

## Appendix A: Definitions of Child Codes

Our child variables are divided into communication modes, communication acts, and reading behaviors. Communication modes were coded only if the child performed the action independently. (Hand-over-hand guidance by the parent was coded as part of the parent coding system and not as part of the child's communication codes.) For each storybook reading, we counted the following communication modes:

- (1) Vocalizations (VO), instances in which the girls used their voices, even though intelligible words were not produced.
- (2) Eyepointing to Symbols, instances in which the girls pointed to symbols with their eyes. This category was coded as successful (ESS) if the child eyepointed to a symbol at an appropriate time and the symbol was interpreted as a meaningful contribution by the parent. The instance was coded as unsuccessful (ESU) if the child eyepointed to a symbol at an inappropriate time or if the parent ignored, missed, or misinterpreted the child's eyepoint. After exploratory analysis, these variables were combined as a new variable, ES (i.e.,  $ESS + ESU = ES$ ).
- (3) Eyepointing in Book, instances in which the girls pointed to symbols or pictures within the book. This category was coded as successful (EBS) if the child eyepointed to the book at an appropriate time, and the symbol was interpreted as a meaningful contribution by the parent. The instance was coded as unsuccessful (EBU) if the child eyepointed to the book at an inappropriate time or if the parent ignored, missed, or misinterpreted the child's eyepoint. After

exploratory analysis, these variables were combined as a new variable, EB (i.e.,  $EBS + EBU = EB$ ).

(4) Pointing to Symbols, instances in which the girls used a finger or object to point to a symbol. (This does not include eyepointing or pushing a symbol on a switch in order to activate it.) This category was coded as successful (PSS) if the child pointed to a symbol at an appropriate time and if the symbol was interpreted as a meaningful contribution by the parent. It was coded as unsuccessful (PSU) if the child pointed at an inappropriate time or if the parent ignored, missed, or misinterpreted the child's point. After exploratory analysis, these variables were combined as a new variable, PS (i.e.,  $PSS + PSU = PS$ ).

(5) Pointing to Pictures of Text within the Book, instances in which the girl used a finger or object to point to something in the storybook. This category was coded as successful (PBS) if the child pointed to the book at an appropriate time and the point was interpreted as a meaningful contribution by the parent or unsuccessful (PBU) if the child pointed at an inappropriate time or if the parent ignored, missed, or misinterpreted the child's point. After exploratory analysis, these variables were combined as a new variable, PB (i.e.,  $PBS + PBU = PB$ ).

(6) Facial Expressions (FE), instances in which the child smiled, frowned, or otherwise assisted in the interpreting of the story content or tone with movements of the face.

(7) Actions on the Book (AB), instances in which the child lifted flaps, scratched-and-sniffed, or pretended to do something based on the story content or illustrations in the book. (This did not include turning pages of the book.)

(8) Switch Use, instances in which the child used an AAC device or another voice-output device. This category was coded as successful (SS) if the child used the switch at a time that made a meaningful contribution to the story or unsuccessful (SU) if the child used the switch at a time that did not make a meaningful contribution to the story. The mothers' response to a switch hit did not influence whether it was coded SS or SU.

For each storybook reading, we counted the following communication acts:

(1) Yes/No Responses (YN), instances in which the girls responded with an affirmation or negation to a question about the story or about the child's experiences as they related to the story. Girls may respond by using eyepointing or switch use. This category also included confirmations or denials to a mother's request for clarification.

(2) Label or Comment (LC), instances in which the girls labeled a picture, made a comment, or responded to who-what-when-where-why questions using any communication mode. This category included labels and comments that were initiations or responses.

(3) Off-topic Comment or Question (OT), instances in which the girl labeled, commented about, or questioned something other than the story or its related

events. This category included responses to other people, objects, and events in the environment.

(4) Direct Parent (DP), instances in which the child requested that the mother perform some storybook-related action (e.g., turning pages, reading something again, repeating a silly story or noise).

For each storybook reading, we counted the following reading behaviors:

(1) Turning Pages. This category was coded as successful (TS) if the child turned the storybook pages independent of the mother, even if the page flapped back afterwards or unsuccessful (TU) if the child made an attempt to turn the page and could not do so independently. An event was not coded if the mother first initiated the page-turn.

(2) Visual Attention to the Book. This category was coded as a fleeting moment (ABF) if the child stopped and looked at the book for less than one second, a sustained glance (ABG) if the child looked at the book for 1 to 2 seconds without interruption, or a silent study (ABS) if the child looked at the book for more than 2 consecutive seconds. Each time the child looked away from the book—even for a split second—the clock was stopped and the length of the attention span was calculated. After exploratory analysis, these variables were combined as a new variable, ATB (i.e.,  $ABF + ABG + ABS = ATB$ ).

(3) Visual Attention to the Parent. This category was coded as a fleeting moment (APF) if the child stopped and looked at the mother for less than one second, a

sustained glance (APG) if the child looked at the mother for 1 to 2 seconds without interruption, or a silent study (APS) if the child looked at the mother for more than 2 consecutive seconds. Each time the child looked away from the mother—even for a split second—the clock was stopped and the length of the attention span was calculated. After exploratory analysis, these variables were combined as a new variable, ATP (i.e., APF + APG + APS = ATP).

## Appendix B: Definitions of Parent Codes

Parent variables are divided into communication modes, communication acts, and reading behaviors. The unit of analysis was the single utterance. Repetitions of utterances were coded as separate utterances (under our repetition categories), and all codes were based on utterances external to the storybook text—i.e., we did not code instances in which the parents dramatically read the text. We were only interested in the communication generated between parent and child through storybook reading.

For each storybook reading, we counted the following communication modes:

(1) Pointing to Symbols, instances in which the mother used a finger or object to direct the child's attention to or model the use of symbols on a communication board or voice-output device. This category may but did not have to include the mother saying the label or message simultaneously. This category was divided into 3 codes: successful (PSS) if the child's gaze followed the mother's point immediately or if the mother kept pointing until the child's attention was drawn to the direction of the point, unsuccessful (PSU) if the child's gaze did not follow the direction of the mother's point before the mother stopped pointing, and assisted (PSA) if the mother helped the child point to the symbols with hand-over-hand physical support. After exploratory analysis, these variables were combined as a new variable, PS (i.e.,  $PSS + PSU + PSA = PS$ ).

(2) Pointing to Pictures or Text in the Book, instances in which the mother used a finger or object to direct the child's attention to something in the storybook. This category was divided into 3 codes: successful (PBS) if the child's gaze followed

the mother's point immediately or if the mother kept pointing until the child's attention was drawn to the direction of the point, unsuccessful (PBU) if the child's gaze did not follow the direction of the mother's point before the mother stopped pointing, and assisted (PBA) if the mother helped the child point to the book with hand-over-hand physical support. After exploratory analysis, we combined these variables as a new variable, PB (i.e., PBS + PBU + PBA = PB).

(3) Action on Book (AB), instances in which the mother lifted a flap, scratched-and-sniffed, or pretended to do something based on the story content or illustrations. This category did not include turning pages or pointing to pictures.

For each storybook reading, we counted the following communication acts:

(1) Attention (A), instances in which the parent requested or demanded for her child to pay attention to a book, reading activity, or picture (e.g., "Look!"; "Look, Petesie"; "See?"; "Guess what?"; "Look at the book"). An Attention Repetition (AR) was coded if the mother repeated the question or comment with little or no modification of wording less than 5 seconds after she asked the initial question and before the child had responded or had a chance to respond. A repetition was not coded if 5 or more seconds elapsed between identical or similar questions. After exploratory analysis, these variables were combined as a new variable, AT (i.e., A + AR = AT).

(2) Labels (L), instances in which the parent labeled or asked for labels for objects, people, or actions in the storybook. Labels often occurred in conjunction with pointing by the parent and/or child (e.g., "Look at the mushroom"; "Point to

the green box”; “What’s that?”; “Show me the dog”; “Horsie, brown horsie”).

Animal sounds were also coded as Labels (e.g., “Ruff!”). A Label Repetition (LR) was coded if the mother repeated the label or comment with little or no modification of wording less than 5 seconds after an initial statement and before the child had responded. After exploratory analysis, these variables were combined as a new variable, LAB (i.e.,  $L + LR = LAB$ ).

(3) Descriptions (D), instances in which the parent provided a description, comment, explanation, summary, or elaboration of the story, focusing on what happened in the text or pictures. Descriptions were more elaborate than a simple label (e.g., “She’s got mud in her eyes”; “The caterpillar turned into a butterfly”; “He was a bad boy!”). A Description Repetition (DR) was coded if the mother repeated the description with little or no modification of the wording less than 5 seconds after an initial statement and before the child had responded or had a chance to respond. After exploratory analysis, these variables were combined as a new variable, DES (i.e.,  $D + DR = DES$ ).

(4) Relation of Pictures, Text, or Events to Child’s Experiences (RC), instances in which the parent asked who-what-when-where-why questions, asked yes-no questions, or made comments linking the events or pictures in the story to a child’s own personal experience (e.g., “You like cake, too”; “He’s brushing his teeth just like you do”; “Would you like to ride in a fast car too?”) A Relation Repetition (RCR) was assigned if the mother repeated a relation comment with little or no modification of wording less than 5 seconds after an initial statement



and before the child had responded or had a chance to respond. After exploratory analysis, these variables were combined as a new variable, REL (i.e., RC + RCR = REL).

(5) Prediction/Inference (PI), instances in which the parent requested or provided (a) predictions about what is going to happen in the story or (b) reasoning underlying motivations, internal states, causes, and effects. This category was distinguished from Description by its focus on less obvious connections between story events (e.g., “What’s going to happen next?”; “Why did she hide?”; “He must be getting his toys together so that he can play in the car on the way to his grandma’s house”).

(6) Print/Sound Concepts (PC), instances in which the mother explicitly related to letters or words in print, especially in regards to letter/sound relationships, phonics, and pronunciation (e.g., “That’s a ‘B’”; “‘D’ says ‘duh’”; “What do these letters say?”)

(7) Directing Child (DC), instances in which the mother directed the child to turn pages, lift flaps, perform actions, or activate a switch. This category included directions about the mechanics of the book or book reading (e.g., “Let’s turn the page”; “Let’s read the book”) or a command to point to symbols or activate a switch (e.g., “Your turn”; “Tell me with your switch”; “Show me with your symbols”). A Directing Child Repetition (DCR) was assigned if the mother repeated a direction with little or no modification of wording less than 5 seconds after an initial statement and before the child had responded or had a chance to

respond. After exploratory analysis, these variables were combined as a new variable, DIR (i.e., DC + DCR = DIR).

(8) Confirms or Requests Clarification (CRC), instances in which the parent requested confirmation, praised the child, offered negative feedback, or requested clarification for expressions of incomprehension (e.g., “Good”; “Uh huh”; “No, it’s not that one”).

(9) Behavior Management (B), instances in which the mothers attempted to control a child’s inappropriate behavior (e.g., “Sit down”; “Stop that”). This category did not include requests for paying attention, which would have been coded as an A for Attention.

For each storybook reading, we counted the following reading behaviors:

(1) Turning Pages, Assisting Child (TPAC), instances in which the mother used a hand-over-hand technique to help her child turn and/or flatten a page. The child must have first initiated this page-turning action.