

**MATERNAL SENSORY SIGNALS
CODING MANUAL**

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BACKGROUND

Maternal sensory signals to her infant are characterized in the context of a free-play interaction. Interactions are recorded during study visits and then coded. Tactile, auditory, and visual maternal signals to the infant are coded continuously in real time. Codes are used to calculate an entropy rate for each mother. Entropy rate is a measure of the predictability of maternal sensory signals.

THE MOTHER-CHILD INTERACTION ASSESSMENT

The mother-child interaction is a 10-minute semi-structured play-period. Mother/infant pairs are given a standard set of toys and are instructed to play as they normally would at home.

Materials. A foam mat covered with a “splat mat” (plastic cover for easy cleaning) is used for the mother and child to sit. A boppy is provided for infants. A bin is used to hold the toys. The standard set of toys includes an electronic steering wheel toy (i.e. “Talking Driver” by Chicco), a plastic set of animals (i.e. “Squeeze and Teethe Forest Friends” by Infantino), and a set of rattles (i.e. “Musical Toys HYP-6005 Mini Orchestra Shaker” by Hohner Kids”).

Setup. The researcher should not be in the room during the assessment in order to encourage participants to play naturally. The mat should be placed in a corner to encourage the mother and child to orient towards the camera(s). Toys should be left in the bin so that the mother and child can choose the ones in which they are interested. Distractions in the room should be limited (i.e. toys/games other than the ones used in the assessment should not be in view to participants). It is recommended that camera(s) can be controlled remotely to pan and zoom around the room, and that two cameras are used to record from different angles. Additionally, it is recommended that at least one camera is placed at the height at which the mother and infant will be sitting in order to capture a good view of their faces. The cameras should zoom close enough to get the best possible picture of the mother and child’s faces, but far enough to capture their entire bodies and toys so that the entirety of the interaction is visible.

Verbal instructions. “First we will have a short play period for you and [CHILD]. Please keep in mind that we are recording from this camera(s) (DEMONSTRATE) and would like to be able to see you and [CHILD] at all times. Please use the toys on the floor to play with [CHILD] as you would at home. All of the toys are washed after each child, so they are clean in case [CHILD] puts them in his/her mouth. I will be back in about 10 minutes. Have fun!”

After providing instructions, the researcher should leave the room.

CODING OVERVIEW

Videos are coded continuously in real time (i.e. using the Observer XT software) in four passes.

1. Pass 1 auditory signals (mother’s vocalizations),
2. pass 2 tactile signals (mother’s touch and holding of child), pass 3 is visual signals (mother’s activity), and pass 4 continues visual signals (child’s looking behavior).

Code types. There are two types of codes used in this scheme: events and states. An *event* is a behavior that occurs at a single point in time (i.e. does not have a duration). For example, a vocalization, (i.e. a single utterance) is considered an event. *States* are mutually exclusive continuous behaviors with a duration. For example, the mother holding the child is a state that is mutually exclusive with not holding the child.

Contact the Neurodevelopmental Research Program (NRP@DU.edu) for a copy of the coding template that can be uploaded into the Observer XT software. [ED1]

MATERNAL SENSORY SIGNALS CODING SCHEME

PASS 1

Sensory category: Auditory
Subject: Mother

VOCAL (Event)

Maternal vocalizations include each distinct utterance or statement (each time there is a break in a sentence, song, phrase, etc., a new vocal should be coded). Laughs and sound effects (e.g., moo) are considered vocalizations.

Notes: A new vocalization should be coded for each distinct utterance/statement (i.e. If the mother says "Here is the giraffe. He is red!", code one vocal at the beginning of the first sentence, and a second vocal at the beginning of the second sentence.) Similarly, a new vocalization should be coded for each distinct statement/phrase in a song (i.e. "Mary had a little lamb/ little lamb/ little lamb" would be coded as 3 separate vocalizations).

Coughs, sneezes, and yawns are not considered vocalizations and should not be coded.

PASS 2

Sensory category: Tactile
Subject: Mother

TOUCH (Event)

Tactile contact with the child (other than holding). One touch should be coded for each distinct instance of contact.

Examples of touch include running fingers through the child's hair, fixing the child's clothes, running a toy car across child's leg, giving the child a kiss, or adjusting child's position.

Notes: A new touch should be coded for each distinct instance of contact (i.e. if the mother runs her fingers through the child's hair twice, code one touch at the beginning of the first time she runs her fingers through, and a second touch at the beginning of the second instance).

Do not code touch if the child touches the mother.

HOLDING CHILD (Mutually Exclusive State)

Holding the child for a period of time.

Examples include carrying or picking up the child, securing the child while he/she is sitting on the mother's lap, supporting the child (i.e. supporting the child so that he/she does not fall over when standing), and restraining the child (i.e. holding the child's arm so that he/she cannot reach a toy, or physically stopping child from crawling or walking).

Notes: A touch code does not need to be coded when the mother initially touches the child to hold him/her. Touches can be coded while mother is holding child. For example, if the mother is holding child and kisses his/her head, a touch should be coded for the kiss.

NOT HOLDING CHILD (Mutually Exclusive State)

Not holding the child.

Note: This state should be coded if the child is sitting on the mother's lap (i.e., using the mom as a chair and supporting themselves) with out any active contact from the mother (i.e., the mother is not holding/supporting the child, the mother's hands are not around the child to secure him/her).

CAN'T TELL IF HOLDING CHILD (Mutually Exclusive State)

Mom and child are both out of camera view, or holding cannot be reasonably distinguished due to bad camera angle.

PASS 3**Sensory Category:** Visual**Subject:** Mother**POINTING** (Event)

Pointing to an object with the intention of directing the child's attention to that object.

Examples include pointing to a toy, the child's shirt, the child's toes, a window, or the lights.

Note: The mother may not be touching an object while she points to it. In this case, "object in hand" would be coded.

Touching or Holding Object (Mutually Exclusive State)

Touching or holding a toy or other object.

Examples include shaking a rattle, pressing buttons on toys, touching objects to count, adjusting the boppy, holding a coffee cup, or holding a baby bottle.

Note: If the mom is only resting her hand on an object, do not code "object in hand" – instead, code "no object in hand" (e.g., the mother may be resting her hand on the boppy).

NO OBJECT IN HAND (Mutually Exclusive State)

Not holding or touching an object. (includes passively resting hand on object).

ACTIVITY NOT VISIBLE (Mutually Exclusive State)

Mother is out of the camera view, or her activity is not visible due to bad camera angle.

PASS 4**Sensory Category:** Visual**Subject:** Child**LOOKING AT MOTHER** (Mutually Exclusive State)

Looking at the mother, the object the mother is holding/playing with, or an activity mother is engaging in.

NOT LOOKING AT MOTHER (Mutually Exclusive State)

Not looking at the mother or her activity. Looking at toys or other objects in the room.

CAN'T TELL CHILD LOOKING (Mutually Exclusive State)

Child is out of the camera view, or looking cannot be reasonably distinguished due to bad camera angle.