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Coding Protocol: Early Math Interventions in Informal Learning Settings: Attention to Literacy

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Coding Protocol

Early Math Interventions in Informal Learning Settings: Attention to Literacy

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Abstract

The purpose of this document is to provide readers with the coding protocol that authors used to code 51 studies that met inclusion criteria for a systematic review. This systematic review focused on how literacy is incorporated into informal math intervention studies for children in preschool to third grade. We investigated what types of literacy activities were integrated, how literacy was a part of data sources collected, and in what ways literacy was mentioned explicitly by authors in research reports. We coded studies in this systematic review to answer the following research questions: (1) How is literacy incorporated? (2) What literacy activities are integrated? (3) How is literacy a part of data sources collected? And (4) In what ways do researchers explicitly mention literacy in their research reports? The most common literacy activity was speaking and listening, and the most frequently included data source related to literacy was standardized literacy achievement measures. Finally, we found that overall, researchers did not detail literacy throughout their research reports. Briefly, we coded studies for the following information:

Coding Protocol Section	Explanation of Codes
Basic Study Information	Authors, year, journal, type of publication, location, sample size, attrition, age or grade, gender, disability status, dual language learner status, race/ethnicity, socioeconomic status, and primary caregiver information
Context	Context of literacy component (i.e., literacy measure, literacy treatment, literacy control, literacy integrated into math intervention, and other)
Literacy Treatment	Literacy treatment group name, intervention type, literacy activities (e.g., reading, writing, speaking and listening), literacy content (e.g., phonics, word identification, oral language, reading comprehension), intervention location, interventionist and training, content of training and duration, purpose of training (e.g., how to facilitate literacy activity), interventionist follow-up support and support characteristics e.g., (time, location, duration)
Literacy Control	Literacy control group type (e.g., control, active control), literacy activities (e.g., reading, writing, speaking and listening), literacy content (e.g., phonics, word identification, oral language, reading comprehension), purpose of literacy as a control, setting, interventionist and training
Literacy Integrated into Math Intervention	Literacy activities (e.g., reading, writing, speaking and listening), type of language (e.g., general language, quantitative language, spatial language)

Literacy Measure	Measure name, literacy content measured (e.g., print knowledge, vocabulary, dialogic reading), home literacy information, caregiver report on child literacy behavior and achievement, purpose for literacy measure, results page number(s)
Literacy Integrated into Math Measure	Literacy activities in math measure (e.g., reading, writing, speaking and listening), literacy activities and page number(s)
Explicit Author Mentions of Literacy	Explicit mentions of key literacy terms (e.g., literacy, reading, writing, speaking and listening, etc.) and elaboration on those concepts by the author in the sections of the research report: title, abstract, introduction/literature review, research question/purpose statement/hypothesis, procedures, rationale of data sources, results/findings, and discussion

Keywords: literacy integration, early literacy, early math, informal learning environments

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Early Math Interventions in Informal Learning Settings: Attention to Literacy

Variable Name	Code Options	Code Descriptions
Study Identifier	Number	This number will be provided for all studies.
Authors	Names	All authors' last names, separated by commas
Year	Year	Year of publication
<p>The following section captures information about the context of the literacy component, or the relationship between literacy and math in each included study. The context chosen in this section corresponds to the other code book. In other words, each type of context has its own section. If there is more than one way literacy is included in a study, you'll have a separate row for each context.</p> <ul style="list-style-type: none"> ● Studies were included, even if they only had literacy measures (and nothing else literacy related). There is a section at the end of this codebook to capture information about literacy as part of an assessment/measure. If there is ONLY literacy present in the assessment/measure of a study, you will code NA/NR for most codes in this section and the other sections up to the assessment/measures section. ● When determining what the context of the literacy component is, consider the literacy activities and content below. Each is explained in the “Activities” and “Content” sections below. <ul style="list-style-type: none"> ○ Activities <ul style="list-style-type: none"> ■ Reading ■ Writing ■ Speaking and listening ○ Content <ul style="list-style-type: none"> ■ Expressive vocabulary/oral language ■ Receptive vocabulary/language comprehension ■ Print knowledge ■ Alphabetic principle ■ Phonological processing ■ Phonics ■ Word identification ■ Fluency ■ Reading comprehension ■ Writing ■ Home literacy environment 		

Context of Literacy Component		
Context of the literacy component	<p>Select one:</p> <p>0 = literacy measure/assessment</p> <p>1 = literacy treatment or literacy/math combined treatment</p> <p>2 = control</p> <p>3 = integrated</p> <p>4 = other/unclear</p> <p>5 = math measure with literacy activity</p>	<p>Select one context here, and ensure all remaining coding relates to that context. If multiple contexts apply, put each on a separate row. For example, if there is a literacy treatment and literacy is integrated into the math intervention, both should be coded separately in their own row. This means each study could have one row or multiple rows. All context codes that are not related to the context you identify here should be left blank. For example, if you coded “1” here, you will complete the treatment codes below and leave the rest of the codes in that row blank, as they do not apply to the treatment.</p> <ul style="list-style-type: none"> ● Literacy measure/assessment = A literacy-related measure/assessment that was administered to the children or the parents is part of this study. <ul style="list-style-type: none"> ○ If any data was collected that relates to literacy - formal/informal, parent/child - it should be documented here. In other words, any data source, not just literacy achievement, should be captured if it includes literacy in some way. <ul style="list-style-type: none"> ■ Note: If a data source that includes literacy is the only way literacy is incorporated in the study, code 0 here and leave all the remaining codes in this tab blank for this row. You will capture information about the data source in the other tab. ● Literacy treatment or literacy/math combined treatment = Either a a literacy <u>treatment</u>, <i>separate from the math treatment was part of this study (i.e. there was both a math intervention and a literacy intervention)</i> OR there was an intervention that “equally” included both math and literacy <ul style="list-style-type: none"> ○ It is acceptable to code “1” here if content other than literacy is part of the literacy intervention, such as if the literacy treatment group received instruction on literacy and on behavior ● Control = The literacy component of this study was the content within the control or active control groups. In other words, literacy was used as a comparison group to the math treatment group. ● Integrated = The literacy component in this study is part of the math intervention. In other words, the math intervention includes some type of literacy activity. <ul style="list-style-type: none"> ○ For example, if there is one numeracy treatment group that uses math books, literacy is integrated into the math intervention through the use of reading as an activity. ○ We are being liberal with our coding of “integrated” (i.e. if there is any literacy activity, capture it). ● Other/unclear = The literacy component cannot be described by any of the above options or the relationship between the math and literacy component is unclear. <ul style="list-style-type: none"> ○ If you choose this code, explain your choice in the anecdotal code below. ● Math measure with literacy activity = The math measure requires students to engage in reading, writing, speaking/listening to demonstrate their math understanding/abilities.

Context of the literacy component notes	Anecdotal	<p>List the name of the group or measure, and include the page number(s) where the group/measure is described. In other words, this is a check in to ensure that we can explain what you chose for the previous code.</p> <ul style="list-style-type: none"> ● If you chose 1 above because there was a combined literacy and math intervention, be sure to explain that here, and make the text in this cell red. <ul style="list-style-type: none"> ○ For example, in the Austin (1988) study, note that the one treatment group included a homework intervention that had both math and literacy components. ● If you chose “other/unclear” above, explain that here. ● If “0” (measure) is chosen above, be sure to list the measures here in alphabetical order here.
<p>NOTE: The following section is designed to capture information on studies that contain a literacy intervention, <u>separate</u> from the math intervention. You will code this section if your study has a literacy treatment. If your study does <i>not</i> have literacy treatment, you will code NA for this section.</p>		
<p>Literacy Treatment</p>		
Literacy treatment group name	Anecdotal	<ul style="list-style-type: none"> ● Record the literacy treatment group name
What is the intervention type?	Anecdotal	<p>Make a 1-2 sentence statement about the type of intervention that was being tested and what the intervention agent was expected to do. Copy and paste if possible, and use summary as needed to keep your response brief.</p> <ul style="list-style-type: none"> ● For example: Children were sent home from school with letter knowledge workbooks; the workbooks contained instructions for parents about how to use the workbook with their child. Parents and children completed the workbooks at home.
What are the literacy activities in the literacy intervention?	<p>Select all that apply: 0 = reading 1 = writing 2 = speaking and listening 3 = other</p>	<p>This code is capturing <i>what</i> the parent and child are doing, not the specific literacy content related to what they are doing. Select all that apply.</p> <ul style="list-style-type: none"> ● 0 = The child or the child and an adult engaged in the reading of books or some type of electronic reading material (e.g., ebooks, apps with reading components) ● 1 = The child <i>produced</i> writing that includes math-related content (e.g., answering short answer questions). <ul style="list-style-type: none"> ○ This <u>excludes</u> simply writing down numerals (e.g., practice writing "12" would not qualify as writing here) ● 2 = Any speaking or listening related activities by the child or the adult, including phonological awareness training, math talk, math language, oral language skills, and listening skills for comprehension.

		<ul style="list-style-type: none"> ○ The parent talking to the child during the invention will likely be required. Simply talking and responding between the parent and child should not be marked here. If the speaking and listening were purposefully included in the intervention, mark that here. ● 3 = Other
Literacy activities note	Anecdotal	<p>Write one sentence (or paste it in from the article) describing the way the literacy activity is used in the treatment. For example, if the math control involved reading, describe what was read, etc.</p> <ul style="list-style-type: none"> ● If you selected “other” for “literacy activity” above, provide some information about what the literacy activity looked like. ● NA = There was no literacy integrated into the math intervention
What is the literacy content in the treatment?	<p>Select all that apply:</p> <p>0 = Expressive vocabulary/oral language</p> <p>1 = Receptive vocabulary/language comprehension</p> <p>2 = Print knowledge</p> <p>3 = Alphabetic principle</p> <p>4 = Phonological processing</p> <p>5 = Phonics</p> <p>6 = Word identification</p> <p>7 = Fluency</p> <p>8 = Reading comprehension</p> <p>9 = Writing</p> <p>10 = Home literacy environment</p> <p>11 = Other</p> <p>12 = Unclear</p> <p>13 = Dialogic reading</p>	<p>This code is capturing <i>the specific literacy content</i> of the literacy activity identified above. Select all that apply:</p> <p>0 = Expressive vocabulary/oral language = Related to speaking, and is composed of general word knowledge, vocabulary, understanding of word order, and knowledge of grammatical rules</p> <ul style="list-style-type: none"> ● For example, <i>producing/using</i> language (i.e. vocabulary, grammar, sentence structure) to effectively communicate thoughts <p>1 = Receptive vocabulary/language comprehension = The “input” of language, or the ability to understand and comprehend spoken language heard or read</p> <ul style="list-style-type: none"> ● For example, a child’s ability to listen and follow directions (e.g. “put on your coat”) <p>2 = Print knowledge = Awareness of letter names, words, and the basic conventions of print/reading such as how to use books and the directionality of print (i.e. concepts of print)</p> <ul style="list-style-type: none"> ● For example, a child identifying the name of the book <p>3 = Alphabetic principle = The understanding that written letters and groups of letters represent corresponding sounds in spoken language</p> <p>4 = Phonological processing/awareness = The ability to detect and manipulate language through matching, blending, and deleting parts of words, including phonemes (distinct individual unit of sound), syllables (e.g. syllable matching or deletion) and rhymes</p> <ul style="list-style-type: none"> ● Involves only sounds <p>5 = Phonics = The understanding of how letters and groups of letters link to sounds to form letter-sound relationships and spelling patterns</p> <ul style="list-style-type: none"> ● Different than phonological processing because phonics involves the relationship between sounds and written symbols <p>6 = Word recognition/identification = The use of patterns (or other strategies) to decode and spell new words when reading and writing</p> <p>7 = Fluency = The ability to read with appropriate speed/rate, accuracy (word identification) and expression/prosody</p> <p>8 = Reading comprehension = The ability to process text, understand its meaning, and to integrate with what the reader already knows</p>

		<p>9 = Writing = The representation of a language with written symbols</p> <p>10 = Home Literacy Environment = Any information collected regarding the HLE, and the quality of the literacy provided in the home</p> <ul style="list-style-type: none"> Specifics can include frequency of books read, number of books in the home, parent involvement with literacy activities, parent confidence in delivering literacy content in the home, <p>11 = Other = Another type of literacy content that does not fit the above codes</p> <p>12 = Unclear = It is unclear what aspect of literacy is included</p> <p>13 = Dialogic reading = process of having dialogue between an adult and a child around the text being read that involves asking questions to help children explore the text at a deeper level, including defining new words, analyzing the components of a story and being able to talk about the text. In other words, dialogic reading is a form of guided and scaffolded reading where the adult combines reading with prompts to get the child engaged in telling the story with the purpose of improving language, particularly with regard to vocabulary development, oral complexity, and narrative skills.</p>
Other Content Note	Anecdotal or NA	<ul style="list-style-type: none"> If you coded “other” or “unclear” above, please make a statement explaining your choice Code NA if you did not code “other” or “unclear”
What was the setting of the literacy intervention?	<p>Select one:</p> <p>0 = Not reported</p> <p>1 = Child’s home only</p> <p>2 = After-school program</p> <p>3 = Summer school program</p> <p>4 = Classroom intervention with an at-home component</p> <p>5 = Home-based daycare setting</p> <p>6 = Museum</p> <p>7 = Library</p> <p>8 = Zoo</p> <p>9 = Community center</p> <p>10 = Other public space</p>	<p>This code refers to ultimately <i>where the child received the literacy</i> support.</p> <ul style="list-style-type: none"> 0 = Not reported or unclear 1 = Child’s home only: The literacy intervention is only conducted at the child’s home. 2 = After-school program: The literacy intervention is conducted at a school, but not during school hours. 3 = Summer school program: The literacy intervention is conducted at a school, but not during the regular school year. 4 = Classroom intervention with an at-home component: The literacy control is conducted at a school, but also includes some type of at-home component. 5 = Home-based daycare setting: The literacy intervention is conducted at a daycare that is ran out of someone’s home 6 = Museum 7 = Library 8 = Zoo 9 = Community center 10 = Other public space <p>11 = Mix of one or more options above: The literacy intervention is conducted at two or more of the locations listed above. Choose this option instead of selecting two from above. If this code is chosen, explain in the next code.</p>

	11 = Mix of one or more options above	
Other Literacy Setting Information	Anecdotal or NR or NA	If you chose “other public space” or “a mix of options”, please anecdotally explain your above choice in one sentence. <ul style="list-style-type: none"> ● Code NR here if you chose 0 above. ● Code NA if you chose 1-9 above, or if there is not a literacy treatment
Who was the intervention agent?	Select one : 0 = Classroom teacher 1 = Researcher 2 = Parent 3 = Older sibling 4 = Home-based daycare provider 5 = Staff at a public space 6 = After school staff or volunteers 7 = Other or Mix of types of intervention agent 8 = Not reported	This refers to who was administering the literacy content to the child in the control group. We are interested in who facilitated the literacy learning for the child. <ul style="list-style-type: none"> ● Classroom teacher, paraprofessional, other school staff ● Researcher, graduate student, research assistant ● Parent, guardian, grandparent, or other adult family member ● Older sibling ● Home-based daycare provider ● Staff at a public space (librarian, zoo staff, museum staff) ● After school staff or volunteers ● Other or Mix of types of intervention agent ● Not reported
Caregiver Training	Select one : 0 = No 1 = Yes 2 = NA	If the intervention agent was a caregiver, did the caregiver receive some type of training, guidance, coaching, or recommendations on how to implement a literacy component? <ul style="list-style-type: none"> ● No, the caregiver did not receive training, guidance, coaching or recommendations on how to deliver the literacy content. ● Yes, the caregiver did receive some type training, guidance, coaching, or recommendations on how to deliver the literacy content. ● NA, The intervention agent was not a caregiver
What was the type of training?	Anecdotal or NA	<ul style="list-style-type: none"> ● Include a statement regarding what the caregiver training looked like. ● Code NA if there was not caregiver training or if the training itself was not described
What was the content of the training?	Select all that apply: 0 = Expressive vocabulary/oral	This code is capturing <i>the specific literacy content</i> of the literacy activity identified above. Select all that apply:

	<p>language 1 = Receptive vocabulary/language comprehension 2 = Print knowledge 3 = Alphabetic principle 4 = Phonological processing 5 = Phonics 6 = Word identification 7 = Fluency 8 = Reading comprehension 9 = Writing 10 = Home literacy environment 11 = Other 12 = NA, NR or Unclear 13 = Dialogic reading</p>	<p>0 = Expressive vocabulary/oral language = Related to speaking, and is composed of general word knowledge, vocabulary, understanding of word order, and knowledge of grammatical rules</p> <ul style="list-style-type: none"> For example, <i>producing/using</i> language (i.e. vocabulary, grammar, sentence structure) to effectively communicate thoughts <p>1 = Receptive vocabulary/language comprehension = The “input” of language, or the ability to understand and comprehend spoken language heard or read</p> <ul style="list-style-type: none"> For example, a child’s ability to listen and follow directions (e.g. “put on your coat”) <p>2 = Print knowledge = Awareness of letter names, words, and the basic conventions of print/reading such as how to use books and the directionality of print (i.e. concepts of print)</p> <ul style="list-style-type: none"> For example, a child identifying the name of the book <p>3 = Alphabetic principle = The understanding that written letters and groups of letters represent corresponding sounds in spoken language</p> <p>4 = Phonological processing/awareness = The ability to detect and manipulate language through matching, blending, and deleting parts of words, including phonemes (distinct individual unit of sound), syllables (e.g. syllable matching or deletion) and rhymes</p> <ul style="list-style-type: none"> Involves only sounds <p>5 = Phonics = The understanding of how letters and groups of letters link to sounds to form letter-sound relationships and spelling patterns</p> <ul style="list-style-type: none"> Different than phonological processing because phonics involves the relationship between sounds and written symbols <p>6 = Word recognition/identification = The use of patterns (or other strategies) to decode and spell new words when reading and writing</p> <p>7 = Fluency = The ability to read with appropriate speed/rate, accuracy (word identification) and expression/prosody</p> <p>8 = Reading comprehension = The ability to process text, understand its meaning, and to integrate with what the reader already knows</p> <p>9 = Writing = The representation of a language with written symbols</p> <p>10 = Home Literacy Environment = Any information collected regarding the HLE, and the quality of the literacy provided in the home</p> <ul style="list-style-type: none"> Specifics can include frequency of books read, number of books in the home, parent involvement with literacy activities, parent confidence in delivering literacy content in the home <p>11 = Other = Another type of literacy content that does not fit the above codes</p> <p>12 = NA, NR, or Unclear = There was no parent training; the content of the training was not mentioned, or it is unclear what aspect of literacy is included.</p> <p>13 = Dialogic reading = process of having dialogue between an adult and a child around the text being read that involves asking questions to help children explore the text at a deeper level, including defining new words, analyzing the components of a story and being able to talk about</p>
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		<p>the text. In other words, dialogic reading is a form of guided and scaffolded reading where the adult combines reading with prompts to get the child engaged in telling the story with the purpose of improving language, particularly with regard to vocabulary development, oral complexity, and narrative skills.</p>
<p>Literacy Treatment Initial Training Duration/Time Notes for Caregiver Intervention</p>	<p>Anecdotal or NA</p>	<p>Copy/paste a sentence or a phrase that provides all relevant detail about the training duration/time for caregivers.</p> <ul style="list-style-type: none"> ● This time refers to training but does <u>NOT</u> refer to follow-up support. <ul style="list-style-type: none"> ○ This may include the number of minutes, sessions, or hours of training. ○ Examples: <ul style="list-style-type: none"> ▪ Parents were trained in one 30 minute session. ▪ Parents received two 45 minute sessions. ● Not applicable (report NA) = The study did not include caregiver training or information related to initial training duration/time.
<p>Literacy Treatment Training Purpose</p>	<p>Select all that apply:</p> <p>1 = NR</p> <p>2 = How to facilitate the literacy activity</p> <p>3 = Specific literacy content</p> <p>4 = Basic/general information about supporting children’s literacy development?</p>	<p>This code refers to the purpose of the training. More than one option could be applicable, so please select all that apply.</p> <ul style="list-style-type: none"> ● NR = There was information provided about the caregiver training ● 1 = This code refers to whether or not the training provided the caregiver with information about the basic procedures of the intervention. In other words, the parents were provided <i>information/support on how to facilitate the activity</i> (e.g., told how the intervention should be implemented, provided modeling or demonstration of the activities). For this code, consider both the initial and the follow up support/training. <ul style="list-style-type: none"> ○ For example, caregivers were provided with information about recommended steps for implementation, or general procedures for how to use or play the intervention activity. As another example - parents were allowed to practice facilitating the activity with the researcher present. ● 2 = This code refers to whether or not the training provided the caregiver with specific literacy content knowledge. Based on the literacy content of the intervention, related content support was provided for the caregiver. For this code, consider both the initial and the follow up support/training. <ul style="list-style-type: none"> ○ For example, were caregivers provided with information about what phonics means, or developmental information about specific literacy skills. ○ This does not refer to a training on a literacy activity or strategy alone where the actual literacy content is not part of the training. ● 3 = This code refers to whether or not the training provided the caregiver with information about best practices or strategies for supporting children’s literacy development or acquisition of knowledge and skills; this may also refer to development in general such as cognitive development or age-appropriate activities. Aside from the intervention-specific training, was

		<p>more general guidance provided for supporting children’s math development? For this code, consider both the initial and the follow up support/training.</p> <ul style="list-style-type: none"> ○ This is more about supporting development than focusing on content. Oftentimes, supporting development and content go together. ○ For example, were caregivers provided with information (e.g., a handout or tip sheet) about how to enhance children’s understanding of counting during a specific activity. How to enhance understanding (mentioned here) would be different than the procedures for implementing the actual intervention (procedure code above).
Caregiver Intervention Follow-Up Support	Select one : 0 = no or not reported 1 = yes	<p>Follow-up support refers only to support after initial caregiver intervention or training that a caregiver receives (e.g., a coaching session with the child, home visit, additional refresher training, text message reminders). Consider any training or support provided after the first/initial meeting/training/support. Codes defined as:</p> <ul style="list-style-type: none"> ● No or not reported = the study did not report information about follow-up training or specifically states that the caregiver did not receive any follow-up support. <ul style="list-style-type: none"> ○ <i>Mark Not Applicable for the remaining follow-up training codes.</i> ● Yes = the study specifically states that the caregiver received some kind of follow-up support.
Caregiver Intervention Follow-Up Support Time, Location, and Nature Notes	Anecdotal or NA	<p>Include a sentence or a phrase (you can copy/paste) that provides all relevant detail about the duration/frequency, location, and nature of follow-up support for caregivers. This may include the number of minutes, sessions, or hours of training, as well as the location. Also, what was the purpose or function? Was it to simply provide coaching, reminders about procedures, check for fidelity of procedures, specific demonstration of a skill that was requested by the parent? For example:</p> <ul style="list-style-type: none"> ● Parents had one home visit, lasting between 30 and 45 minutes by a researcher. ● Parents received weekly text message reminders. ● Not applicable (report NA) = The study did not include caregiver follow-up training.
<p>NOTE: The following section is designed to capture data on studies in which the literacy content was delivered to a control OR active control group. If your study does <i>not</i> have a literacy control or active control condition, you will code NA for each code in this section.</p>		
<p>Literacy Control</p>		
Is there literacy content in the control OR active control group?	Select one : 0 = Control 1 = Active control 2 = NA (neither)	<p>Are <i>children</i> in the control OR active control group receiving some kind of literacy content, play, support, or opportunities? For this code, we are interested in whether the authors identified the group as <i>control</i> or <i>active control</i>.</p> <ul style="list-style-type: none"> ● 0 = Control, child participants in the control group were receiving extra support, training, play, activities or opportunities related to literacy. ● 1 = Active control, child participants in the active control group were receiving extra support, training, play, activities or opportunities related to literacy.

		<ul style="list-style-type: none"> 2 = Neither, either it was unclear if the group was identified as <i>control</i> or <i>active control</i>, or the authors used both terms interchangeably (control and active control) to describe the group.
What are the literacy activities in the control OR active control?	Select all that apply: 0 = reading 1 = writing 2 = speaking and listening 3 = other	<p>This code is capturing <i>what</i> the parent and child are doing, not the content of what they are doing. Select all the literacy activities that apply.</p> <ul style="list-style-type: none"> 0 = Students or students with an adult engaged in the reading of books or some type of electronic reading material (e.g., ebooks, apps with reading components) 1 = Any writing <i>produced by the child</i> that includes math-related writing (e.g., writing word problems and answering short answer questions with writing). <u>Excludes</u> writing Arabic numerals (e.g., writing "12" would not qualify as writing here) 2 = Any speaking or listening related activities, including phonological awareness training, math talk, math language, oral language skills, and listening skills for comprehension. 3 = other
Literacy activities note	Anecdotal	<p>Write one sentence (or paste it in from the article) describing the way the literacy activity is used as a control. For example, if the math control involved reading, describe what was read, etc.</p> <ul style="list-style-type: none"> If you selected "other" for "literacy activity" above, provide some information about what the literacy activity looked like.
What is the literacy content in the control OR active control?	Select all that apply: 0 = Expressive vocabulary/oral language 1 = Receptive vocabulary/language comprehension 2 = Print knowledge 3 = Alphabetic principle 4 = Phonological processing 5 = Phonics 6 = Word identification 7 = Fluency 8 = Reading comprehension 9 = Writing 10 = Home literacy environment	<p>This code is capturing <i>the specific literacy content</i> of the literacy activity identified above. Select all that apply:</p> <p>0 = Expressive vocabulary/oral language = Related to speaking, and is composed of general word knowledge, vocabulary, understanding of word order, and knowledge of grammatical rules</p> <ul style="list-style-type: none"> For example, <i>producing/using</i> language (i.e. vocabulary, grammar, sentence structure) to effectively communicate thoughts <p>1 = Receptive vocabulary/language comprehension = The "input" of language, or the ability to understand and comprehend spoken language heard or read</p> <ul style="list-style-type: none"> For example, a child's ability to listen and follow directions (e.g. "put on your coat") <p>2 = Print knowledge = Awareness of letter names, words, and the basic conventions of print/reading such as how to use books and the directionality of print (i.e. concepts of print)</p> <ul style="list-style-type: none"> For example, a child identifying the name of the book <p>3 = Alphabetic principle = The understanding that written letters and groups of letters represent corresponding sounds in spoken language</p> <p>4 = Phonological processing/awareness = The ability to detect and manipulate language through matching, blending, and deleting parts of words, including phonemes (distinct individual unit of sound), syllables (e.g. syllable matching or deletion) and rhymes</p> <ul style="list-style-type: none"> Involves only sounds <p>5 = Phonics = The understanding of how letters and groups of letters link to sounds to form letter-sound relationships and spelling patterns</p>

	<p>11 = Other 12 = Unclear 13 = Dialogic reading</p>	<ul style="list-style-type: none"> • Different than phonological processing because phonics involves the relationship between sounds and written symbols <p>6 = Word recognition/identification = The use of patterns (or other strategies) to decode and spell new words when reading and writing 7 = Fluency = The ability to read with appropriate speed/rate, accuracy (word identification) and expression/prosody 8 = Reading comprehension = The ability to process text, understand its meaning, and to integrate with what the reader already knows 9 = Writing = The representation of a language with written symbols 10 = Home Literacy Environment = Any information collected regarding the HLE, and the quality of the literacy provided in the home</p> <ul style="list-style-type: none"> • Specifics can include frequency of books read, number of books in the home, parent involvement with literacy activities, parent confidence in delivering literacy content in the home, <p>11 = Other = Another type of literacy content that does not fit the above codes 12 = Unclear = It is unclear what aspect of literacy is included 13 = Dialogic reading = process of having dialogue between an adult and a child around the text being read that involves asking questions to help children explore the text at a deeper level, including defining new words, analyzing the components of a story and being able to talk about the text. In other words, dialogic reading is a form of guided and scaffolded reading where the adult combines reading with prompts to get the child engaged in telling the story with the purpose of improving language, particularly with regard to vocabulary development, oral complexity, and narrative skills.</p>
Other content note	Anecdotal or NA	<p>If you coded “other” or “unclear” above, please make a statement explaining your choice.</p> <p>Code NA if you did not code “other” or “unclear”</p>
Why is literacy being used as a control in the math intervention?	Anecdotal or NA	<p>Provide a brief explanation as to why the author chose to include the above literacy activities and content as part of the control OR active control group. Base this explanation off of the author's words (not our assumptions). Copy and paste a statement if possible.</p> <ul style="list-style-type: none"> • For example, “Phonological awareness training was selected as an active control group to directly compare the effects of ANS training against a group who did not receive the training. We chose phonological awareness because it provided the control group with meaningful content as opposed to a BAU group.” • Code NA if there was no explanation provided
What was the setting of the literacy	Select one : 0 = Not reported	<p>This code refers to ultimately <i>where the child received the literacy</i> support.</p> <p>0 = Not reported or unclear 1 = Child’s home only: The literacy control is only conducted at the child’s home.</p>

control?	<p>1 = Child's home only 2 = After-school program 3 = Summer school program 4 = Classroom intervention with an at-home component 5 = Home-based daycare setting 6 = Museum 7 = Library 8 = Zoo 9 = Community center 10 = Other public space 11 = Mix of one or more options above</p>	<p>2 = After-school program: The literacy control is conducted at a school, but not during school hours. 3 = Summer school program: The literacy control is conducted at a school, but not during the regular school year. 4 = Classroom intervention with an at-home component: The literacy control is conducted at a school, but also includes some type of at-home component. 5 = Home-based daycare setting: The literacy control is conducted at a daycare that is ran out of someone's home 6 = Museum 7 = Library 8 = Zoo 9 = Community center 10 = Other public space: The literacy control is conducted at some public place that is not mentioned above. 11 = Mix of one or more options above: The literacy control is conducted at two or more of the locations listed above. Choose this option instead of selecting two from above. If this code is chosen, explain in the next code.</p>
Who was the intervention agent for the control group?	<p>Select one: 0 = Classroom teacher 1 = Researcher 2 = Parent 3 = Older sibling 4 = Home-based daycare provider 5 = Staff at a public space 6 = After school staff or volunteers 7 = Other or Mix of types of intervention agent 8 = Not reported 9 = NA</p>	<p>This refers to who was administering the literacy content to the child in the control group. We are interested in who facilitated the literacy learning for the child.</p> <ul style="list-style-type: none"> ● Classroom teacher, paraprofessional, other school staff ● Researcher, graduate student, research assistant ● Parent, guardian, grandparent, or other adult family member ● Older sibling ● Home-based daycare provider ● Staff at a public space (librarian, zoo staff, museum staff) ● After school staff or volunteers ● Other or Mix of types of intervention agent ● Not reported ● NA = Code NA in cases where there is not an intervention agent (e.g., BAU control condition)

Caregiver Training	Select one : 0 = No 1 = Yes 2 = NA	IF the control group agent was a caregiver, did the caregiver receive some type of training, guidance, coaching, or recommendations on how to implement a literacy component? <ul style="list-style-type: none"> No, the caregiver did not receive training, guidance, coaching or recommendations on how to deliver the literacy content. Yes, the caregiver did receive some type training, guidance, coaching, or recommendations on how to deliver the literacy content. NA, The control group agent was not a caregiver
NOTE: The following section captures information surrounding how literacy was integrated within the math intervention . In other words, you will analyze the math intervention to see if/how literacy was part of the math intervention. If you completed either of the above sections (i.e., literacy treatment or literacy control), this section might still apply if there are additional literacy components integrated into the math intervention.		
Integrated Literacy into the Math Intervention		
What are the literacy activities integrated into the math intervention?	Select all that apply: 0 = reading 1 = writing 2 = speaking and listening 3 = other	Select all the literacy activities that apply. This code is capturing what the parent and child are doing, not the content of what they are doing. <ul style="list-style-type: none"> 0 = Students or students with an adult engaged in the reading of books or some type of electronic reading material (e.g., ebooks, apps with reading components) 1 = Any writing <i>produced by the child</i> that includes math-related writing (e.g., writing word problems and answering short answer questions with writing). <u>Excludes</u> writing Arabic numerals (e.g., writing "12" would not qualify as writing here) 2 = Any speaking or listening related activities, including phonological awareness training, math talk, math language, oral language skills, and listening skills for comprehension <ul style="list-style-type: none"> Also includes rote counting, one-one correspondence, or any other math skill that depends on a literacy activity. 3 = other
Literacy activities note	Anecdotal	Write one sentence (or paste it in from the article) describing the way a literacy activity is used in the math intervention. For example, if the math intervention involved reading, describe what was read, etc. <ul style="list-style-type: none"> If you selected "other" for "literacy activity" above, provide some information about what the literacy activity looked like. If you chose "2" (speaking/listening) above, mention the specific type of language here (e.g. one-to-one-correspondence, shape terms, etc.)
Type of language	Select all that apply: 1= General language 2=Quantitative language	If you chose "speaking and listening" for "literacy activities" above, choose a code(s) here to describe which type of language is being used. <ul style="list-style-type: none"> NA = "Speaking and listening" was not chosen above for literacy activity. General language = language not specifically related to mathematical language understanding

	3=Spatial language 4=NA	<ul style="list-style-type: none"> ○ E.g. Verbal counting, such as when children are asked to count aloud as high as possible (one, two, three, etc.), can be acquired through rote memorization and does not require understanding of the deeper structure ○ E.g. One-to-one correspondence (i.e., each number word is said when pointing to a different item) is another basic principle children can learn without understanding quantitative words such as “more” or spatial words such as “last.” ● Quantitative or comparative language = determining more and less, part–whole comparisons, and nonverbal arithmetic words (e.g., combine/more/less/take away) ● Spatial language = <ul style="list-style-type: none"> ○ Shape terms: standard math names for two- and three-dimensional objects, such as circle, triangle, rectangle, cone, pyramid ○ Dimensional adjectives: words describing size of objects, people, and spaces, such as big, little, long, short, tall, tiny, huge ○ Spatial features terms: words describing features and properties of two- and three-dimensional objects, spaces, and people, such as curvy, edge, side, line, corner, straight, flat ○ Spatial location and directions: words that describe the relative position of objects, people, and points in space, such as between, into, forward, over, behind, near, far
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NOTE: The following section captures information surrounding the various literacy reports and measures collected.

Study Identifier	Number	This number will be provided for all studies.
Authors	Names	All authors’ last names, separated by commas
Year	Year	Year of publication
Name of Literacy Measure or Math Measure with Integrated Literacy	Anecdotal	Make a row in the excel sheet for each individual measure.

Literacy Reports and Literacy Measures Information

<p>Content of the Literacy Measure</p>	<p>Select all that apply:</p> <p>0 = Expressive vocabulary/oral language</p> <p>1 = Receptive vocabulary/language comprehension</p> <p>2 = Print knowledge</p> <p>3 = Alphabetic principle</p> <p>4 = Phonological processing</p> <p>5 = Phonics</p> <p>6 = Word identification</p> <p>7 = Fluency</p> <p>8 = Reading comprehension</p> <p>9 = Writing</p> <p>10 = Home literacy environment</p> <p>11 = Other</p> <p>12 = Unclear</p> <p>13 = Dialogic reading</p>	<p>This code is capturing <i>the specific literacy content</i> of the literacy measure/assessment identified above. When determining the content of a measure, it is appropriate to make an inference based on the title (if needed because a description is not provided). Just be sure to explain your interference in your content note below.</p> <p>Select all that apply:</p> <p>0 = Expressive vocabulary/oral language</p> <ul style="list-style-type: none"> ● E.g. Child is given a word bank and is asked to say or write a sentence correctly using one or more of the words <p>1 = Receptive vocabulary/language comprehension</p> <ul style="list-style-type: none"> ● E.g. Peabody Picture Vocabulary Test ● E.g. Definitional Vocabulary subtest of the Test of Preschool Early Literacy Skills (TOPEL) <p>2 = Print knowledge</p> <ul style="list-style-type: none"> ● Examples: <ul style="list-style-type: none"> ○ General assessment of letter name knowledge, such as asking a child to look at and name letters (e.g., “this is the letter <i>A</i>” → not related to sounds) ○ Asking a child to identify the title of a book or where the text begins in a book ○ Print Knowledge subtest of the Test of Preschool Early Literacy Skills (TOPEL) <p>3 = Alphabetic principle</p> <ul style="list-style-type: none"> ● E.g. Child identifies a letter for the sound being spoken aloud or a word for a word being read aloud <p>4 = Phonological processing/awareness</p> <ul style="list-style-type: none"> ● E.g. Child is asked to say a word aloud but break it into phonemes (e.g. /c/ /a/ /t/ is “cat) ● E.g. Comprehensive Test of Phonological Processing elision subtest (omission of a sound or syllable when speaking) ● E.g. Phonological Awareness subtest of the Test of Preschool Early Literacy Skills (TOPEL) <p>5 = Phonics</p> <ul style="list-style-type: none"> ● E.g. Child is asked to spell a word that is read aloud using magnetic letters <p>6 = Word recognition/identification</p> <ul style="list-style-type: none"> ● E.g. Child is given a list of written words and asked to read them aloud ● E.g. Woodcock Reading Mastery Test Word Identification subtest <p>7 = Fluency</p> <ul style="list-style-type: none"> ● E.g. Child reads aloud and one or more of the following is documented - the time it takes to read, the number of words they read correctly, and the expression they read/did not read with <p>8 = Reading comprehension</p> <ul style="list-style-type: none"> ● E.g. Child reads (or is read to) and is asked questions to determine if they understood what they read <p>9 = Writing</p> <ul style="list-style-type: none"> ● E.g. Child is asked to generate ideas and write/type a response <p>10 = Home Literacy Environment</p>
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		<ul style="list-style-type: none"> ● E.g. Log where parents document how many times they read to their child each week <p>11 = Other = Another type of literacy content that does not fit the above codes</p> <ul style="list-style-type: none"> ● E.g. Parent survey on confidence for supporting their child with literacy <p>12 = Unclear = It is unclear what aspect of literacy is included</p> <p>13 = Dialogic reading=process of having dialogue between an adult and a child around the text being read that involves asking questions to help children explore the text at a deeper level, including defining new words, analyzing the components of a story and being able to talk about the text. In other words, dialogic reading is a form of guided and scaffolded reading where the adult combines reading with prompts to get the child engaged in telling the story with the purpose of improving language, particularly with regard to vocabulary development, oral complexity, and narrative skills.</p>
Description of Literacy Measure Note	Anecdotal	<p>Provide a brief description of the measure, such as a list of skills included in the measure.</p> <ul style="list-style-type: none"> ● For example, for a phonological awareness measure, you might write “Child is asked to say a word aloud but break it into distinct phonemes” <ul style="list-style-type: none"> ○ Another example - If the TOPEL is a measure, here you would note that it measures print knowledge, vocabulary, and phonological awareness. ● If you coded “other” or “unclear” above, please also write a brief explanation for your code here.
Additional Home Literacy Environment Information	Anecdotal or NA	<p>If information about the home literacy environment was collected, please copy and paste information about this measure.</p> <ul style="list-style-type: none"> ● Code NA if there was not a measure about the HLE.
Caregiver Report on Child Literacy Behavior/ Achievement	Anecdotal or NR	<p>Did the caregivers provide information on the child’s literacy achievement or behavior? This code is for parents reporting on what their child’s literacy behavior is like either before or during an intervention, not for reporting on what literacy practices happen in the home and not for reporting literacy measures collected. In other words, if researchers asked parents to describe their child’s behavior or achievement (at any point during the study), report that here. Paste in anecdotal information describing this if so.</p> <ul style="list-style-type: none"> ● NR, No information about the caregivers report on the child’s literacy achievement or behavior (before, during, or after the intervention) was provided. ● Examples of anecdotal info: <ul style="list-style-type: none"> ○ Caregivers described the child as a reader in an interview before the intervention ○ Caregivers tracked how the child’s literacy <u>behavior</u> changed using a log during the intervention. ● Look in the methods/measures sections

Purpose for Including Literacy Measure	Anecdotal	<p>Why did the author include a literacy measure in this study? Write a 1-2 sentence explanation describing the researchers' rationale for including a literacy measure as part of their study. The goal is to capture why the author states they chose to include a literacy measure. However, if that information is not explicitly provided, make an inference based on the information you have.</p> <ul style="list-style-type: none"> ● Example: The purpose of including the emergent literacy tasks was to determine whether the effects of the intervention were specific to parental support for mathematics or whether the intervention would also enhance home literacy practices (Starkey & Klein, 2000, p. 665-666)
Literacy Measure Results Page Number(s)	Anecdotal	<ul style="list-style-type: none"> ● If the study reports the results of the literacy measures, please report those page numbers here. For example: 56 or 31-32. If there are multiple page numbers, separate them by semicolons. ● Code NA if results are not reported or if there were no literacy measures.
Math Measure with Literacy Activities		
What are the literacy activities in the math measure?	Select all that apply: 0 = reading 1 = writing 2 = speaking and listening 3 = other	<p>Select all the literacy activities that apply.</p> <ul style="list-style-type: none"> ● 0 = Students or students with an adult engaged in the reading of books or some type of electronic reading material (e.g., ebooks, apps with reading components) ● 1 = Any writing produced by the child that includes math-related writing (e.g., writing word problems and answering short answer questions with writing). Excludes writing Arabic numerals (e.g., writing "12" would not qualify as writing here) ● 2 = Any speaking or listening related activities, including phonological awareness training, math talk, math language, oral language skills, and listening skills for comprehension <ul style="list-style-type: none"> ○ Also includes rote counting, one-one correspondence, or any other math skill that depends on successful literacy skills. ● 3 = other
Literacy activities note and Page Number(s)	Anecdotal	<p>Write one sentence (or paste it in from the article) describing the way a literacy activity is used in the math measure. Include page number.</p> <ul style="list-style-type: none"> ● If you selected "other" for "literacy activity" above, provide some information about what the literacy activity looked like.
<p>Explicit Mentions of Literacy in the Research Report</p> <p>The following section is to determine if there are explicit mentions of literacy throughout the research report. Code "yes" if there is an "explicit" mentions of literacy, in other words, if the following words appear: literacy, reading, writing, speaking, listening. If none of these words appear, consider the following content specific terms: Expressive vocabulary/oral language, Receptive vocabulary/language comprehension, Print knowledge, Alphabetic principle, Phonological processing, Phonics, Word identification, Fluency, Reading comprehension, Writing, Home literacy environment.</p>		

Was literacy explicitly mentioned in the title or abstract?	0 = No 1 = Yes	
Was literacy explicitly mentioned in the introduction/ literature review?	0 = No 1 = Yes	
Was literacy explicitly mentioned in a research question, purpose statement, or hypothesis?	0 = No 1 = Yes	
When describing the intervention and procedures, did the authors explicitly mention literacy?	0 = No 1 = Yes	
If literacy was explicitly acknowledged when the researchers described their data sources, was a rationale provided for the use of literacy?	0 = No 1 = Yes	
Were findings related to literacy explicitly discussed in the findings/ results section?	0 = No 1 = Yes	
Was literacy explicitly discussed in the discussion section?	0 = No 1 = Yes	