mother teaches the child to name every animal, talk about them, and imitate the sounds made by the animals
Level 5	The child can point out named pictures, and say names of three or more	32	4	lip flower	Child to match pictures and names with material objects (3 or more), or point to the corresponding object when names.
Level 5	The child can point out named pictures, and say names of three or more	32	4	Sorting and matching 4	Child to match pictures and names with material objects (3 or more), or point to the corresponding object when names.
Level 6	The child can point out the picture mentioned and correctly name the name of 6 or more pictures	26	1	Picture talk 5	The child can point out the picture mentioned and correctly name the name of 6 or more pictures: mother and child talk about picture and colors in the picture. Child points at 7 or more than 7 pictures and talk about them.
Level 6	The child can point out the picture mentioned and correctly name the name of 6 or more pictures	26	3	Picture talk 1	The child can point out the picture mentioned and correctly name the name of 6 or more pictures: Mother and child perform the content of the picture, talk about the picture, the child points out the picture mentioned, and correctly names the name of 6 or more pictures
Level 6	The child can point out the picture mentioned and correctly name the name of 6 or more pictures	26	4	Picture Talk3	The child can point out the picture mentioned and correctly name the name of 6 or more pictures: Mother and child perform the content of the picture, talk about the picture, the child points out the picture mentioned, and correctly names the name of 6 or more pictures

Table C.13: Cognitive Task Content (Understanding Objects) IV

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 6	The child can point out the picture mentioned and correctly name the name of 6 or more pictures	29	3	picture book 3	The child can point out the picture mentioned and correctly name the name of 6 or more pictures: Child learns to identify and name the names of the animals in the book and makes the sounds of the animals. (6 or more)
Level 6	The child can point out the picture mentioned and correctly name the name of 6 or more pictures	29	4	Sorting and matching 5	The child can point out the picture mentioned and correctly name the name of 6 or more pictures: Mother teaches the child to match each card with the picture in each picture card, and name and identify the animals. (6 or more)
Level 6	The child can point out the picture mentioned and correctly name the name of 6 or more pictures	30	1	Cap House	The child can point out the picture mentioned and correctly name the name of 6 or more pictures: Child places caps into the circles on the drawing board; child matches caps with circles of the same color, and names different parts of the house.(6 or more)
Level 6	The child can point out the picture mentioned and correctly name the name of 6 or more pictures	30	2	Puzzle7	The child can point out the picture mentioned and correctly name the name of 6 or more pictures: Child can piece the puzzle well and name different parts of a face (eyes, nose, mouth, and ears, etc) (6 or more)
Level 6	The child can point out the picture mentioned and correctly name the name of 6 or more pictures	33	2	Puzzle7	The child can point out the picture mentioned and correctly name the name of 6 or more pictures: Child can piece the puzzle well and name different parts of a face (eyes, nose, mouth, and ears, etc) (6 or more)
Level 6	The child can point out the picture mentioned and correctly name the name of 6 or more pictures	36	1	Puzzle7	The child can point out the picture mentioned and correctly name the name of 6 or more pictures: Child can piece the puzzle well and name different parts of a face (eyes, nose, mouth, and ears, etc) (6 or more)

Table C.14: Cognitive Task Content (Understanding Objects) V

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 7	The child can talk about the pictures, answer questions, understand, or name the verbs (eat, play, etc.)	23	4	Picture talk 2	The child can talk about the pictures, answer questions, understand, or name the verbs: child reads book with mother, says objects in the picture, turns page, imitates actions in the picture and match object in the picture with object in real world.
Level 7	The child can talk about the pictures, answer questions, understand, or name the verbs (eat, play, etc.)	25	2	Picture Talk4	The child can talk about the pictures, answer questions, understand, or name the verbs: child talks about the pictures, mimics behaviors in the pictures, answer questions, understands or names the verbs (eat, play, etc.).
Level 7	The child can talk about the pictures, answer questions, understand, or name the verbs (eat, play, etc.)	27	1	picture book 4	The child can talk about the pictures, answer questions, understand, or name the verbs: child talks about the pictures, mimics behaviors in the pictures, answer questions, understands or names the verbs (eat, play, etc.).
Level 7	The child can talk about the pictures, answer questions, understand, or name the verbs (eat, play, etc.)	27	4	Picture talk 2	The child can talk about the pictures, answer questions, understand, or name the verbs: child reads book with mother, says objects in the picture, turns page, imitates actions in the picture and match object in the picture with object in real world.
Level 7	The child can talk about the pictures, answer questions, understand, or name the verbs (eat, play, etc.)	28	1	Doll, Clothes, Bed, Bed Sheet, Pillow	The child can talk about the pictures, answer questions, understand, or name the verbs: Child and mother play with the doll, talk about activity about doll, bed, and baby's clothes, with child and recognize or say the names of doll, bed and body parts.
Level 7	The child can talk about the pictures, answer questions, understand, or name the verbs (eat, play, etc.)	28	4	Picture talk 3	The child can talk about the pictures, answer questions, understand, or name the verbs: Child talks about pictures and names the object in the picture, and answers the questions.
Level 7	The child can talk about the pictures, answer questions, understand, or name the verbs (eat, play, etc.)	29	1	Picture Talk 5	The child can talk about the pictures, answer questions, understand, or name the verbs: Child can name the objects in pictures, talk about pictures, answer questions, and identify colors (red, orange).
Level 7	The child can talk about the pictures, answer questions, understand, or name the verbs (eat, play, etc.)	30	3	Picture Talk4	The child can talk about the pictures, answer questions, understand, or name the verbs: The child can talk about the pictures, answer questions, understand, or name the verbs: Child talks about pictures and names the object in the picture, and answers the questions.
Level 7	The child can talk about the pictures, answer questions, understand, or name the verbs (eat, play, etc.)	32	1	Picture talk 1	The child can talk about the pictures, answer questions, understand, or name the verbs: The child can name the pictures, talk with mother about the contents in the pictures, and answer questions.
Level 7	The child can talk about the pictures, answer questions, understand, or name the verbs (eat, play, etc.)	33	3	Picture talk 3	The child can talk about the pictures, answer questions, understand, or name the verbs: Child talks about pictures and names the object in the picture, and answers the questions.

Table C.15: Cognitive Task Content (Understanding Objects) VI

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 8	The child can follow the storyline, name actions, and answer question	26	2	language: recognize verbs	Child can follow the story line, name actions and answer question
Level 8	The child can follow the storyline, name actions, and answer question	28	2	picture book 5	Child can follow the story line, name actions and answer question
Level 8	The child can follow the storyline, name actions, and answer question	31	1	Picture talk 2	Child can name animals, discuss them, and mimic their sounds
Level 8	The child can follow the storyline, name actions, and answer question	31	3	picture book 5	Child can understand the story, answer questions, and name behaviors
Level 8	The child can follow the storyline, name actions, and answer question	34	1	Picture Talk4	Child can follow the storyline, name actions, and answer questions: Child can name the pictures and talk about them. Child can name the details and answer questions.
Level 8	The child can follow the storyline, name actions, and answer question	34	3	Picture Talk 6	Child name the pictures, talk about the pictures, connect the contents of the pictures with the real life, and raise questions.
Level 8	The child can follow the storyline, name actions, and answer question	35	4	Picture Talk 5	The child can follow the storyline, name actions, and answer question: Child is able to same the name of shapes and talks about them, is able to answer question.
Level 9	The child can understand stories, talk about the content in the pictures	32	2	Picture book 7	Child can understand stories, talk about the content in the pictures
Level 9	The child can understand stories, talk about the content in the pictures	33	1	Picture book 6	Child can understand stories, discuss the content of pictures, and the concept of wet, dry, clean, and dirty
Level 9	The child can understand stories, talk about the content in the pictures	36	2	Picture book 5	Child can understand the development of a story page by page

Table C.16: Cognitive Task Content (Understanding Objects) VII

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 10	The child can keep up with the development of the story	36	4	Picture book 8	The child can keep up with the development of the story: The child discusses and understand the main contents of the story
Level 10	The child can keep up with the development of the story	37	2	Picture book 8	Children can understand the story and answer questions. Mom and the child performed the story in the book and answered the questions.
Level 10	The child can keep up with the development of the story	41	4	picture talk : Clinic	The child can keep up with the development of the story: The child discusses and understand the main contents of the story
Level 10	The child can keep up with the development of the story	42	2	Picture book 6	The child can keep up with the development of story in each page during reading the book.
Level 11	The child can say the name of each graphics, discuss the role of each item and then link the graphics in the card together	37	4	Picture talk 7	The child can say put the name of each graphics, discuss the role of each item, and then linkthe graphics in the card together. Mom and the child discuss the picture and come up with something else to discuss.
Level 11	The child can say the name of each graphics, discuss the role of each item and then link the graphics in the card together	38	1	Picture book 6	The child can tell the things in each picture and discuss being at school and the teacher's work with children.
Level 11	The child can say the name of each graphics, discuss the role of each item and then link the graphics in the card together	38	3	Picture book 6	The child can tell the things in each picture and discuss being at school and the teacher's work with children.
Level 11	The child can say the name of each graphics, discuss the role of each item and then link the graphics in the card together	39	4	Picture talk: yard	Mom and the child discuss the picture together, what the people in the picture are doing and telling their names.
Level 11	The child can say the name of each graphics, discuss the role of each item and then link the graphics in the card together	40	4	Picture talk 7	The child can name the name and colors of the things in the picture. Encourage your child to concentrate on the picture and connect different pictures.
Level 11	The child can say the name of each graphics, discuss the role of each item and then link the graphics in the card together	42	1	2 socks doll, home and furniture	Discuss the usage of each different room with the child and place furniture according to the usage of each room. Play a house game with your child.

Table C.17: Cognitive Task Content (Understanding Objects) VIII

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 12	The child can name the things in the picture and link different pictures together and discuss some of the activities in the pictures	40	2	Picture book 8	Let the children talk about the book, and the mother asks the child some questions to help the child follow up the development of the story. Let the children talk about their experiences of buying things.
Level 12	The child can name the things in the picture and link different pictures together and discuss some of the activities in the pictures	41	1	Picture book 9	Children can understand and keep up with the development of the storyline in the book and answer simple questions.
Level 12	The child can name the things in the picture and link different pictures together and discuss some of the activities in the pictures	42	3	picture talk 6	The child can name the things in the picture and link the different pictures together. discuss some of the activities in the school.
Level 13	The child can name the things in the picture and talk about the function of objects	40	3	2 socks doll, home and furniture	The child placed the furniture and said the name of each furniture. Talk about the usage of each room, and what the doll does in each room.

C.3 Fine Motor Skills

Table C.18: Fine Motor Task Content (Drawing) I

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 1	Doodle using crayons	12	3	Crayon and paper	Child is to doodle on the paper
Level 1	Doodle using crayons	13	2	Crayon and paper	Child is to doodle on the paper
Level 1	Doodle using crayons	14	4	Crayon and paper	Child doodles on the paper.
Level 1	Doodle using crayons	16	4	Crayon and paper	Child doodles on the paper.
Level 1	Doodle using crayons	18	1	Crayon and paper	Child scribbles on the paper.
Level 1	Doodle using crayons	20	2	Crayon and paper	Child doodles on the paper.
Level 2	Mimic draw circles	21	1	Crayon and Paper	Drawing Circles: Child Imitating round and round.
Level 2	Mimic draw circles	22	3	Crayon and Paper	Drawing Circles: Child mimics to draw circles
Level 3	Mimic circles and draw straight lines	23	3	Crayon and Paper	Circles and straight line: Child to scribble on the paper, and to draw circles and perpendicular line
Level 3	Mimic circles and draw straight lines	24	3	Crayon and Paper	Circles and straight line: Child draws straight lines and circles.
Level 3	Mimic circles and draw straight lines	25	3	Crayon and Paper	Circles and straight line: let the child doodle on the paper and draw circles and straight lines from top to bottom and from left to right.
Level 3	Mimic circles and draw straight lines	26	2	Crayon and Paper	Circles and straight line: child randomly scribbles, drawing circle, and horizontal line.
Level 3	Mimic circles and draw straight lines	27	2	Crayon and Paper	Circles and straight line: child can draw circles, and horizontal lines.
Level 3	Mimic circles and draw straight lines	29	4	Crayon and Paper	Circles and straight line: Let the child draw horizontal, and color circles.

Table C.19: Fine Motor Task Content (Drawing) II

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 4	Draw circle, vertical line, and horizontal line	30	2	Crayon and Paper	vertical line and horizontal line and circle: let the child draw circle, vertical line, and horizontal line.
Level 4	Draw circle, vertical line, and horizontal line	30	4	Crayon and Paper	vertical line and horizontal line and circle:: ask the child to draw vertical lines, horizontal lines, and imitate to draw circles.
Level 4	Draw circle, vertical line, and horizontal line	31	2	Crayon and Paper	vertical line and horizontal line and circle
Level 4	Draw circle, vertical line, and horizontal line	32	1	Crayon and Paper	vertical line and horizontal line and circle
Level 4	Draw circle, vertical line, and horizontal line	33	2	Crayon and Paper	vertical line and horizontal line and circle
Level 4	Draw circle, vertical line, and horizontal line	34	2	Crayon and Paper	vertical line and horizontal line and circle: Child can doodle, and draw a circle and lines towards different directions.
Level 5	Draw circle, vertical line, and horizontal line	36	1	Crayon and Paper	Draw cicle, many lines, and cross lines: The child could draw circles, many lines (barricades or posts) and crossing lines
Level 5	Draw circle, vertical line, and horizontal line	36	3	Crayon and Paper	Draw cicle, many lines, and cross lines: The child could draw vertical lines (barricades or posts), circles or lamp posts
Level 5	Draw circle, vertical line, and horizontal line	37	3	Crayon and Paper	Draw cicle, many lines, and cross lines: The child can imitate drawing curves and zigzag curves.

Table C.20: Fine Motor Task Content (Drawing) III

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 6	Draw a cross (or T), curves and zigzag curves	38	3	Crayon and Paper	Draw a cross, curves, and zigzag curves: Children can draw cross shapes with horizontal and vertical lines Glyphs or T-shapes, draw curves and Z-line
Level 6	Draw a cross (or T), curves and zigzag curves	39	1	Crayon and Paper	Draw a cross, curves, and zigzag curves: Let the child draw a cross (or T) on the paper and draw a curve and a zigzag curve according to the picture.
Level 6	Draw a cross (or T), curves and zigzag curves	39	4	Crayon and Paper	Draw a cross, curves, and zigzag curves: The child can draw a cross (T-shaped), curve and Z-line on the paper.
Level 6	Draw a cross (or T), curves and zigzag curves	41	4	Crayon and Paper	Draw a cross, curves, and zigzag curves: Children can draw horizontal lines, vertical lines, and crosses, or T-shapes.
Level 7	Draw caterpillars	40	2	Crayon and Paper	Draw caterpillars: Children learn to draw caterpillars with heads.
Level 7	Draw caterpillars	41	2	Crayon and Paper	Draw caterpillars The child can draw caterpillars according to the picture.
Level 7	Draw caterpillars	42	4	Crayon and Paper	Draw caterpillars The child can draw caterpillars according to the picture.

C.4 Gross Motor

Table C.21: Gross Motor Task Content I

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 1	Let the child touch the ball	6	1	Soft cloth ball	Let baby touch the ball, entertain baby
Level 2	The child moves (crawls) and follows the ball	7	1	Soft cloth ball	The child moves (crawls) and follows the ball: when mother rolls the ball, let baby move and follow the ball to its side.
Level 2	The child moves (crawls) and follows the ball	7	2	Rolling water bottle	The child moves (crawls) and follows the ball: mother rolls the bottle and the baby crawls to follow
Level 2	The child moves (crawls) and follows the ball	8	3	Rolling water bottle	The child moves (crawls) and follows the ball: baby crawls to follow the bottle
Level 2	The child moves (crawls) and follows the ball	9	1	Soft cloth ball	The child moves (crawls) and follows the ball: Baby crawls to the ball by himself
Level 2	The child moves (crawls) and follows the ball	11	4	Soft cloth ball	The child moves (crawls) and follows the ball: Baby crawls to the ball by himself
Level 3	Roll the ball	10	2	Soft cloth ball	Roll the ball: baby draws pleasure through throwing and rolling the ball
Level 4	Push the toy when walking	12	2	Push the trolley	Push the toy when walking: a toy that the child can push while walking, to help the child to connect the movement and the word “push”
Level 4	Push the toy when walking	14	3	Push the trolley	Push the toy when walking: a toy that the child can push while walking, to help the child to connect the movement and the word “push”
Level 4	Push the toy when walking	17	1	Push the trolley	Push the toy when walking: the baby pushes the toy while walking. Help the baby connect the action with the word “push”.

Table C.22: Gross Motor Task Content II

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 5	Pull the toy	15	3	Pull a cart	Pull the toy: a toy that will follow when the child pulls. Help the child to connect the action with the word "pull"
Level 5	Pull the toy	17	4	Sock, Doll, Hat, and Little Car	Pull the toy:the baby pulls forward the little car.
Level 6	Pull and walk forward or backward	18	3	Pull a cart	Pull and walk forward or backward: The child can pull the toy while walking forwards or walking backwards.
Level 6	Pull and walk forward or backward	20	4	Sock, Doll, Hat, and Little Car	Pull and walk forward or backward: the child can pull the car forward and backward while walking.
Level 7	Throw ball backward, forward, upward and into a target	21	3	Soft cloth ball	Throw ball backward, forward, upward and into a target: child throws the ball backward or forward to the mother
Level 7	Throw ball backward, forward, upward and into a target	22	4	Soft cloth ball	Throw ball backward, forward, upward and into a target: Let the child throw up the soft ball, and throw it into the box, and understand the meaning of up and into
Level 7	Throw ball backward, forward, upward and into a target	31	4	Soft cloth ball	Throw ball backward, forward, upward and into a target: Child can throw the soft fabric ball under or on certain objects. Child can throw the soft fabric ball upwards

Table C.23: Gross Motor Task Content III

Difficulty Level	Difficulty Level Aim	Month	Week	Learning Materials	Task Aim and Content
Level 8	Move forward or backward. Child can understand "upward", "downward", "inside of", "outside of", "stop", "go", "fast", "slow."	23	1	Pull a cart	Move forward or backward. Child can understand "upward", "downward", "inside of", "outside of", "stop", "go", "fast", "slow." asks the child to pull bottle caps and understands the meaning of "stop" and "go".
Level 8	Move forward or backward. Child can understand "upward", "downward", "inside of", "outside of", "stop", "go", "fast", "slow."	24	4	Sock, Doll, Hat, and Little Car	Move forward or backward. Child can understand "upward", "downward", "inside of", "outside of", "stop", "go", "fast", "slow.": Sock doll, hat and toy car: Child can drag the toy car and move forward or backward. Child can understand "upward," "downward," "inside of," "outside of," "stop," "go," "fast," "slow."
Level 8	Move forward or backward. Child can understand "upward", "downward", "inside of", "outside of", "stop", "go", "fast", "slow."	28	2	Sock, Doll, Hat, and Little Car	Move forward or backward. Child can understand "upward", "downward", "inside of", "outside of", "stop", "go", "fast", "slow.": he baby can push forward or pull backward the little car while walking. Play the toy and understand the meanings of stop, go, fast, slow and next to.
Level 9	Hold the soft ball on his or her head stably while walking	28	4	Soft cloth ball	Hold the soft ball on his or her head stably while walking: child can hold the soft cloth ball on his head stably while walking; throw soft cloth ball, understand the meaning of up, under, across, on, high
Level 9	Hold the soft ball on his or her head stably while walking	30	3	Soft cloth ball	Hold the soft ball on his or her head stably while walking: child can hold the soft cloth ball on his head stably while walking; throw soft cloth ball, understand the meaning of on, under, across, on, high, and up.

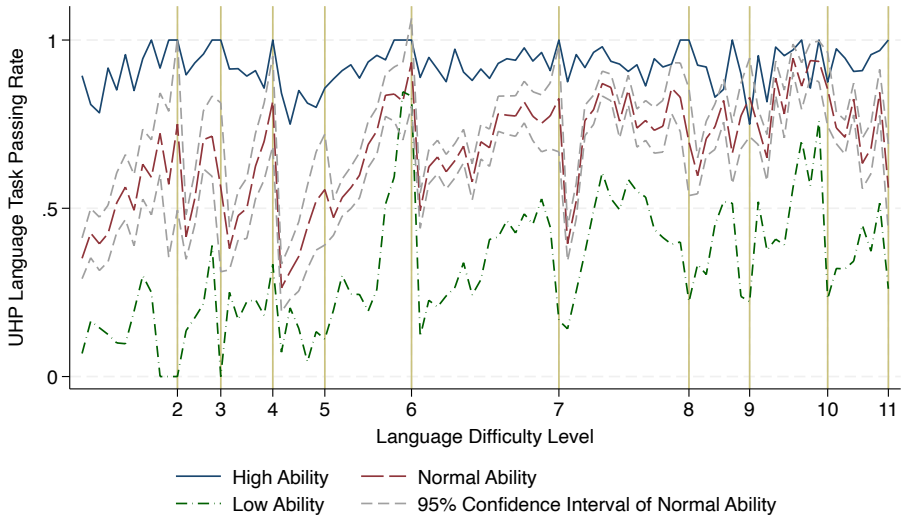
D Defining Ability Over All Levels

Figure D.1 disaggregates Figure 4 in the paper by ability as defined in Table D.1. There is a high level of persistence of ability across difficulty levels for the same skill. See Heckman and Zhou (2026). Table D.1 documents our ability measure, which is defined by performance across each level for each skill. Our ability categories are skill-specific and measured over *all* levels of the same skill throughout the intervention. Learning rates are strongly related to ability. Low-ability children learn more slowly.

Table D.1: Ability Categories (Skill-Specific, Measured over All Levels)

High Ability	Pass the first task for more than 80% of difficulty levels, and pass all skill-specific tasks at an average rate of more than 80%.
Normal Ability	Pass the first task for less than 80% of difficulty levels, and the pass rate is greater than 50%; or pass the first task for more than 80% of difficulty levels, and the average passing rate of all skill-specific tasks is between 50% and 80%.
Low Ability	The average passing rate of all skill-specific tasks is less than 50%.

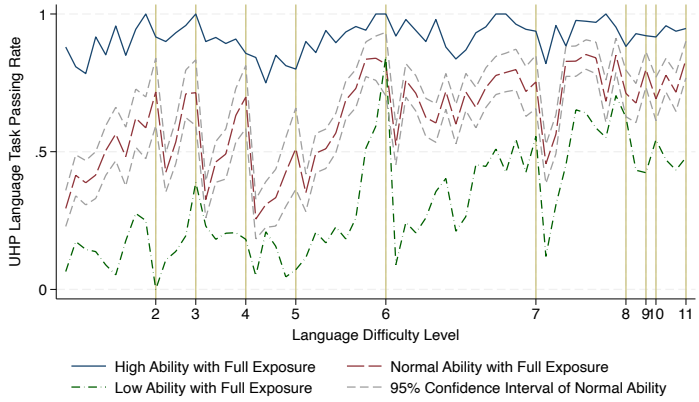
Figure D.1: By Ability Group Over all Levels: Average Language Task Passing Rates



Notes: 1. The yellow solid lines indicate the last task at each difficulty level. Within difficulty levels, tasks are arranged by the order of the children taking them.

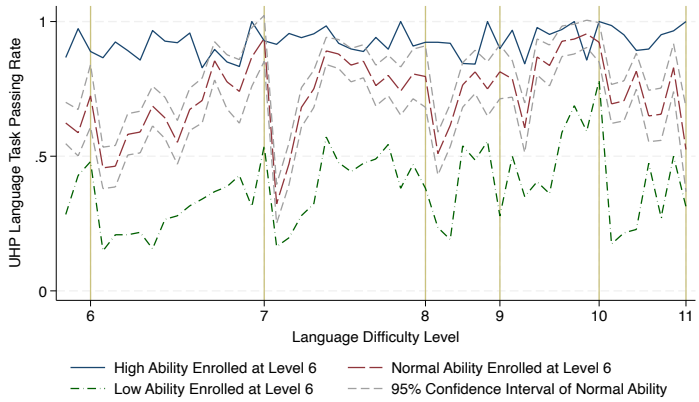
Some care must be taken in interpreting Figures 4 in the text and D.1. Treated children differ in the extent of the full curriculum to which they are exposed. This creates differences in skill levels and learning rates as characterized by Equations (1) and (5). Figure D.2 shows learning patterns by age for children who experience the full curriculum, whereas Figure D.3 shows the learning rates for children who enter the curriculum at level 6. The patterns are similar but by no means identical. Later entrants perform less well on average at the start of each level, and their learning rates are generally lower.

Figure D.2: Among Children with Full Exposure of Curriculum: Average Language Task Passing Rates by Ability Group Over all Levels



Notes: 1. The yellow solid lines indicate the last task at each difficulty level. Within difficulty levels, tasks are arranged by the order of the children taking them.

Figure D.3: Among Children Enrolled at Level 6: Average Language Task Passing Rates by Ability Group Over all Levels



Notes: 1. The yellow solid lines indicate the last task at each difficulty level. Within difficulty levels, tasks are arranged by the order of the children taking them.

Sawtooth patterns arise from the transitions across levels for language skills. The

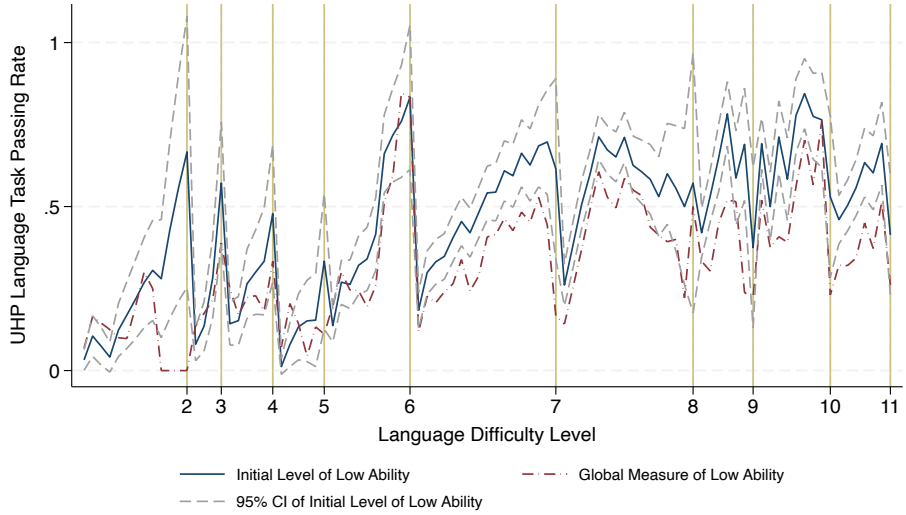
pattern for normal and low-ability children is consistent with the notion that a new type of skill in category s is being learned at different levels, calling into question the conventional practice that forces a common scale across levels.[2] High-ability children have, on average, the highest passing rates, a phenomenon that persists across levels and is found for other skills (See Appendix E, Figures E.1-E.3). But even for them, there is a modest decline in initial passing rates consistent with learning new skills across levels.

D.1 Comparing Learning Rates by Ability Measures

Figure D.4 compares the learning curve across all levels between this measure and the measure in Table D.4. These two measures give the same messages. First, low ability children can catch up by having higher passing rate at later levels as a result of each level as a result of formal investment. Second, the patterns of learning are the same: passing rates gradually go up with a level and then suddenly drop at the beginning of each new level. This is consistent with learning new skills.

[2]It is of course possible that the same skill is being learned across levels, but the passing threshold for the skill jumps up discontinuously at each transition point. Consistent over-statement of the skill requirements across levels seems implausible and is inconsistent with the evidence in Heckman and Zhou (2026). The uniform patterns of decline are implausible if thresholds are not being adjusted systematically.

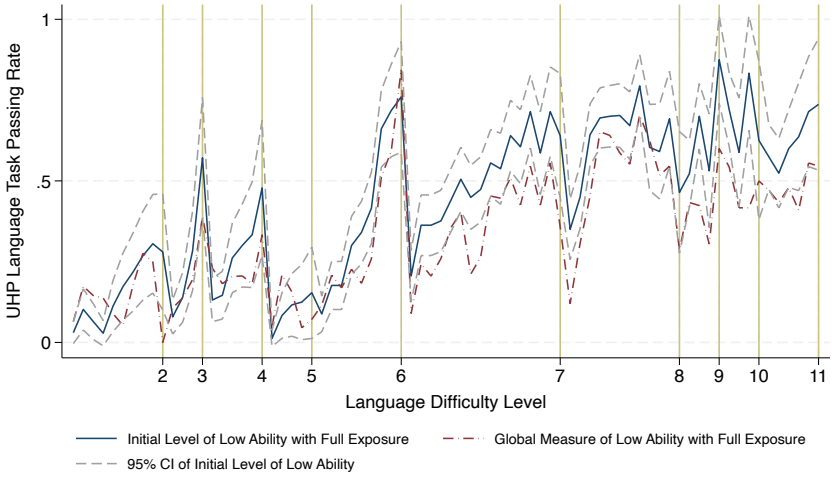
Figure D.4: Comparing Initial Levels and Over all Levels Low Ability: Average Language Task Passing Rates



Notes: 1. The yellow solid lines indicate the last task at each difficulty level. Within difficulty levels, tasks are arranged by the order of the children taking them.

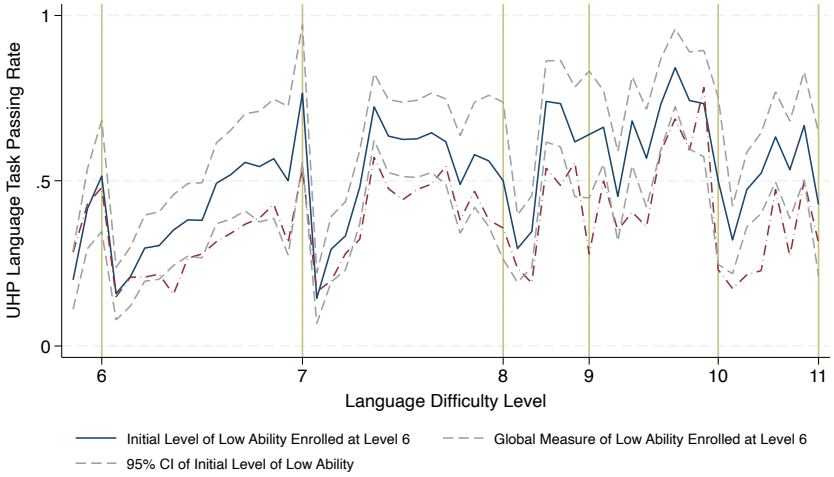
Figure D.5 and Figure D.6 compare the estimates from the two measures.

Figure D.5: Comparing Initial Levels and Over all Levels Low Ability with Full Exposure of Curriculum: Average Language Task Passing Rates



Notes: 1. The yellow solid lines indicate the last task at each difficulty level. Within difficulty levels, tasks are arranged by the order of the children taking them.

Figure D.6: Comparing Initial Levels and Over all Levels Low Ability Enrolled at Level 6: Average Language Task Passing Rates



Notes: 1. The yellow solid lines indicate the last task at each difficulty level. Within difficulty levels, tasks are arranged by the order of the children taking them.

E UHP Task Passing Rate by Ability

E.1 Compare Ability based on Global Measure and Initial Level Measure

Figure E.1: By Ability Group (Global Measure): Average Cognitive Task Passing Rates

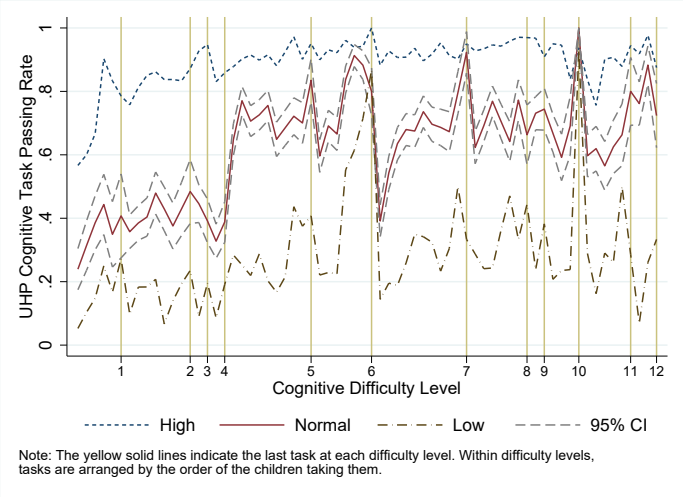


Figure E.2: By Ability Group (Global Measure): Average Fine Motor Task Passing Rates

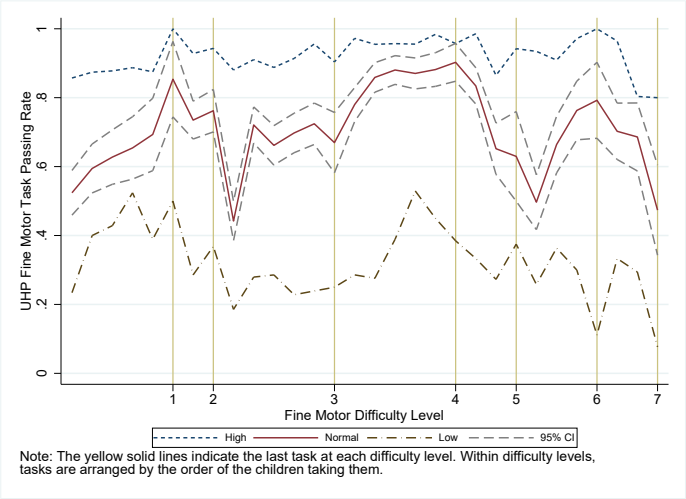


Figure E.3: By Ability Group (Global Measure): Average Gross Motor Task Passing Rates

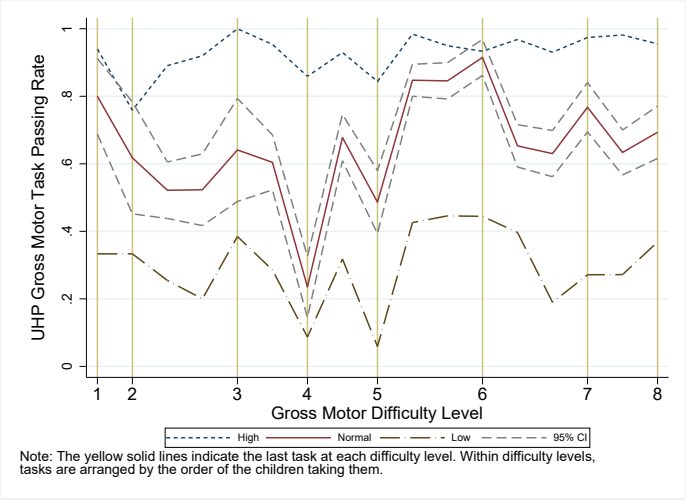
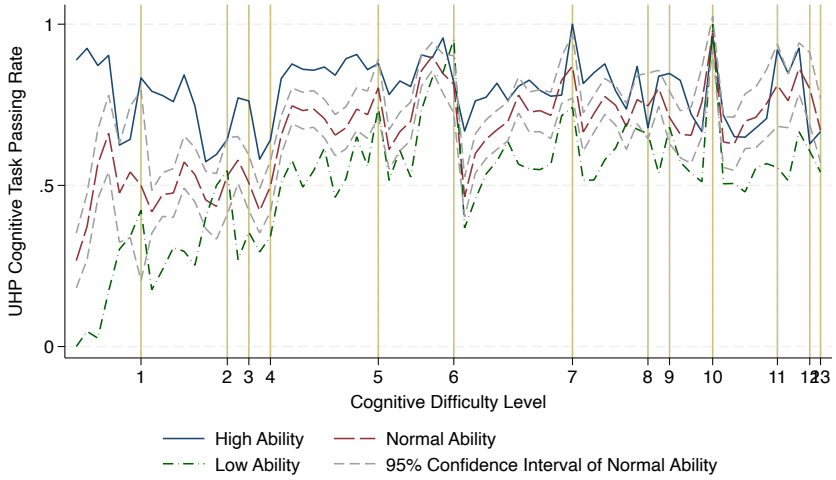
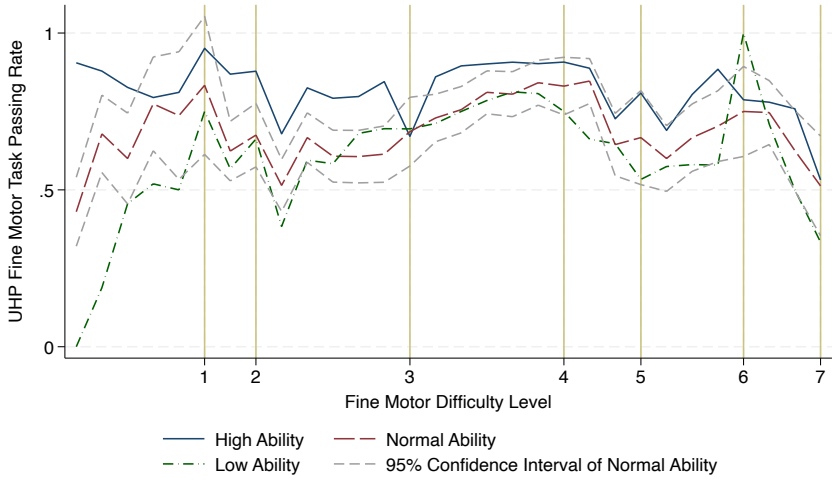


Figure E.4: **Initial Level of Ability Group**: Average Cognitive Task Passing Rates



Notes: 1. The yellow solid lines indicate the last task at each difficulty level. Within difficulty levels, tasks are arranged by the order of the children taking them.

Figure E.5: **Initial Level of Ability Group**: Average Fine Motor Task Passing Rates



Notes: 1. The yellow solid lines indicate the last task at each difficulty level. Within difficulty levels, tasks are arranged by the order of the children taking them.

F Testing for Commonality in Skills Across Levels and Guessing Parameter

We test for the comparability of the skills across levels. To do so, we follow a procedure pioneered by Lord and Novick (1968). Defining $D(\ell, s) = 1$ as a correct answer on item s in level ℓ, we fit three-parameter item response theory (IRT) models level by level as follows:

$$\Pr(D(s, \ell, a) = 1 \mid \theta) = c_\ell + (1 - c_\ell)\Phi(\alpha_\ell(\theta - b_{\ell,s})) \tag{F.1}$$

where θ is "true ability." c_ℓ is a "guessing parameter" for level ℓ, which can be interpreted as a measure of measurement error for the true θ. "α_ℓ" is a discrimination parameter and $b_{\ell,s}$ is a difficulty parameter for item s in level ℓ. Φ is a logit cdf.

Table F.1 presents the parameter estimates for the language skill. In the curriculum, tasks are similar within each level, and children improve their skills through repetition. We align the IRT model with this data structure, testing if skills are measured on the same scale across levels. To do so, we constrain the discrimination parameter (α_ℓ) to be equal for all tasks within a level but allow it to vary across levels. We estimate a unique difficulty parameter ($b_{\ell,s}$) for each item (task) within each level. That is, item difficulties are free within each level and across levels. Recall that the standard IRT model assumes no skill growth and only assesses a single trait. We modify it to account for learning within a level and allow the difficulty parameters ($b_{\ell,s}$) to decrease as the task sequence number (s) increases for a given level ℓ.

In Table F.1, Panel A presents the estimated discrimination parameter for each level. The estimates differ significantly across levels, indicating that the scales of the latent skills are not uniform across levels. This finding is consistent with the analysis of Heckman and Zhou (2026) and the visual evidence in Figure 5. Panel B presents the difficulty parameters. Different skills appear at different levels. First, note that these parameters are not directly comparable across levels due to the different discrimination parameters. Second, we observe a clear pattern: the difficulty parameters ($b_{\ell,s}$) generally decrease within each level. This pattern provides evidence that children's language skills grow within levels.

Panel C presents estimates of the guessing parameters (c_ℓ), the probability of a correct response by chance. This is an estimate of measurement error within each level. They are significantly different from zero in only a few levels, suggesting measurement error is generally low. We conduct a likelihood ratio test comparing the model in Equation (F.1) to a restricted model where parameters are constrained to be equal across levels (i.e., $\alpha_\ell = \alpha_{\ell-1}$, $b_{\ell,s} = b_{\ell-1,s}$ and $c_\ell = c_{\ell-1}$ $\forall \ell$). That is, in a restricted model associated with uniform skills across levels with discrimination constrained to be equal across tasks and across levels; item difficulties are free within levels but constrained across levels. Also, guessing parameters are constrained to be equal across levels. Panel D presents the likelihood ratio test between these two models. We reject the null hypothesis that the constrained model fits as well as the full model. In other words, consistent with the ocular evidence in Figure 5, we find no evidence for a common scale for language skill across levels. Most confidence intervals for c_ℓ include zero, so guessing is not generally an important phenomenon.

Heckman and Zhou (2026) present a more rigorous econometric examination of guessing in these data and find little evidence that guessing is an important phenomenon in the data.

We reject the hypothesis of a common scale for the cognitive skill, but fail to reject it for fine motor skills. This finding is consistent with the more formal model of Heckman and Zhou (2026).

Table F.1: Language Skill: 3-Parameter IRT by Level

	UHP Language Levels ℓ									
	$\ell = 2$	$\ell = 3$	$\ell = 4$	$\ell = 5$	$\ell = 6$	$\ell = 7$	$\ell = 8$	$\ell = 9$	$\ell = 10$	$\ell = 11$
Panel A. Discrimination										
α_ℓ	2.071***	2.483***	2.041***	1.513***	1.704***	3.029***	1.465***	3.703	4.342	1.297***
	(0.174)	(0.621)	(0.619)	(0.178)	(0.304)	(0.447)	(0.090)	(3.680)	(3.211)	(0.247)
Panel B. Difficulty										
Task 1 $b_{\ell,1}$	0.413***	0.361**	0.871***	0.833***	0.127	0.288***	0.166**	0.084	0.080	-0.807**
	(0.086)	(0.145)	(0.244)	(0.134)	(0.168)	(0.066)	(0.073)	(0.120)	(0.116)	(0.393)
Task 2 $b_{\ell,2}$	0.149	-0.011	0.537**	0.567***	-0.199	-0.053	-0.252***	-0.101	0.475**	-0.777**
	(0.092)	(0.121)	(0.217)	(0.136)	(0.163)	(0.055)	(0.075)	(0.230)	(0.225)	(0.367)
Task 3 $b_{\ell,3}$	0.167*	-0.434**	0.318	0.377**	-0.267	-0.111**	-0.890***	-0.253	-0.235	-1.039***
	(0.100)	(0.172)	(0.212)	(0.156)	(0.177)	(0.055)	(0.088)	(0.346)	(0.273)	(0.389)
Task 4 $b_{\ell,4}$	-0.021	-0.567**	-0.038	0.160	-0.408**	-0.060	-1.153***	-0.610	-0.069	-0.659
	(0.102)	(0.241)	(0.207)	(0.175)	(0.183)	(0.054)	(0.097)	(0.440)	(0.174)	(0.414)
Task 5 $b_{\ell,5}$	-0.215**	-0.307	-0.215	-0.088	-0.612***	-0.152**	-1.551***	-0.242	-0.762**	-0.819**
	(0.107)	(0.305)	(0.245)	(0.204)	(0.190)	(0.061)	(0.115)	(0.322)	(0.313)	(0.369)
Panel C. Guessing										
c_ℓ	0.000	0.094	0.236	0.000	0.029	0.160	0.000	0.282	0.517	0.035
Lower 95% CI	[-0.00005,	[-0.03478,	[0.09127,	[-0.00011,	[-0.13276,	[0.10766,	[-0.00009,	[0.07218,	[0.40155,	[-0.33489,
Upper 95% CI	0.00005]	0.22258]	0.38154]	0.00011]	0.18989]	0.21302]	0.00009]	0.49172]	0.63149]	0.40518]
Panel D. Common Scale Test										
Test Statistics of the Likelihood-ratio Test						284.228			*p*-value: 0.000	

Notes: 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses. We report the estimated 3-parameter IRT with guessing parameter. As each task within each difficulty level is the same and allows learning within level, 3PL estimated with discrimination constrained equally across tasks within each level; item difficulties are free within levels. 2. Task number indicates the order of task children had within each level. Tasks across levels are not similar. 3. Panel D. presents test statistics of the likelihood-ratio test between the full model presented in the table and the constrained model assuming a common scale across levels with discrimination constrained equal across tasks and across levels; item difficulties free within levels but constrained across each level; guessing parameter constrained equal across levels. We reject the hypothesis that constrained model fit is as good as the full model.

Table F.2: Cognitive Skill: 3-Parameter IRT by Level

	UHP Cognitive Levels ℓ					
	$\ell = 1$	$\ell = 2$	$\ell = 5$	$\ell = 6$	$\ell = 7$	$\ell = 8$
Panel A. Discrimination						
a_ℓ	1.773***	1.789***	3.022***	2.019***	1.986***	1.587***
	(0.182)	(0.225)	(0.396)	(0.132)	(0.225)	(0.213)
Panel B. Difficulty						
Task 1 $b_{\ell,1}$	0.780***	0.270**	-0.306***	-0.474***	0.247**	-0.584***
	(0.117)	(0.121)	(0.103)	(0.066)	(0.123)	(0.215)
Task 2 $b_{\ell,2}$	0.474***	0.108	-0.610***	-0.730***	-0.217*	-0.735***
	(0.119)	(0.109)	(0.097)	(0.071)	(0.122)	(0.210)
Task 3 $b_{\ell,3}$	0.182	0.059	-0.475***	-0.702***	-0.430***	-0.957***
	(0.116)	(0.123)	(0.093)	(0.072)	(0.116)	(0.200)
Task 4 $b_{\ell,4}$	-0.010	-0.114	-0.510***	-1.385***	-0.549***	-0.876***
	(0.127)	(0.118)	(0.105)	(0.096)	(0.123)	(0.211)
Task 5 $b_{\ell,5}$	0.149	0.079	-0.577***	-1.702***	-0.639***	-0.792***
	(0.142)	(0.129)	(0.106)	(0.116)	(0.124)	(0.249)
Panel C. Guessing						
c_ℓ	0.000	0.007	0.157	0.000	0.126	0.068
	(0.000)	(0.049)	(0.049)	(0.000)	(0.052)	(0.109)
Panel D. Common Scale Test						
Test Statistics of the Likelihood-ratio Test			177.910		p-value: 0.000	

Notes: 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses. We report the estimated 3-parameter IRT with guessing parameter. As each task within each difficulty level is the same and allows learning within level, 3PL estimated with discrimination constrained equally across tasks within each level; item difficulties are free within levels. 2. Task number indicates the order of task children had within each level. Tasks across levels are not similar. 3. Panel D. presents test statistics of the likelihood-ratio test between the full model presented in the table and the constrained model assuming a common scale across levels with discrimination constrained equal across tasks and across levels; item difficulties free within levels but constrained across each level; guessing parameter constrained equal across levels. We reject the assumption that a constrained model could fit as well as the full model. 4. We could not fit cognitive levels 3 and 4 because there are not enough tasks within these two levels to fit 3-parameter IRT.

Table F.3: Fine Motor Skill: 3-Parameter IRT by Level

	UHP Fine Motor Levels ℓ			
	$\ell = 1$	$\ell = 3$	$\ell = 4$	$\ell = 6$
Panel A. Discrimination				
a_ℓ	1.849***	2.481***	2.237***	1.966***
	(0.364)	(0.481)	(0.181)	(0.218)
Panel B. Difficulty				
Task 1 $b_{\ell,1}$	-0.324	0.130	-1.133***	-0.613***
	(0.257)	(0.121)	(0.082)	(0.098)
Task 2 $b_{\ell,2}$	-0.632***	-0.614***	-1.288***	-0.964***
	(0.242)	(0.148)	(0.090)	(0.115)
Task 3 $b_{\ell,3}$	-0.807***	-0.506***	-1.422***	-1.230***
	(0.259)	(0.134)	(0.098)	(0.138)
Task 4 $b_{\ell,4}$	-0.974***	-0.581***	-1.449***	-1.266***
	(0.292)	(0.143)	(0.102)	(0.188)
Panel C. Guessing				
c_ℓ	0.057	0.208	0.000	0.000
	(0.138)	(0.066)	(0.000)	(0.000)
Panel D. Common Scale Test				
Test Statistics of the Likelihood-ratio Test	21.264		p-value:0.943	

Notes: 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses. We report the estimated 3-parameter IRT with guessing parameter. As each task within each difficulty level is the same and allows learning within level, 3PL estimated with discrimination constrained equally across tasks within each level; item difficulties are free within levels. 2. Task number indicates the order of task children had within each level. Tasks across levels are not similar. 3. Panel D. presents test statistics of the likelihood-ratio test between the full model presented in the table and the constrained model assuming a common scale across levels with discrimination constrained equal across tasks and across levels; item difficulties free within levels but constrained across each level; guessing parameter constrained equal across levels. We can not reject the assumption that the constrained model could fit as well as the full model. 4. We could not fit fine motor levels 2, 5, and 7 because there are not enough tasks within these two levels to fit 3-parameter IRT.

G Effects of Z on Time to First Mastery for Other Skills

Table G.1: Effects of $\boldsymbol{Z}$ on Time to First Mastery (Cognitive)

	UHP Cognitive Levels ℓ			
$d(s,\ell)$	$\ell=5$	$\ell=6$	$\ell=7$	$\ell=8$
Grandparent	0.377	0.426*	0.731**	0.632**
	(0.356)	(0.215)	(0.341)	(0.262)
% Left-Behind in the Village	4.511*	2.061**	4.375**	2.333**
	(2.449)	(0.996)	(2.113)	(1.133)
Father's Years of Education	0.040***	0.010	0.029	0.013
	(0.015)	(0.011)	(0.027)	(0.008)
Mother's Years of Education	-0.036**	-0.013	-0.026	-0.016**
	(0.014)	(0.011)	(0.028)	(0.008)
Male	0.191	0.100	0.002	-0.215**
	(0.122)	(0.111)	(0.156)	(0.099)

1. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. We report average marginal effects from our fitted OLS. Standard errors clustered at the village level are reported in parentheses.
2. $\boldsymbol{Z}$ includes gender, type of primary caregiver, parents' years of education, and fraction of left-behind children at the village level.

Table G.2: Effects of $\boldsymbol{Z}$ on Time to First Mastery (Fine Motor)

	UHP Fine Motor Levels ℓ				
$d(s,\ell)$	$\ell=3$	$\ell=4$	$\ell=5$	$\ell=6$	$\ell=7$
Grandparent	0.259	0.238	0.111	0.487***	0.231
	(0.176)	(0.147)	(0.100)	(0.173)	(0.165)
% Left-Behind in the Village	1.996**	2.250*	1.199**	1.567*	0.440
	(0.923)	(1.209)	(0.495)	(0.798)	(1.020)
Father's Years of Education	0.006	0.012	0.006	0.009	0.012***
	(0.012)	(0.014)	(0.006)	(0.008)	(0.004)
Mother's Years of Education	-0.008	-0.017	-0.007	-0.007	-0.015***
	(0.011)	(0.014)	(0.006)	(0.008)	(0.002)
Male	0.156*	-0.013	-0.034	0.159	-0.035
	(0.092)	(0.077)	(0.053)	(0.106)	(0.099)

1. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. We report average marginal effects from our fitted OLS. Standard errors clustered at the village level are reported in parentheses.
2. $\boldsymbol{Z}$ includes gender, type of primary caregiver, parents' years of education, and fraction of left-behind children at the village level.

H Evidence on Dynamic Complementarity Among Low Ability Group in Global Measure

H.1 Language Skill

Table H.1: **Global Measure of Ability:** Time to First Mastery Among Low Ability Group by Enrollment Cohort (Language)

	UHP Language Levels ℓ				
$d(s,\ell)$	$\ell=7$	$\ell=8$	$\ell=9$	$\ell=10$	$\ell=11$
Full Exposure of Curriculum	5.295	3.280	1.780	1.583	1.850
Enrolled at Level 6	4.648	4.157	2.413	2.275	3.185
p-value	0.270	**0.031**	**0.000**	**0.043**	**0.000**
stepdown p-value	0.267	**0.072**	**0.004**	**0.072**	**0.004**

Notes: 1. This table illustrates the learning speed within the same UHP level conditional on enrollment cohorts. Time to first mastery is the number of trials a child takes until the first success at each difficulty level during the intervention for each skill type. 2. Children with full exposure of curriculum stands for children who did not skip any UHP levels prior than level 6. Children enrolled at level 6 stands for children who skipped all UHP levels prior than level 6. 3. Stepdown p-values are constructed by multiple hypotheses between children with full exposure versus children enrolled at level 6 across UHP levels based on Romano and Wolf (2005a,b) by 250 times of bootstrap.

H.2 Cognitive Skill

Table H.2: Time to First Mastery Among Low Ability Group by Enrollment Cohort (Cognitive)

	UHP Cognitive Levels ℓ			
$d(s,\ell)$	$\ell=5$	$\ell=6$	$\ell=7$	$\ell=8$
Full Exposure of Curriculum	4.143	3.169	4.742	2.864
Enrolled at Level 5	3.348	3.500	4.760	3.833
p-value	0.268	0.404	0.980	**0.037**

Notes: 1. This table illustrates the learning speed within the same UHP level conditional on enrollment cohorts. Time to first mastery is the number of trials a child takes until the first success at each difficulty level during the intervention for each skill type. 2. Children with full exposure of curriculum stands for children who did not skip any UHP levels prior than level 5. Children enrolled at level 5 stands for children who skipped all UHP levels prior than level 5.

H.3 Fine Motor Skill

Table H.3: Time to First Mastery Among Low Ability Group by Enrollment Cohort (Fine Motor)

	UHP Fine Motor Levels ℓ			
$d(s,\ell)$	$\ell=3$	$\ell=4$	$\ell=5$	$\ell=6$
Full Exposure of Curriculum	3.000	2.542	1.667	2.250
Enrolled at Level 3	3.417	3.294	2.095	2.444
p-value	0.319	0.102	0.114	0.747

Notes: 1. This table illustrates the learning speed within the same UHP level conditional on enrollment cohorts. Time to first mastery is the number of trials a child takes until the first success at each difficulty level during the intervention for each skill type. 2. Children with full exposure of curriculum stands for children who did not skip any UHP levels prior than level 3. Children enrolled at level 3 stands for children who skipped all UHP levels prior than level 3.

I Cross Skill Effects

I.1 Cross Skill Effects on Rate of Learning

For vector $\boldsymbol{K}(a)$,

$$\boldsymbol{K}(a+1) = \boldsymbol{F}(\boldsymbol{K}(a), \boldsymbol{I}(a)) \tag{I.1}$$

We add cognitive and fine motor skills' stock of knowledge in the previous level on the rate of learning of language level by level, and examine their effects. We fit the following regression:

$$\begin{aligned} d(s,\ell) = \beta_0 + \beta_1 Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1) + \beta_2 Pr(D(c,\ell-1,\bar{a}(\ell-1,s))=1) \\ + \beta_3 Pr(D(f,\ell-1,\bar{a}(\ell-1,s))=1) + \beta' \boldsymbol{Z} \end{aligned} \tag{I.2}$$

where $d(s,\ell)$ denotes the time to first mastery of language skill s at level ℓ, $Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1)$ is the predicted probability of mastering the final language task in level $\ell-1$; $Pr(D(c,\ell-1,\bar{a}(\ell-1,s))=1)$ is predicted probability of mastering the final cognitive task that is a prerequisite for the first language task at level ℓ, and $Pr(D(f,\ell-1,\bar{a}(\ell-1,s))=1)$ is predicted probability of mastering the final fine motor task that is a prerequisite for the first language task at level ℓ. c here stands for cognitive skill and f stands for fine motor skill.

Table I.1 shows how the initial stock of knowledge of each skill, approximated by the predicted performance in the previous level, contributes to the learning speed

in the language level. Note that the outcome variable is time to first mastery. A smaller value indicates that the children learn faster (i.e., take fewer tasks to reach their first correct answer). As expected, the initial stock of knowledge of language is the major contribution to language learning speed at all levels. Children with a higher initial stock of knowledge learn faster. We observe that cognitive and fine motor skills have a significant positive effect on language learning, but their effects are not uniform across levels, indicating that different levels of skill accumulate through various channels. Our level-by-level analysis shows that the technologies differ by level, consistent with different skills being produced by level.

Table I.1: Cross Skill Effects on Language Time to First Mastery

	UHP Language Levels ℓ				
$d(s,\ell)$	$\ell=7$	$\ell=8$	$\ell=9$	$\ell=10$	$\ell=11$
$Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	-5.689***	-2.488***	-0.833*	-0.652*	-2.518***
$s=$ Language	(1.090)	(0.580)	(0.454)	(0.334)	(0.521)
$Pr(D(c,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	-1.314**	-1.120***	-1.073***	0.018	-0.381
$c=$ Cognitive	(0.565)	(0.335)	(0.386)	(0.708)	(0.435)
$Pr(D(f,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	-1.357	-2.118***	-0.242	-1.635**	-0.664*
$f=$ Fine Motor	(1.201)	(0.726)	(0.336)	(0.700)	(0.349)
$\boldsymbol{Z}$	X	X	X	X	X
stepdown p-value					
$Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	**0.000**	**0.000**	**0.074**	**0.072**	**0.000**
$Pr(D(c,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	**0.036**	**0.003**	**0.010**	0.976	0.537
$Pr(D(f,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	0.375	**0.007**	0.547	**0.036**	**0.074**

Notes: 1. $Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1)$ is the predicted probability of mastering the final language task in level $\ell-1$; $Pr(D(c,\ell-1,\bar{a}(\ell-1,s))=1)$ is predicted probability of mastering the final cognitive task that is a prerequisite for the first language task at level ℓ, and $Pr(D(f,\ell-1,\bar{a}(\ell-1,s))=1)$ is predicted probability of mastering the final fine motor task that is a prerequisite for the first language task at level ℓ. 2. Control variables ($\boldsymbol{Z}$) include gender, the fraction of time children were raised by grandparents through the intervention, parents' years of education, and the fraction of left-behind children at the village level. 3. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. We report coefficients from the logits. Standard errors clustered at the village level are reported in parentheses. 4. Stepdown p-values are constructed by multiple hypotheses across UHP levels based on Romano and Wolf (2005a,b) by 5000 times of bootstrap.

Table I.2: Cross Skill Effects on Cognitive Time to First Mastery

	UHP Cognitive Levels ℓ						
$d(c,\ell)$	$\ell=2$	$\ell=3$	$\ell=4$	$\ell=5$	$\ell=6$	$\ell=7$	$\ell=8$
$Pr(D(c,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	-0.729	-0.567***	-0.687***	-0.580	-1.703**	-6.103***	-0.308
$c=$ Cognitive	(0.503)	(0.175)	(0.184)	(0.586)	(0.725)	(1.475)	(0.480)
$Pr(D(s,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	-1.984***	-0.562***	-0.573***	-2.041***	-1.677***	-2.627***	-2.674***
$s=$ Language	(0.617)	(0.152)	(0.211)	(0.708)	(0.433)	(0.844)	(0.336)
$Pr(D(f,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	-3.143**	-0.304	0.119	-2.552**	-0.885	-0.493	-0.946**
$f=$ Fine Motor	(1.234)	(0.236)	(0.265)	(1.182)	(0.679)	(0.748)	(0.422)
$\boldsymbol{Z}$	X	X	X	X	X	X	X
stepdown p-value							
$Pr(D(c,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	0.490	**0.008**	**0.003**	0.809	**0.063**	**0.002**	0.958
$Pr(D(s,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	**0.008**	**0.003**	**0.024**	**0.017**	**0.002**	**0.010**	**0.000**
$Pr(D(f,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	**0.036**	0.602	0.960	**0.093**	0.602	0.958	**0.081**

Notes: 1. $Pr(D(c,\ell-1,\bar{a}(\ell-1,c))=1)$ is the predicted probability of mastering the final cognitive task in level $\ell-1$; $Pr(D(s,\ell-1,\bar{a}(\ell-1,c))=1)$ is predicted probability of mastering the final language task that is a prerequisite for the first cognitive task at level ℓ, and $Pr(D(f,\ell-1,\bar{a}(\ell-1,c))=1)$ is predicted probability of mastering the final fine motor task that is a prerequisite for the first cognitive task at level ℓ. 2. Control variables ($\boldsymbol{Z}$) include gender, the fraction of time children were raised by grandparents through the intervention, parents' years of education, and the fraction of left-behind children at the village level. 3. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. We report coefficients from the logits. Standard errors clustered at the village level are reported in parentheses. 4. Stepdown p-values are constructed by multiple hypotheses across UHP levels based on Romano and Wolf (2005a,b) by 5000 times of bootstrap.

Table I.3: Cross Skill Effects on Fine Motor Time to First Mastery

	UHP Fine Motor Levels ℓ					
$d(s,\ell)$	$\ell=2$	$\ell=3$	$\ell=4$	$\ell=5$	$\ell=6$	$\ell=7$
$Pr(D(f,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	-0.752***	-2.682***	-2.205***	-1.496***	-1.474**	-1.169***
$f=$ Fine Motor	(0.147)	(0.474)	(0.469)	(0.342)	(0.695)	(0.347)
$Pr(D(s,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	-0.020	-0.442	-0.079	-0.217	-0.948*	0.147
$s=$ Language	(0.167)	(0.524)	(0.305)	(0.252)	(0.488)	(0.900)
$Pr(D(c,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	-0.334***	0.177	-0.907***	-0.217	0.568	-0.647
$c=$ Cognitive	(0.121)	(0.420)	(0.324)	(0.263)	(1.392)	(0.490)
$\boldsymbol{Z}$	X	X	X	X	X	X
stepdown p-value						
$Pr(D(f,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	**0.000**	**0.000**	**0.001**	**0.001**	**0.092**	**0.006**
$Pr(D(s,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	0.986	0.882	0.986	0.882	0.138	0.986
$Pr(D(c,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	**0.017**	0.986	**0.017**	0.882	0.986	0.531

Notes: 1. $Pr(D(f,\ell-1,\bar{a}(\ell-1,f))=1)$ is the predicted probability of mastering the final fine motor task in level $\ell-1$; $Pr(D(s,\ell-1,\bar{a}(\ell-1,f))=1)$ is predicted probability of mastering the final language task that is a prerequisite for the first fine motor task at level ℓ, and $Pr(D(c,\ell-1,\bar{a}(\ell-1,f))=1)$ is predicted probability of mastering the final cognitive task that is a prerequisite for the first fine motor task at level ℓ. 2. Control variables ($\boldsymbol{Z}$) include gender, the fraction of time children were raised by grandparents through the intervention, parents' years of education, and the fraction of left-behind children at the village level. 3. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. We report coefficients from the logits. Standard errors clustered at the village level are reported in parentheses. 4. Stepdown p-values are constructed by multiple hypotheses across UHP levels based on Romano and Wolf (2005a,b) by 5000 times of bootstrap.

I.2 Cross Skill Effects on Transmission

Table I.4: Including Cross Skill Effect: Language Skill Transmission $Q(s, \ell, a(\ell), \boldsymbol{Z})$ by levels

	UHP Language Levels ℓ				
$\Pr(D(s,\ell,\bar{a}(\ell,s))Z)=1$	$\ell=7$	$\ell=8$	$\ell=9$	$\ell=10$	$\ell=11$
$Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	0.295*	0.176	0.767***	0.575***	0.468**
$s=$ Language	(0.154)	(0.176)	(0.184)	(0.113)	(0.221)
$Pr(D(c,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	0.395***	0.398***	0.124	0.031	0.375**
$c=$ Cognitive	(0.135)	(0.118)	(0.192)	(0.301)	(0.154)
$Pr(D(f,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	0.132	0.152	-0.058	0.266	0.196
$f=$ Fine Motor	(0.152)	(0.121)	(0.137)	(0.184)	(0.134)
$\boldsymbol{Z}$	X	X	X	X	X
stepdown p-value					
$Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	**0.094**	0.546	**0.000**	**0.000**	**0.067**
$Pr(D(c,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	**0.005**	**0.002**	0.732	0.875	**0.014**
$Pr(D(f,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	0.633	0.417	0.813	0.319	0.319

Notes: 1. $Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1)$ is the predicted probability of mastering the final language task in level $\ell-1$; $Pr(D(c,\ell-1,\bar{a}(\ell-1,s))=1)$ is predicted probability of mastering the final cognitive task that is a prerequisite for the first language task at level ℓ, and $Pr(D(f,\ell-1,\bar{a}(\ell-1,s))=1)$ is predicted probability of mastering the final fine motor task that is a prerequisite for the first language task at level ℓ. 2. Control variables ($\boldsymbol{Z}$) include gender, the fraction of time children were raised by grandparents through the intervention, parents' years of education, and the fraction of left-behind children at the village level. 3. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. We report coefficients from the logits. Standard errors clustered at the village level are reported in parentheses. 4. Stepdown p-values are constructed by multiple hypotheses across UHP levels based on Romano and Wolf (2005a,b) by 5000 times of bootstrap.

Table I.5: Including Cross Skill Effect: Cognitive Skill Transmission $Q(s, \ell, a(\ell), \boldsymbol{Z})$ by levels

	UHP Cognitive Levels ℓ						
$d(c,\ell)$	$\ell=2$	$\ell=3$	$\ell=4$	$\ell=5$	$\ell=6$	$\ell=7$	$\ell=8$
$Pr(D(c,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	0.531***	0.732***	0.522***	0.512***	0.260*	0.742***	0.421**
c = Cognitive	(0.175)	(0.150)	(0.117)	(0.160)	(0.150)	(0.266)	(0.174)
$Pr(D(s,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	0.575***	0.472***	0.668***	0.058	-0.058	0.292*	0.187
s = Language	(0.127)	(0.107)	(0.172)	(0.103)	(0.116)	(0.170)	(0.116)
$Pr(D(f,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	0.000	-0.049	-0.160	0.200	0.288*	0.121	0.247
f = Fine Motor	(0.238)	(0.178)	(0.202)	(0.192)	(0.153)	(0.131)	(0.165)
$\boldsymbol{Z}$	X	X	X	X	X	X	X
stepdown p-value							
$Pr(D(c,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	**0.020**	**0.001**	**0.001**	**0.004**	0.368	**0.026**	**0.075**
$Pr(D(s,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	**0.001**	**0.001**	**0.002**	0.978	0.978	0.368	0.444
$Pr(D(f,\ell-1,\bar{a}(\ell-1,c))=1\|Z)$	1.000	0.993	0.941	0.846	0.253	0.888	0.474

Notes: 1. $Pr(D(c,\ell-1,\bar{a}(\ell-1,c))=1)$ is the predicted probability of mastering the final cognitive task in level $\ell-1$; $Pr(D(s,\ell-1,\bar{a}(\ell-1,c))=1)$ is predicted probability of mastering the final language task that is a prerequisite for the first cognitive task at level ℓ, and $Pr(D(f,\ell-1,\bar{a}(\ell-1,c))=1)$ is predicted probability of mastering the final fine motor task that is a prerequisite for the first cognitive task at level ℓ. 2. Control variables ($\boldsymbol{Z}$) include gender, the fraction of time children were raised by grandparents through the intervention, parents' years of education, and the fraction of left-behind children at the village level. 3. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. We report coefficients from the logits. Standard errors clustered at the village level are reported in parentheses. 4. Stepdown p-values are constructed by multiple hypotheses across UHP levels based on Romano and Wolf (2005a,b) by 5000 times of bootstrap.

Table I.6: Including Cross Skill Effect: Fine Motor Skill Transmission
$Q(s, \ell, a(\ell), \boldsymbol{Z})$ by levels

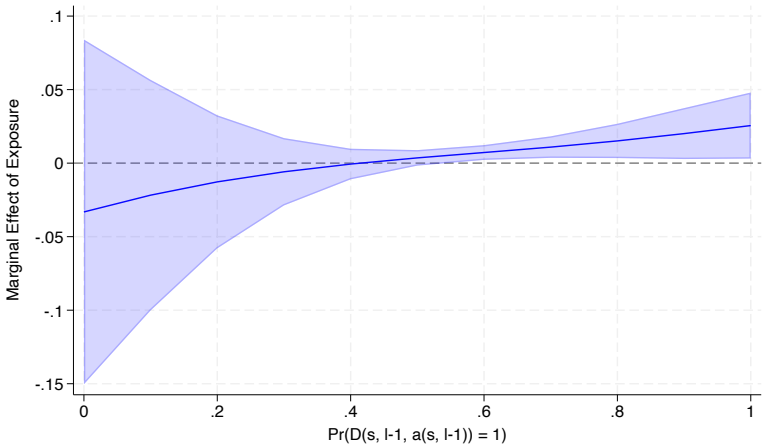
	UHP Fine Motor Levels ℓ					
$d(s,\ell)$	$\ell=2$	$\ell=3$	$\ell=4$	$\ell=5$	$\ell=6$	$\ell=7$
$Pr(D(f,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	0.571***	0.571***	0.520***	0.720***	0.852***	0.130
f = Fine Motor	(0.095)	(0.112)	(0.085)	(0.276)	(0.205)	(0.186)
$Pr(D(s,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	0.062	-0.221	0.166**	0.265	0.133	1.299***
s = Language	(0.105)	(0.155)	(0.077)	(0.276)	(0.162)	(0.362)
$Pr(D(c,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	0.222*	0.354***	0.127	-0.090	0.138	0.191
c = Cognitive	(0.126)	(0.127)	(0.097)	(0.244)	(0.355)	(0.295)
$\boldsymbol{Z}$	X	X	X	X	X	X
stepdown p-value						
$Pr(D(f,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	**0.000**	**0.000**	**0.000**	**0.034**	**0.000**	0.904
$Pr(D(s,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	0.904	0.485	0.156	0.784	0.862	**0.003**
$Pr(D(c,\ell-1,\bar{a}(\ell-1,f))=1\|Z)$	0.270	**0.014**	0.532	0.904	0.904	0.904

Notes: 1. $Pr(D(f,\ell-1,\bar{a}(\ell-1,f))=1)$ is the predicted probability of mastering the final fine motor task in level $\ell-1$; $Pr(D(s,\ell-1,\bar{a}(\ell-1,f))=1)$ is predicted probability of mastering the final language task that is a prerequisite for the first fine motor task at level ℓ, and $Pr(D(c,\ell-1,\bar{a}(\ell-1,f))=1)$ is predicted probability of mastering the final cognitive task that is a prerequisite for the first fine motor task at level ℓ. 2. Control variables ($\boldsymbol{Z}$) include gender, the fraction of time children were raised by grandparents through the intervention, parents' years of education, and the fraction of left-behind children at the village level. 3. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. We report coefficients from the logits. Standard errors clustered at the village level are reported in parentheses. 4. Stepdown p-values are constructed by multiple hypotheses across UHP levels based on Romano and Wolf (2005a,b) by 5000 times of bootstrap.

I.3 Cross Skill Effects on Static Complementarity

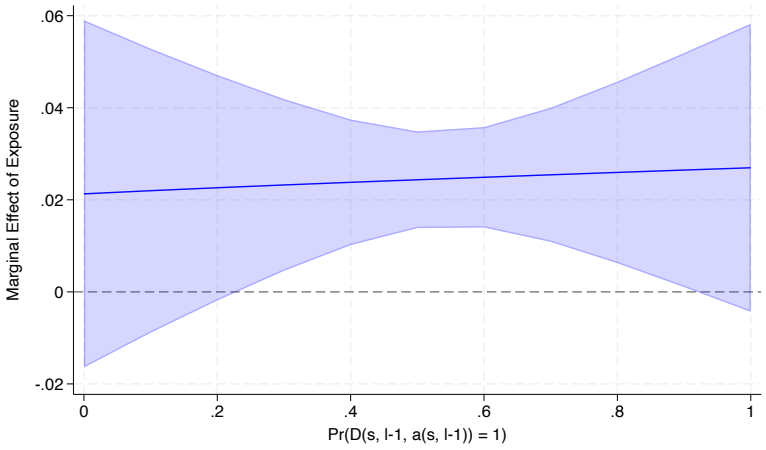
In this section we plot the static complementarity using the normal ability children as they have more variations in the marginal effect of exposure.

Figure I.1: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Language Level 7)



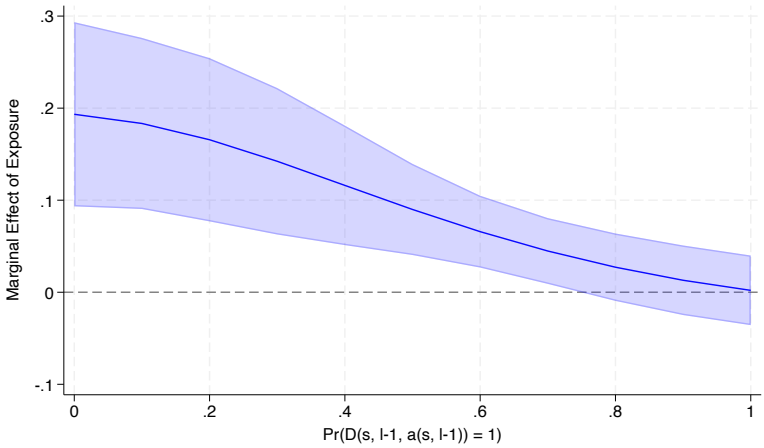
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.2: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Language Level 8)



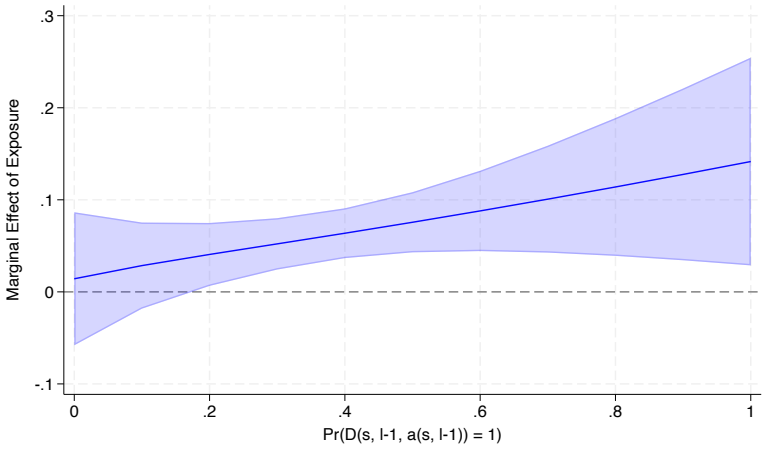
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.3: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Language Level 9)



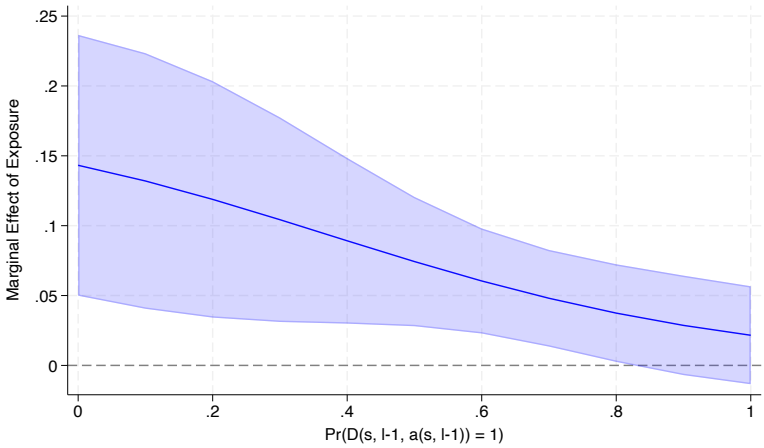
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.4: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Language Level 10)



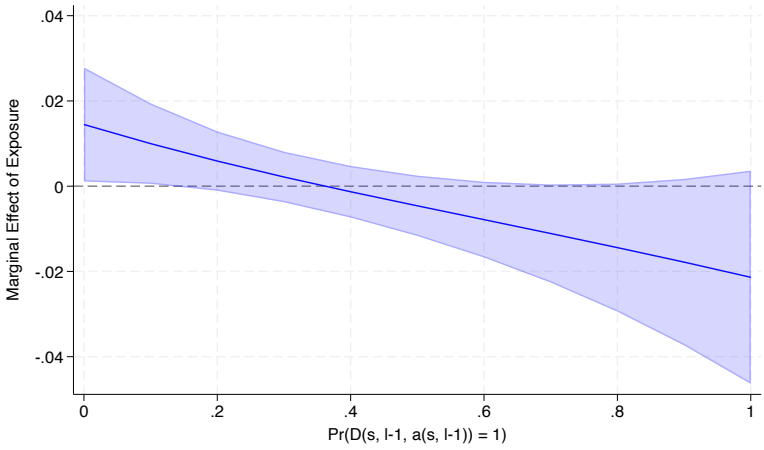
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.5: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Language Level 11)



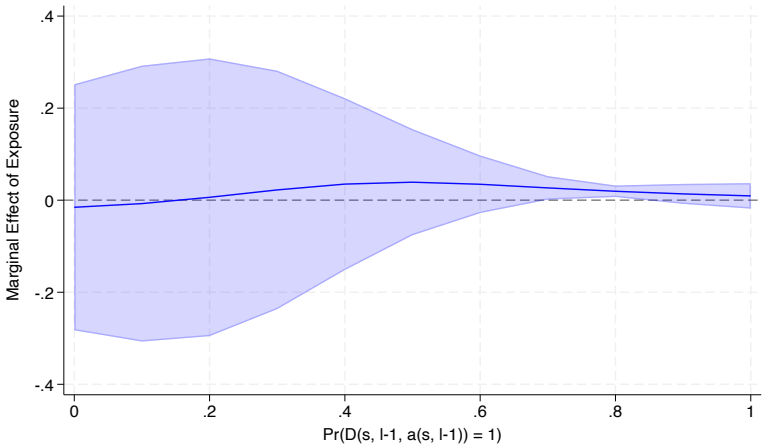
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.6: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Cognitive Level 5)



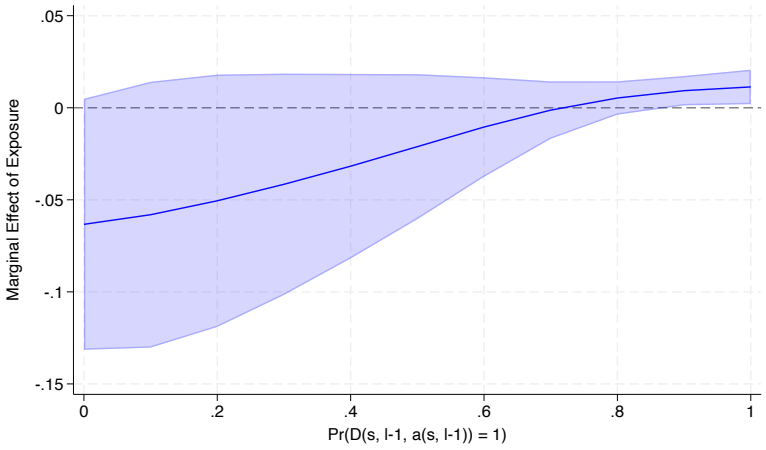
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.7: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Cognitive Level 6)



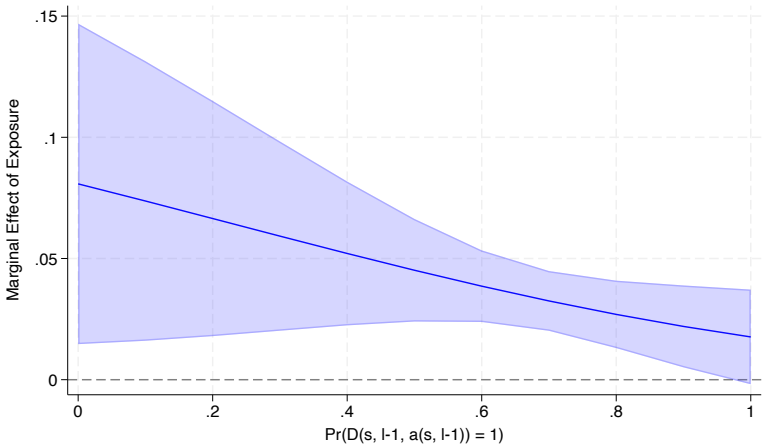
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.8: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Cognitive Level 7)



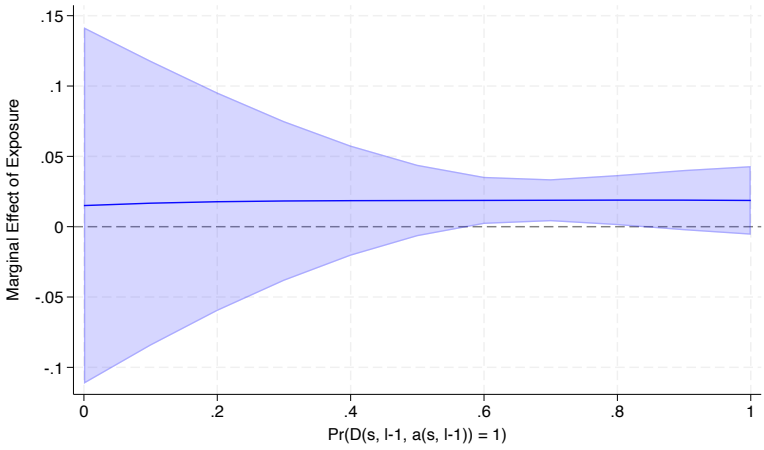
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.9: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Cognitive Level 8)



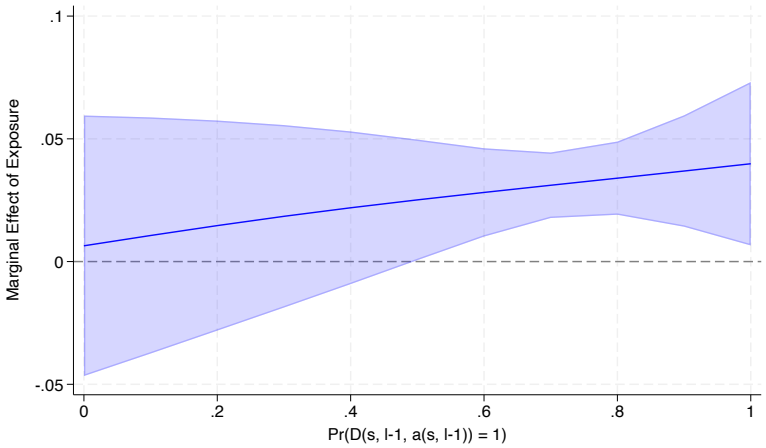
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.10: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Fine Motor Level 3)



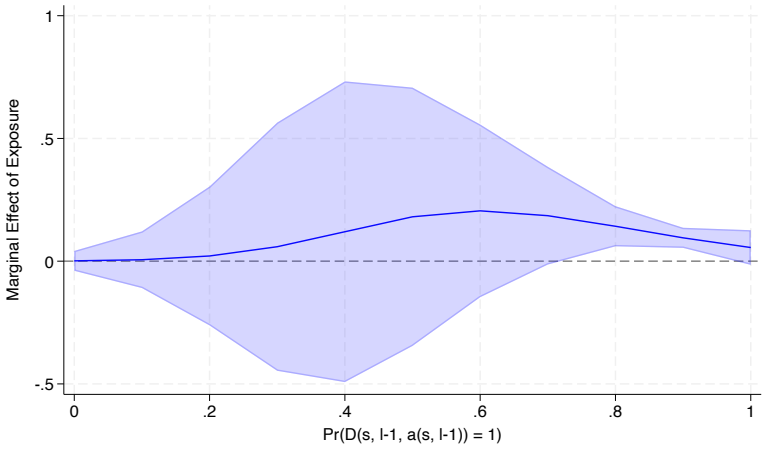
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.11: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Fine Motor Level 4)



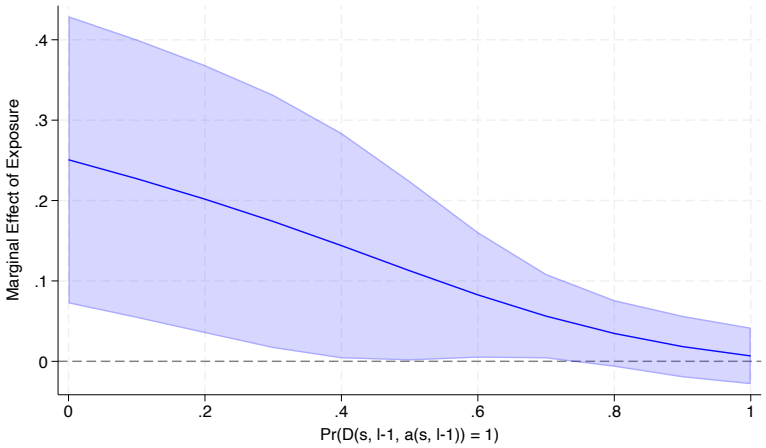
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.12: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Fine Motor Level 5)



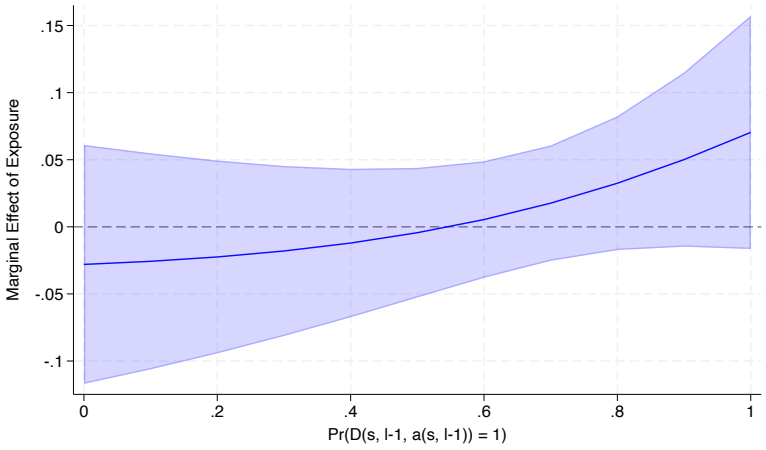
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.13: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Fine Motor Level 6)



Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure I.14: Static Complementarity **with Cross Skills**: Average Marginal Effects of Investment to Initial Stock of Knowledge (Fine Motor Level 7)



Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

J Transmission Term by Levels for Other Skills

Table J.1: Cognitive Skill Transmission $Q(s, \ell, a(\ell), \boldsymbol{Z})$ by levels

	UHP Cognitive Levels ℓ						
$\Pr(D(s,\ell,\bar{a}(\ell,s))Z)=1$	$\ell=2$	$\ell=3$	$\ell=4$	$\ell=5$	$\ell=6$	$\ell=7$	$\ell=8$
$Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	0.942***	0.983***	0.773***	0.618***	0.387***	1.110***	0.730***
	(0.124)	(0.052)	(0.054)	(0.078)	(0.110)	(0.150)	(0.152)
Grandparent	-0.132	-0.201**	0.070	-0.021	-0.109	-0.174**	-0.190
	(0.118)	(0.082)	(0.116)	(0.071)	(0.121)	(0.070)	(0.119)
% Left-Behind in the Village	-0.747**	0.414	-0.268	-0.330*	0.171	-0.083	-0.148
	(0.367)	(0.295)	(0.397)	(0.181)	(0.306)	(0.238)	(0.393)
Father's Years of Education	-0.020***	-0.002	-0.004	-0.003	0.004*	0.004**	-0.005
	(0.008)	(0.006)	(0.006)	(0.003)	(0.002)	(0.002)	(0.005)
Mother's Years of Education	0.020**	0.003	0.004	0.003	-0.003	-0.005***	0.006
	(0.008)	(0.006)	(0.006)	(0.002)	(0.002)	(0.002)	(0.006)
Male	-0.098**	0.049	-0.008	0.035	-0.004	-0.017	-0.051*
	(0.040)	(0.044)	(0.042)	(0.035)	(0.034)	(0.025)	(0.030)
$Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$ stepdown p-value for estimated coefficients	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

Notes: 1. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. We report average marginal effects from the logits. Standard errors of average marginal effects are clustered at the village level and are reported in parentheses. 2. Control variables ($\boldsymbol{Z}$) include gender, the fraction of time children were raised by grandparents throughout the intervention, parents' years of education, and the fraction of left-behind children at the village level. 3. Stepdown p-values for estimated coefficients from logit are constructed by multiple hypotheses between whether children's last task of the previous level is correct or not across UHP levels based on Romano and Wolf (2005a,b) by 5000 times of bootstrap.

Table J.2: Fine Motor Skill Transmission $Q(s, \ell, a(\ell), \boldsymbol{Z})$ by levels

	UHP Fine Motor Levels ℓ					
$\Pr(D(s,\ell,\bar{a}(\ell,s))Z)=1$	$\ell=2$	$\ell=3$	$\ell=4$	$\ell=5$	$\ell=6$	$\ell=7$
$Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$	0.814***	0.702***	0.636***	0.836***	0.905***	0.651***
	(0.092)	(0.079)	(0.062)	(0.226)	(0.140)	(0.165)
Grandparent	0.080	-0.359***	0.140**	-0.114	0.007	0.133
	(0.086)	(0.093)	(0.061)	(0.131)	(0.077)	(0.159)
% Left-Behind in the Village	-0.543**	-0.027	0.457***	-0.395	0.137	0.352
	(0.225)	(0.305)	(0.155)	(0.346)	(0.247)	(0.411)
Father's Years of Education	0.001	0.004**	-0.002	-0.001	0.001	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Mother's Years of Education	-0.001	-0.003	0.000	-0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Male	0.046	-0.047	0.025	-0.124**	0.157***	0.018
	(0.035)	(0.039)	(0.033)	(0.049)	(0.043)	(0.066)
$Pr(D(s,\ell-1,\bar{a}(\ell-1,s))=1\|Z)$						
stepdown p-value for estimated coefficients	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

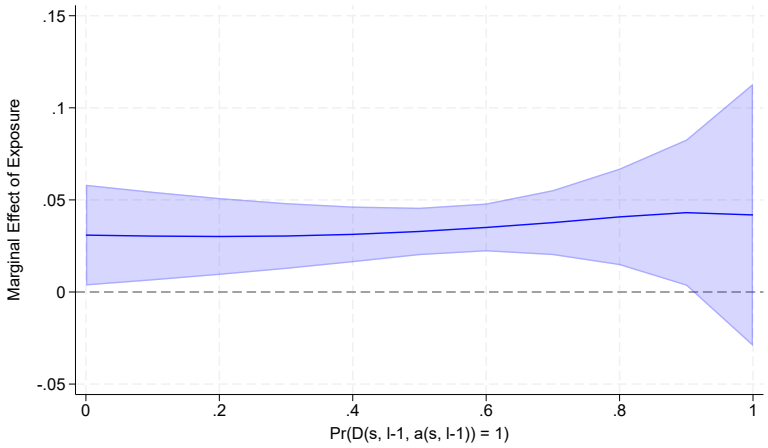
Notes: 1. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. We report average marginal effects from the logits. Standard errors of average marginal effects are clustered at the village level and are reported in parentheses. 2. Control variables ($\boldsymbol{Z}$) include gender, the fraction of time children were raised by grandparents throughout the intervention, parents' years of education, and the fraction of left-behind children at the village level. 3. Stepdown p-values for estimated coefficients from logit are constructed by multiple hypotheses between whether children's last task of the previous level is correct or not across UHP levels based on Romano and Wolf (2005a,b) by 5000 times of bootstrap.

K Static Complementarity by Levels and Skills

In this section we plot the static complementarity using the normal ability children as they have more variations in the marginal effect of exposure.

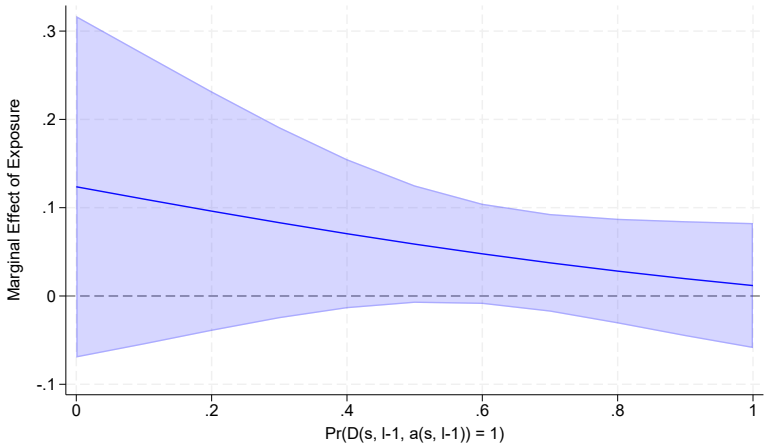
K.1 Language

Figure K.1: Static Complementarity: Average Marginal Effects of Investment to Initial Stock of Knowledge (Language Level 8)



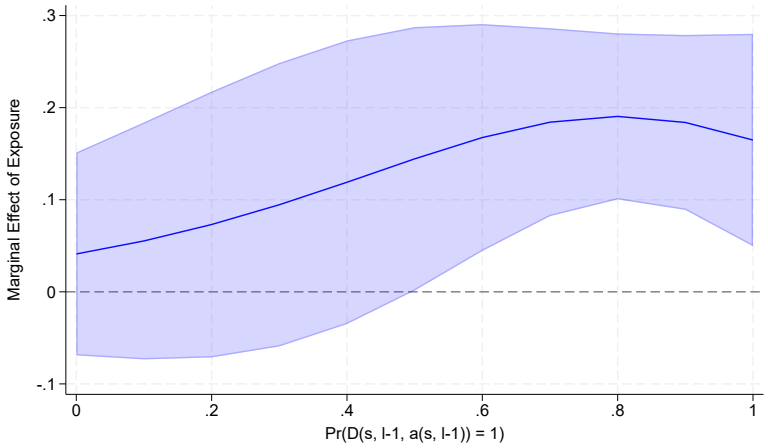
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure K.2: Static Complementarity: Average Marginal Effects of Investment to Initial Stock of Knowledge (Language Level 9)



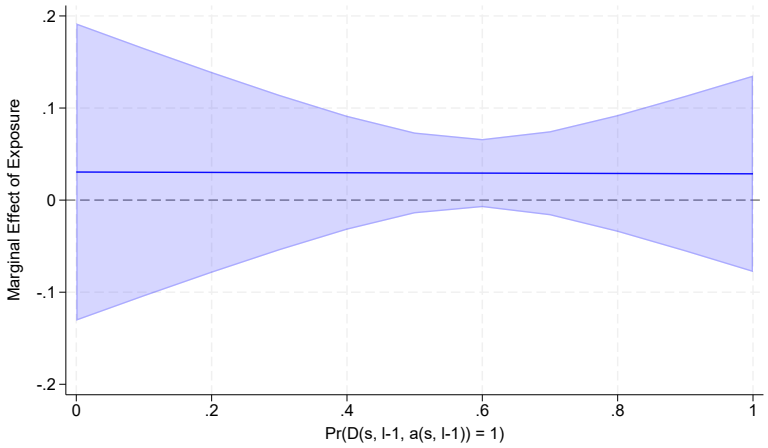
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure K.3: Static Complementarity: Average Marginal Effects of Investment to Initial Stock of Knowledge (Language Level 10)



Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

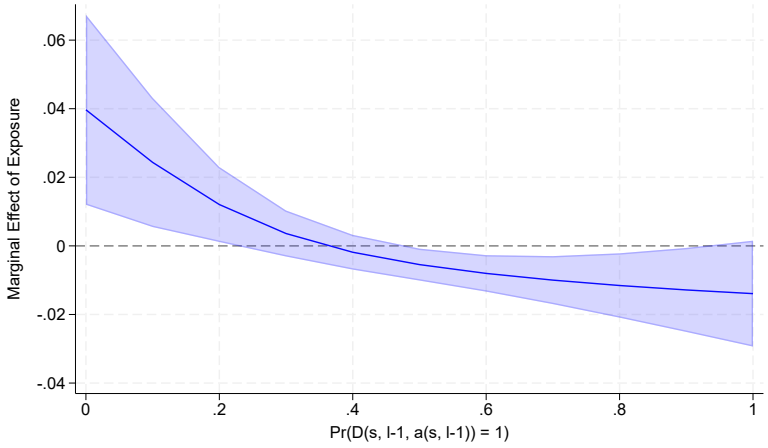
Figure K.4: Static Complementarity: Average Marginal Effects of Investment to Initial Stock of Knowledge (Language Level 11)



Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

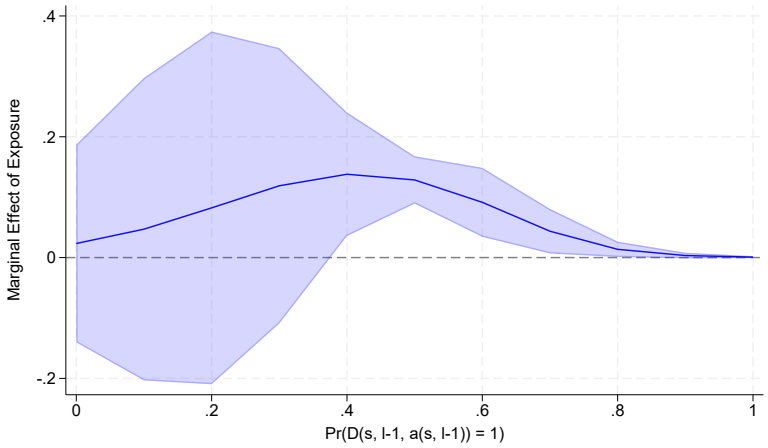
K.2 Cognitive

Figure K.5: Static Complementarity: Marginal Effects of Exposure by Initial Stock of Knowledge (Cognitive Level 5)



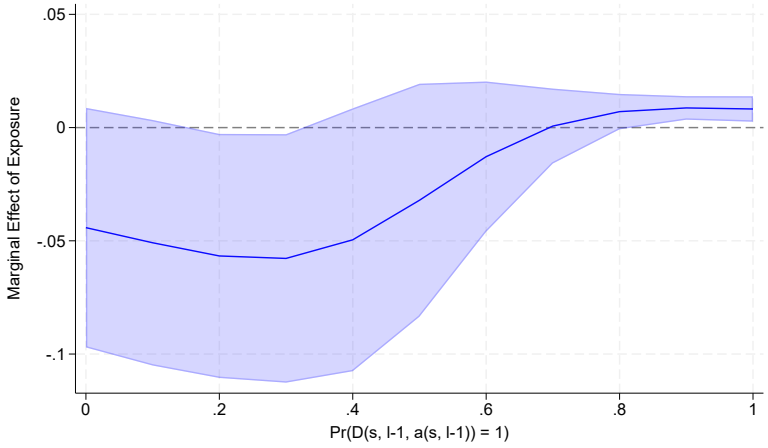
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.
2. For this level we exclude sample with no exposure effect for computation.

Figure K.6: Static Complementarity: Marginal Effects of Exposure by Initial Stock of Knowledge (Cognitive Level 6)



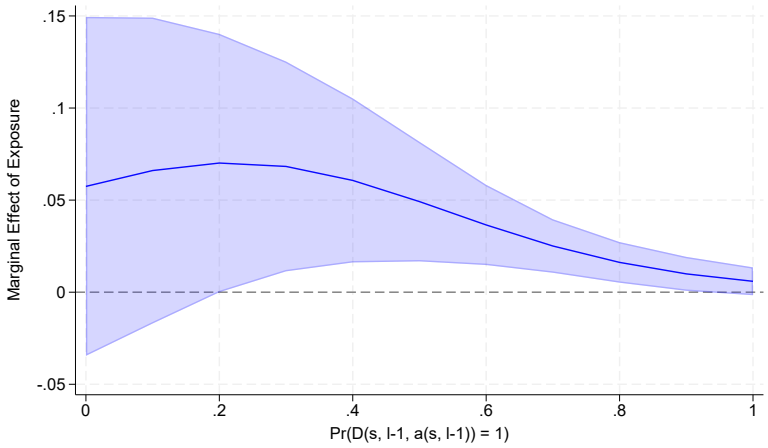
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure K.7: Static Complementarity: Marginal Effects of Exposure by Initial Stock of Knowledge (Cognitive Level 7)



Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.
2. For this level we exclude sample with no exposure effect for computation.

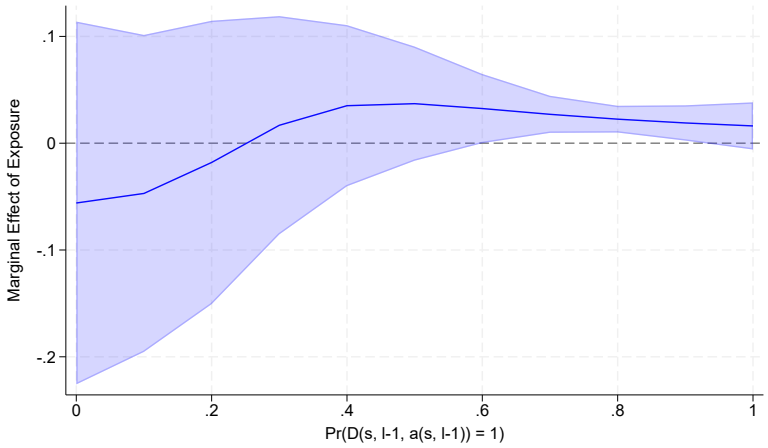
Figure K.8: Static Complementarity: Marginal Effects of Exposure by Initial Stock of Knowledge (Cognitive Level 8)



Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level. 2. For this level we exclude sample with no exposure effect for computation.

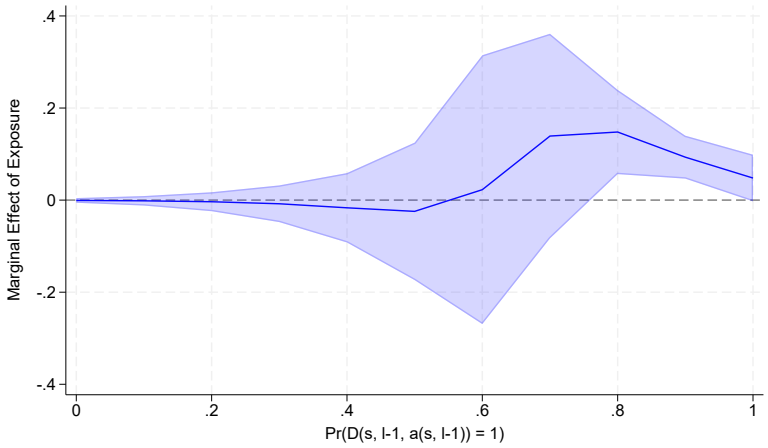
K.3 Fine Motor

Figure K.9: Static Complementarity: Marginal Effects of Exposure by Initial Stock of Knowledge (Fine Motor Level 4)



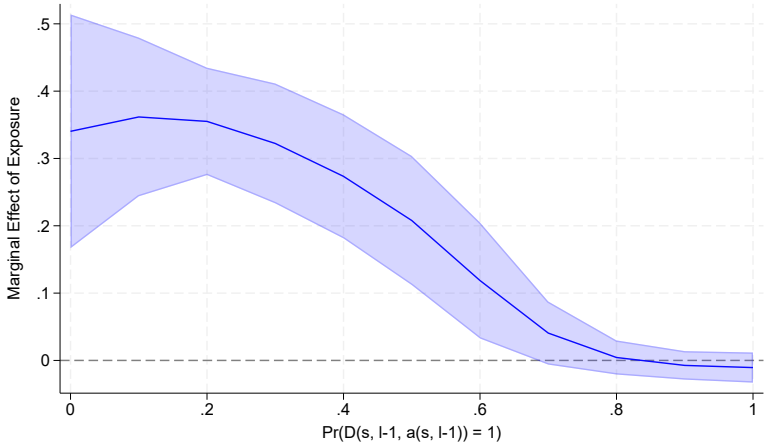
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level. 2. For this level we exclude sample with no exposure effect for computation.

Figure K.10: Static Complementarity: Marginal Effects of Exposure by Initial Stock of Knowledge (Fine Motor Level 5)



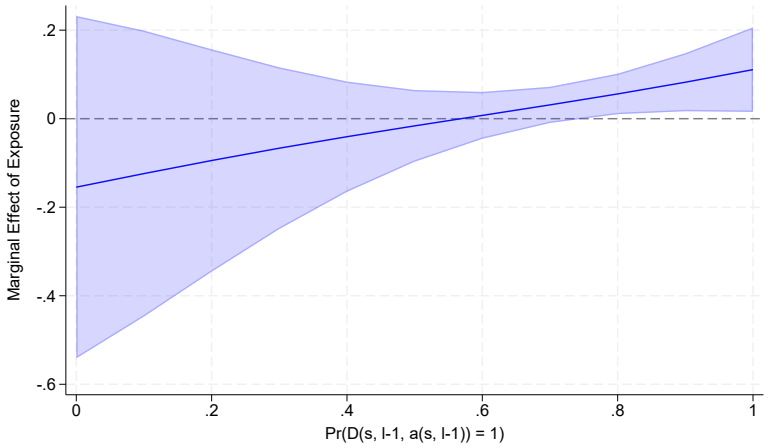
Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure K.11: Static Complementarity: Marginal Effects of Exposure by Initial Stock of Knowledge (Fine Motor Level 6)



Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.
2. For this level we exclude sample with no exposure effect for computation.

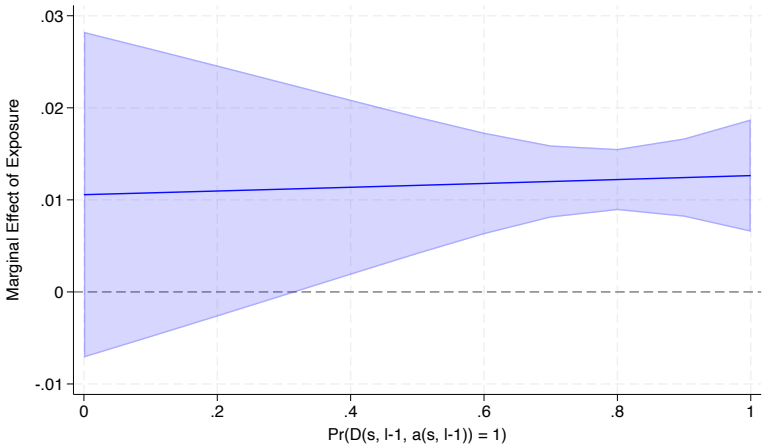
Figure K.12: Static Complementarity: Marginal Effects of Exposure by Initial Stock of Knowledge (Fine Motor Level 7)



Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level. 2. For this level we exclude sample with no exposure effect for computation.

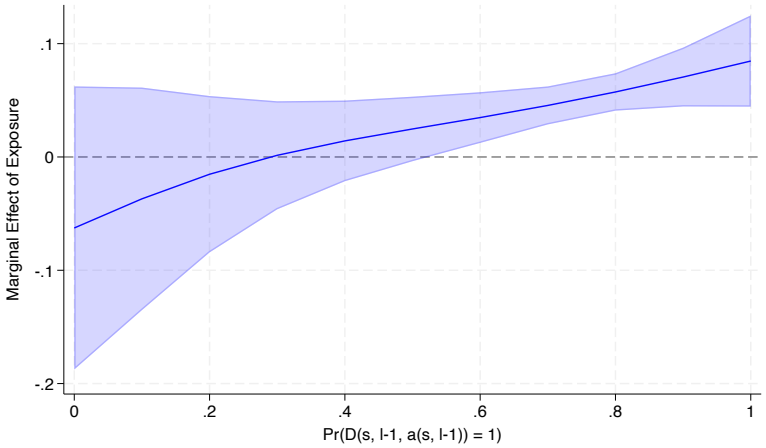
K.4 Static Complementarity Pooling Across Levels for Cognitive and Fine Motor

Figure K.13: Static Complementarity: Average Marginal Effects of Investment to Initial Stock of Knowledge (Cognitive, All Levels)



Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

Figure K.14: Static Complementarity: Average Marginal Effects of Investment to Initial Stock of Knowledge (Fine Motor, All Levels)



Notes: 1. 90% confidence intervals calculated with standard errors clustered at the village level.

L Learning Prior to Treatment in Other Skills

L.1 Treatment Group

L.1.1 Cognitive Skill

Table L.1: Estimated Effect of Learning Outside of the Program for Using First Performance on Entry in the Programs (Cognitive)

$\Pr(D(a^*, s, \ell) = 1 \mid a^*, Z(a^*))$	(1)	(2)
Enrollment Age (a^*)	0.035**	0.048***
	(0.014)	(0.016)
Grandparent		-0.179***
		(0.050)
$a^* \times$ % Left-Behind in the Village*		-0.037
		(0.025)
% Left-Behind in the Village		0.206
		(0.530)
Father's Years of Education		0.000
		(0.006)
Mother's Years of Education		0.008
		(0.006)
Male		-0.051
		(0.032)
UHP Level at First Month Control	X	X

Notes: 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We report average marginal effects from our fitted OLS. Standard errors clustered at the village level are reported in parentheses. 2. Control variables ($\boldsymbol{Z}$) include gender, type of primary caregiver, parents' years of education, and fraction of left-behind children at the village level.
*This is the interaction term between enrollment age (a^*) and % of left-behind children in the village.

Table L.2: Estimated Effect of Learning Outside of the Program for Across Different Entry Groups Using First Month's Entry Level Performance (Cognitive)

	UHP Cognitive Entry Levels ℓ							
$\Pr(D(a^*, s, \ell) = 1 \mid a^*, \boldsymbol{Z}(a^*))$	ℓ=1	ℓ=2	ℓ=3	ℓ=4	ℓ=5	ℓ=6	ℓ=7	ℓ=8
Enrollment Age (a^*)	0.013	-0.007	-0.065	0.054	-0.003	0.043	0.064***	0.178**
	(0.023)	(0.014)	(0.081)	(0.093)	(0.038)	(0.033)	(0.019)	(0.073)
Grandparent	-0.141*	-0.224***	-0.181	-0.233*	-0.072	-0.174	-0.159	-0.430*
	(0.073)	(0.063)	(0.152)	(0.122)	(0.130)	(0.202)	(0.103)	(0.239)
$a^* \times$ % Left-Behind in the Village*	-0.039	-0.036	0.441	0.376	0.005	0.057	0.167	-0.877
	(0.138)	(0.113)	(0.471)	(0.446)	(0.331)	(0.471)	(0.247)	(0.876)
% Left-Behind in the Village	-0.021	0.313	-9.120	-7.901	-1.412	-2.381	-5.279	23.572
	(1.737)	(2.208)	(9.504)	(9.490)	(7.832)	(12.528)	(5.801)	(23.436)
Father's Years of Education	-0.011	-0.001	0.017	0.041**	0.001	0.018	0.016	0.013
	(0.008)	(0.010)	(0.018)	(0.017)	(0.013)	(0.026)	(0.013)	(0.024)
Mother's Years of Education	0.007	0.019*	0.002	-0.006	0.011	-0.014	-0.001	0.019
	(0.006)	(0.011)	(0.018)	(0.014)	(0.015)	(0.027)	(0.013)	(0.027)
Male	-0.022	-0.059	-0.029	-0.203**	-0.082	-0.048	-0.014	0.117
	(0.048)	(0.063)	(0.075)	(0.101)	(0.064)	(0.129)	(0.080)	(0.132)

1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We report average marginal effects from our fitted OLS. Standard errors clustered at the village level are reported in parentheses. 2. Control variables include gender, type of primary caregiver, parents' years of education, fraction of left-behind children at the village level, and the interaction term between monthly age and fraction of left-behind children at the village level.
*This is the interaction term between enrollment age (a^*) and % of left-behind children in the village.

L.1.2 Fine Motor Skill

Table L.3: Estimated Effect of Learning Outside of the Program for Using First Performance on Entry in the Programs (Fine Motor)

$\Pr(D(a^*, s, \ell) = 1 \mid a^*, Z(a^*))$	(1)	(2)
Enrollment Age (a^*)	0.025	0.021*
	(0.010)	(0.011)
Grandparent		-0.091
		(0.063)
$a^* \times$ % Left-Behind in the Village*		0.081**
		(0.037)
% Left-Behind in the Village		-2.199**
		(0.857)
Father's Years of Education		-0.004
		(0.005)
Mother's Years of Education		0.008
		(0.005)
Male		-0.008
		(0.031)
UHP Level at First Month Control	X	X

Notes: 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We report average marginal effects from our fitted OLS. Standard errors clustered at the village level are reported in parentheses. 2. Control variables ($\boldsymbol{Z}$) include gender, type of primary caregiver, parents' years of education, and fraction of left-behind children at the village level.
*This is the interaction term between enrollment age (a^*) and % of left-behind children in the village.

Table L.4: Estimated Effect of Learning Outside of the Program for Across Different Entry Groups Using First Month's Entry Level Performance (Fine Motor)

	UHP Fine Motor Entry Levels ℓ		
$\Pr(D(a^*, s, \ell) = 1 \mid a^*, \boldsymbol{Z}(a^*))$	ℓ=1	ℓ=2	ℓ=3
Enrollment Age (a^*)	0.011	-0.095	0.017
	(0.012)	(0.064)	(0.026)
Grandparent	-0.085	-0.014	-0.095
	(0.080)	(0.121)	(0.101)
a^* × % Left-Behind in the Village*	0.128*	0.220	0.353*
	(0.076)	(0.433)	(0.178)
% Left-Behind in the Village	-2.860**	-5.355	-8.939**
	(1.369)	(9.045)	(4.357)
Father's Years of Education	-0.007	-0.008	-0.003
	(0.007)	(0.015)	(0.010)
Mother's Years of Education	0.010*	0.010	0.009
	(0.006)	(0.016)	(0.010)
Male	-0.040	0.023	-0.023
	(0.046)	(0.064)	(0.043)

Notes: 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We report average marginal effects from our fitted OLS. Standard errors clustered at the village level are reported in parentheses. 2. Control variables ($\boldsymbol{Z}$) include gender, type of primary caregiver, parents' years of education, and fraction of left-behind children at the village level.
*This is the interaction term between enrollment age (a^*) and % of left-behind children in the village.

L.2 Estimated Effect of Learning for Control Group Using Comparable Level Constructed by Midline Denver Items for Other Skills

Table L.5: Estimated Out-of-program Growth for Control Group Using Comparable Level Constructed by Midline Denver Items (Cognitive)

	Comparable Cognitive Level ℓ Constructed by Midline Denver Items						
	$\ell = 2$	$\ell = 3$	$\ell = 4$	$\ell = 5$	$\ell = 6$	$\ell = 7$	$\ell = 8$
Age at Midline	0.017***	0.042***	0.017***	0.058***	0.019***	0.061***	0.049***
	(0.002)	(0.003)	(0.004)	(0.006)	(0.003)	(0.006)	(0.017)
Grandparent	-0.057**	-0.052	-0.106**	-0.148***	-0.054	-0.087*	-0.062
	(0.026)	(0.032)	(0.053)	(0.047)	(0.035)	(0.045)	(0.053)
Age × % Left-Behind in the Village	-0.006	-0.021	-0.033	-0.081**	-0.008	0.014	-0.044
	(0.025)	(0.029)	(0.032)	(0.037)	(0.030)	(0.041)	(0.163)
% Left-Behind in the Village	0.298	0.752	1.148	3.095***	0.546	-0.145	1.875
	(0.794)	(0.902)	(1.032)	(1.125)	(0.956)	(1.223)	(5.723)
Father's Years of Education	0.004	0.007*	0.011**	0.002	0.013***	0.003	0.002
	(0.003)	(0.004)	(0.005)	(0.006)	(0.005)	(0.006)	(0.010)
Mother's Years of Education	0.007**	0.003	0.008	0.013**	0.005	0.008*	0.005
	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.010)
Male	-0.020	-0.021	0.042	0.024	0.004	0.051*	0.010
	(0.016)	(0.023)	(0.028)	(0.031)	(0.029)	(0.029)	(0.060)

Notes: 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We report average marginal effects from our fitted OLS. Standard errors clustered at the village level are reported in parentheses. 2. Control variables ($\boldsymbol{Z}$) include gender, type of primary caregiver, parents' years of education, and fraction of left-behind children at the village level. 3. Comparable levels are constructed using Denver items that are comparable to the UHP curriculum.

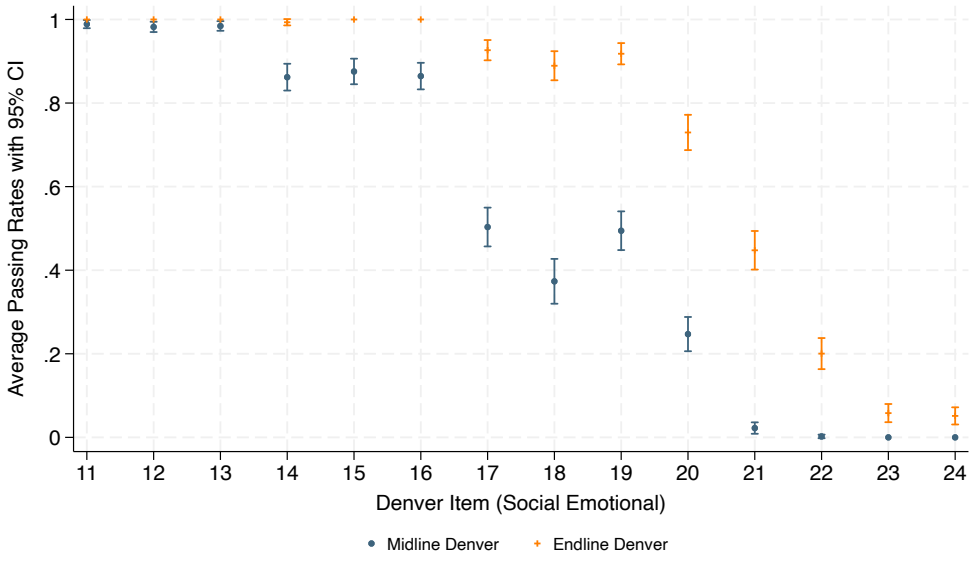
Table L.6: Estimated Out-of-program Growth within Control Group Using Comparable Level Constructed by Midline Denver Items (Fine Motor)

	Comparable Fine Motor Level ℓ Constructed by Midline Denver Items			
	$\ell = 1$	$\ell = 3$	$\ell = 4$	$\ell = 6$
Age at Midline	0.002*	0.073***	0.032***	0.005
	(0.001)	(0.007)	(0.010)	(0.005)
Grandparent	-0.017	-0.113*	-0.163***	-0.032*
	(0.017)	(0.060)	(0.052)	(0.019)
Age × % Left-Behind in the Village	0.004	0.030	0.197*	0.077
	(0.009)	(0.055)	(0.102)	(0.069)
% Left-Behind in the Village	-0.143	-0.589	-6.818**	-2.864
	(0.286)	(1.843)	(3.382)	(2.473)
Father's Years of Education	0.003	0.007	0.003	0.006
	(0.002)	(0.007)	(0.009)	(0.005)
Mother's Years of Education	0.002	0.009	0.013	0.000
	(0.002)	(0.008)	(0.010)	(0.003)
Male	0.005	-0.074*	-0.039	-0.042
	(0.009)	(0.044)	(0.047)	(0.033)

Notes: 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We report average marginal effects from our fitted OLS. Standard errors clustered at the village level are reported in parentheses. 2. Control variables ($\boldsymbol{Z}$) include gender, type of primary caregiver, parents' years of education, and fraction of left-behind children at the village level. 3. Comparable levels are constructed using Denver items that are comparable to the UHP curriculum.

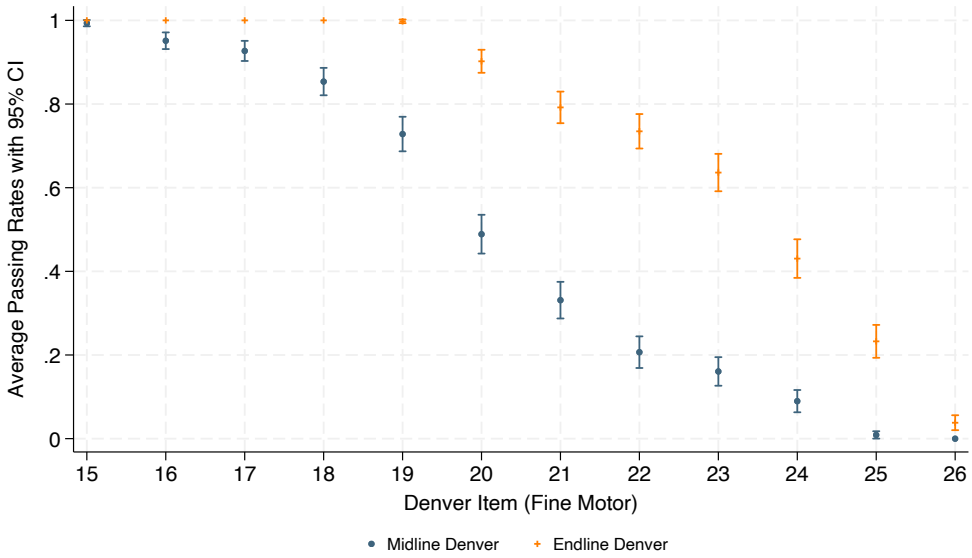
L.3 Out-of-program Growth: Item by Item Comparison of Controlled Group Children's Performance Between Midline and Endline Denver for All Skills

Figure L.1: Out-of-program Growth: Item by Item Comparison of Control Group Children's Performance Between Midline and Endline Denver (Social-Emotional)



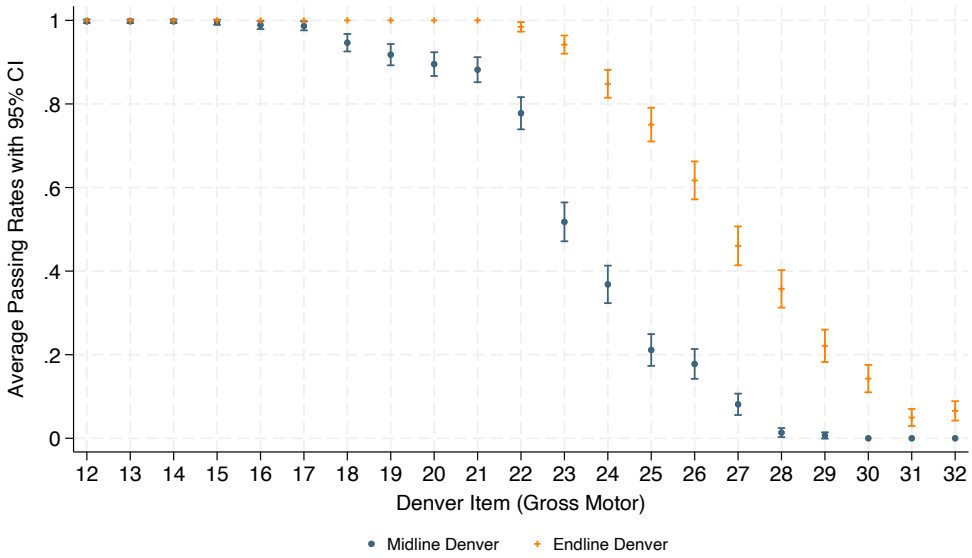
Notes: 1. We compare the same controlled children's Endline and Midline Social-Emotional Denver items' performance of the extact same items being tested twice. Endline and Midline Denver had 12 months of interval. Controlled children did not receive any intervention throughout the program.

Figure L.2: Out-of-program Growth: Item by Item Comparison of Control Group Children's Performance Between Midline and Endline Denver (Fine Motor)



Notes: 1. We compare the same controlled children's Endline and Midline Fine Motor Denver items' performance of the extact same items being tested twice. Endline and Midline Denver had 12 months of interval. Controlled children did not receive any intervention throughout the program.

Figure L.3: Out-of-program Growth: Item by Item Comparison of Control Group Children's Performance Between Midline and Endline Denver (Gross Motor)



Notes: 1. We compare the same controlled children's Endline and Midline Gross Motor Denver items' performance of the extact same items being tested twice. Endline and Midline Denver had 12 months of interval. Controlled children did not receive any intervention throughout the program.

Table L.7: Out-of-program Growth: Comparing Controlled Group Children's Performance Between Midline and Endline Denver (Language)

Denver Item	Midline Passing Rate	Endline Passing Rate	$p-value$
13	0.984	1.000	**0.008**
14	0.946	1.000	**0.000**
15	0.937	1.000	**0.000**
16	0.890	0.998	**0.000**
17	0.836	0.998	**0.000**
18	0.768	0.995	**0.000**
19	0.753	0.998	**0.000**
20	0.746	0.989	**0.000**
21	0.682	0.980	**0.000**
22	0.725	0.989	**0.000**
23	0.554	0.904	**0.000**
24	0.366	0.804	**0.000**
25	0.345	0.780	**0.000**
26	0.163	0.627	**0.000**
27	0.185	0.678	**0.000**
28	0.254	0.763	**0.000**
29	0.095	0.582	**0.000**
30	0.125	0.594	**0.000**
31	0.075	0.526	**0.000**
32	0.053	0.436	**0.000**
33	0.009	0.205	**0.000**
34	0.027	0.314	**0.000**
35	0.004	0.068	**0.000**
36	0.004	0.070	**0.000**
37	0.017	0.246	**0.000**

Notes: 1. We compare the same controlled children's Endline and Midline Language Denver items' passing rates. Endline and Midline Denver had a 12-month interval. Controlled children did not receive any intervention throughout the program. 2. We do not report Denver items prior to the 13th because these items are not age-suitable for controlled children at Midline and Endline.

Table L.8: Out-of-program Growth: Comparing Controlled Group Children's Performance Between Midline and Endline Denver (Social-Emotional)

Denver Item	Midline Passing Rate	Endline Passing Rate	$p-value$
11	0.989	1.000	**0.025**
12	0.982	1.000	**0.005**
13	0.984	1.000	**0.008**
14	0.862	0.993	**0.000**
15	0.876	1.000	**0.000**
16	0.864	1.000	**0.000**
17	0.503	0.927	**0.000**
18	0.373	0.889	**0.000**
19	0.494	0.918	**0.000**
20	0.247	0.730	**0.000**
21	0.022	0.448	**0.000**
22	0.002	0.200	**0.000**
23	0.000	0.058	**0.000**
24	0.000	0.051	**0.000**

Notes: 1. We compare the same controlled children's Endline and Midline Social-Emotional Denver items' passing rates. Endline and Midline Denver had a 12-month interval. Controlled children did not receive any intervention throughout the program. 2. We do not report Denver items prior to the 11th because these items are not age-suitable for controlled children at Midline and Endline.

Table L.9: Out-of-program Growth: Comparing Controlled Group Children's Performance Between Midline and Endline Denver (Fine Motor)

Denver Item	Midline Passing Rate	Endline Passing Rate	$p-value$
15	0.993	1.000	0.083
16	0.951	1.000	**0.000**
17	0.927	1.000	**0.000**
18	0.854	1.000	**0.000**
19	0.728	0.998	**0.000**
20	0.489	0.902	**0.000**
21	0.331	0.792	**0.000**
22	0.207	0.735	**0.000**
23	0.161	0.636	**0.000**
24	0.090	0.430	**0.000**
25	0.009	0.233	**0.000**
26	0.000	0.038	**0.000**

Notes: 1. We compare the same controlled children's Endline and Midline Fine Motor Denver items' passing rates. Endline and Midline Denver had a 12-month interval. Controlled children did not receive any intervention throughout the program. 2. We do not report Denver items prior to the 15th because these items are not age suitable for controlled children at Midline and Endline.

Table L.10: Out-of-program Growth: Comparing Controlled Group Children's Performance Between Midline and Endline Denver (Gross Motor)

Denver Item	Midline Passing Rate	Endline Passing Rate	$p-value$
12	0.998	1.000	0.318
13	0.998	1.000	0.318
14	0.998	1.000	0.318
15	0.996	1.000	0.158
16	0.989	1.000	**0.025**
17	0.987	1.000	**0.014**
18	0.947	1.000	**0.000**
19	0.918	1.000	**0.000**
20	0.895	1.000	**0.000**
21	0.882	1.000	**0.000**
22	0.778	0.984	**0.000**
23	0.518	0.942	**0.000**
24	0.368	0.848	**0.000**
25	0.211	0.751	**0.000**
26	0.178	0.617	**0.000**
27	0.081	0.460	**0.000**
28	0.014	0.357	**0.000**
29	0.007	0.221	**0.000**
30	0.000	0.143	**0.000**
31	0.000	0.050	**0.000**
32	0.000	0.066	**0.000**

Notes: 1. We compare the same controlled children's Endline and Midline Gross Motor Denver items' passing rates. Endline and Midline Denver had a 12-month interval. Controlled children did not receive any intervention throughout the program. 2. We do not report Denver items prior to the 11th because these items are not age-suitable for controlled children at Midline and Endline.

L.4 Robustness Check for Learning Outside Program

Table L.11: Comparing Denver Passing Rates Between Controlled Children in Same Age Range At Different Points of Time (Language)

Denver Item	Children 29–39 Months at *Midline*	Children 29–39 Months at *Endline*	$p-value$	step down $p-value$
13	1.000	1.000		
14	1.000	1.000		
15	1.000	1.000		
16	1.000	1.000		
17	0.996	1.000	0.382	1.000
18	0.985	0.990	0.619	1.000
19	0.981	0.990	0.428	1.000
20	0.974	0.980	0.641	1.000
21	0.955	0.970	0.392	1.000
22	0.981	0.975	0.660	1.000
23	0.899	0.842	**0.036**	0.371
24	0.674	0.711	0.492	1.000
25	0.648	0.678	0.605	1.000
26	0.292	0.379	0.064	0.546
27	0.303	0.320	0.803	1.000
28	0.443	0.458	0.867	1.000
29	0.131	0.194	0.095	0.629
30	0.206	0.189	0.541	1.000
31	0.154	0.217	0.081	0.608
32	0.071	0.069	0.909	1.000
33	0.004	0.010	0.413	1.000
34	0.028	0.040	0.619	1.000
35	0.000	0.005	0.253	0.948
36	0.004	0.005	0.848	1.000

Notes: 1. We compare the different controlled children's Language Denver items' passing rates, but they were in the same age range at Midline and Endline. Endline and Midline Denver had a 12-month interval. Controlled children did not receive any intervention throughout the program. 2. Children 29–39 months at midline represent the children whose monthly ages are between 29 and 39 at Midline Denver. 3. Children 29–39 months at endline represent the children whose monthly ages are between 29 and 39 at Endline Denver. 4. We do not report Denver items prior to the 13th because these items are not age-suitable for controlled children at Midline and Endline. 5. We do not report the 37th Language Denver item because only one child between 29 and 39 months at Endline measured that item. 6. Step down $p-values$ are constructed by multiple hypotheses between the younger and older children in the control group at enrollment, based on Romano and Wolf (2005a,b) by 250 times of bootstrap.

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