

The Joint Engagement Rating Inventory (JERI)

Technical Report 25

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The Joint Engagement Rating Inventory

1 Purpose

This Technical Report describes items designed for rating video-recorded observations of children interacting with a caregiver. Usually the child is between 12- and 42 months of age, but some of the items are likely useful for older children with developmental delays. Usually the child's partner is a parent, but the items can also be used with other partners (e.g., guardians, grandparents, teachers, and even peers). To acknowledge most of this potential range of partners, we use the term caregiver throughout this report.

The inventory presented here includes 35 rating items that can be used to rate a child's joint engagement as well as various aspects of the child's and caregiver's behavior and of their shared activities.

The JERI began when we (Adamson, Bakeman, Deckner, & Nelson, 2012) formulated rating items to characterize joint engagement, communication dynamics, and shared topics in children with autism, Down syndrome, and typical development. Here the JERI was applied to 5 minute scenes in the Communication Play Protocol (CPP; Technical Report 8; Adamson & Bakeman, 2016). We continue to use the JERI in our on-going studies of early joint engagement and communication development. In addition, we are working with colleagues to adapt the JERI for other intervention and developmental studies. In some of this work, the JERI is applied to video recordings of interactions that were up to 15 minutes long that were made using protocols other than the CPP. In these adaptations, we both select items from the JERI and we formulate new rating items that characterize additional aspects of joint engagement that are central to the new work. As these new items are finalized, they are added to the JERI. In Section 6, we acknowledge the researchers and projects that have contributed to these new items.

This technical manual is based in part on Technical Report 17 (Items for Rating the Communication Play Protocol: Engagement State, Child and Caregiver Behavior, and Shared Topic June 15, 2011) that documents the 17 rating items used in Adamson, L. B., Bakeman, R., Deckner, D. F., & Nelson, P. B. (2012). Rating parent-child interactions: Joint engagement, communication dynamics, and shared topics in autism, Down syndrome, and typical development. *Journal of Autism and Developmental Disorders*, 42, 2622–2635. We have continued to develop the rating items, producing annual revisions as we clarify and add rating items for new research studies. In 2016 Technical Report 17 was sufficiently transformed that we produced Technical Report 25 for The Joint Engagement Rating Inventory that included revised descriptions of the original 17 items and added an 18th item. In 2018, a second edition (25.2) was released which contained 27 items, and 2020, we released the current version (25.3) that includes 32 items and additional information about the current use of the JERI. We anticipate that as new items are added we will edit the Technical Report and upload new revisions to the web site.

Our intention, as reflected in our decision to copyright this manual, is to share the JERI and to allow others to adapt it by selecting items from it, adding items to it, and building upon the material. But this use must be appropriately attributed so that it is clear that you give appropriate credit and you indicate if changes were made. Furthermore, you may not use the material for commercial purposes. Please contact us (suma@uga.edu and/or bakeman@gsu.edu) if you have questions about the JERI and its use.

Section 6 provides comments and references related to the conceptual foundation, validity, formulation of new items, and use of the JERI.

2 Overview

The observer's task is to view video records of a caregiver-child interaction and to make judgments about the interaction using seven-point items. The inventory is divided into 4 clusters: child engagement state items (1–4, 22–24), child activity items (5–9, 20, 25–26, 30–31), caregiver activity items (10–13, 21, 28–29, 33–35), and dyadic interaction items (14–19, 27, 32). The items selected from the inventory for a particular study are applied repeatedly until all conditions (e.g., scenes in a CommunicationPlay) in the study are characterized.

The 35 items are listed below. Items 1–17 were in the original inventory (Adamson et al., 2012); the source of items 18–35 is detailed in Section 6. In the table, the background for new items 19–35 is grey. Items new to this version are noted with an asterisk. Brief descriptions of the anchors for each item are presented in section 3. Extended definitions and examples are provided in section 4. Helpful suggestions related to the rating process are offered in section 5.

Child Engagement State Items

1. Total joint engagement
22. Joint engagement
2. Supported joint engagement
3. Coordinated joint engagement
4. Symbol-infused joint engagement
23. Unengaged
24. Object engagement

Child Activity Items

5. Initiation of communication
6. Responsiveness to partner's communication
7. Expressive language level and use
8. Quality of behavior patterns
9. Child's affect
20. Affiliative obedience
25. Stereotyped, restricted, and repetitive behaviors
26. Attention to caregiver
30. Child's social imitation
31. Child's instrumental imitation

Caregiver Activity Items

10. Scaffolding
11. Symbol highlighting
12. Following in on child's focus
13. Caregiver's affect
21. Calm authority
28. Language facilitation
29. Communicative temptations
33. Exploration Activation*
34. Physical Support of Joint Engagement*
35. Active Direction*

Dyadic Interaction Items

14. Elaboration of shared topic
15. Sustainability of shared topic
16. Scope of shared topic
17. Fluency and connectedness
18. Shared routines and rituals
19. Shared story creation
27. Fun
32. Tone

3 Items and their anchors

| | Item | Anchors | | |
|------------------------------|---|--|--|---|
| | | 1 = | 4 = | 7 = |
| Child Engagement State Items | 1. Child’s total joint engagement | No episodes of the joint engagement state | In joint engagement for approximately half of the scene (displays several brief or a few relatively sustained episodes) | Almost always in the joint engagement state |
| | 22. Child’s joint engagement | No episodes of the joint engagement state | Spends about a third of the scene in joint engagement that is of moderate quality, or briefly in joint engagement in a strikingly high quality manner | Frequently in rich and varied episodes of joint engagement |
| | 2. Child’s supported joint engagement | No episodes of the supported joint engagement state | Spends about a third of the scene in supported joint engagement that is of moderate quality, or briefly in supported joint engagement in a highly striking manner | Frequently in rich and varied episodes of supported joint engagement |
| | 3. Child’s coordinated joint engagement | No episodes of the coordinated joint engagement state | Spends about a third of the scene in coordinated joint engagement that is of moderate quality, or briefly in coordinated joint engagement in a strikingly high quality manner | Frequently in rich and varied episodes of coordinated joint engagement |
| | 4. Child’s symbol-infused joint engagement | No episodes of the symbol-infused joint engagement state | Spends about a third of the scene in symbol-infused joint engagement that is of moderate quality, briefly in symbol-infused joint engagement in a strikingly high quality manner | Frequently in rich and varied episodes of symbol-infused joint engagement |
| | 23. Unengaged | Almost always engaged with objects, people, and/or symbols | Unengaged for approximately a third of the scene | Almost always unengaged |
| | 24. Object engagement | No episodes of object engagement | Spends about a third of the scene in object engagement that is of moderate quality, or briefly in object engagement in a highly striking manner | Frequently in rich and varied episodes of object engagement |

| | Item | Anchors | | |
|----------------------|--|---|---|---|
| | | 1 = | 4 = | 7 = |
| Child Activity Items | 5. Child’s initiation of communication | Never makes a communicative initiative | Takes the lead at least a few times during interactions with the caregiver | Continually makes clear communicative initiations |
| | 6. Child’s responsiveness to partner’s communication | Almost always resists or ignores bids | Responds to bids regularly but not continually | Complies with and anticipates almost every bid |
| | 7. Child’s expressive language level and use | No expressive language | Produces many different single words during a scene with few or no word combinations | Fluent and frequent use of sentences |
| | 8. Child’s quality of behavior patterns | Repetitive and restricted movements and expressions | Behavior is neither markedly restricted and repetitive nor remarkably varied and fluid | Varied and fluid movements and expressions |
| | 9. Child’s affect | Affect is either disruptive, highly inappropriate, or very flat and constricted | Affect appears mellow or content as opposed to flat; affect does not impede communication, but neither does it enhance it | Affect is smoothly modulated, appropriate, serves to enhance other modes of communication |
| | 20. Child’s affiliative obedience | Does not follow caregiver direction | Intermittent pleasing behavior and deference to caregiver | Displays continual respect and deference to caregiver |
| | 25. Child’s stereotyped, restricted, and repetitive behaviors | Does not engage in stereotyped, restricted, or repetitive behaviors | Regular displays of stereotyped, restricted, or repetitive behaviors that impacts engagement in negative way | Pervasive and imposing stereotyped, restricted, or repetitive behaviors |
| | 26. Child’s attention to caregiver | Does not pay attention to caregiver | Intermittently pays attention to caregiver | Frequently in rich and varied episodes of attending to the caregiver |
| | 30. Child’s social imitation | No social imitation | Several instances of prompted social imitation or a few instances of spontaneous social imitation | Frequent, varied, and rich spontaneous social imitation |
| | 31. Child’s instrumental imitation | No instrumental imitation | Several instances of prompted instrumental imitation or a few instances of spontaneous instrumental imitation | Frequent, varied, and rich spontaneous instrumental imitation |

| | Item | Anchors | | |
|--------------------------|---|---|---|---|
| | | 1 = | 4 = | 7 = |
| Caregiver Items | 10. Caregiver's scaffolding | Provides minimal support for the child's communication and/or actions on objects | Provides moderate levels of support | Continually supports and extends the child's actions |
| | 11. Caregiver's symbol highlighting | Rarely emphasizes symbols | Moderate number of attempts are made | Almost continual attempts to focus attention on symbols |
| | 12. Caregiver's following in on child's focus | Rarely follows in on the child's current focus | Builds on the child's focus on a regular, but not continual basis | Almost continually joins and acts to sustain the child's interest |
| | 13. Caregiver's affect | Tense, disruptive, or affectively flat, to the point of being expressionless and subsequently very hard to read | Mellow or content as opposed to flat; affect does not impede communication, but neither does it enhance it | Smoothly modulated, appropriate, and serves to enhance other modes of communication |
| | 21. Caregiver's calm authority | No use of gently firm direction | Intermittent use of kind, confident guidance | Consistently calm, clear, firm, and direct |
| | 28. Caregiver's language facilitation | Rare use of language facilitation strategies | Language scaffolding strategies are employed in one third of the scene; or less time but of high quality; or more time of low quality | Continual use of a variety of language facilitation strategies |
| | 29. Caregiver's communicative temptations | Never makes any communicative temptations | Communicative temptation strategies in one third of the scene; or less time but of high quality; or more time of low quality | Continuous flexibility in making communicative temptations |
| | 33. Caregiver's exploration activation | No acts to energize the child's exploration | A few clear instances of activation that support exploration or sustains an act of exploration | Consistently and adeptly produces varied acts to energize |
| | 34. Caregiver's physical support of joint engagement | No physical support through presence or actions | Intermittent use of physical supports that are neither sustained nor varied | Varied and consistent use of physical supports |
| | 35. Caregiver's active direction | No use of concise, supportive direction | Intermittently concise, corrective, and direct communication or direction | Continual concise and supportive corrective direction |
| Dyadic Interaction Items | 14. Elaboration of shared topic | Dyad shares only one topic that involves only a single activity | Dyad able to generate at least a few topics that entail more than one element (e.g., varying play with an object) | Detailed and varied topics |
| | 15. Sustainability of shared topic | Fleeting topics | Topics are maintained for a moderate duration (e.g., sustaining a conversation or play for a few turns) | Sustained topics |

| | Item | Anchors | | |
|--|--|---|---|--|
| | | 1 = | 4 = | 7 = |
| | 16. Scope of shared topic | All topics involve perceptible objects and events in the here and now | Dyad shares a few displaced references or several displaced references about the same topic | Repeated displaced references about several topics |
| | 17. Fluency and connectedness | No interaction is established | Interaction lacks smoothness, appears to be largely dominated by one partner | Fluid and balanced interaction that is often sustained |
| | 18. Shared routines and rituals | No evidence of routines and rituals | Some shared routines and rituals which are not sustained and do not permeate the interaction | Sustained, varied, and nuanced rituals and routines |
| | 19. Shared story creation | Dyad does not engage in ways that could create a story | Caregiver and child attempt to initiate stories but they are not sustained and there is no elaboration | Sustained and elaborated story creation that grows in creativity |
| | 27. Fun | Stressful and tense interaction | The interaction is moderately tense with intermittent and brief fun exchanges | Continuous fun and enjoyment in the interaction |
| | 32. Tone | No shared enjoyment | Neither the parent nor child rarely if ever appear tense or bored and they briefly display shared enjoyment a few times | Sustained shared enjoyment, characterized by high vitality and positive affect |

4 Definitions

Thirty-two items are defined, each with 7 points: 1 indicates a very low rating and 7 a very high rating. Anchors and midpoints are specified for each item. Note that these are descriptions, not value judgments. A rating of 7 is not necessarily better than a lower rating nor is it always optimal. Users may opt to use all 32 items or a subset as seems appropriate for their purposes (see section 6 for examples). However in most instances we recommend that raters be trained on and apply no more than 10 items for a particular study (see Technical Report # 27).

We defined the anchors so that the range of ratings represents possible descriptions of how children and caregivers might act during scenes of the Communication Play Protocol (CPP) during our study of the emergence of symbols during early childhood. Our samples, to date, have included typically developing toddlers from 18 to 30 months of age and young children from 18 to 60 months of age with developmental disorders including autism, Down syndrome, and severe language delay due to a range of etiologies. Some of the children also have severe motor and cognitive delays. Some of the children were becoming verbal, some were nonverbal, and some were acquiring language using alternative and augmented language systems.

Ratings characterize activities during scenes that are approximately 5 minutes long (or up to 15 minutes if another observational protocol is used). They should be based on what occurred during the entire interaction time period, not just the period of time when the caregiver and child were enacting the plot specified for the scene.

For simplicity we often use the terms verbal and nonverbal to describe communication. Our definition of verbal communication includes speech as well as use of an AAC device to produce a word, and manual sign. Nonverbal communication refers to intentional actions that convey specific messages including communicative gestures (e.g., pointing) and discrete affective expressions (e.g., a smile).

4.1 Child's Engagement State (Items 1–4; 22-24)

The first five items rate the child's joint engagement. The rater is asked to assess the child's joint engagement with objects or events, both real and symbolized, that they share with the caregiver. In addition there is an item for object engagement (item 24) and one for unengaged (item 23).

Remember: Refer to the technical manual for coding engagement states (Tech. Report 9) often when rating engagement state. This is crucial because your ratings are based on your judgments about the child's engagement states. There are definitions, examples, and rules you should have in mind about coding engagement states when you are rating engagement states.

The term "joint" is key to items 1-4 and item 22. It refers to a shared topic. Thus, for a child to be considered "in" joint engagement, he or she must be attending to the same object or event as the caregiver. It may be helpful to think of this engagement as triadic

since it involves the child, a shared object, and (either explicitly or implicitly) a partner. Joint engagement may also occur when the topic is in the here and now or when it is partially or fully present through symbols.

Because joint engagement involves the flow of the child's attention, we find it helpful to think of it as a "state" because it emphasizes that joint engagement has duration and that it occurs in episodes that begin and end. Thus we do not credit as joint engagement a fleeting glance to a person or a single quick point to a shared object. Before constructing items to rate the child's joint engagement, we formulated a coding scheme for joint engagement states (Adamson, Bakeman, & Deckner, 2004; also Technical Report 9, *Coding symbol-infused engagement states*, Adamson, Bakeman, Russell, & Deckner, 1998). This coding scheme described a systematic way to segment the child's attention into a series of mutually exclusive and exhaustive engagement states. In this scheme, an engagement state is by definition at least 3 seconds long. Therefore this item may not capture very brief changes in attention such as a single glance at an object or caregiver. It is important to consult the coding scheme manual for other rules related to coding engagement states, including differentiating joint engagement from other states (including unengaged, onlooking, and object) and decision rules about when a joint engagement state gradually wanes.

When the JERI is adapted for studies that include older verbal children, it may be necessary to make an exception to the rule that engagement states are mutually exclusive since the child may be observed both in joint engagement with a shared object or event and in object engagement with a different object. This is a rare exception to the mutually exclusive rule and should be made sparingly and only when the child is clearly attending equally and actively to both an object (object engagement) and to a shared topic, usually verbally, with the parent (joint engagement).

One of the challenges of rating joint engagement states is to remain child-centered. The ratings are made of the child's attention while the child is actively engaged with a partner whose participation is needed for a joint engagement state to occur. The partner's participation is usually evidenced by active manipulation of the object although it may also be conveyed by communicative acts that are related to the shared event. A child cannot be in a state of joint engagement if the partner is not involved. There may be times when a child is seeking joint engagement but the partner is not engaged with a shared object. There are also times when a caregiver is merely narrating the child's actions ("background chatter") and not actively engaged in a shared activity. In such instances, the child is not in a state of joint engagement.

Another challenge is to determine if the child is indeed actively involved with a shared topic that focuses on objects and events over and above the social interaction per se. Joint engagement is not credited when the caregiver and child engage in dyadic play (e.g., a game of peek-a-boo) that does not include a shared focus other than their mutual activity. When there appears to be a topic beyond the social interaction, be sure that there are clear indications that the child is engaged with the shared topic. Partners may act in ways that make it appear that the child is sharing an object or an event even

when the child's attention is elsewhere. They may also attract attention so that the child watches their display or demonstration without fully engaging with it; in such cases the child is considered to be in a state of "onlooking" rather than in a state of "joint engagement." Also be careful not to assume that a child is jointly engaged with the topic of a partner's speech and gestures if the only indication of their involvement is that they seem to be listening to the partner. It is important that there be clear indications that the child is engaged with the same specific topic on which the partner is focused.

The first item focuses solely on the amount of joint engagement. The next item, item 22, considers the quality of the joint engagement as well as the quantity. Here again, the form of joint of engagement does not matter (as described next), with this item providing a more nuanced rating of overall joint engagement. The next three items characterize different forms of joint engagement. Items 2 and 3 differentiate between episodes of joint engagement during which the child is actively attending to the caregiver (a state called "coordinated" joint engagement, since the child is attending both to the shared topic and the caregiver) or episodes during which the child is focusing almost exclusively on the shared topic (a state called "supported" joint engagement since the child is attending to an object or event that the caregiver is influencing even if the child is not acknowledging this influence). Item 4 captures information about whether episodes of joint engagement are infused with symbols as well as focused on objects and events in the current context.

In a study where we used a state based coding scheme to describe engagement states of typically developing toddlers and young children with autism and Down syndrome (Adamson, Bakeman, Deckner, & Romski, 2009), we describe these different forms of joint engagement in using the following examples:

These two distinctions (between coordinated and supported and between symbol-infused and nonsymbol-infused) generate four forms of joint engagement. The contrast between these forms can be illustrated by imaging four variations on a play sequence during which a child engages in an activity, putting pieces into a puzzle. In all four variations, the child permits the caregiver to also join in the activity (hence this is joint engagement, not solitary object engagement). An episode that would be coded as *nonsymbol-infused supported* joint engagement might be described as follows: the child's attention is attracted to the puzzle by the caregiver who places it in front of the child and hands the child a piece; the child readily accepts the piece and tries to place it in a puzzle as the mother assists by orienting the puzzle frame, naming the piece and verbally encouraging the child ("That's a cow. You can put it over in the barn") and pointing to the correct location; the child successfully places the piece and reaches for another one. For this sequence to be considered an episode of *coordinated* joint engagement, the child would also have to display explicit attention to the mother, for example, looking at her face when he accepts the puzzle piece, glancing towards her with a smile when the piece is correctly placed, or handing her the second puzzle piece and saying "Mom, your turn." For the sequence to be considered *symbol-infused*, the child would have to act in a way that made it clear that he was attending to symbols as well as present objects and actions by, for example, speaking ("A horse!") or following

the caregiver's specific verbal (both speech and AAC) statements (e.g., reorienting a piece when the mother says "turn it around" without prompting the child using accompanying gestures and actions on the object).

When you are rating the items related to forms of joint engagement, consider each form independently. The distinction between forms is descriptive, not evaluative. For example, coordinated joint engagement is not "better" than supported joint engagement. Rather in episodes of coordinated joint engagement, the child is actively acknowledging the partner and in episodes of supported joint engagement the child is not actively acknowledging the partner's involvement with their shared topic.

Also do not expect the ratings for the forms to "add up" to the rating for total joint engagement (item 1). Whether or not an engagement state is symbol-infused is independent of whether or not it is coordinated or supported. In other words, coordinated joint engagement may be symbol-infused or not, and supported joint engagement may likewise be symbol-infused or not. Moreover, although when coded in real time, the amount of coordinated and supported joint engagement does add up to the amount of total joint engagement (because all moments of joint engagement are either within a state of coordinated joint engagement or a state of supported joint engagement), when rated on items describing the quantity and quality of coordinated and supported joint engagement, such simple addition is not accurate. Note that item 1 focuses solely on quantity of joint engagement while items 2–4 consider quality as well. Furthermore, the midpoint for item 1 (approximately a half) does not parallel the midpoint for items 2–4 (approximately a third).

It is important to note that the same caveats apply to the child's joint engagement item (item 22) as well. Even though this item has the same scale as the forms of joint engagement, they cannot be simply summed. Most clearly, symbol-infused joint engagement, as noted above, must also be characterized as either coordinated or supported and cannot be added to either. Generally, because these rating scales are not distributed evenly, simple summations of supported and coordinated joint engagement would not work consistently (e.g., 3 sec of SJE + 3 sec of CJE = 6 sec of JE/ TJE, still a rating of 2). Further, remember that quality is considered when rating supported and coordinated joint engagement and that the two scales may be affected by this differently. For example, due to exceptionally high quality a child may receive 5s or 6s on both coordinated and supported joint engagement, but these ratings summed result in an impossible rating of ten or higher.

4.1.1 Child's Total Joint Engagement

Child's Total Joint Engagement describes the overall quantity of joint engagement during a scene. The low and high anchors are

**No episodes of the joint engagement state and
Almost always in the joint engagement state.**

The midpoint of 4 characterizes a child who is in joint engagement for approximately half of the scene in several brief or a few relatively sustained episodes.

This item characterizes the amount of joint engagement. As described above, joint engagement occurs when the child actively engages with the same object or event that the partner is attending to. Joint engagement may be as brief as a 3 second episode or it may be sustained for many minutes. The overall amount of total joint engagement is the sum of time spent in all periods of joint engagement.

4.1.22 Child's Joint Engagement.

Joint Engagement describes both the quantity and the quality of the child's time in joint engagement. The low and high anchors are

**No episodes of the joint engagement state and
Frequently in rich and varied episodes of joint engagement.**

The midpoint of 4 characterizes a child who spends about a third of the scene in joint engagement that is of moderate quality or a child who spends less time but the state is of strikingly high quality or more time but the state is of very low quality.

In *joint engagement*, the child and caregiver are actively involved with the same object or event. The term "joint" is key to these items. It refers to a shared topic. Thus, for a child to be considered "in" joint engagement, he or she must be attending to the same object or event as the caregiver. It may be helpful to think of this engagement as triadic since it involves the child, a shared object, and (either explicitly or implicitly) a partner. Joint engagement may also occur when the topic is in the here and now or when it is partially or fully present through symbols. Note that the child does not need to actively acknowledge the caregiver in order to be in a state of joint engagement. During joint engagement, even when a child is not attending to the caregiver, the caregiver's participation is influencing the child's experience.

The partner's participation is usually evidenced by active manipulation of the object although it may also be conveyed by communicative acts that are related to the shared event. A child cannot be in a state of joint engagement if the partner is not involved. There may be times when a child is seeking joint engagement but the partner is not engaged with a shared object. There are also times when a caregiver is merely narrating the child's actions ("background chatter") and not actively engaged in a shared activity. In such instances, the child is not in a state of joint engagement.

Partners may act in ways that make it appear that the child is sharing an object or an event even when the child's attention is elsewhere. They may also attract attention so that the child watches their display or demonstration without fully engaging with it; in such cases the child is considered to be in a state of "onlooking" rather than in a state of "joint engagement." Also be careful not to assume that a child is jointly engaged with the topic of a partner's speech and gestures if the only indication of their involvement is that they seem to be listening to the partner. It is important that there be clear indications that the child is engaged with the same specific topic on which the partner is focused.

Another challenge is to determine if the child is indeed actively involved with a shared topic that focuses on objects and events over and above the social interaction per se. Joint engagement is not credited when the caregiver and child engage in dyadic play (e.g., a game of peek-a-boo) that does not include a shared focus other than their social interaction itself. When there appears to be a topic beyond the social interaction, be sure that there are clear indications that the child is engaged with the shared topic that includes an object or event.

When deciding on your rating for this item, first consider the amount of time the child is in joint engagement state and then next consider the quality of the child's joint engagement. Joint engagement may be as brief as a 3 second episode or it may be sustained for many minutes. The overall amount of joint engagement is the sum of time spent in all periods of joint engagement. It may help to select a point based on quantity and then move it upward or downward based on the quality of the child's actions during the state. During higher quality joint engagement, the child appears very interested in and focused on the shared topic. You may get the sense that the child is energized by the shared activity. During lower quality joint engagement, the child's involvement with the shared topic is minimal or the child may appear bored by the shared activity.

4.1.2 *Child's Supported Joint Engagement*

Child's Supported Joint Engagement describes both the quantity and the quality of the child's time in supported joint engagement. The low and high anchors are

**No episodes of the supported joint engagement state and
Frequently in rich and varied episodes of supported joint engagement.**

The midpoint of 4 characterizes a child who spends about a third of the scene in supported joint engagement that is of moderate quality. The midpoint is also appropriate when supported joint occurs for less time but is of strikingly high quality or more time but is of very low quality (as when the child is only minimally involved with the shared activity).

In *supported joint engagement*, the child and caregiver are actively involved with the same object or event, but the child is not actively acknowledging the caregiver's participation. An episode of supported joint engagement may be brief or sustained and the child's interest in the shared topic may vary from superficial to intense. During higher quality supported joint engagement, the child appears very interested in and focused on the shared topic. You may get the sense that the child is energized by the shared activity. During lower quality supported joint engagement, the child's involvement with the shared topic is minimal or the child may appear bored by the shared activity.

Be sure to differentiate between support joint engagement and other engagement states such as object engagement (where there is not a shared object) and onlooking (where the child is merely watching the caregiver's activity). Also note that even though the child is not attending to the caregiver, during joint engagement, the caregiver's

participation is influencing the child's experience. If the caregiver is merely narrating the child's on-going activity in a way that does not influence it, this is not joint engagement.

When deciding on your rating for this item, first consider the amount of time the child is in supported joint engagement state and then next consider the quality of the child's supported joint engagement. It may help to select a point based on quantity and then move it upward or downward based on the quality of the child's actions during the state.

4.1.3 Child's Coordinated Joint Engagement

Coordinated Joint Engagement describes both the quantity and the quality of the child's time in coordinated joint engagement. The low and high anchors are

**No episodes of the coordinated joint engagement state and
Frequently in rich and varied episodes of coordinated joint engagement.**

The midpoint of 4 characterizes a child who spends about a third of the scene in coordinated joint engagement that is of moderate quality or a child who spends less time but the state is of strikingly high quality or more time but the state is of very low quality.

In *coordinated joint engagement*, the child and caregiver are actively involved with the same object or event and the child is actively and repeatedly acknowledging the caregiver's participation. Repeated glances to the caregiver's face are the most common evidence of the child's attention to the partner. In addition, the child may acknowledge the partner verbally as when a child says "Mom, your turn" without looking towards her. To code coordination without glances as evidence, it is necessary to be sure that the child is indeed specifically addressing the partner rather than labeling the activity (saying, e.g., "your turn.")

Coordinated joint engagement may occur in brief or sustained episodes. Quality of coordinated joint engagement is assessed by considering a number of characteristics related both to the intensity of the child's involvement with the object and his/her engagement with the partner. During higher quality coordinated joint engagement the child and caregiver share affect with one another (e.g., smile at each other), and the child's attention to the partner seems spontaneous rather than forced. The child seems to be drawing the partner into the interaction. Moreover, the child is, as in high quality supported joint engagement, very interested in the shared activity. Lower quality coordinated joint engagement may describe episodes during which the child's glances to the caregiver are contingent on the caregiver's command for visual attention or little affect is shared. Moreover, the child's level of involvement with the shared activity may be quite minimal.

When deciding on your rating for this item, first consider the amount of time the child is in coordinated joint engagement state and then next consider the quality of the child's coordinated joint engagement. It may help to select a point based on quantity and then

move it upward or downward based on the quality of the child's actions during the state.

4.1.4 Child's Symbol-Infused Joint Engagement

Child's Symbol-Infused Joint Engagement describes both the quantity and the quality of the child's time in symbol-infused joint engagement. The low and high anchors are

**No episodes of the symbol-infused joint engagement state and
Frequently in rich and varied episodes of symbol-infused joint engagement.**

The midpoint of 4 characterizes a child who spends about a third of the scene in symbol-infused joint engagement that is of moderate quality or a child who spends less time but the state is of strikingly high quality or more time but the state is of strikingly low quality.

In *symbol-infused joint engagement*, the child and caregiver are actively involved with the same object and event and the child is paying attention to symbols. A symbol stands for (refers to) another entity that may or may not be present, or even real. Symbols are usually spoken but a gesture may be symbolic (e.g., a spider is symbolized by moving spread fingers "up a water pipe" or the child may act "like a teapot") and a word may be presented visually rather than orally. They may expand the shared topic by adding new aspects (such as a name) to a shared object ("Dog!"), by introducing an imaginary characteristic to an event ("Pretend it's a car."), by expanding an event beyond the here and now ("Yesterday, we went to the park."), or by referencing an internal state ("I want that!" "Do you know what I want?").

The rater's task is to assess how aware the child appears to be of the symbolic aspect of activities that are occurring during an episode of joint engagement. Evidence that the child is actively attending to symbols often involves the child producing symbols, as when, for example, the child names objects or converses with the caregiver with spoken words, AAC words, and/or manual signs. Credit the child with producing symbols even if it appears that the symbols are imitative or prompted, as when the caregiver says "say ball" and the child says "ball" or when the child's utterance might be described as echolalia (as when he or she repeats the caregiver's utterance without reversing pronouns or when he or she reproduces a jingle.)

Not all sounds are symbolic; babbles or sounds that follow the prosodic contour of a sentence without actually utilizing words do not qualify. Moreover, speech alone may not provide sufficient evidence that a child is engaged with symbols. Do not credit the child with engagement with symbols if he or she uses the same word repeatedly solely as a communicative filler or "continue." For example, if a child says "yes" (or "ok" or "no") every time the adult asks a question, do not assume that the child is attending to the specific symbolized content of the adult's utterances. The words may be being used merely as a conversational device and as such, are not sufficient to indicate engagement with the symbols. Also, if you are not sure what the child is saying, do not consider the vocalization as evidence of symbol-infusement even if the caregiver interprets the vocalization as speech. However, if the child produces an abbreviated or idiosyncratic

version of a word (e.g., “raffe” for “giraffe”; “dawh” for “dog”) do count this as a word. Moreover, do not credit the child with producing a symbol if the caregiver essentially produces it for the child, as when the caregiver uses the child’s hand to push a button or manipulates the child’s hand to shape a sign.

Evidence of attention to symbols may be solely receptive, as when a child complies with a sequence of instructions that the caregiver presents verbally when it is clear that the child is responding specifically to the caregiver’s language and not also her gestures or affect. Be sure that the child is responding to the content of the caregiver’s verbalization and not to his or her actions or affect. To consider a joint engagement symbol infused, you must be sure that the child is paying attention to the content of symbols. Thus, be sure not to credit the child with attention to the content of the partner’s speech just because the partner is talking. (Remember that some partners narrate a shared activity—providing what might be called “background chatter”—even when they know that their partner—including newborn infants or a pet dog—isn’t able to understand what they are saying.) If the child is able to “get the message” using the partner’s nonsymbolic actions, do not credit the child with attention to symbols. Thus, if the partner calls attention to an object by shaking it, pointing at it, and saying its name, do not assume that the child turned to look at it because he or she was responding to its name. In addition, do not credit the child with symbol-infusement if gestures are not clearly standing on their own as reference to an object, without object support. Thus, a point is not sufficient evidence of symbol-infusement (although a point directed toward an object named by the adult [e.g., “point to your nose”] would).

When deciding on your rating for this item, first consider the amount of time the child is in symbol-infused joint engagement state and then next consider the quality of the child’s symbol-infused joint engagement. It may help to select a point based on quantity and then move it upward or downward based on the quality of the child’s actions during the state. Higher quality symbol-infused joint engagement occurs when the child spontaneously speaks, uses AAC words, uses manual signs and/or symbolic gestures frequently during the scene, whereas lower quality symbol-infused joint engagement describes an episode during which the child’s symbol use is sparse or seems mechanical or prompted (e.g., child repeats words after the caregiver has said them, the child inserts key words into a song the caregiver is singing, or caregiver asks a series of questions and the child gives short, perfunctory responses).

4.1.23 Unengaged.

Child Unengaged describes the amount of time the child is not engaged with objects, people, and/or symbols during the interaction. The low and high anchors are

**Almost always engaged with people, objects, and/or symbols and
Almost always unengaged.**

The midpoint of 4 characterizes a child who spends about a third of the observation unengaged.

The child may be unoccupied, may be scanning the environment as though looking for something with which to be engaged, or may be flitting between foci without committing to any. Consider a child unengaged if the child is not in an engagement state that lasts at least 3 seconds. Thus, a child may briefly glance at an object or at the caregiver but still be considered unengaged. Include segments in which the child appears to be gazing at the camera unless the child is clearly involved with the camera as an object and/or the child is actively engaging with camera operator. Also consider a child unengaged if he or she is crying or having a tantrum and is not focused on any particular object or person. Moreover, consider a child unengaged if he or she is merely making contact with an object but is not actively attending to it in a way that would be considered Object Engagement (see Technical Report 9 for more detail), as when, for example, the child is grasping a cloth but not exploring it or munching on a piece of food without displaying any indication that he or she is attending to it..

Note that whether or not a child is off task bears no weight on the child's engagement state. If the child is engaged with a person or object that is not the target of the interaction (i.e., talking to a parent off camera, playing with a toy from home), that portion of the interaction should be rated the same as if the child is on task. Further, as long as there is a focus to the child's attention, the child should be considered engaged. This includes Onlooking (again, see Technical Report 9); during which time the child is observing a caregiver's actions but does not meet the criteria for joint engagement.

4.1.24 Child's Object Engagement.

Child's Object Engagement describes both the quantity and the quality of the child's time in object engagement. The low and high anchors are

**No episodes of the object engagement state and
Frequently in rich and varied episodes of object engagement.**

The midpoint of 4 characterizes a child who spends about a third of the scene in object engagement that is of moderate quality. The midpoint is also appropriate when object engagement occurs for less time but is of strikingly high quality or more time but is of very low quality (as when the child is only minimally involved with the object).

In *object engagement*, the child is engaged in object play, exploring or playing with object(s) by him or herself. The sense of the activity that is included in this rating is that the child is playing alone with an object and not engaged with another person. Usually these objects are present and concrete but object engagement may also occur when the child is talking about an object or activity with an object ("open door") or engaged in symbolic play that does not involve the partner. Note that the object of focus may be symbolized, as when the child appears engaged with an object that is no longer in the room (e.g., the child appears to search around while saying, "toy cow gone"). Do not include segments in which the child is merely in contact with an object, as when he or she "absent-mindedly" holds a small toy while scanning the room.

Note that the caregiver may attempt to engage the child during object engagement, but the child ignores her. If the child is engaged with both a shared object and the caregiver, consider the episode joint engagement rather than object engagement.

Object engagement may occur in brief or sustained episodes. Moreover, remember to consider only periods of object engagement that last at least 3 seconds.

Quality of object engagement is assessed by considering a number of characteristics related to the intensity of the child's involvement with the object. During low quality object engagement a child may be minimally involved with an object as when the child simply manipulates a toy without appearing to be attending to its actions (i.e., rolling a car back and forth while staring off into space or pushing toys around with no aim) and/or engages in stereotyped, repetitive or sensory interests with objects (e.g., spinning or flicking objects in an unusual way). When a child consistently engages in object focused stereotypical behaviors, the maximum rating should be capped at a 3, even if the quantity reflects a higher rating. A child engaging in stereotypical, restricted, or repetitive behaviors should be considered to be mostly focused on the act itself rather than the object (or person), and thus including this time in object engagement is unwarranted.

During moderate quality object engagement, the child interacts with an object with purpose in simple play (i.e. rolling a ball or car and back and forth) or combines actions to create combination play (i.e. stacking blocks to build, taking things in and out). Moderate quality object engagement would also include simple pretend play (i.e. performing simple pretend actions with a doll, such as taking care of them, pretending to eat, racing a car).

During higher quality object engagement, the child is actively exploring objects and elaborates upon their immediate affordances. For example, the child might bring objects together in a relatively novel way (e.g., driving a block – that is a pretend car- into a “garage” he or she made made out of a box) rather than merely playing with a toy as it is intended (e.g., going zoom zoom with a toy car). High quality object engagement also includes advanced pretend play, such as pretending objects are something else (i.e. a block is a phone), he or she is someone else (i.e. “I’m Mommy, I’m making dinner”), or making toys into actors (i.e. pretending dolls are alive and use them as ‘agents’ of play by making them walk, eat, etc.).

When deciding on your rating for this item, first consider the amount of time the child is in object engagement state and then next consider the quality of the child's object engagement. It may help to select a point based on quantity and then move it upward or downward based on the quality of the child's actions during the state. If object engagement consists of both high and low quality use of objects, consider the balance of the two when assigning the rating.

4.2 Child's Activities (Items 5-8; 20, 25-26, 30-31)

4.2.5 Child's Initiation of Communication.

This item characterizes the child's active attempts to initiate communication during his or her interactions with the caregiver. The low and high anchors are

Never makes a communicative initiative and
Continually makes clear communicative initiations.

The midpoint of 4 characterizes a child who takes the lead a few times during interactions with the caregiver.

A communicative initiation occurs when the child attempts to lead the interaction with his or her caregiver in a new direction. Thus a turn that is an initiation is more than a direct response to the caregiver's previous turn.

An initiation often occurs at the beginning of a series of communicative turns. For example, the mother and child are discussing a picture of a giraffe, and the child says, "Baby!" and points to a new photo of a baby to call the caregiver's attention to it. An initiation may also occur within an ongoing sequence when the child introduces a new object or topic in a way that might redirect or substantially expand the interaction. For example, a communication initiation occurs when, after sharing a toy car with the caregiver, a child picks up a second car and says, "Let's race, Mommy!" Another example of an initiation is when the child draws attention to a new feature of an object such as its color without being prompted. However, if the child stayed focused on the original car and said "Red" after the mother asked "What color is this?" or after they were naming colors of other objects, this would not be considered an initiation because it does not move the interaction in a new direction but rather follows directly upon the prior turn.

The child's communicative initiations may be verbal (spoken, augmented, or manually signed) or nonverbal (communicative gestures, an intentional vocalization). Nonverbal initiations are often more difficult to identify than verbal initiations. Examples include showing or offering an object to the caregiver in an attempt to start a shared activity or pointing emphatically to an object that the child wants the caregiver to see. Note that if a child hands a caregiver an object and then walks away or turns his attention to different object, the child is not initiating an interaction with the caregiver.

The child may inadvertently influence the course of the interaction without making an initiation. For example, a partner may join in on the child's on-going activity without being invited to do so. Or a child may grab an object from the caregiver without indicating an intention to communicate that he wanted to start a turn taking sequence. Even if the caregiver glosses the grab as an invitation to start a game of turn taking, do not consider such inadvertent influence evidence of child's initiation of communication. Also remember that initiations must be directed to the caregiver. For example, a child engaging in solitary pretend play with a school bus in the corner may introduce many

new topics and expansions to herself without directing these comments or play to the caregiver.

A high rating usually indicates that a child had made many initiations about a variety of different topics throughout the scene. It can also indicate that the child has repeated the same distinctive initiation (e.g., “asking” the caregiver to blow up a balloon over and over again either verbally by saying “more balloon” or nonverbally by emphatically offering the mother the balloon to blow up again). However, do not credit all repetitions as initiations if they are not distinct attempts to start a new round of interaction (e.g., the child who repeatedly whines “I want” when asking for an object.) Give primary consideration to how often and how clear and readily interpretable the child’s initiations are, not to their specific form. A child who is high on this item often gives you the sense that he or she is taking the lead.

4.2.6 *Child’s Responsiveness to Partner’s Communication.*

This item assesses the child’s responsiveness to the caregiver as a communicative partner. The low and high anchors are

**Almost always resists or ignores bids and
Complies with and anticipates almost every bid.**

The midpoint of 4 characterizes a child who responds to bids regularly but not continually.

The key here is to assess how responsive the child appears to be to the adult’s communication. Evidence of responsiveness includes both the child’s overall pattern of attention (e.g., indication that the child shifts his or her gaze to follow a partner’s points or orients to the partner when he or she calls the child’s name) and in the child’s own verbal and nonverbal communication (e.g., the child answers a question or otherwise continues on the topic of the partner’s prior comment). Note that responsiveness is in part dependent on the caregivers’ production of communicative acts that the child can respond to. If the caregiver is passive and provides essentially no acts for the child to respond to, default to a code of 4. However, if the caregiver provides even a few acts that the child might respond to, characterize the child’s response to these acts even though the evidence of a pattern might be quite thin.

The rater needs to consider both the frequency and the quality of the child’s responsiveness. The lower end of this item is appropriate both when a child appears to ignore or to be oblivious to the partner’s attempts to communicate and when he or she is responsive in ways that cut off communication through active rejection of the partner’s communicative bids (e.g., repeatedly shouts “No!” when the caregiver makes a suggestion). The high anchor is appropriate when the child seems not only attentive to the adult’s contributions to the communication but also eagerly anticipatory. For example, the child not only answers the caregiver’s questions but also seems to eagerly anticipate that the caregiver will ask another question (i.e., you get the sense that the child is responding to questions the caregiver would ask before she asks them) or make another comment about a shared object.

4.2.7 *Child's Expressive Language Level and Use.*

This item assesses the child's use of expressive language. The low and high anchors are
No expressive language and
Fluent and frequent use of sentences.

The midpoint of 4 characterizes a child who produces many different single words during a scene with few or no word combinations.

Consider as language the use of spoken words, AAC words, and manual signs. At the time when this manual was written, we did not have any participants who were sophisticated sign language users. However, there are children and partners who use "babysigns" or have a limited repertoire of manual signs for, e.g., "more" and "eat". If in doubt, don't consider a gesture a manual sign. But when a manual sign is clearly produced – as when a partner says what the child has just signed – do credit the manual sign as evidence of expressive language use.

The child does not need to be directing the language toward the partner. However, the production does need to be intelligible as a word (so do not count vocalizations or phonetically consistent forms (PCFs) that you cannot gloss without reference to the immediate context) and intentional (so do not count as language times when a child appears to repeatedly activate the AAC device just to make a sound or when the caregiver manipulates the child's hand to activate the device or shape a sign).

Words that are produced during a song should be considered language use. However, do not count set phrases, whether in a song or produced in other contents, as evidence of the use of word combinations or varied vocabulary. For example, "thank you" or "all done" should be coded as a single word, not a phrase, unless the child uses the individual words flexibly.

Although the child's use of words such as "yes" or "no" may not be enough evidence to consider a child's joint engagement as symbol-infused in item 4, these words are part of the child's expressive vocabulary and should be included in your characterization of the child's expressive language level and use.

For reference, a rating of 1 usually means the child has no expressive language, a rating of 2 usually represents a child who uses 1 or 2 different words, 3 about 5 words, 4 at least 10 single words with no or few word combinations, 5 predominately 2-word utterances, 6 mostly 3-word utterances, and 7 predominately sentences. These guidelines are usually helpful, but not firm because the frequency of the child's language use should also be considered when determining the most representative rating.

4.2.8 *Child's Quality of Behavior Patterns.*

This item evaluates the variety and fluidity of the child's behavior. The low and high anchors are

Repetitive and restricted and
Varied and fluid.

Thus at one end we are describing a child who does a very few very simple actions in a manner that appears awkward (e.g., a child who only spins and waves objects) and on the other, a child who seems both agile and generative. The midpoint of 4 is used when the quality of behavior patterns is neither markedly restricted and repetitive nor remarkably varied and fluid. The child who is rated a 4 acts appropriately on objects with a modest range of age-appropriate schemes.

All of the child's actions are relevant to this item. Thus, observe the range and manner of fine motor and gross motor behavior as well as affective, vocal, and verbal expressions. Consider the variety of actions during play, conversations, and functional activities. Also consider self-stimulating behaviors (e.g., repetitive movements such as twirling, rocking, hand flapping) that would tend to lower your rating of the child's behavior when characterizing the quality of the child's behavior.

4.2.9 *Child's Affect.*

Ratings on this item should capture the way the child's affective expressions are integrated into the social interaction with the caregiver. We are not characterizing the negative or positive valence of affect but rather its presence and its effect on the interaction. Note that affect can be used as communication (as when, for example, a child smiles as if to say "I like that" when the caregiver holds up a balloon) and it can influence communication (as when the meaning of a child's use of the word balloon is qualified by its accompanying vocal intonation and facial expression, conveying messages as varied as "I love the balloon!", "I'm scared of the balloon", or "Where did the balloon go?"). The low and high anchors for this item are

Disruptive and highly inappropriate, or expressionless and constricted and Smoothly modulated, appropriate, and serves to enhance other modes of communication.

The midpoint of 4 characterizes a child whose affect appears mellow or content as opposed to flat. The child's affect does not impede communication, but neither does it enhance it. The midpoint score also may be used when the child is moderately expressive for much of the episode or when the child's affect varies considerably as when a child's affect is predominantly flat but he or she has one sustained exchange with the partner during the scene when appropriate affect is used with clarity.

When assessing the child's affect, consider all modalities that can be used to convey affect including vocal inflections, facial expressions, body language, etc.

Note that expression of negative affect does not always indicate a low rating. If the child uses negative affect appropriately and communication is enhanced by its expression, then the rating would be higher than if the child produced negative affect that disrupts communication.

Our focus is mainly on the modulation of affect and on specific affective expressions. However, some children appear to convey a sustained level of affect. For example, a child may appear consistently happy or merry, even if the affect is not appropriate to

the specific context or used purposely in ways that communicate. Or a child might seem persistently grumpy, again without much modulation or specific communicative intent. In such instances, you should take such “background affectivity” into account in your rating if the interaction with the partner is enhanced or diminished by the positive – or negative – mood that the child’s overall countenance creates.

4.2.20 *Child’s Affiliative Obedience.*

This item captures the degree of the child’s responsiveness to and amenability with the caregiver’s directions. The low and high anchors are

**Does not comply with caregiver’s directions and
Displays continual respect and deference to caregiver.**

As with the rating item for caregiver’s calm authority, this item characterizes how the child’s actions reflect what has been referred to as a “hierarchical caregiver -child relationship” because the caregiver acts as the primary agent of behavior regulation and decision-making for the child (Lindahl & Malik, 1999). However, here we focus on the child’s attitude and actions, assessing them separately from the clarity and tone of the caregiver’s instructions.

High ratings on affiliative obedience will occur when the child is attentive to the caregiver’s directions and suggestions and complies with them readily and positively. Markers include a willingness to follow the caregiver’s lead and no or at most low resistance to the caregiver’s directions. In addition, the child should appear to enjoy being obedient, displaying pleasant affect while following caregiver’s lead and checking in with the caregiver by, for example, glancing at the caregiver and smiling to acknowledge that he or she is complying with a request. Indications that a child is relatively high on affiliative obedience may also occur when a child seeks to gain the caregiver’s guidance by, for example, asking for help or information. The highest rating on this item should be reserved for a child who consistently shows respect and deference to the caregiver by being amenable to suggestions and seeking guidance. The child follows the caregiver’s lead not only willingly but happily. The child may look to the caregiver for direction and the child appears comfortable receiving and accepting the caregiver’s guidance.

Low ratings on affiliative obedience will occur when the child repeatedly resists the caregiver’s directions and suggestions and is noncompliant either by ignoring the caregiver’s directions and requests or defiant refusals. **The lowest rating is reserved for a child who does not comply with the caregiver’s directions.** The child may ignore the caregiver’s input or actively resist following the caregiver’s lead. The child may even actively contradict the caregiver by refusing a request. The child sets the pace of the interaction and the nature of the play. The child unilaterally determines when one activity ends and when to move to the next activity or bag in the interaction.

The midpoint of this item is defined by a child who intermittently follows the caregiver’s lead and appears to be trying to please the caregiver in the process. The child displays some deference to the caregiver but also attempts at times to tell the caregiver what to

do. There is at least one relatively extended exchange during which the child clearly defers to the caregiver without any sign of resistance.

4.2.25 *Child's Stereotyped, Restricted, and Repetitive Behaviors.*

This item evaluates the amount and severity of the child's stereotyped, restricted, and repetitive behaviors. The low and high anchors are

Does not engage in stereotyped, restricted, or repetitive behaviors and Pervasive and imposing behaviors.

Stereotyped and repetitive behaviors are actions, language, and vocalizations that do not serve a purpose outside of themselves and/or are dysfunctional. These include self-stimulating behaviors (i.e. spinning a toy in close proximity of eye, humming), stereotyped behaviors (i.e. lining objects up with no other purpose, odd posturing or hand positions), repetitive behaviors (i.e. rocking back and forth, perseveration), and dysregulated behaviors (i.e. high-pitched squealing, inappropriate emotional reactions). Please note that a particular behavior can often be categorized into different types of behaviors based on the specific child and the context. It is not necessary to determine how a behavior qualifies as long as it otherwise meets the requirements of this item. Similarly, the examples given are not exhaustive and other behaviors can certainly be characterized as stereotyped, restricted, or repetitive.

When a child performs these types of behaviors, it is remarkable because, though a child may be using an object or seeming to share something with another person, the focus is actually on the behavior itself, not on engagement. These types of behaviors may feel awkward, odd, or inappropriate. This is the case when a child spends time lining up cars without driving them around or making a train, or when a child constantly hums but in a non-musical manner.

At one end we are describing a child who exhibits no displays of stereotyped or repetitive behaviors. The midpoint of 4 is used when the stereotyped, restricted, and repetitive behavior patterns are presented regularly and in a way that it, at least sometimes, negatively impacts the child's ability to engage meaningfully. The child who is rated a 4 has clear difficulty participating in a meaningful way in joint engagement and object engagement. At the far end of the scale, a child may appear to be stuck in these types of behaviors and spends a majority of the scene performing them. Further, a high rating on this item denotes a child that struggles to refocus to more meaningful play, whether that be independently or with the assistance of the caregiver. Engagement with the caregiver and/or objects is severely impacted by the child's behaviors.

All of the child's actions are relevant to this item. Thus, observe the manner of fine motor and gross motor behavior as well as affective, vocal, and verbal expressions. Consider actions during play, conversations, and activities. The severity of the behaviors should be considered when rating this item. Behaviors that do not disrupt the interaction (i.e. finger splaying while jointly engaged, rocking while continuing to engage) should be adjusted downward to denote that it is not overly impacting the interaction. Behaviors that limit the child's ability to participate in meaningful

interaction, whether that be with a person, object, or joint engagement, should cause the rating to move upward on the scale. Severe presentations of these behaviors may cause the child to be unable to break out of the behaviors. Not only are their behaviors pervasive throughout the interaction, but they also become the center of the child's focus, essentially blocking out the opportunity for the child to engage in something more meaningful interaction.

Note that this item can overlap with types of engagement, such as when a child is hand flapping while answering questions that mom presents about a toy or talking about the colors of the train cars while ritualistically placing them in a line. Further, stereotyped behaviors can be present without engagement as when a child shakes a toy back and forth without considering the function of the toy or when a child picks out different toys only to peer at them.

4.2.26 *Child's Attention to Caregiver.*

This item describes both the quantity and the quality of the child's active involvement with the caregiver. The low and high anchors are

**Does not pay attention to caregiver and
Frequently in rich and varied episodes of attending to the caregiver.**

The midpoint of 4 characterizes a child who intermittently attends to the caregiver.

This item describes how often and intently the child pays explicit attention to the caregiver. This attention may involve looking directly at the caregiver's face (e.g., a brief glance; gazing at the mother) but it may also occur when the child is clearly interested in seeing what the caregiver is doing (e.g., the child watches the caregiver demonstrate how she wants the child to act on an object). It may also be explicitly naming the caregiver (e.g., "Mommy, your turn."). Note that the child may be engaged with the caregiver during a state of joint engagement and not be credited with attention to the caregiver, as when the child shares an object or event without directly attending to the caregiver.

The lower end of the scale describes a child who never explicitly attends to his or her caregiver or who does so for only unclear, fleeting moments, as when a child may be looking around the room and scans past the caregiver.

The higher end of the scale is reserved for a child who attends to his or her caregiver for a considerable amount of time. Here, the child is clearly paying attention to the caregiver in a way that seems impactful to the interaction. This attention may occur in several brief glances during periods of joint engagement, in which case the entire episode of joint engagement that includes the glances would be considered as involving attention to the caregiver. In addition, such attention to the caregiver may occur without joint engagement as when a child plays a game of peek-a-boo that entails relatively prolonged states (at least 3 seconds) of engagement just with the caregiver.

In addition to considering quantity of attention to the caregiver, quality of attention should be considered. Quality of attention to the caregiver should be assessed in terms

of both the spontaneity of the child's attention and how integral the attention to the caregiver is to the child's other activities. High quality attention is spontaneous and not solely initiated by the caregiver, as when a caregiver demands the child's attention such when they say, "look at me". Furthermore, high quality attention is integral to the child's activity. For example, the child might attend to the caregiver to model her behavior rather than merely to watch. Or, the child might display high quality attention to the caregiver by attempting to actively draw the caregiver into the interaction by explicitly focusing on the caregiver by peering into her face, trying to share affect, or repeatedly calling her name. Lower quality attention to the caregiver appears to be both fleeting and flat, as when the child quickly glances towards the caregiver with a neutral facial expression when the caregiver calls the child's name.

4.2.30 Child's Social Imitation.

Ratings for this item (*child's social imitation*) and for the next item (*child's instrumental imitation*) focus on the child's propensity/inclination to imitate others' actions. Here we focus solely on imitative acts that serve, at least in part, a social function. The low and high anchors are

No social imitation and

Frequent, varied, and rich spontaneous imitation that serves a social function

The midpoint of 4 characterizes a child who exhibits several instances of prompted social imitation or a few instances of spontaneous social imitation.

In the current item, our focus is on imitation acts that serve a social function. Following Uzgiris (1981; 1990) and following research in typical children and children with ASD (e.g., Legare & Nielsen, 2015; Vivanti et al., 2016), social imitation is defined as aligning one's own behavior to the model's behavior for social-affiliative motives/purposes (promoting a feeling of connectedness and affiliation between imitator and demonstrator). First the rater should identify instances of imitation and then decide if the action serves a social function. This may be indicated by the child's focus on the model including affective expressions and attention to the partner (e.g., the child claps his hands as he looks gleefully at his partner; the imitated act is part of a game as when the child imitates the way the partner takes a turn). Eye contact and shared smiles are not required to credit social imitation, but, without these behaviors, it should be markedly clear that a child is imitating in order to further feelings of connectedness and affiliation with the parent. Note that a child may imitate the partner in ways that solely serve an instrumental function (see below, item 11), in which case these instrumental imitations would not be considered in rating the child's social imitation.

The child might imitate the partner's motor actions, including "transitive actions" (i.e., actions on objects) and "intransitive actions" (i.e., actions without objects), and the partner's sounds, including noises, verbalizations, and vocalizations.

Both meaningful actions (e.g., conventional gestures; labels for an object) and non-meaningful (i.e., changes that do not lead to an end state or carry a specific meaning,

and can only be described as changes of limb postures in space). The one exception is that we will exclude from consideration instances when the imitation is clearly echolalic in that it is performed in an automatic manner without explicit awareness (e.g., the child says “what do you want to eat” right after the caregiver says “what do you want to eat” without pausing from play.)

To be considered imitation, the child’s action should be at least a close approximation of the partner’s action. Credit as imitation instances where the child clearly is trying to model the partner’s actions but appears to lack the skills to do so exactly (e.g., the child says “gampa” rather than the model’s “grandpa”; the child attempts but fails to put a block on top of another block after observing a model do this successfully). Look for evidence that the child is following the “topography” of the imitation. That is, the child attempts to imitate all components of the action, even those that are not driven by the intended use of the toy (i.e. using a particular rhythm, intonation, style, that the parent demonstrated.) However, do not count actions that may have been prompted by an object’s affordances rather than by observation of the partner’s actions (e.g., a child, who is not looking at the partner, takes a sip from a cup right after the partner does). It is necessary that the child pay at least minimal attention to what the parent’s actions in order for imitation to be credited.

When rating this item, a distinction is made between prompted and spontaneous imitation. Prompted imitation is preceded by a specific instruction to imitate, such as “you do it” or “your turn”. Prompted imitations may also direct the child to perform a demonstrated action, such as “put it here” or “turn the page”. Spontaneous imitation occurs when the child imitates the partner’s behavior without being instructed to do so. Higher ratings indicate increased frequency and also greater likelihood of spontaneous rather than prompted imitation.

Finally, the rater needs to decide whether or not the imitation acts observed during a scene are repetitive and relatively simple (e.g., the child repeatedly waves her hands right after the caregiver does) or rich and varied (e.g., the child produces several instances of nuanced imitation as when he alters the volume of his voice in imitation of the partner’s loud and soft singing’ the child imitates a range of different actions). For example, imitation that is rich and varied might include several different gestures, while repetitive imitation would be the same gesture repeated multiple times. For example, imitation of all the various gestures in the song ‘the wheels on the bus’ would be considered rich and varied imitation while imitation of only the ‘round and round’ motion would be considered repetitive.

4.1.31 Child’s Instrumental Imitation.

Ratings for this item (*child’s instrumental imitation*) and for the previous item (*child’s social imitation*) focus on the child’s propensity/inclination to imitate others’ actions. Here we focus solely on imitative acts that serve, at least in part, an instrumental function. The low and high anchors are

No instrumental imitation and

Frequent, varied, and rich spontaneous imitation that serves an instrumental function

The midpoint of 4 characterizes a child who exhibits several instances of prompted instrumental imitation or a few instances of spontaneous instrumental imitation.

In the current item, our focus is on imitation acts that serve an instrumental function. Following Uzgiris (1981; 1990) and following research in typical children and ASD (e.g., Legare & Nielsen, 2015; Vivanti et al., 2016), instrumental imitation refers to imitating a partner in order to acquire knowledge relevant to instrumental goals (e.g., learning, through imitation, how to open a container to retrieve a toy; imitating a parent's label to name a toy), and results in a tangible instrumental outcome (toy is retrieved from the container). The instrumental function of the imitation is expressed through the child's focus on the act being modeled and the child's apparent attempt to use the action to serve a cognitive function and to understand a new or puzzling event.

As for item 10, the child might imitate the partner's motor actions, including "transitive actions" (i.e., actions on objects) and "intransitive actions" (i.e., actions without objects), and the partner's sounds, including noises, verbalizations, and vocalizations. Both meaningful actions (e.g., conventional gestures; labels for an object) and non-meaningful (i.e., changes that do not lead to an end state or carry a specific meaning and can only be described as changes of limb postures in space). As in item 10, the one exception is that we will exclude from consideration instances when the imitation is clearly echolalic in that it is performed in an automatic manner without explicit awareness (e.g., the child says "what do you want to eat" right after the caregiver says "what do you want to eat" without pausing from play. Similarly, imitated actions that are excessively repetitive and do not seem to depart from the interaction should not be given much weight, if any. For example, if a parent parks a car in the garage and closes the door, and the child begins to open and close the garage door over and over, it should not be counted as an imitative act.

To be considered imitation, the child's action should be at least a close approximation of the partner's action. Credit as imitation instances where the child clearly is trying to model the partner's actions but appears to lack the skills to do so exactly (e.g., the child says "gampa" rather than the model's "grandpa"; the child attempts but fails to put a block on top of another block after observing a model to do this successfully). Look for evidence that the child is following the "topography" of the imitation. That is, the child attempts to imitate all components of the action, even those that are not driven by the intended use of the toy (i.e. using a particular rhythm, intonation, style, that the parent demonstrated.) However, do not count actions that may have been prompted by an object's affordances rather than by observation of the partner's actions (e.g., a child, who is not looking at the partner, takes a sip from a cup right after the partner does). It is necessary that the child pay at least minimal attention to what the parent's actions in order for imitation to be credited.

When rating this item, a distinction is made between prompted and spontaneous imitation. Prompted imitation is preceded by a specific instruction to imitate, such as

“you do it” or “your turn”. Prompted imitations may also direct the child to perform a demonstrated action, such as “put it here” or “turn the page”. Spontaneous imitation occurs when the child imitates the partner’s behavior without being instructed to do so. Higher ratings indicate increased frequency and also greater likelihood of spontaneous rather than prompted imitation.

Finally, the rater needs to decide whether or not the imitation acts observed during a scene are repetitive and relatively simple (e.g., the child repeatedly waves her hands right after the caregiver does) or rich and varied (e.g., the child produces several instances of nuanced imitation as when he alters the volume of his voice in imitation of the partner’s loud and soft singing’ the child imitates a range of different actions). For example, imitation of all the motions needed to operate all the buttons of a pop-up toy would be considered to be rich and varied imitation while imitation of only the pushing motion to operate one button of the pop-toy would be considered repetitive.

4.3 Caregiver’s Items (10-13, 21, 28-29, 33-35)

4.3.10 Caregiver’s Scaffolding.

This item assesses how well the caregiver supports the child’s activities and provides opportunities for learning about shared objects and events and about communicating, including language. Its low and high anchors are

**Provides minimal support for the child’s communication and/or actions on objects and
Continually supports and extends the child’s actions.**

The midpoint of 4 is used when the caregiver provides moderate levels of support; this can occur either when a caregiver only intermittently uses scaffolding strategies that are well keyed to the child’s abilities and interests or when a caregiver uses a mixture of strategies that are only sometimes well adapted to the child’s abilities.

The goal of scaffolding is to effectively facilitate the child’s performance and to guide the child’s actions so that he or she can do and say things that would likely not occur without support (i.e., creating a “zone of proximal development”; Vygotsky, 1978). That is, it tends to help the child engage in conversation and/or exploration of an object or event. You are considering how often and how effectively the caregiver is aiding the child in doing what he or she might not be able to do on his or her own.

Scaffolds come in a variety of forms, including handing the child an additional object, telling the child what to do, labeling a novel object, establishing a predictable turn-taking structure, attracting attention to a new object, and joining the child’s current focus and elaborating it to sustain the child’s interest. When a caregiver scaffolds, he or she appears to be working on a goal with the child that appropriately matches and extends the child’s abilities.

It is important to evaluate the adult's actions relative to the child's actions. An action may be supportive in one context but not in another. However, remember that you are evaluating the caregiver's actions, not the child's actions. Be aware that a child's sophistication may sway your views of the adult's scaffolding. A precocious child is not always indicative of high-quality scaffolding. A child who is having difficulty acting on objects or communicating may nevertheless be provided high quality scaffolding that is well suited to his or her level of functioning. At such times, the caregiver may support the child so that he or she clearly is joining well with the child's on-going activity and moving it systematically to a more accomplished level. But if the caregiver is unable to extend the child's activity through his or her support, even if you are quite certain this is due primarily to the child's limited capacity to benefit from the caregiver, you should not credit the caregiver with a higher level of scaffolding than what you observe the caregiver able to do in terms of support and extension of the child's actions. In other words, it is appropriate to rate a caregiver low on scaffolding if he or she has difficulty finding an entry point upon which to build even though you sense that the child is an unusually difficult partner to engage. Note that we are not evaluating the specific forms and focus of communication (see items 11 and 13) or whether or not the caregiver is following the child's agenda (see Item 12). Rather, we focus here on the appropriateness and consistency of the caregiver's actions that are supporting the child's actions.

High quality scaffolding is flexible; a high rating is used for caregivers who modify their support based on the child's response and whose support is well-timed relative to the child's current activity. The caregiver may adjust and pace her behavior relative to the child's behavior in order to not overwhelm the child. High quality scaffolding is often clearly successful in that the caregiver guides the child to accomplish something that he or she might not have been able to do alone. It may also be subtle, especially if the child is already quite skilled and a slight but well-placed support (for example, a single probing question or the provision of a key puzzle piece) supports the child's movement toward a new accomplishment. If the child is severely delayed, high quality scaffolding may skillfully guide the child to relatively minimal accomplishments.

A low rating might describe a caregiver who is passive and under involved or one who is rigid and harsh. The caregiver may be unable to modify her support based on the child's responses or may seem to monopolize the play activity.

When you rate this item, first decide how often the caregiver's actions are supporting the child's activities, including his or her actions on objects and his or her participation in their social interaction. Next, consider the quality of the support that the caregiver provides.

4.3.11 Caregiver's Symbol Highlighting.

This item focuses on how often the caregiver attempts to direct the child's attention to symbols. The low and high anchors are

**Rarely emphasizes symbols and
Almost continual attempts to focus attention on symbols.**

The midpoint of 4 is to be used when a moderate number of attempts are made by the caregiver to direct the child's attention to symbols.

This item characterizes how often the caregiver acts in ways, either subtle or explicit, that may teach the child about symbols and their use. A caregiver high on this item seems very focused on teaching the child new words and encouraging the child to actively use language. Note that language may include AAC words and manual signs.

There are several ways that a caregiver can highlight symbols. The most common symbol highlighting strategies draw attention to specific words, phrases, and symbolic gestures and acts. This may include providing feedback on the child's symbol use (e.g., confirms correct use of a specific symbol or repeats child's utterances); prompting the child to use symbols (an attempt to elicit specific words and/or symbolic gestures from the child); and providing symbols to the child (explicitly provides a label or description). Other strategies include instructing the child about symbolic play by, for example, demonstrating how to use an object to represent another object ["Let's pretend this block is a car."] or prompting the child to do so ["Show me how the doll goes to sleep."] Another way is to explicate the symbolic process by making direct statements about the symbolic status of an object ["That's not really a lion."] and correcting a child's use of a symbol ["Say cat, not kitty."]. Such explication will likely be rare and is not a necessary requirement for considering a caregiver for a relatively high rating on this item. It is important that only instances where a caregiver brings symbols to the fore are considered symbol highlighting. Caregivers often present the child with a steady stream of language and other symbols. Background chatter that seems to simply fill the silences or conversations that focus on present objects and the current interaction rather than words are not likely to contain instances of symbol highlighting. Songs may provide a context for symbol-highlighting but only if the caregiver emphasizes words by, for example, pausing strategically to offer the child a place to "fill in" the lyrics.

Note that this item is related to item 10, caregiver's scaffolding, since some scaffolds may support and promote symbol use. However, the current item is focused specifically on how often the caregiver acts in ways that support and promote attention to symbols. Unlike the scaffolding item, this one does not assess the appropriateness or success of the caregiver's actions but rather how often these highlighting actions occur.

4.3.12 Caregiver's Following In on Child's Focus.

This item focuses on how the caregiver is placing his or her actions relative to the child's on-going interest. The rater needs to determine whether the adult is following the child's interests. The low and high anchors are

**Rarely follows in on the child's current focus and
Almost continually joins and acts to sustain the child's interest.**

The midpoint of 4 is used when a caregiver builds on the child's focus on a regular, but not continual basis.

When rating the caregiver's following-in, pay attention to how often and skillfully he or she tracks the child's current focus of attention. You are not rating the balance between following-in and directing attention, although the two may indeed be related.

Remember you are rating the caregiver's tendency to follow-in on the child's focus, not his or her propensity to direct the interaction. A caregiver may introduce an object initially but then follow the child's focus during the play with that particular object. For example, a caregiver may redirect the child's interest by suggesting that they play with a shape sorter but then 'follow' the child's focus by labeling each block's shape that the child picks up to sort. Take into account only the amount and quality of the following-in actions.

A high rating describes a caregiver who is attentive to the child's interest and changes her own activity to maintain focus with the child. The more the caregiver seems to be "tracking" the child's focus, the higher the rating should be. For example, the caregiver may provide a label for an object the child turns to look at or make a comment that expands the topic of the child's utterance. The caregiver seems to keep the interaction going by following the child's interest.

A low rating describes a caregiver who is either under-involved and consistently misses cues from the child or one who persistently tries to introduce new topics or repeatedly redirects the child's attention away from his or her current activity. When the caregiver is not building on the child's focus this may be because the caregiver is attempting to direct or redirect the child's focus or because the caregiver is allowing the child to pursue his/her agenda independently.

4.3.13 Caregiver's Affect.

This item captures the caregiver's affect and how it influences the caregiver-child interaction. The low and high anchors are

**Tense, disruptive, or expressionless, and
Smoothly modulated, appropriate, and serves to enhance other modes of
communication.**

The midpoint rating of 4 characterizes a caregiver whose affect may be described as mellow, muted, or content as opposed to flat. The caregiver's affect does not either impede or enhance his or her communication with the child.

A low rating is used when the caregiver's tension interferes with the flow of the interaction. Tension may be expressed by a strained voice and/or tightened worried facial expression. A caregiver low on this item may also appear frustrated, preoccupied, distracted, unresponsive, or bored. A low rating may also describe a caregiver whose affect is disruptively intense to a point that it seems to impede communication.

A high rating is used when the caregiver uses affect to enhance the communication through vocal inflections, facial expressions, or body language. For example, the

caregiver emphatically pulls a toy train out of a container and gasps excitedly to draw the child's attention to the train.

4.3.21 Caregiver's Calm Authority.

This item captures the degree to which the caregiver directs the interaction with confident calm authority. The low and high anchors are

**No use of gently firm direction and
Consistently calm, clear, firm, and direct.**

The caregiver provides clear indications about what she wants and expects the child to focus on and what she wants the child to do and she guides the child confidently (rather than tentatively) and gently (rather than harshly or punitively).

Calm authority reflects a style of parenting that fits within what has been referred to as a "hierarchical parent-child relationship" because the caregiver acts as the primary agent of behavior regulation and decision-making for the child (Lindahl & Malik, 1999). It also conveys a tone of confidence and kindness that may reflect the cultural value of "respeto" and more broadly, "familismo" (Stern et al., 2014).

Indicators that will inform this rating may most clearly be observed during transitions in the play session. High levels of calm authority are evident when the caregiver gently guides the child's attention from one activity to a new activity by telling the child which toy to use, when play with a specific toy ends and the next begins, and how to act during the transition (e.g., hold the bag and put the toys away). But there are also opportunities to assess whether the caregiver is asserting confident calm authority during an activity. High levels are evident when the caregiver provides instructions about what they should do together. She may do this both by speaking with a calm voice and non-verbally through her gestures such as pointing and posture such as leaning inward from behind the child to indicate the desired site for their shared activity. As she sets the agenda for play, she acts in ways that suggest that she expects the child to be amendable to her suggestions and directions; however, when choosing a rating for this item, only consider the caregiver's actions, not the child's response.

Low levels of calm authority are evident when the caregiver's directions for the child are delivered in a way that indicates the caregiver's lack of confidence that his/her actions and directions will result in child compliance. Low levels of calm authority can be shown in many ways: through a tone that conveys that the caregiver is pleading with the child to follow directions given, asking if the child wants to follow a particular direction (and doing so almost always in this fashion), defaulting to the child's desires and deferring to the child rather than providing leadership, use of a "play voice" and plays with the child but does not guide the child, providing minimal direction with the contents of the bags or transitions from one bag to the next. Low levels are also evident when the caregiver's behavior appears aimless in the interaction.

The lowest rating indicates there are no signs of the caregiver calmly asserting his/her authority to direct the interaction. The caregiver does not use gentle firm directions and

instructions. The caregiver may always let the child take the lead or when she does try to guide the child, she appears either harshly demanding or extremely tentative. She may issue some suggestions, but she does not do so with confidence and clarity.

The middle rating indicates that the caregiver periodically attempts to guide the interaction. There is at least one relatively extended exchange during which the caregiver clearly provides kind but firm directions to the child.

The highest rating on this item should be reserved for caregivers who consistently guide the interaction using calm, clear, and firm directions. The caregiver is calm yet authoritative in directing the child's attention to which activity to begin with and when to change activities. The caregiver appears very confident that she is setting the agenda or has decided when it is appropriate for the child to do so.

4.3.28 Caregiver's Language Facilitation.

This item focuses on the quality and quantity of a caregiver's language input that scaffolds the child's receptive and expressive language development. The low and the high anchors are

**Rare use of language facilitation strategies and
Continual use of a variety of language facilitation strategies**

The midpoint 4 is used when a caregiver makes a moderate quality and quantity of language input that could potentially scaffold the child's language learning; this occurs when the strategies are produced only in one third of the scene. A moderate level can be also characterised by a low quantity of language facilitation strategies but of high quality, or a high quantity of language facilitation strategies but of low quality.

Language facilitation strategies are caregivers' use of language that is contingent with or responsive to the child's current focus of attention. Note that language may include AAC words and sign language. Effective caregivers fine-tune the complexity of their language expression to match their children's zone of proximal development (ZPD; Vygotsky, 1978). Therefore, these strategies guide the child to accomplish language use in ways that he/she cannot do without support. Effective language facilitation strategies include interpreting the child's actions or vocalisations into words, providing a label for the child, commenting on the child's actions or focus of attention, repeating the child's preceding spoken utterance, stressing key words, expanding or recasting the child's preceding spoken utterance, using cloze procedures (or fill-in-the blanks), asking follow-in questions (i.e., wh-questions that are aimed at helping the child expand the conversational topic rather than testing the child's language), and follow-in directions (i.e., instructions that match the shared activity and that are aimed at helping the child take the next step).

It is important to evaluate the adult's language use in relation to the child's actions. A strategy may be supportive in one context but not in another e.g., supporting a child to count is facilitative for a child who is still learning to count but repeatedly asking the child to count to show that the child knows numbers very well is not facilitative. A

facilitative caregiver does not demand a response that the child is not ready to produce, e.g., getting the child to imitate a long sentence. Instead a facilitative caregiver acknowledges the child's efforts to respond, e.g., when child makes the vocalisation "mmm" to indicate *more bubbles*, the caregiver responds as if the child said *more* and expands it to "here comes more bubbles!"

As caregiver's language facilitation concerns caregivers' language input, do not include caregivers' use of gestural prompts unless they are used together with language. For instance, if a caregiver silently points to new object for the child to label, the caregiver has not produced any language input for the child. However, if the caregiver says, "What's this?" or "This is (pause)" while pointing to a new object, credit the caregiver for what has been said to the child.

Remember that you are evaluating the caregiver's facilitation, not the child's actions. Be aware that a child's sophistication in language use may sway your views of the caregiver's use of language facilitation strategies. A verbose child may appear as highly expressive and responsive to the caregiver. But, if the language expression is not a consequence of the caregiver's facilitation, do not credit the caregiver for using facilitation techniques. In contrast, a caregiver who frequently facilitates a quiet child's language may receive only subtle responses from the child. Therefore, focus on the facilitation and consistency of the caregiver's language input.

A high rating describes a caregiver who consistently uses a variety of language facilitation strategies in an appropriate amount to help the child learn new words and language structures. The caregiver reinforces the child's current use of language and guides the child to use words or language structures that the child has not mastered. The language facilitation encourages the child to use language for two-way communication with the caregiver. The caregiver keeps a balance between the turns that the child and caregiver produce.

A low rating describes a caregiver who is passive or under-involved, one who consistently dominates the interaction or consistently directs the child, without offering opportunities for the child to make the next advancement in language use.

4.3.29 Caregiver's Communicative Temptations.

This item focuses on the quality and quantity of caregiver's attempts to set up a communicative environment that elicits or sustains an interaction with the child. The low and the high anchors are

**Never makes any communicative temptations and
Continuous flexibility in making communicative temptations**

The midpoint of 4 is used when a caregiver makes a moderate level of communicative temptations during the interaction; this occurs when communicative temptation strategies are produced only in one third of the scene. A moderate level can also be characterised by a low quantity of communicative temptations but of high quality or a high quantity of communicative temptations but of low quality.

Communicative temptations are specific arrangements made to the child's communicative environment to tempt the child to initiate, request or learn a specific skill (i.e., incidental teaching, Hart & Risley, 1975). To elicit an initiation or request from the child, the caregiver may tactfully control access to an object that the child likes, places the object of interest out of the child's reach but within the child's sight, introduce a new element (e.g., toy or topic) to the play or interaction, or intrude the play or interaction. For instance, while playing with a puzzle, the caregiver may playfully hide a piece of the puzzle in the pocket, give the child one piece of puzzle at a time or give the child an inappropriate object to fit in the puzzle.

Communicative temptations also include caregiver behaviours that are aimed at drawing the child's attention to the interaction such as shaking a bubble bottle at the child to spur the child's curiosity, imitating a nonengaged child (e.g., joining in a child who is jumping alone), deliberate waiting, singing a song that goes with the object, and sits strategically with the child or changes the positioning of the child so that they face each other at eye level. With a highly engaged child, a caregiver may also expand the child's interest or interactional topic by gradually introducing a novel object to the play or demonstrating a different way to play with the object that the child likes.

Communicative temptations modify the child's environment by manipulating the child's focus of attention. Do not count modifications that abruptly or drastically change the child's focus of attention to a new one.

A high rating describes a caregiver who is suave, strategic, and flexible in modifying the communicative environment to hook in a nonengaged child, offer a turn to the child, or expand the shared activity and topic. Effective communicative temptations are complemented by language facilitation strategies but note that the use of language facilitation alone is not evidence of communicative temptation. High quality communicative temptations guide the child to perform in a way that that he or she might not be able to do alone and acknowledges the child's efforts to respond. To tempt the child, caregivers appear enthusiastic and excited and use facial expressions to show anticipation for a turn from the child. While slight exaggerations are common in typical interactions and are part of communicative temptations, do not count forceful excitements or highly exaggerated expressions that are unusual in typical interactions as effective communicative temptations.

A low rating describes a caregiver who is passive, under-involved, or misses opportunities to offer a turn to the child. Low quality communication temptations include environmental manipulations that are either too sophisticated or rudimentary to the child.

4.3.33 Caregiver's Exploration Activation.

This item captures whether and how the caregiver acts in ways that unsettles the child momentarily to energize exploration. Its low and high anchors are

Does not produce acts to energize the child's exploration and

Consistently and adeptly produces a variety of acts to energize the child's experience and exploration of the environment.

The midpoint of 4 is used when the caregiver provides a few clear instances of activation that support exploration or sustains one act of exploration activation throughout.

Paquette (2004) proposed the concept of the “activation relationship” to specifically highlight differences in how fathers interact with their children relative to mothers. Paquette’s concept draws upon the attachment perspective of Bowlby (1969), specifically the complementary processes of parents encouraging children to proximity seek in mother-child interactions and explore in father-child interactions that undergird attachment. Paquette (2004) contends that activation – the “triggering of emotional arousal mechanisms” (p. 203) – stimulates children by creating unknown or strangeness in physical and social environments and allows them to learn to be brave in new situations. Furthermore, Paquette (2004) describes activation by fathers as occurring primarily within the context of rough-and-tumble play (RTP). Although Paquette (2004) views activation behaviors as unique to fathers, others argue that characterizing fathers as energizing and mothers as soothing and nurturing belies the similarities in father and mother behavior (Tamis-LeMonda, 2004). This item seeks to capture activation of exploration behaviors within a less physical context (not RTP), during mother-child and father-child interactions that focus primarily on shared attention to objects and events, either present or displaced in time and space.

Exploration activation can be indicated by several different caregiver behaviors, all of which might energize and heighten the child’s interest in exploring the environment. These behaviors include the caregiver suddenly moving their own or their child’s hands or other body parts, loud and animated expressions of excitement about an object or event, or otherwise surprising the child. The parent may unsettle a child by building-up tension about when a hidden object might appear, humorous teasing about the interaction, and friendly competition about who in the dyad acts on the object.

It is crucial to consider whether the caregiver is geared to excite the child rather than indicative of regular behavior or behavioral control. For the former, an example might be a parent who speaks in a consistently loud tone. In this situation, the parent is not using volume to startle or excite the child and should not be considered for this item. For the latter, if a parent snatches a toy from a child’s hand, it could be that the parent is attempting to remove it from the child’s space and hence, not be relevant to this item. Or this act could be a clear indication of exploration activation as when a caregiver snatches the toy teasingly, says “not yours, my turn!” with a grin, and then hands it back to the child.

Also note that this rating does not rely on the child responding in kind to the caregiver’s attempts to excite and unsettle by reacting with surprise, showing enjoyment, or beginning to or sustaining exploration. However, when a child’s excitement is clearly influenced by the parent’s activation, this can be considered as evidence that the caregiver is using clear and well-intentioned actions to encourage the child to explore the environment.

One last important consideration is how an activation item, one regularly applied to RTP, may look during an interaction. Physical mobility is likely low but not impossible such as when a child may stand to dance, leap-up in surprise, or lunge to grab a toy. If we consider how RTP creates mutual excitement between partners which is often equal parts fun, energetic, and stimulating and transfer that to a triadic interaction with toys, the focus of the play changes, but the activation and excitement level should still be as clear.

When deciding on a rating, it is important to consider the duration, variety, and clarity of the intent of caregiver's exploration activating acts. Caregivers who are rated high in exploration activation use activation behaviors throughout the majority of the session. Further, multiple markers of exploration activation are seen. Remember that this item does not rely on child behavior, but a caregiver rated on the high end of the scale is likely encouraging an interaction that is lively, fun, and playful. Caregivers rated a 7 will produce a variety of behaviors throughout the session that clearly are used to keep the child energized, exploring objects and/or the interaction itself. Moreover, these acts will often be adeptly used so that the clarity of the intention and timing seem well tuned to encouraging further exploration.

Caregivers rated in the middle of the scale do produce behaviors that encourage exploration but they do not occur consistently throughout the session and they are not varied. A rating in the middle of the scale is also suitable when the caregiver acts in ways that encourage exploration but it is not clear that their intent is to activate heightened exploration, or the activating acts occur in only one play sequence. Further, a rating in the middle of the scale would be appropriate if a parent only uses one strategy during the session. A rating of 4 is likely to be quite low on 2 of the three considerations of duration, variety, and clarity. For example, a caregiver regularly exclaims, "You did it, good job! Do it again!" and gives the child a big high-five when the child is building a castle. Variety is low, it is not clear that the intent is to activate exploration (rather than just to praise) which could lack excitement, and the duration is consistent but limited to one play act lasting about 5 minutes.

Caregivers on the low end of the scale will rarely produce acts that activate exploration and when they occur, these acts will not be varied and an intent to heighten interest in objects and events is not clear. If a caregiver shows no clear activation acts, rate a 1. It is important to remember, particularly on the low end of the scale, that positive affect is not a primary indicator of exploration activation. An example of this type of behavior might be a parent who smiles directly to the child and uses a calm, warm voice while reading the book but does not act in ways that activate interest in the story by, e.g., expressing excitement over what is going to happen next.

4.3.34 Caregiver's Physical Support of Joint Engagement

This item captures how the caregiver uses physical presence and actions to support joint engagement within a caregiver-child interaction. Its low and high anchors are

**Provides no physical support for joint engagement through presence or actions and
Uses a variety of physical supports consistently throughout the session.**

The midpoint of 4 is used when the caregiver acts in physically supportive ways intermittently during the interaction but the acts are neither sustained nor varied.

It has long been recognized that caregivers engage physically with their young children during interactions. To date, most attention has focused on rough-and-tumble play (RTP; Kerns & Barth, 1995; Ross & Taylor, 1989) during which the parent vigorously moves and touches the child, generating a highly charged person engagement that is not focused on shared objects and events. Other rating systems of parent behaviors during interactions capture some aspects of physical engagement, such as in the NICHD Study of Early Child Care and Youth Development (SECCYD) Parent Sensitivity rating item (Owen et al., 1996) which uses “sitting near the child, at the child's level, to interact” as one of the markers (Owen et al., 2010). Moreover, some descriptions of early parent-infant face to face interactions explicitly note how parents situate themselves relative to the infant and how touching and embracing are used to modulate the infant’s attention and affect (Feldman, 2007). The item we propose here differs from these other items by focusing on variations in how caregivers engage with their child physically in ways that support their joint focus on objects and events.

Caregiver behaviors that provide physical support for joint engagement vary in style and presentation. The key is to remember that the physical act supports shared engagement with objects and events and is not only an act on an object or a child. For example, the action of transferring toys to the child can work in two ways: as a functional necessity for supplying and removing toys or as an interactive tool for maintaining joint engagement with the toys. More specifically, a caregiver may remove salt and pepper shakers from a bag as a prelude to playing with them or a caregiver may deliberately hold them at the ready so that the child can easily access them while they “cook breakfast”. Only the second action provides physical support of joint engagement.

There are several aspects of physical presence that a rater should consider when rating a caregiver’s physical support of joint engagement including how close the caregiver is to the child, how the caregiver physically interacts with the child using the toys, and/or whether the caregiver repositions the child or objects in space to facilitate joint engagement. For example, a caregiver might lean into the center of play while interacting, or the parent might recline onto the floor creating a physical surround of the child and positioning their eyes at the child’s eye level. Similarly, a parent might maintain contact with the child throughout the interaction as a sign of support and encouragement. Similarly, the caregiver might use physical actions to manipulate the child or objects to create a more physically active interaction that affects the quality of joint engagement in a positive way.

Always remember, the behaviors that should be considered here are those that initiate, sustain, or increase the quantity and quality of joint engagement within the interaction, not just the interaction with the child.

This item assesses not only the quantity of a parent's expression of physical support but also its quality. Quality is assessed in terms of how well the support fits the on-going context in terms of how well it is tailored to the child's current engagement. For example, a caregiver's repeated tapping on the child's shoulder with a toy may be a well-suited attempt to call attention to how the new toy adds to an on-going activity ("here is the other shaker"), or it may call attention to a new toy that might interfere with the on-going activity ("play with this, not the book")

Because this item assesses the caregiver's physical support, considering the child's response is not central to the rating. However, because joint engagement is inherently dyadic, a child's response may be considered as a part of the evaluation of the quality of the caregiver's physical support to initiate and sustain joint engagement.

Caregivers who are rated high on this item will use a variety of discrete behaviors that provide physical support of joint engagement throughout the session. They will also likely orient their body in a way that facilitates joint engagement during most of the session. Caregivers high in physical support will likely show high levels of touching their child, both passively (as exhibited by close sitting) and actively (as evidenced by high-fives, hand-over-hand toy manipulation, and physical assistance in play acts). This parent will also use their physical presence as an addition to verbal communication – leaning into the child's space when talking, putting their face in line-of-sight, or continually tracking their child's face through their own body positioning and responses.

Caregivers rated in the mid-range of the scale use physical presence intermittently to support joint engagement. Unlike higher ratings, ratings in the mid-range of the scale indicate that the caregiver likely still presents supportive physical actions but not as frequently. Or, perhaps the physical supports to joint engagement are not to support the overall joint engagement itself such as when a parent places a child in their lap to contain them from running away but does not use the proximity to further the interaction. A mid-range rating is also appropriate for a caregiver who initially orients to a lower eye level and then occasionally also reaches into the child's immediate play space to manipulate the same toy or give an occasional high-five. However, for a caregiver who initially orients themselves at the child's level but does not actively maintain this to their advantage to enter the child's space or reorients as the child moves, the rating should be below the midpoint. This could also look like a caregiver-child interaction in which the child sits on or touches the parent throughout most of the interaction, but that is the limit to the parent's physical presence.

Caregivers rated on the low end of the scale will show very little, if any, variety of physical actions that support joint engagement and they will do rarely. A caregiver who seldom uses their physical presence to support joint engagement would be rated on the

low end of the scale. This would describe a caregiver who only pulls a child close during a brief period of book reading or who leans over into the child's face to emphasize an instruction but otherwise relies on verbal instructions. Duration of the act and range of actions should be considered when assigning a rating, so a rating on the low end of the scale will reflect both limited actions, perhaps one or two, and for only a brief instance(s) throughout the interaction.

Caregivers who do not provide any physical supports for joint engagement will receive a rating of 1. This is most easily depicted by a caregiver who is disengaged from the child's play but it may also describe a parent who depends exclusively on verbal acts to support joint engagement.

4.3.35 Caregiver's Active Direction.

This item captures the degree to which the caregiver directs the interaction using active, clear, concise, and often corrective direction. The low and high anchors are

No use of clear, concise, and corrective direction and
Consistently clear, concise, and corrective direction.

The midpoint of 4 is used when the caregiver provides intermittent use of active directions. To be rated a 4, parents should exhibit clear use of an active direction style of parenting though may not utilize this style consistently throughout the interaction.

Brody and Flor (1998) describe "no nonsense parenting" as parenting with high levels of control. These behaviors occur in conjunction with affectionate and warm parenting behaviors. Brody & Flor (1998) posit that this combination of parenting behaviors is meant to relay both vigilance and concern for the child's well-being and position the parenting style between authoritative and authoritarian methods of control.

Both styles of control use high levels of directive behaviors, in which the parent actively participates in the child's experience by providing clear guidance through instruction and demonstration. Parents who use authoritative approaches to control are more likely to offer reasoning and explanations for their guidance while those who use more authoritarian practices will not and are more likely to use punishment for incorrect behavior. The goal of the new item is to capture observable parenting behaviors within a parent-child play interaction that exemplify aspects of no-nonsense parenting. Caregiver active direction focuses on clear, concise, and consistent caregiver direction through verbal statements and physical behaviors but lacks the democratic explanations provided by authoritative parents.

Directive parenting has been assigned a negative valence in much of the literature by focusing on the interruption by the parent within the parent-child interaction. Caregiver active direction does not make this assumption. The focus is on whether the caregiver's direction is intended to encourage (e.g., "put that [toy] there") rather than prohibit (e.g., removal of the focal toy of interest). Additionally, active direction uses corrective (e.g., "no, not that one") rather than restrictive (e.g., "you can't do that") statements.

Overall, active direction should further the interaction rather than impede it. Contextual markers for supportive guidance through direction should indicate that the parent is following their child's interest and is responding to their actions and behaviors. For example, a parent may state, "No, that's the pepper" when the child incorrectly selects the pepper shaker instead of the salt when prompted. This statement is concise (e.g., no embellishment or extra information), corrective (e.g., addressing that the child selected the wrong shaker), and direct (i.e., the error is addressed rather than making a suggestion about correction or naming the incorrect selection).

Physical displays of control may include overt manipulation of the objects and space. Ispa et al. (2015) found that physical interventions were most often used to demonstrate or correct how a child interacted with a toy. Specific behaviors may include taking a toy from the child to demonstrate how to use it, abruptly moving or removing toys from the child's space, or holding the child in place.

Physical behaviors are often used in conjunction with verbal direction. Rather than exclusively exerting the parent's will, active direction should support, extend, or expand the dyadic play. Instructive guidance may sound like, "You don't do it that way," "You have to push the button," or "No, you're doing it wrong." These statements are often repeated and use an insistent, rather than suggestive, tone. Further, it is important to note that when taken in isolation, parent comments and behavior may appear to be negative, teasing, or sarcastic. An example of this kind of statement is, "Ew, you put too much salt on the eggs. They're going to be nasty." Full contextual information should consider: 1) the child's response, 2) the effect on the interaction, and 3) the overarching tone of the interaction.

- 1) Child's response – the child should not indicate upset or fear in response to the parent's direction. For example, if a parent teases, "You're too little; you can't do it", the child's response should indicate that the statement was in some way motivating. This could be demonstrated by persistence, seeking assistance, or a pivot to another activity. The child's response should not portray defeat or upset.
- 2) Effect on the interaction – the interaction should be benefited by the parent's guidance. Overall, parental guidance should have a net positive on the interaction through continuation of the dyadic play. Active direction does not stop the interaction.
- 3) Overarching tone – the tone of the interaction may vary in numerous ways. However, the tone should not relay tension, anger, or irritation. Even when individual statements or actions may seem more negative than positive in isolation, as may be the case with sarcasm or teasing, the above two components (i.e., response and effect) will inform the contextual tone.

Low ratings of caregiver active direction indicate that the parent either uses exclusively either restrictive or prohibitive direction or no clear and concise direction at all. Parents who receive a low rating on active direction may use suggestive directives rather than clear ones. Parents may appear to be aloof or removed from the interaction, displaying low levels of support or warmth to the child.

Middle ratings of caregiver active direction may include intermittent use active direction. It may be that parents only use these behaviors a few times so that they appear to be more isolated instances rather than an overall approach to the interaction. Middle ratings are also warranted when a parent uses active direction interchangeably with suggestive or restrictive direction.

High ratings of caregiver active direction indicate that the parent consistently uses consistent clear and concise direction. Further, this type of supportive guidance should clearly extend the interaction in some way, such as through expansion of the child's experience (i.e., the parent's guidance scaffolds the child's play). The highest rating should be reserved for an interaction in which there is a clear reciprocal quality in which the caregiver consistently reacts to the child's actions and the child, in turn, proceeds with play.

4.4 Dyadic Interaction Items (14-19, 27, 32)

4.4.14 *Elaboration of Shared Topic.*

This item characterizes the complexity of the child and caregiver's shared topics. The low and high anchors are

Unelaborated topics and
Topics that are detailed and varied.

The midpoint of 4 is used when most topics are elaborated with at least one additional detail or new element.

A dyad that is low on this item shares a topic or topics that have only single elements (e.g., rolling a ball back and forth to one another). A dyad that is high on this item includes numerous elements in their shared topic or topics (e.g., while sharing a photo of giraffes, the dyad labels the animals, counts them, discusses the animals' features, etc).

This rating focuses on the complexity of shared topics. Details and variations may be either verbal or nonverbal. For example, a child and caregiver may elaborate the shared topic of playing instruments together by using a variety of actions to produce sounds as well as by singing new songs.

In this item we are only interested in characterizing the elaboration of shared topics. Thus you must base your rating only on times when the child is in a state of joint engagement (see item 1). If the caregiver provides details and varies a topic but the child is not engaged with the object or event, there is not a shared topic and so you

should not let the caregiver's actions influence your rating. Moreover, it does not matter who makes the contribution to the topic's elaboration (or lack thereof). We will capture the child's and the adult's contribution in other items. Similarly, we are not interested here in the duration of the topic (see item 15) or its scope (see item 16).

4.2.15 Sustainability of Shared Topic.

This item characterizes the duration of the child and caregiver's shared topics. The low and high anchors are

**Fleeting topics and
Topics that are sustained.**

The midpoint of 4 is used when topics are maintained for a moderate duration (e.g., sustaining a conversation or play for a few turns).

This item assesses how long the caregiver and child remain focused on a shared topic. A topic ends when shared engagement with the topic ends. It also ends when there is a clear seam between the focus of one shared topic and another (as when, e.g., the child and caregiver stop discussing a picture of dog and begin to discuss a new picture.) However, deciding if a shared topic continues is not tied specifically to concrete objects. A shared topic may shift when both the caregiver and child shift focus to a new element of an object (e.g., at first they play with a puzzle, putting the pieces in; then they shift to talking about one of the piece and how the animal it depicts sounds.). In contrast, a shared topic may move to new objects (e.g., the caregiver and child talk about the name of the animals depicted by each puzzle piece and then about animals in the picture.) The key is to define the theme of the topic. If you can identify a strong link between different actions and/or objects that might constitute a topic, do not chunk a period of joint engagement into distinct topics. However, if you don't discern the link or if it appears minimal, conclude that there are distinct topics.

A dyad that is low on this item quickly attends to a topic and then moves on to the next topic (e.g., rapidly naming each picture in the art gallery). They may share few or many topics, but each topic is quick and fleeting in duration. A dyad that is high on this item stays focused on each topic for a longer period of time. The time spent on a topic may be unelaborated (e.g., a child asking his or her mother to blow up a balloon repeatedly throughout a scene) or include many details and elaborations (e.g., taking turns playing a drum in a variety of ways for an extended amount of time).

Like items 14 and 16, this item focuses on characteristics of shared topics, in this case their duration. Thus, the child must be in a state of joint engagement for a topic to be considered shared. Also note that we are concerned only with how long topics are sustained, not with who is primarily responsible for maintaining the topic or who introduces or terminates the topic.

4.2.16 Scope of Shared Topic.

This item assesses the spatial and temporal displacement of the shared topic. We are primarily interested in capturing how often, if at all, the child and caregiver focus

together on topics that are not in the immediate here and now. The low and high anchors are

All topics involve perceptible objects and events in the here and now and Repeated displaced references about several topics.

The midpoint of 4 describes a dyad that shares a few displaced references or several displaced references about the same topic.

Displaced references include references to the past and future, to objects outside the playroom or hidden from view, and to internal states including desires (“What do you want?”) and beliefs (“Do you know what’s in the box?”). Displacement is clearest when the entire topic relates to imperceptible events (e.g., “Daddy likes his new car”). But there will also be times when the displaced reference is combined with an immediate one, as when a comparison is made between two objects, one here and one elsewhere (“This doll is just like the one you have at home.”). Topics can also be displaced when the caregiver and child engage in complex pretend play that displaces their speech and actions from the immediate here and now into an imaginary space.

Remember that we are rating shared topics. If the caregiver makes a displaced reference but the child gives no indication that he or she is also attending to the displaced referent, do not count this as an instance of displaced reference.

Do not credit a child with understanding a caregiver’s reference to a displaced reference unless the child provides clear indication that he or she understands the reference. If the child’s behavior could occur without such understanding, do not consider this an example of displaced reference. For example, if the child is pointing to an object and the caregiver says “What do you want” and the child continues to point and says the name of the object, do not credit the child with attending to an internal state as well as the shared topic.

In many cases, evidence for the scope of the shared topic is in the content of the utterance and can be easily overlooked when viewing the scene for overall impressions. Be sure to listen carefully to what is said so that you can capture subtle shifts in focus such as the marking of internal states.

4.2.17 Fluency and Connectedness.

This item characterizes the flow of the interaction. The low and high anchors are

No interaction is established and Fluid and balanced interaction that is often sustained.

The midpoint of 4 is used when the interaction lacks smoothness and appears to be largely dominated by one partner.

Several variables are relevant to rating this item: the balance between partners, the connection of the partners to each other and their play, and the fluency of the interaction.

For balance, consider if the interaction is being dominated by one partner. With young children, or children with delay, the parent will often fill this role, but it could easily be that the child dominates the interaction. For ratings on the lower half of the scale, 1 – 4, it is likely the interaction is, at least mostly, dominated by one partner, and as you move into the higher ratings, the interaction becomes more balanced. At the highest rating, 7, the interaction should be almost completely balanced, with both partners contributing to the interaction readily.

For the connectedness, look for a common theme throughout the interaction. This will often be most evident by a dyad attending to the same activity without prompting. High connectedness results in a calm enthusiasm for the interaction with the partners eagerly anticipating each other's actions. Very low connectedness would be present in a child (or parent) that exhibits no interest in the interaction independently and may only interact after prompting or luring interest via a spectacle (i.e., the parent presents an attractive task such as playing music or blowing bubble). Sometimes connectedness can be present without the partners clearly focusing on the same object. This is most likely to be evident with a child that is able to multi-task so that, in effect, the child may be attending to both an independent task but is also clearly keeping up with the parent and a, at least minimally, shared task. A rating of 4 is consistent with a dyad that exhibits connectedness for most of the interaction; the quality of the connection need not be exceptionally high, and it would be expected for there to be a few instances of one partner dropping the connection with the other.

For fluency, consider how readily the partners are able to pass the interaction back and forth. This is easy to think about as the overall turn-taking structure of the interaction. High fluency is present when a dyad is able to go back-and forth with each other. Sometimes one partner may lead and sometimes the other. One partner may contribute more, but the other is always present to participate when needed. Fluency in lower ratings is marked by dropped "turns". A rating of 4 allows for there to be a number of dropped or delayed turns that are not necessarily detrimental to the interaction. An example of this would be a child who is busy playing with a shared object and may not always reply to the partner's line of questioning. Lower fluency may also be marked by a rigidity to the interaction such as the parent adhering to repeated questioning about basic qualities (i.e., colors, numbers, sounds), prompted responses (i.e., "you take your turn), or a very minimal response (i.e., a repeated head nod as a response).

An interaction may blend verbal and nonverbal modes of communication. For example, one of the partners may take turns by nodding and gesturing while the other may speak. For this item, it is not important if the interaction sustains a focus on a single topic or if there are several different topics discussed during a scene.

Remember that the rating scale is set-up so that a 1 indicates there is no interaction at all. A rating of 2 is often indicative of a dyad in which there is an extremely low amount of interaction, which includes brief episodes that may not meet the minimum threshold to qualify as joint engagement. For example, if a child takes a toy the parent is offering on only a few occasions but will not enter into joint engagement, this may be

rated a 2. A two may also indicate a dyad in which the interaction falls apart quickly once one partner joins the other. This can be exemplified by a child having a tantrum whenever the parent manipulates a shared object. A rating of 4 may be warranted for a number of different interaction types, considering that there are three main components that contribute to the overall rating, but the midpoint generally describes an interaction in which one partner needs quite a bit of support. A good example of this type of interaction would be a typically developing 12-month-old. Generally, the infant wants to interact but lacks the skill set to do so independently, so the partner provides the objects, the line of play, and the structure of the interaction. The infant may become distracted readily or lose interest but is eager to join back in the play once recalled to the interaction. A rating of 7 marks what should closely resemble an “adult” interaction in which partners hold equal stakes and contributions to the interaction.

4.2.18 *Shared Routines and Rituals.*

This item characterizes the frequency and quality of shared routines and rituals that occur when the mother and child are interacting. The low and high anchors are

No routines and rituals and
Sustained, varied, and nuanced routines and rituals.

The midpoint of 4 is used when the mother and child display some shared structures but they are not sustained and they do not permeate the interaction.

Routines and rituals are characterized by coordinated activity in which the participants settle comfortably into routines that become scripted over time and reflect shared implicit expectations (Aksan, Kochanska, & Ortmann, 2006). When identifying a routine or ritual, the exchange or interaction should clearly indicate an established pattern of behavior.

When deciding on your rating for this item, first consider the frequency and duration of routines and rituals and then next consider the quality of the interaction or exchange. It may help to select a point based on quantity and then move it upward or downward based on the quality of the routines or rituals. Higher quality routines occur when there is evidence of receptivity between the participants; evidence of harmonious communication; and the exchange flows naturally back and forth.

4.2.19 *Shared Story Creation.*

This item captures the degree to which the dyad’s interactions include characteristics of story creation in the interactions between caregiver and child. The low and high anchors are

Does not engage in ways that could create a story and
Occurs in a sustained interaction that elaborates upon the story and grows in creativity.

The midpoint of 4 characterizes when a caregiver or child’s attempts to initiate stories but they are not sustained and there is no elaboration to the story.

Dyadic story creation is operationally defined in the broadest sense of narrative development, which can encompass various narrative genres as originally outlined by Heath (1986), and taking into consideration the distinct styles (low-context vs. high-context) of creating and telling stories (Paul, 1995; Westby & Rouse, 1985). Story creation is uniquely different from general conversation, in that some degree of cohesion and thematic unity is accomplished by the dyad to describe a sequence of events. The following narrative genres can be created:

Recast/Recount: Retelling of an event/experience with a sequential order that can be accompanied in high-context styles by verbal imitation, role-playing, and using present tense, and in low-context styles to summarize concisely using past tense. Example: A personal narrative about something that previously happened or something from the past being connected to something in the present.

Event cast/Script: Describing an ongoing activity or planned procedure, often accompanied by metalinguistic, metacognitive behavior (e.g., 'thinking out loud') in low-context styles, and not expected in high-context styles. Example: Explaining how to brush teeth before going to bed.

Account: Sharing an experience that can be accompanied in high-context styles by topic-associated organization that is often non-linear and non-predictable, and in low-context styles by topic-centered organization that is often linear and predictable. Example: Telling about going to grandma's house.

Story: Fictional account of people, animals, and or objects (that take on animacy) who carry out a goal or overcome a problem that is often accompanied by social or moral importance to the dyad's culture in both high- and low-context styles. Example: *Los Tres Cochinitos*; *The Three Little Pigs*.

The rating is based on the quantity and quality of story creation elements shared between caregiver and child in their interactions with the contents of the three bags. There should be evidence that both participants are participating in the story creation, if only by accepting the other person's story related actions. For example, a caregiver suggests they make dinner for dad and the child responds, "yes!" and continues cooking. However, if the caregiver begins to narrate an activity with the toys (e.g., introducing the idea of making eggs for dad) but the child is clearly not attending to the caregiver's suggestion (e.g., the child is focused on trying to unscrew the saltshaker), this is not evidence of shared story creation. Higher ratings on this scale result from engagement in story creation that is co-created by caregiver and child, sustained and nuanced, and that may occur across contents of more than one of the bags. Nuanced stories draw on elements from outside the immediate setting, such as those related to the child's experiences other than the here and now or imaginary scenarios and may include drawing together elements from across multiple components of the play interaction (e.g., creating a story that connects toys from different bags of the Three Bags task). Story creation may be brief, credited in one brief exchange, or it may be sustained. Higher ratings are given to sustained story creation. If a story creation

exchange is initiated by the child, the rating should be a 5 or higher, unless there is no accompanying response from the caregiver that sustains a story being created.

Elements of dyadic story creation include:

“Story” elements, initiated by either caregiver or child, that elaborate upon the pictures of the book, the elements of the stove, features of the toy cottage, or an integration of elements across the bags.

The caregiver and/or child build upon their partner’s contribution to the story so that both are active participants.

The story created draws upon elements outside the immediate interaction, such as activities in the child’s life or friends/relatives not present, or imaginary scenarios.

A high rating indicates at least one sustained interaction (i.e. a multiple bout exchange between caregiver and child that elaborates upon the story and grows in creativity). For dyadic story creation to be credited, elements of the created story must be initiated and elaborated on with a contribution from each partner. Either partner can initiate the story, but a response that elaborates must take place by the other partner. For this highest rating, the dyad incorporates more sophisticated elements of story creation such as incorporating elements from outside the immediate interaction or creating a story that combines elements.

A low rating indicates that the dyad does not engage with the elements of the bags in ways that could create a story that goes beyond the here and now features of the book’s pictures and the toys. Labeling objects, pictures, and items is not counted as story creation.

A midpoint rating indicates a dyad in which multiple attempts to initiate stories are made, and the partner attends to the initiation (i.e. follows along) and responds behaviorally or verbally. The exchanges are judged as relatively low in quality, because the exchanges are not sustained and there is no elaboration to the story.

4.2.20 Fun.

This item characterises the quality of enjoyment that the caregiver and child share in the interaction. The low and high anchors are

Stressful and tense interaction and
Continuous fun and enjoyment in the interaction.

The midpoint 4 is used when the interaction contains intermittent and brief fun exchanges but is generally moderately tense.

Fun is characterised by an enjoyable interaction. When both caregiver and child are having fun, they are pleased with each other, and you will notice light and cheerful expressions such as laughter and smiles. They also willingly take the next turn, let the partner take the next turn or help the partner take the next turn. Do not consider forceful and nervous laughter and hesitations as indications of fun. Fun exchanges may include tickling, cuddling, and teasing each other as well as playing with fun words such

as “up, up, up”, animal sounds, or silly words. The interaction is considered fun only when there is reciprocity between the caregiver and child. If the caregiver is enticing the child with a potentially fun toy but the child does not respond or if the child is enjoying a toy on his/her own, do not count it as fun.

A tense interaction is forceful and contains protests and hesitations as well as indications of displeasure and unwillingness to collaborate with the partner. You will notice struggles in engaging the interaction partner, physical avoidance such as running away from the partner, or ignorance of the partner’s verbal and nonverbal messages.

A high rating is used when the interaction is light and pleasurable. The caregiver and child are consistently having fun throughout the interaction.

A low rating is used when the interaction appears stressed and there are consistent hesitations or unwillingness to take turns.

4.2.32 Tone.

This item characterizes the tone of the interaction. The goal is to capture vitality and positive affect expressed within the dyad, which is likely to be an indication of shared enjoyment. The low and high anchors are

No shared enjoyment and

Sustained shared enjoyment, characterized by high vitality and positive affect

The midpoint of 4 is used when neither the parent nor child rarely if ever appear tense or bored and they briefly display shared enjoyment a few times.

Vitality captures the arousal aspect, with a continuum from boredom to highly playful, whereas positive affect captures the valence of the interaction, ranging from persistently tense, negative, or persistently flat affect to shared enjoyment and fun.

The rating must consider both partners in the dyad. During periods of shared enjoyment, both the caregiver and child appear to be having fun. They are pleased with each other, and you will notice light and cheerful expressions such as laughter and smiles. They also willingly take the next turn, let the partner take the next turn or help the partner take the next turn. Shared enjoyment may also occur during exchanges that are not necessarily in joint engagement such as tickling, cuddling, and teasing each other as well as playing with fun words such as “up, up, up”, animal sounds, or silly words. Shared enjoyment is considered to have occurred only when there is reciprocity between the caregiver and child. If one partner is clearly enjoying playing, and the other is supportive of the enjoyment consider the middle of the scale, even though full enjoyment is not being fully demonstrated (for example, a child is smiling and chatting while pretending to share food with a toy giraffe and the mother is suggesting ideas of what they might eat next). If the caregiver is enticing the child with a potentially fun toy but the child does not respond or if the child is enjoying a toy on his/her own, do not count this as a period of shared enjoyment. Also, do not consider forceful and nervous laughter and hesitations as indications of enjoyment.

5. Notes about the rating process.
 - 5.1. **CODE THE ENTIRE SCENE.** Resist the temptation to give undue weight to the most interesting moments.
 - 5.2. **LOOK AT BOTH VIEWS TWICE.** Each scene should be viewed a minimum of 2 times to assign ratings to all of the items; however, 3 passes often seem necessary.
 - 5.3. **READ THE MANUAL AGAIN (AND AGAIN).** There are numerous items to assess and it can be overwhelming to try to remember the details of each. Having your manual on hand as a guide while you are making your ratings can be very helpful.
 - 5.4. **GUARD AGAINST “SLIDING” SCALES.** The anchors for the items are designed to be used for a number of different scenes as enacted by children who vary greatly in age and in ability. It is easy to adjust ratings to a specific case. Try very hard not to. Rather, select ratings relative to the descriptions in the manual, even if this means that you do not use certain ratings during a particular session.
 - 5.5. **RATE THE RIGHT PERSON!** It is important to remember each item may not look at the same participants. Some focus on the child, some on the caregiver, and others on both. This means that we may have to focus only on the child or on the caregiver. This is sometimes difficult to do because the partner’s behavior often seems so salient. Adults often work hard to provide at least the illusion that they and a child are engaged together. They may, for example, verbally direct the child to do something just as, or right after, the child begins to do something. In such an instance, do not credit the adult with influencing the child. Moreover, partners may try very actively to engage the child’s attention, either to themselves or to a shared toy, and yet they may not succeed. If they do not, do not be influenced by their attempts when coding the child’s focus of attention. Don’t “rich interpret.” Don’t let the actions of a sophisticated caregiver lead you to conclude that the child is sophisticated!
 - 5.6. **CODE ONLY WHAT YOU SEE.** Do not let your knowledge of the caregiver or child’s abilities sway how you rate their actions. The caregiver and child may act quite differently from one scene to the next. Be careful not to let your previous experiences rating a prior scene influence your ratings for the current scene.
 - 5.7. **KEEP TRACK OF INTERESTING MOMENTS.** If you think that you have found either a very clear example of an item rating or a very unusual or puzzling example, make a note of this to share with others. In addition, you may be provided with a checklist of specific acts that the researchers would like to keep track of for later reference. It is helpful to have information about interesting examples and specific acts but provide these only after you have finished reviewing and rating a scene.

6. Notes and references about the JERI

6.1. SELECTING AND ADAPTING ITEMS.

Although the JERI contains 35 rating items, not all are needed to address specific research questions. Researchers may wish to streamline the rating process by preselecting items before training and rating proceed. Moreover, when the items are applied to observations made in different contexts than the CPP or with children and caregivers who differ substantially in age or culture from our original study, it is important to adapt the items. Adaptions may include adding more examples of the rating anchors and specifying rules about compensating for video recording issues. Moreover, new items may be added to address new research questions.

Here is a selection of our publications using the JERI. The rating items selected from the inventory are listed at the end of each reference.

Adamson, L.B., Bakeman, R., Deckner, D. F., & Nelson, P. B. (2012). Rating Parent–Child Interactions: Joint Engagement, Communication Dynamics, and Shared Topics in Autism, Down Syndrome, and Typical Development. *Journal of Autism and Developmental Disorders*, *42*, 2622–2635. (CPP observations rated using items #1–17.)

Hirsh-Pasek, K., Adamson, L. B., Bakeman, R., Owen, M. T., Golinkoff, R. M., Pace, A., Yust, P. K. S., & Suma, K. (2015). The contribution of early communication quality to low-income children’s language success. *Psychological Science*, *26*, 1071–1083. (The three bags procedure rated using 3 rating items: #4 S-IJE; #17 Fluency and connectedness; 1 additional item was created: #18 Routines and rituals)

Suma, K., Adamson, L. B., Bakeman, R., Robins, D. L., & Abrams, D. N. (2016). After early autism diagnosis: Changes in intervention and parent-child interaction. *Journal of Autism and Developmental Disorders*, *46*, 2720–2733. (The CPP rated using 5 items: #2 SJE; #3 CJE; #10 Scaffolding; #15 Sustainability; #17 Fluency and connectedness)

Adamson, L.B., Bakeman, R., Suma, K., & Robins, D.L. (2019). An expanded view of joint attention: Skill, engagement, and language in typical development and autism. *Child Development*, *90*, e1-e18. <https://doi.org/10.1111/cdev.12973> (CPP observations rated using 9 items: #1–4 joint engagement items; #7 Child’s expressive language; #9 Child affect; #10 Scaffolding; #12 Following-in on child’s focus; #17 Fluency and connectedness.)

Tamis-LeMonda, C., Caughy, M., Rojas, R., Bakeman, R., Pacheco, D., Owen, M., Adamson, L.B., Suma, K., & Pace, A. (2020). Culture, parenting, and language: Respeto in Latine mother-child interactions. *Social Development*, *29*, 1-24. <https://doi.org/10.1111/sode.12430> (The three bags procedure rated using 2 rating items: #20 Child affiliative obedience and #21 Parent calm authority)

Masek, L. R., Paterson, S. J., Golinkoff, R. M., Bakeman, R., Adamson, L. B., Owen, M. T., Pace, A., & Hirsh-Pasek, K. (2021). Beyond talk: Contributions of quantity and quality of communication to language success across socioeconomic strata. *Infancy*, 26(1). <https://doi.org/10.1111/infa.12378> (The three bags procedure rated using #17 Fluency and connectedness)

Adamson, L. B., Caughy, M. O., Bakeman, R., Rojas, R., Owen, M. T., Tamis-LeMonda, C. S., Pacheco, D., Pace, A., & Suma, K. (2021). The quality of mother-toddler communication predicts language and early literacy in Mexican American children from low-income households. *Early Childhood Research Quarterly*, 56(3), 167-179. <https://doi.org/10.1016/j.ecresq.2021.03.006> (The three bags procedure rated by using 5 rating items: #4 symbol-infused joint engagement, #17 Fluency and connectedness, #19 Routines and rituals, #20 Child affiliative obedience and #21 Parent calm authority)

Suma, K., Caughy, M. O., Bakeman, R., Washington, J., Murray, B., & Owen, M. (under review). Active Direction in parenting: A new observational measure of African American parenting style.

Caughy, M. O., Suma, K., Owen, M. T., Rojas, R., Bakeman, R. (under review). Mothering and fathering: Similarities and differences related to family cultural context.

In addition, the JERI rating items have been adapted for use in several research projects, including:

The Development of Auditory Joint Engagement. (NIH/NICHD 5R01 HD035612; Adamson PI) (The CPP rated using 8 items: #1–4 joint engagement items; #7 Expressive language level and use; #10 Scaffolding; #12 Following-in on child's focus; #17 Fluency and connectedness; #18 Routines and rituals)

The DUET project: Enhancing the Communication Foundation for Language Development in Early Childhood (William Penn Foundation, Hirsh-Pasek PI). (Modified CPP rated using adaptation of 3 items: #4 S-IJE; #17 Fluency and connectedness; #18 Routines and rituals)

Quality of Early Mother-Child Communication and Language Outcome in Low-Income Hispanic Children. (NIH/NICHD, Caughy PI). (The three boxes task rated using adaptations of 6 items: #1 Total JE, #2 SJE, #3 CJE, #4 S-IJE; #17 Fluency and connectedness; #18 Routines and rituals; 3 additional new items were created: #19 Shared story creation, #20 Child affiliative obedience, and #21 Caregiver calm authority)

Connecting the dots: An RCT integrating standardized ASD screening, quality treatment, and long-term outcomes. (ACE-Network NIH, D. Robins, PI). (Three CPP scenes rated using adaptation of 13 items: #23 Unengaged, #24 Object engagement, #22 Child engagement, #3 CJE, #4 S-IJE, #5 Initiations, #7 Expressive language, #8 Quality of behavior, #9 Child affect, #26 Attention to caregiver, #12 Following in, #17 Fluency and connectedness, #18 Routines and rituals; 3

additional new items were created: #30 Child's social imitation, #31 Child's instrumental imitation, and #32 Tone)

Understanding and Potentially Treating ASD-ADHD Combination (ACE Center NIH, Kollins & Dawson, co-PIs). (Semi-structured free play using adaptations of 12 JERI items: #23 Unengaged, #24 Object engaged, #22 Joint engagement, #2 SJE, #3 CJE, #4 S-IJE, #6 Responsiveness, #7 Expressive language, #26 Attention to caregiver, #17 Fluency and connectedness, #18 Routines and rituals)

PACE Coaching Project (Ministry of Children and Family Development Award, P. Mirenda, PI). (Adaptation of the CPP using 7 adapted JERI items: #2 SJE, #3 CJE, #4 SIJE, #7 Expressive language, #10 Scaffolding, #12 Following-in, #17 Fluency and connectedness)

Research and Education for Autism in Children (Kennedy Krieger Institute, R. Landa, PI). (Child only free play using 4 JERI adaptations: #5 Initiation, #25 SRRBs, #7 Expressive language, #26 Attn to Caregiver; Parent-Child free play using adaptations of 14 JERI items: #2 SJE, #3 CJE, #4 SIJE, #5 Initiations, #6 Responsiveness, #35 SRRBs, #7 Expressive language, #26 Attn to Caregiver, #10 Scaffolding, #12 Following-in, #28 Lang facilitation, #29 Comm temptations, #17 Fluency and connectedness, #18 Routines and rituals)

Tailoring Treatment Targets for Early Autism Intervention in Africa (NIH/NIMH, L. Franz, PI). (Free play child-only using adaptations of 4 JERI items: #23 Unengaged, #24 Object Engagement, #7 Expressive language, #26 Attn to Caregiver; Parent-child play using adaptations of 16 JERI items: #23 Unengaged, #24 Object Engagement, #22 Child Engagement, #2 SJE, #3 CJE, #4, SIJE, #6 Responsiveness, #7 Expressive language, #26 Attn to Caregiver, #10 Scaffolding, #12 Following-in, #13 Caregiver's Affect, #28 Lang Facilitation, #29 Comm Temptations, #17 Fluency and connectedness, #18 Routines and rituals)

WHO Project on Caregiver Skills Training Programme for Families of Children with Developmental Disorders or Delays. (E. Salomone, PI) (10 minutes of free play with provided toys using adaptations of #6 Initiation of communication, #7 Expressive language, #10 Scaffolding, #12 Following in, #13 Caregiver's Affect, #17 Fluency and Connectedness, and #18 Routines and rituals; adaptations to rating scales were created for 2 state coding items: #22 Unengaged, and #23 Object engagement; 3 additional new items were created: #24 Joint engagement, #25 Stereotyped, restricted, and repetitive behaviors, and #26 Attention to caregiver.)

Intervention study for mothers of young children with autism (T. Wong, PI) (mother-child interactions using adaptations of #4 SIJE, #24 Joint engagement, #7 Expressive language, #17 Fluency and connectedness; 3 additional new items have been created: #27 Fun, #28 Language facilitation and #29 Communicative temptations.)

BEER parent training for early autism intervention (Michelle Snijder, PI) (approximately 6 minutes of semi-structured play repeated twice using adaptations of #1 Total joint engagement, #2 Supported joint engagement, #3 Coordinated joint engagement, #4 Symbol-infused joint engagement, #7 Child's expressive language level, #10 Caregiver scaffolding, #11 Symbol highlighting, #12 Following in, #13 Caregiver affect, and #17 Fluency and Connectedness)

Infant Predictors of ADHD and ASD Symptomology (NICHD, PI A. Federico) (semi-structured play in which the parent does not interact for the middle portion, using 15 JERI items: #1 Total joint engagement, #2 Supported joint engagement, #4 Symbol-infused joint engagement, #5 Child's initiation of communication, #6 Child's responsiveness to communication, #7 Child's expressive language level, #8 Quality of behavior patterns, #12 Following in, #17 Fluency and Connectedness, #22 Child joint engagement, #24 Object engagement, #26 Child's attention to caregiver, #28 Caregiver language facilitation, #29 Caregiver communicative temptations, #32 Tone)

Language Development in Deaf and Hard of Hearing Children (NIDCD, PI D. Houston). (The three-box task with 3 JERI items: #4 Symbol-infused joint engagement, #17 Fluency and connectedness, and #26 Shared routine and rituals)

6.2. TRAINING AND AGREEMENT.

Technical Report 27 (*JERI Procedures*; Suma, Adamson, & Bakeman, 2017) provides information about training raters and about assessing their reliability.

Technical Report 28 (*KappaAcc: Deciding if Kappa is Big Enough by Estimating Observer Accuracy*; Bakeman, 2018) provides information regarding using kappa to report interobserver reliability and estimated accuracy.

6.3 ADDITIONAL REFERENCES

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- Adamson, L. B., Bakeman, R., Deckner, D. F., & Ronski, M. A. (2009). Joint engagement and the emergence of language in children with autism and Down syndrome. *Journal of Autism and Developmental Disorders, 39*, 84–96.
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