

Parent-Child Snack Coding System
Yoder, Lieberman, Thompson
10/19/10

Overview

Purpose of the coding system

Theory posits that parents who use many responses and consistently respond to children's behavior have children with better language later in development. Amount of linguistic responses to children's communication acts or focus of attention are thought to facilitate language development by providing words at times children have a short-term memory of the referent for the word, thus aiding the association of the adult-provided word and its meaning. Consistency (response/opportunity) of such responding is thought to be an important metric of responsivity because children with autism may be more likely to attend to adult talk if the children learn that their behavior and communication is often narrated or linguistically mapped, respectively.

This manual is designed to guide observers through a process that will yield variable scores thought to reflect variability in amount and consistency with which parents respond to their children. Specifically, the extent to which parents provide responses that add linguistic information about children's focus of attention and/or add to children's immediately preceding communication.

Parent responses may need to be pro-rated by the proportion of intervals observed that are highly codable. By "pro-rate", we mean multiplying the number of intervals with a coded response by the proportion of total intervals that are coded as "high codeability". Once data are collected on all children, a statistical analysis will be run to determine whether the number of intervals with responses needs to be prorated. Considering whether this pro-rating is necessary is particularly important for the PCS procedure because the degree to which events are controllable is less in parent-child sessions than in examiner-child sessions. Some of these controlled events and off-screen or obscured camera angle periods are likely to occur more often in the PCS than in other procedures.

Because some scientists prefer to pro-rate responses by the opportunities for these responses, number of intervals with attention and/or communication leads or both will be coded. Therefore, this code also asks observers to note the occurrence of such response opportunities (aka "leads").

Therefore, we will be deriving 6 frequency counts from the PCS coding, which in turn, will be used to compute various variables for later analysis. The frequency counts will be the number of (a) intervals with low codability (b) intervals with high codability, (c) intervals with a child attentional lead, (d) intervals with a child communicative act, (e) intervals with a parental linguistic response following any lead., (f) intervals with a parent linguistic response following child communication (a subset of "e").

To reliably code the types of adult behavior, experience tells us that key terms need to be defined. Sometimes we define the terms because they have accompanying separate symbols (i.e., "codes") that are to be recorded in the Procoder data file (i.e., those defined in a file used by Procoder called a "code file"). Usually, we define the terms because they are used frequently and in a specific way in this manual. This degree of specificity will seem "picky" at times, but is necessary for variable values to be very similar across different observers for the same session (i.e., reliable).

Overview of coding process

Observers will do the following:

1. Download the code file onto his/her harddrive. This may only have to be done once for the project period.
2. Download the media file onto his/her harddrive. This will have to be done for all sessions and all participants.
3. Set up ProcoderDV software to use a 5-second interval behavior sampling method.
4. Use the Procoder DV software to code the media file.
 - a. Because different types of behaviors are to be considered for coding for each interval, the decisions are grouped into 3 "sets" (what Procoder calls "groups") of mutually exclusive codes. These 3 sets are: (a) low codability (l) vs. high codability (h), (b) child attention lead (a) vs child communicative act (c) vs null, (c) parent linguistic response (r), vs. null. "Null" means the interval is left blank (i.e., no code is selected from the pull-down menu for the target group for the target interval).
 - b. Two "passes" through the media file are strongly suggested. A "pass" through the media file means that the observer looks at each interval (or, in the case of momentary interval coding, the offset frame of each interval) and makes a decision how to code each interval until all 120 intervals are coded for the set of codes to be addressed during the pass.
 - i. Two reasons exist for strongly recommending that a pass be used to determine codability of interval (i.e., low vs. high) that is separate from the pass used to code lead and response. First, the codability dimension is coded using a momentary interval sampling method. A momentary interval coding method is one in which we code the level (low vs. high) of codability based exclusively on what occurs at the margins (e.g., offset) of the interval. In contrast, the lead and response coding is conducted through a partial interval coding method. In a partial interval coding, the key behavior is tallied if it occurs anytime during the interval. Thus the entire interval needs to be observed. This difference in type of interval coding is used because duration is best estimated using momentary coding and frequency is best estimated using partial interval coding. Second, the mindset for deciding codability is quite different from the mindset for deciding lead and response. For example, 'lead and response are thought to

be best coded in the same "pass" because once a lead has been identified it is natural to determine if a response FOLLOWS the lead within the same interval. In contrast, the coding of lead and response are not contingent on what was coded for codability. Recall that codability is tallied only to determine whether pro-rating by duration of codeable time is needed and to provide the denominator or this pro-rated score if necessary.

5. Save the ProCoderDV data file on your personal hard drive and derive the variable scores using a software program called INTMAN or the New MOOSES program.
6. After variable derivation, store the ProCoderDV data file and the analysis file on the secure text server.
7. Indicate in the coding progress chart that the coding has been completed.
8. At the VU site, indicating that coding is complete on the coding progress chart is the signaling method data entry personnel use to indicate data is available for entry.

Putting The Media Files on Your Harddrive:

The media file will initially be on the secure media server (yousendit.com). See the Yousendit.com manual for downloading files to your harddrive. Copy the media file from the secure media server to a folder on your desktop that is labeled something like "Parent-Child Snack procedure media files" Do not code from a CD or from the media server.

Putting the Code File on Your Harddrive:

The code file named PCS code file 3_2_10.cod will initially be on the secure text server. See the manual for downloading files to your harddrive from this text server. Copy the code file from the secure text server to a folder on your desktop that is labeled something like "code files for procoder". Do not link to the copy of the code file on the secure text server. Doing so can cause later corruption of files. The code file should resemble the following:



The screenshot shows a software window with a blue title bar containing the text "pcs code file 3_2_10.cod". Below the title bar is a menu bar with "File" and "Data". A toolbar with various icons is located below the menu bar. The main area of the window is divided into two tabs: "Codes" (selected) and "Group Descriptions". The "Codes" tab displays a table with three columns: "Code", "Description", and "Group".

Code	Description	Group
l	low codability	1
h	high codability	1
a	child attentional lead	2
c	child communication act	2
r	parental linguistic response	3

Loading ProcoderDV:

To use ProcoderDV to code, do the following:

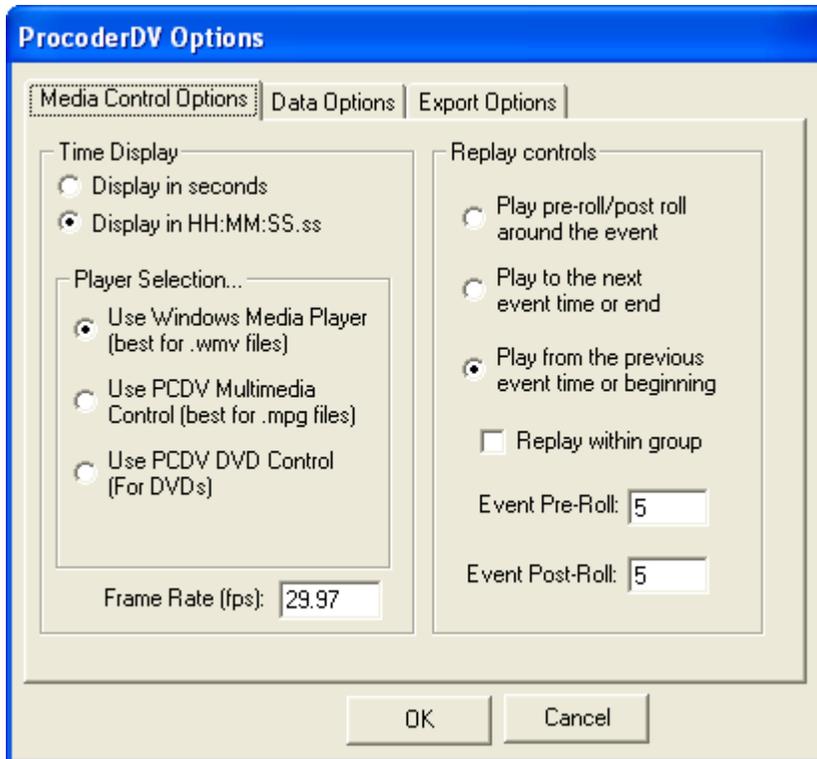
- a. Load ProcoderDV (2-left-click on the procoder icon-looks like an analogue clock).
- b. You should get the following:

**Setting ProcoderDV options:**

If you are using ProcoderDV for the first time, you'll need to activate it. Select "Help", "Activate this copy", enter your email and user number. These can be obtained by emailing Jon.Tapp@vanderbilt.edu.

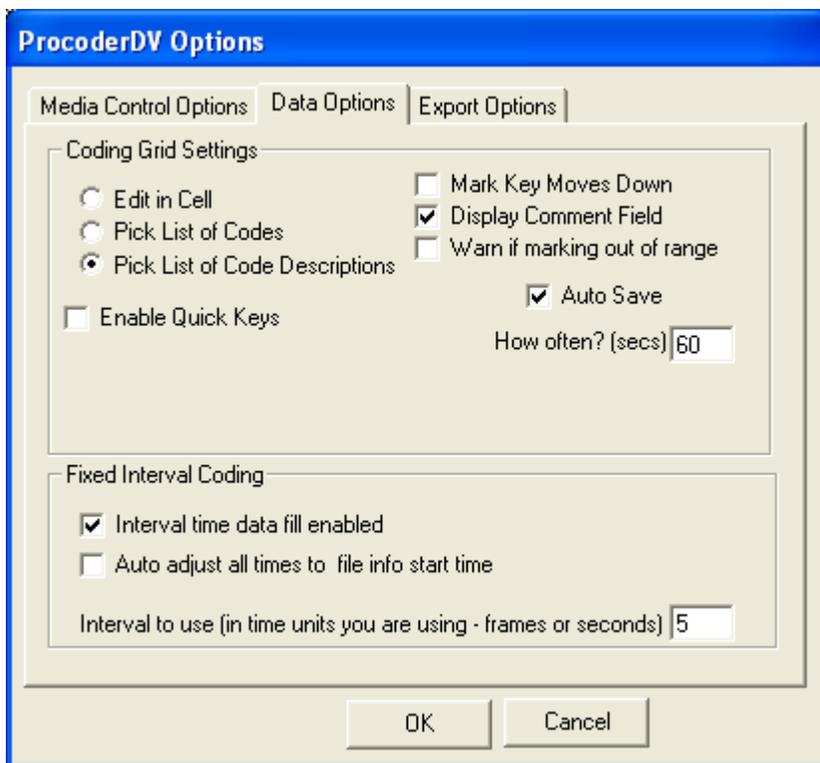
If you are setting up ProcoderDV for interval coding for the first time, check the option settings to make sure they are set correctly for interval coding (i.e., the type of coding you are doing).

Select, Edit, Option to get the following:



Under the “Media control options” tab, “Time display” should be set for “display in HH:MM:SS.ss”. “player selection” should be set for “wmv”, “Replay controls” should be set for “play from previous event time or beginning”. The event pre-roll or event post-roll times don’t matter.

Select the “Data options” tab and get something like:



1. Now select “Data options” tab. Check “pick list of code descriptions” and “display comment field.” Check “auto save” and enter 60 seconds. Under “fixed interval coding,” select “interval time data fill enabled.” Enter “5” in “interval to use.”

The export options don’t need to be changed. So select “OK” to end the options set up.

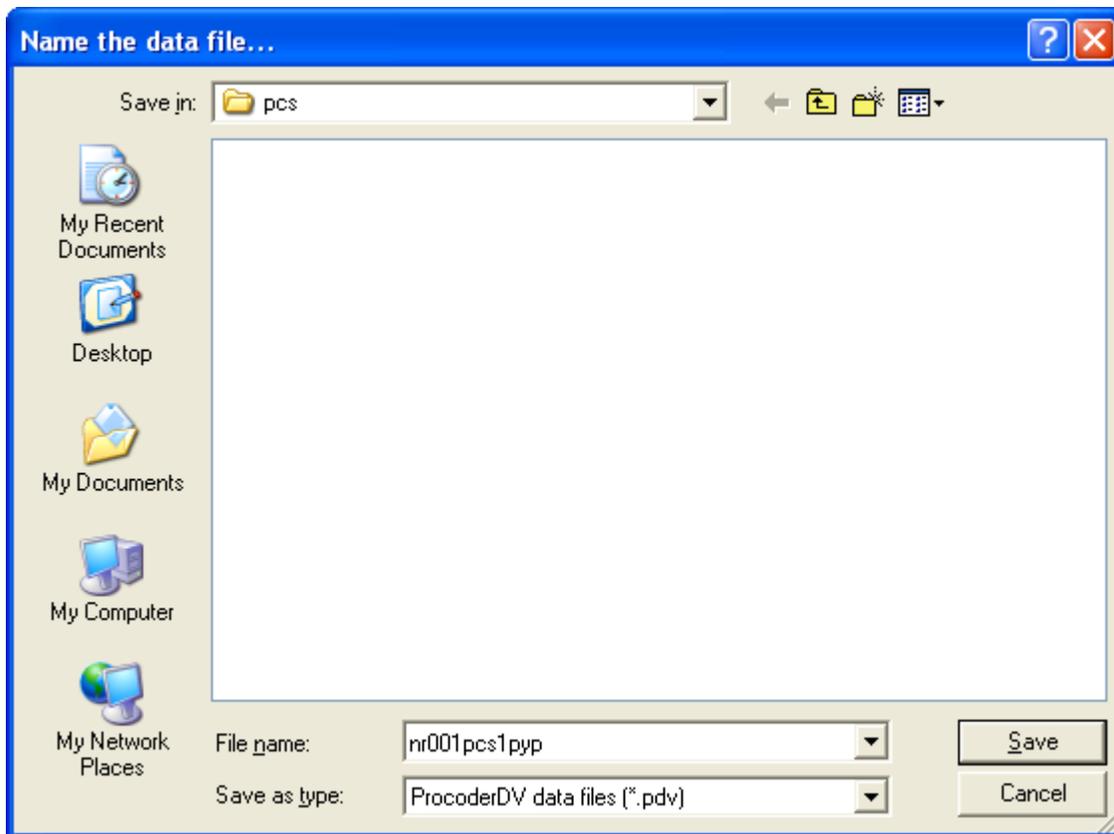
Once set, you won’t have to change the options unless they are changed for another type of coding system (e.g., timed event coding for child communication coding of the language sample).

Using Procoder to Code.

Once the ProcoderDV software options are set up, you’ll need to (a) open an observation file (a file containing your record of the coding for each interval), (b) open the media file (a digital record of the parent-child procedure for the participant you are about to code), and (c) open the cod file (a list of letter symbols that are short hand for what you are coding) for the Parent-child snack.

Open an observation file

On the welcome bar for procoderDV select, File, new (if haven’t started one yet for this session-but “open” if have already created an observation file for this session), observation data file. You’ll get a window that looks like the following:



In the “save in:” box, navigate to where the file is to be saved. These should be saved first on your desktop in a folder labeled something like “Parent-child snack Useful Speech files” and after you are finished coding you will upload the completed procoder data file to the secure text server. In the “file name:” box, label the filename using the following convention:

Site initial-3 ID numbers-procedure initials-time period number-coder initials-coding type initial (primary or reliability). No extension is needed because procoder will attach “.pdv”.

Eg., for a Nashville participant with the ID 001 in the Parent child snack procedure at time 1 coded by Paul Yoder as primary data would have a file name as follows: “N001PCS1PYP”. Case does not matter for these filenames.

Press “save” to create this file in the indicated location with indicated filename.

nr001 pcs1 pyp.pdv

File Media Control Data

Save Export Media Replay Seek Delete Insert Mark Add Row

File Info Data

Start Frame:

Subject Identifier: Ctrl+Click to Mark

Session Date: Start Time:

Session Time: End Time:

Location: Date Started:

Session Code: Date Completed:

Observer/Coder:

Notes:

Media File: C:\Documents and Settings\Paul Yoder\Desktop\se 3018 spring 2010\mee
 Source is DVD Player

Code File: C:\Documents and Settings\yoderpi\My Documents\autism parent project\2

[Click here to calc length](#)

You should see something like the above.

Choose the **File Info** Tab. Fill in this information:

Start Frame:

- Subject Identifier: e.g., N001 (Subject ID#)
- Session Date: e.g., 12/4/05 (date the procedure was recorded)
- Session Time: e.g., 1, 2, 3, 4 or 5 (assessment time period)
- Location: e.g., VU or UNC (site at which procedure occurred)
- Session Code: e.g., PCS (initials of procedure)
- Observer/Coder: e.g., PY (your initials)
- Start Time: leave blank
- End Time: leave blank
- Date Started: e.g., 1/15/10 (date you begin coding)
- Date Completed: e.g., 1/20/10 (date you complete coding)

Notes: Indicate whether the data is primary or reliability data.

Media File: **Browse** to locate the media file to be coded; a link is created to this file.

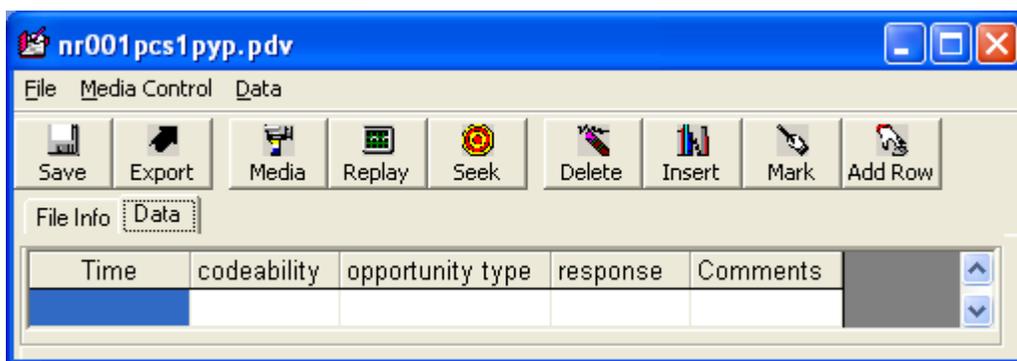
Make sure that file is copied to your hard drive. The folder containing your media file should be labeled something like “Parent-Child Snack procedure media files”. It is very important not to code from a CD or from the media server.

Code File: to locate the .cod file; a link is created to this file.

It will initially be on the shared text server but should be copied on your harddrive. This file is labeled “pcs code file 3_2_10.cod”.

It is important that you **SAVE** the data file at this point. Doing so will enable the program to "recall" the media and code file that you have linked. Otherwise, the files will not remain linked for the next time you open the data file.

Once the File info is inputted and you have saved the media and code file links, **CLOSE**, and re-open the data file and select the “data” tab. You should see something like the following:



Set up the Data page for coding.

Adjust the comments field and the time cell by putting the cursor on the margins of the cells and holding the left mouse button down while you stretch the margin of the cells (like you might in excel).

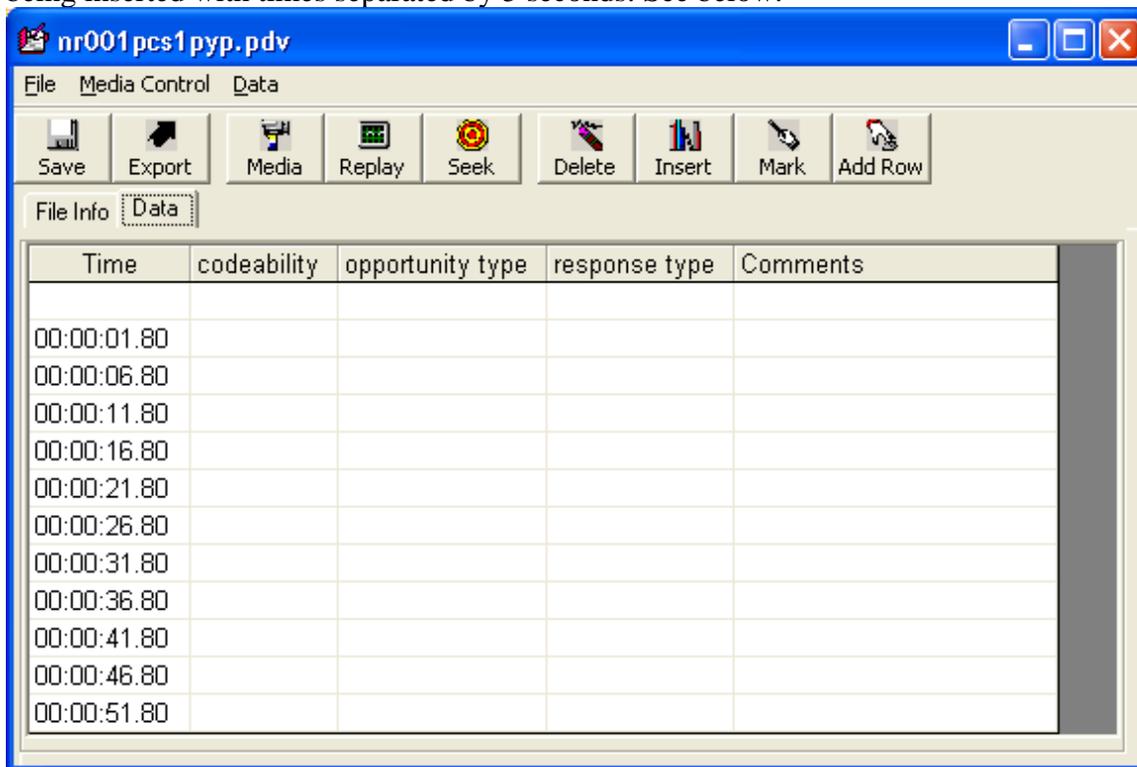
Open Media for coding.

Select Media button: The media file will open on your screen. If you are using two monitors, in the media window, select “options”, “size”, “fit to window” (not stretch to window). If you are using one monitor, use the cursor in the corner of the media file window to resize it to retain its width-to-height ratio while filling half the width of the monitor (the data file should fill the other half of the monitor display).

Create the times for the intervals in the data file.

In the data file window, (not media window), put the cursor in the first “time” cell. Use Ctrl+D to begin the media file. Mark the beginning of the session by using Ctrl+X keystroke at the offset of the examiner saying “start coding” or when the parent places an object on the table. **If you are coding a reliability file, then begin the session at the point that the primary coder began the session by typing in that time in the 1st “time” cell.** If you do this, make sure that you attend to whether a colon ":" or a period "." is used to denote the time. Select “Data” from menu bar (not data tab), select “add

rows” (not “add a row”), enter the number of rows you need to code for the duration of the session (e.g., you usually will have a 10 minute session and 5 second intervals, giving 120 intervals [10 minutes x 12 intervals per minute = 120]. This will result in 120 rows being inserted with times separated by 5 seconds. See below.



Begin coding in the 2nd interval. Place the cursor in the cell for the 2nd interval (the interval with time 00:00:06.80). Use the replay function (e.g., ctrl-A) to “replay” this interval from the previous interval.

Begin coding in the 2nd interval.

Use the mouse or arrow key to move down to next interval. Repeat viewing the interval as often as needed to code each dimension. Assuming the cursor is "registered" on the cell for the interval, use the Ctrl A keystroke to do so.

Rationale for Level of Distinctions, Inclusion of Categories, Need for the Definitions, and Identification of Terms to be Defined

As mentioned earlier, a certain number of 5-second intervals will be "low codability". Experience indicates this is an easier dimension to understand if we define what is considered a low codability interval first. To aid in coding low codability, we will define the term "off-screen". Any interval that does not meet the criteria for *low* codability, is by

definition, *high* codability. There is no "null" option for the codability decisions because low vs. high codability distinctions are exhaustive in this coding system.

We are also coding parental responses that occur after either a child's attentional lead or intentional communication act. These caregiver responses are referred to as "linguistic responses." There are two types of parental responses that qualify as a linguistic response. One type of response to a child's behavior is to talk about the child's attentional lead. An attentional lead is, by definition, attention *to* something (i.e., an object, person or activity). We refer to this "something" as a "referent." Responses to children's attentional leads "follow the child's attentional focus." Talking about the child's focus of attention is thought to aid the child in learning new spoken vocabulary. Although one can distinguish types of linguistic responses (e.g., comments vs. directives vs. questions), we do not do so because recent evidence shows that follow-in directives (a) are highly correlated with follow-in comments, and (b) are as highly correlated with later language in children with ASD as are follow-in comments.

The second type of response to a child's behavior that qualifies as a linguistic response is putting the child's immediately preceding intentional communication act into words. We are coding, in addition to attentional leads, children's intentional communication acts as opportunities for parental responses. This is a very complex concept that will be defined in detail. Therefore, much of the coding manual is devoted to defining this slippery concept.

Although one *can* distinguish between talking about the child's focus of attention and putting into words the child's immediately preceding verbal or nonverbal communicative message, this coding system does not do so because (a) data supports their correlation with later language about equally, (b) both are theoretically linked to later child language through similar mechanisms (associational) and (c) experience indicates that distinguishing them is difficult.

For both types of linguistic response, we are interested in the type of caregiver talking that maps in a direct way onto the child's focus of attention or child's immediately preceding intentional communication act. Thus, a list of utterances is provided on page 26 that may occur in response to a child's attentional lead or communication act but do not make any specific semantic reference to the child's behavior. These lists of exclusionary utterance types are exhaustive. That is, they are to be used in deciding whether to count an utterance that is contingent on a child lead or communication act as a linguistic response. The coder will likely think of or encounter other examples that seem very similar to the ones in the list; however, we ask that coders not add to the list to avoid unreliable coding due to a changing list of exclusionary utterance types.

Tips for Coding and Definitions

Tips for coding the codability column.

1. Low codability or high codability (l or h) is coded in all intervals on a 1st and separate pass. That is, the codability dimension is an exhaustive one. All intervals **MUST** have either a "l" or a "h" recorded in the corresponding cells.
2. Because codability is coded using a *momentary* interval coding system, one only has to determine if the key behavior is present at the border frame for the interval. For this project we will use the *offset* frame of the interval as the “moment” coded for codability.
3. One may rapidly get to the border frame (i.e. offset frame) for intervals by (a) selecting the cell for the interval being coded and selecting the “seek” button or ctrl-r. Some coders may not “feel” that momentary interval coding is “fair” or “accurate” and believe that partial (or even whole) interval coding would be “better”. These coders are asked to read chapter 4 of Yoder and Symons. The key point is that multiple studies have shown that momentary interval coding results in more accurate estimates of duration than partial (or whole) interval coding. Additionally, we are not coding level of codability to determine whether to code a particular interval for “lead” or “response”. All intervals will be coded for lead and response. Instead, we are coding this dimension to estimate overall level of codability for the session so that such may be used to prorate lead and response scores if warranted. If concerns remain, coders are asked to talk with Yoder.
4. Ask whether the offset frame of the interval has “low” codability characteristics first. If it does not, then that frame has “high” codability characteristics.

Definitions needed to code the codability column.

Low codability:

A. The following are *examples* of distractions/situations that may occur during the session. During these instances, a parent would not be expected to use the coded responses, and therefore the interval would be marked as “low codability.”

Regardless of the duration of the distraction during the interval (e.g., 1 second versus entire 5 second interval), the interval will always be marked “low codability” if the behavior occurs at the offset of the interval. The interval will always be “low codability” when at the offset of the interval the:

(1) child is engaging in behavior that needs behavior modification (ignoring or intervening)

a. child is engaged in behavior that is reasonably judged as in need of active ignoring to extinguish

e.g., child playing with diaper bag, mother’s handbag, etc

e.g., child attending to door/door knob possibly indicating that he /she wants to leave the room

b. child is engaged in behavior that is in need of behavior control methods (including comfort or distraction)

e.g., Throwing objects.

e.g., Climbing on furniture.

e.g., Hitting/biting adult.

e.g., Crying uncontrollably; unable to attend to objects/adult

e.g., Banging on the observation window or self-stimming while looking in the mirror

e.g., Child out of seat.

(2) interval is not part of the prearranged session length.

e.g., parent leaves area where child is positioned to retrieve toys

(3) part of session is interrupted

e.g., bathroom break

e.g., fire drill

e.g., interruption for transition to books from toys, includes door opening and closing

e.g., cell phone ringing

e.g., child coughing/sneezing/parent wiping child's nose

(4) beeping noise from timer to end session is heard during any part of the interval.

B. The coder cannot see child's hands and/or face or cannot see adult's face or head orientation. When the coder cannot see child's hands or face, it is important to note because the coder must do so to determine the child's precise focus of attention or communicative referent. When the coder cannot see the adult's face the adult's spoken referent is difficult to code. View of hands or face can be problematic for the following reasons:

(1) obstructions (object blocks camera view of hands or face)

(2) actor position (actor may be turning away from camera)

(3) actor being off screen,

(4) video so out of focus that coder cannot make out what object or person child is looking at, what child is doing, or where adult is looking.

High codability: Any interval that is not coded "low codability".

Tips for coding the "lead" and "responses" columns of the observational data file (partial interval coding).

1. All intervals (not just those previously coded as high codability) are considered on the 2nd pass for child "lead" and adult "response" codes. These two codes will be coded on a single pass, but are described sequentially below.
2. Leads and responses are coded using a partial interval coding system. That is, the entire interval is observed and occurrence of the key behavior is recorded if it occurs anytime during the interval.
3. The presence and type of lead or presence of a response is indicated in the appropriate (lead or response) column or it is left blank.
4. Sometimes the child's focus of attention changes during an interval, so multiple leads occur. In this case, the coder will first consider whether there is an adult response to any lead in the interval. If so, the coder would code the child lead type (attentional or communicational) to which the adult responded.
5. Sometimes a child attentional lead and a child communication act occur within the same interval. If the parent linguistically responds to the attentional lead, code the attentional lead. If a child attentional lead and a communication act occur within the same interval and the parent linguistically responds to the communication act, code the communication act. If a child attentional lead and a communication act occur within the same interval, and the parent does not respond to either, code the child communication act (no linguistic response is coded).
6. Sometimes the child's foci of attention are unclear because the apparent referents of the child's gaze, touch, and/or communication differ. In such cases, communicative referents are credited before looking referents and looking referents are credited before touching referents. (unless there have been multiple leads that are affected by rule 4 above).
7. Child leads often carry over from one interval into the next. For example, the child is playing with and looking at the beads in intervals 61, 62, 63, 64, and 65. She should be credited with an attentional lead for each of these intervals.

Definitions needed to code the lead column.

Referent (the object of the child's "lead")

- i. table
- ii. parent or adult
- iii. snack items (cheerios, juice bottle that child brings to session)
- v. jewelry on parent
- vi. pacifier
- vii. child's chair, chair buckle
- viii. toys the child brings into the PCS session that have not been removed.
- ix. other items in room that are on-screen if child is out of seat

An attentional lead is shown by the child demonstrating attention. Attention is shown via looking or active touching for at least 1 second (i.e., sustained). Brief (less than 1 second) looking and active touching is not coded because (a) experience indicates such potential examples are difficult to code reliably or (b) the behavior does not meet criteria for face validity for the construct "child lead" or "opportunity for parental response".

Looking is inferred by the direction the nose is pointing, because we often cannot see the pupils or eye lashes. Active touching means to move the referent with one's hand or to move one's hand or fingers on the referent. Passively holding an object without moving hand over the object or without moving the object in a way that does not seem purposeful is not coded because either (a) experience indicates they are difficult to code reliably or (b) the behavior does not meet criteria for face validity for the construct "lead".

Adult responses can only be coded when the child "owns" his or her attentional lead. Therefore, we only code attentional leads the child "owns". The child comes to "own" an attentional lead by (a) initiating attention to it or (b) adopting the adult's attentional focus.

Child-initiated attentional leads: Sustained looks or active touch that the child begins without adult explicit verbal prompts or adult verbal direction. Because it is difficult to get coders reliable on what might be an adult nonverbal "prompt to attend", child attentional leads that might be considered a response to the adult's NONVERBAL material arrangements (e.g., placing the cup in front of the child) will be considered "child-initiated". The only reason this is important to note is that child-initiated attentional leads can be considered for a response immediately (i.e., in the interval in which the child-initiated attentional lead is first observed).

Child-adopted attentional leads: Sustained looks or active touch that the child uses at least once during each of at least 2 intervals after the adult has talked about the object or event. It is believed the child needs to be engaged with the new item for a period of time before benefitting from responses used by the parent. For this coding manual, this amount

of time is defined as 2 consecutive intervals of child attention. The onset of the count for the 2 intervals is the interval after the interval in which the adult has talked about the new object. For example, if the adult modeled pushing the train and saying "choo-choo" in interval 40, and the child uses a sustained look or active touching of the train in interval 41, and 42, then child's attentional lead is coded for interval 43. The child does not have to attend continuously to the object the parent introduced for 2 intervals, but the attentional leads must be sustained (i.e., last at least 1 second) during of each of the intervals.

Child intentional communication act:

Steps used to code an intentional communication act. (1) Identify those elements of a communication act that are present in what you've already noticed, e.g., attention to object and vocalization. (2) Identify remaining elements that are needed to consider this cluster of child behaviors as an intentional communication act (e.g., look to adult or a gesture that entails attention to adult).

Definition of intentional communication act. Conceptually, an intentional communication act is one of the three following forms of child behavior (A) a nonimitative symbol (i.e., sign or word).. (B) a conventional gesture with attention shown to the adult (sometimes the attention is implied as indicated in this manual under "attention to adult"), or (C) a nonconventional gesture or non-word vocalization with coordinated attention to object and person The operational definitions used for coding intentional communication are in the following sections.

A. Symbols:

Two types of symbols are considered sufficient (i.e., no attention to adult or object is necessary) to be coded a communication act: nonimitative signs and nonimitative words. No transcription of symbols is required for this coding system.

1. Nonimitative signs

In this coding manual, "signs" are those that are found in A Basic Course in American Sign Language (Humphries, et al., 1980) that are not exact or reduced imitations of immediately preceding adult models. The following website can be accessed for video clip examples of sign productions: <http://www.aslpro.com/cgi-bin/aslpro/aslpro>. A child's hand movements (i.e., sign approximations) are classified as "signs" when *all* of the following occur:

1. The hand movement and location with respect to the rest of the body are like the conventional sign. The hand shape does not have to match the conventional sign exactly, but the movement and location of the sign should be a close fit, given the child's motor limitations.
2. The coder determines that the child is using the word in a semantically and pragmatically conventional manner (i.e., not for an idiosyncratic child meaning). To determine that a sign is used in a semantically appropriate manner, the examiner must determine that (1) the context of the discourse is appropriate and/or (2) the context of

the snack is appropriate for this sign to be used. Judges must exercise conservative judgment when assigning semantic propriety to a possible signed word. This is especially true with pro-forms, like “do,” that can be perceived as “possibly appropriate” in almost any situation. A good way of looking at this is that the sign must be truly appropriate and developmentally plausible, rather than simply “conceivably appropriate.”

3. The word that the sign represents is in the unabridged English dictionary;
4. Judges should apply their knowledge of language development, as determined by reviewing the child’s age equivalency scores on the Mullen Expressive Language subscale and the MCDI and a general attitude of conservatism when judging whether a possible signed form should actually be assigned sign status.
5. A “possible sign” may be accorded sign status in some contexts because of its semantic and pragmatic appropriateness yet *not be* judged as a symbol in other contexts. This will most typically occur when the same sign is used in contexts that are consistent with the adult meaning of the target word as well as in contexts that appear to be overly generalized uses of the target. For example, if the child appropriately uses the sign for “orange” to refer to an orange, it would be coded as a communication act even if it doesn’t show attention to the adult because it meets the criteria for a nonimitative sign. However, if the child later uses the sign for orange while pointing to an apple, the latter possible signing instance would *not* be given sign status. To get credit as a communication act, the child would have to add attention to adult, as in other nonverbal, unconventional gestural acts.
6. A “possible sign” that is frequently used in ways that are not consistent with the adult meaning of the word [and do not clearly appear to be overgeneralizations of the target word] may be judged to be a *non-symbol* even in those few contexts in which semantic and pragmatic conditions make word status plausible. For example, if the child signs “cookie” for “cookie” and other circumstances in which it appears to mean neither cookie nor a close semantic neighbor of cookie, it would not be given symbolic status in *any* context (i.e., it would be coded only if it was accompanied by attention to the adult).
7. If the child points to his or herself this should **not** be coded as a sign (e.g., “me”); it should be coded as a proximal point if it meets the criteria to be coded as an act.
8. Clapping vs. signing more. These instances should be interpreted by the coder. Timing of the clapping motion relative to nonlinguistic information that would influence interpreting the act as a request for more vs. an applause for some interesting event, as well as the demeanor of the child, should be taken into consideration when determining whether the child is signing “more” (or request) or clapping (for declarative function). For example, if the child claps during or immediately following bubbles being blown and the child is smiling and/or laughing, these will be considered claps and not a sign for more. Claps must be accompanied by attention to adult and object to be coded. If the child claps during or immediately following bubbles but is **not** laughing and smiling, these acts would be considered a sign for more and be coded if they meet the other requirements for a sign.

A list of common signs and some common approximations are in Appendix A:

2. Nonimitative word.

A child's vocalization should be considered a word (i.e., symbol and thus does not require attention to adult to be a communication act) when *all* of the following occur.

1. It contains a vowel nucleus that is the same as or is functionally equivalent to the adult target vowel. (See appendix for a description of functional equivalence) **and**
2. It contains one or more target consonants or child-like consonant substitutions (see appendix for common sound substitutions) of the target word in the appropriate position **and**
 - a. Exception: if the target word is only a vowel (such as “a” or “I”) it is okay if the child’s vocalization does not contain a consonant. However if the only consonant in a word is deleted (due to a final constant deletion or omission of unstressed syllable) the child’s vocalization is not considered close enough to the target word)
3. The observer determines that the child is using the word in a semantically and pragmatically conventional manner (i.e., not as a possible idiosyncratic child meaning). To determine that a word is used in a semantically appropriate manner, the examiner must determine that (a) the context of the discourse is appropriate and/or (b) the context of the snack is appropriate for this word to be used. Judges must exercise conservative judgment when assigning semantic propriety to a possible word. This is especially true with pro-forms, like “do,” that can be perceived as “possibly appropriate” in almost any situation. A good way of looking at this is that the word must be truly appropriate and developmentally plausible, rather than simply “not inappropriate” or “conceivably appropriate.” Judges should apply their knowledge of language development and other language test scores for the target child to judge the feasibility of a hypothesized utterance the child may be trying to say. For example, if the child’s age equivalency score is over 20 months, it is reasonable to hypothesize the child may be trying to say a multi-word utterance. If the child’s age equivalency score is under 20 months, it is unlikely that the child is actually trying to say a multi-word phrase **and**
4. The word is in the unabridged English dictionary OR is on the MCDI **and**
5. It does not qualify as an imitation of a word candidate **and**
6. It does not have the same phonetic shape as another word transcribed within the same sample for the same child. The coder should transcribe whichever word is most pragmatically and semantically appropriate.

B. Conventional gestures (needing attention to adult, and not to object):

The following is an exclusive list of this type of gesture.

1. Distal point: In a distal point the index finger is extended towards the object /person of interest, or a group of unspecified objects. The other fingers should be clearly separated from the index finger making the point obvious.
2. Shh gesture
3. Head nod or head shake
4. Wave
5. Shoulder shrug

6. Making a depictive gesture/pantomime-like action: Pantomime is the use of a part of the body or face to imitate an object or the use of an object or to act out a meaning to the adult. For example:
- Pretending to brush one's hair without a hairbrush
 - Moving arms in a "rocking baby" movement without a doll
 - Fingers "walking" like a mouse in "walk-mouse-creep-mouse"
 - Finger plays such as "Here's the church, here's the steeple..."
 - Blowing a kiss.
 - Wave
 - Immediately imitated signs (sign approximations must meet definitions for sign given above)

Attention to adult.

Attention to the adult is indicated by gaze to face, precisely answering a question, or exact verbal imitation.

Gaze to adult's face is defined as looking at the adult's face. Use the orientation of the child's eyes and face/nose to determine if the child is looking at the adult's face. If there is a question as to whether the child is looking at the adult, then do not code. CODE CONSERVATIVELY.

Influencing Adult Behavior:

If an adult communication act or "potentially influential adult behavior" about an object of interest occurs after some components of the child's communication act (i.e. gaze shift) and before others (i.e. vocalization), then components separated by the adult's actions must separately meet criteria for intentional communication to be coded as separate communication acts.

If an adult communication act or potentially influential adult behavior causes the child's gaze shift to the object during a communication act, then don't count the components that are separated by the adult's communication act or action as coordinated.

The concept of "coordinated" means that the child joins them as evidenced by the child using the behaviors sequentially due to his/her initiation. That is, one of the behaviors is not due to the adult's communication or potentially influential behavior.

The child's look can occur after adult's behavior if other components of the communication act also occur after potentially-influencing adult behavior.

The following is an exhaustive list of potentially influencing adult behaviors.

1. Gross movements in head/body (e.g., getting up out of seat, moving head, shoulders, trunk to examine or get something on other surface, raising arms).
2. Vocal or verbal communication acts.
3. Moving object of interest to square near face.

If the child is looking in the direction of the adult, and the adult is completely off-screen, do not consider this attention to adult. In order to infer attention to adult when the adult's face is off-screen, some portion of the adult's body needs to be visible onscreen so the coder can infer where the adult's face is probably located. If there is an object near the adult's face it may be unclear whether the child is looking at the object or at the adult's face. If an object is within an imaginary box delineated by the adult's shoulders and top of the adult's head, we can't tell whether the child is looking at the object or the face. Therefore, no credit is given in these instances for either attention to adult or attention to object.

Example of attention to adult in this type of situation:

- The adult has the bubble wand at his/her mouth to blow. The adult moves the wand down, and the child continues to look at the adult's face, then looks at the wand independent of the adult and vocalizes. This would be coded as a communication act since coordinated attention to object and adult as well as a vocalization has occurred.
- The adult pretends to drink from a cup then lowers it below her chin but still within the imaginary box around her head. The child looks at the cup, clearly tilts his head and looks up at the adult's face, then clearly lowers his head and looks back at the cup. We would consider this as both a look to adult and look to object since there was a clear head shift.

Nonexample of attention to adult in this type of situation:

- The adult has the bubble wand at his/her mouth to blow but then moves the wand down. The child follows the wand down and vocalizes but does not look at the adult's face within the three second period independently. This would NOT be coded as a communication act since the child did not meet the criteria for attention to adult.
- Adult blows balloon and child looks to the area around the adult's face. Since we cannot determine if the child is looking at the adult, the balloon, or both, we do not code the look to the adult or object.
- If the child makes an additional movement or the adult makes an additional movement that makes it clear the child is showing sequential attention to object and person, credit the child with attention to person even if for part of the potentially communicative interaction the adult has the object in the box around her face.

Answering an adult question exactly and correctly. Such acts show attention to the adult question as evidenced by the precisely answered question. Those responses that are only partially on and those that are downright deviant do not inherently show attention to adult. The meaning of the child's communication act needs to be sufficiently specific to answer the question completely. The child's answer can be word, non-word and non-sign (e.g., distal point, proximal point) but must provide enough information to the adult

Examples of answering an adult question exactly and correctly.

- Adult: "What do you want to play with?" Child: says "Ball"
- Adult: "What do you want to play with?" Child: signs "Ball."
- Adult: "What do you want to play with?" Child: points to car.

Non-examples of answering an adult question exactly and correctly

- Adult: “What do you want to play with?” Child: “Those.”
- Adult: “what do you want to play with?” Child: points to group of toys, adult is unable to determine exactly which toy child is pointing to.

Exact (or reduced) and immediate imitation of adult's word. Such acts show attention to the adult model as evidenced by the precisely matched model, but they do not necessarily include attention to object. There is no question that these are imitations of the adult word because they meet the phonetic and referential requirements for words but are produced immediately after an adult utterance containing the same word (within 3 seconds of adult utterance and/or within the same communicative turn). To be considered imitative, the child's utterance must not add additional words to the adult's utterance, but may contain only a portion of the adult's utterance.

C. Unconventional Gesture or Non-Word Vocalization(needs coordinated attention to object and person).

1. Unconventional Gestures with intrinsic attention to object (needing attention to adult):

Attention to object is intrinsic to this group of gestures, and therefore no further evidence of attention to object is needed. The exclusive list is as follows:

- **Tapping with fingers** in an attempt to get the adult to attend to an object or event. Tapping or hitting with the palm is not coded.
- **Claps:** A clap must consist of hand-to-hand contact which occurs two or more times in order to be coded as such. Flapping of hands in a clapping-like gesture in which contact is not made or the bringing of hands together to rest (in which contact between hands is made only once) cannot be coded as a clap.
- **Proximal pointing:** Child refers to an object by touching it with a finger.
 - The index or middle finger must be extended, must touch the referent, and must be separated from the adjacent fingers. It is not necessary to actually see the finger make contact with the object if it is clear that the object has been touched (e.g., object moves or spins).
 - At least two of the adjacent fingers should be curled under or arched up.
 - When the child or adult is using the extended index finger to operate a toy (e.g., cash register buttons), this is not a proximal point.
- **Moving object toward adult:** When seated across from each other, the child must move the object across the midline of the table and aim between the adult's shoulders. If seated in any other arrangement, the object must be moved at least half the distance between the two.
 - The child *does not need to release the object* if the move is considered an "offer" or "rejection" that is not received by the adult listener.
 - If the child begins to move the object to the adult then changes his mind, **this is not coded.**
 - Moving the object toward the adult does not include the child moving an object to another object either in front of the adult or in the adult's hand unless the act is dependent on the adult's presence (e.g., putting object in a bag the adult is holding would not be coded).
 - Moves are counted if the adult has his/her hand(s) out/open in expectation of the object and the child pushes the object toward the adult.

Example:

- A child bats a Nerf object with a stick to a stick in the adult's hand for the adult to bat it back or rolls a ball to the adult. These *do* count as move toward adult. The child would not have moved the Nerf object to the other stick or rolled the ball (with the expectation for it to come back) if the adult was not present.

Non-Codable Example:

- The child pretends to pour tea in the adult's cup by moving the pitcher to the cup in the adult's hand without any expectation that

the adult perform any action. This *does not* count as move toward the adult. The child would have moved the pitcher to the cup even if the adult were not holding it.

- **Reaching.** A reach must be *open-handed involving an extended arm*. The intention of the act may be imperative or declarative. A reach is *not* scored if any of the following occur: (a) The child touches the desired object without the adult's assistance, (b) An object is in the "reaching" hand, (c) There is extreme, strained body movement with tilting of the torso towards the "goal," suggesting clearly that the child's intent is to reach the object rather than to request help.

2. Over-generalized signs (needing attention to adult):

- Over-generalized signs: When a sign is over-generalized it is considered non-symbolic and therefore is treated as a gesture. When a sign is over-generalized and is used for the incorrect item and accompanied with attention to adult (e.g., child looks at adult and signs "dog" for cat) the communication act is coded.

3. Imitative Signs with intrinsic attention to adult (needing attention to object):

- Imitative signs: When a sign is produced in imitation of either a spoken or signed word it is considered non-symbolic communication and is treated as an unconventional gesture, and must be accompanied by coordinated attention to object and adult in order to be coded. Imitation intrinsically shows attention to adult.

4. Unconventional Gestures with intrinsic attention to object and adult

These do not need additional evidence of coordinated attention to adult and or object because they intrinsically show attention to both without gaze shifts, answering prompts or imitation.

- **Upturned palm:** The palm should be upturned as if to say "give that to me." There should be an expectant pause in which the child waits for the adult to react. The upturned palm must not be part of an act designed to retrieve an object independently.
- **Giving object to adult.** Child has a grasp on the object AND moves object in the direction of the experimenter AND the experimenter and child have at least a brief moment when they are both touching the object OR child drops item into experimenter's upturned hand in an intentional and controlled way. A "give" may be distinguished from a "take" by the individual who initiates the movement. Other examples of "moving object to adult" require that the child provide additional evidence of attention to the adult to be an intentional communication act. Note that an object must be deliberately transferred *to* an adult by the child rather than just placed on the floor in close proximity of an adult – setting an object on the floor by an adult does not constitute a "give".

- ***Showing an object to the adult:*** The child must extend the object toward the adult. The intention of the act must be solely to "show" the object. The adult is not expected to take or do anything with or to the object except to look and perhaps to comment upon it.
- ***Moving an adult's hand to an object to be operated or opened.*** Child grasps or leads the adult's hand to touch or toward the object the child apparently wants opened, operated, or retrieved.

5. Nonsymbolic vocalizations (needs additional evidence of coordinated attention to object and person).

These include nonword vocalizations and imitative word candidates. The coordinated attention to object and person must be within 3 seconds of the onset of the vocalization.

Coordinated attention is defined as showing attention to an object AND person within 3 seconds of each other sequentially or simultaneously.

Attention to object/event. Attention to object/event is demonstrated when the child looks at, deliberately moves or deliberately manipulates an object. Simply touching, holding, or picking up an object without looking or manipulating it does not qualify as attention to object/event. The child can be credited for attention to an object that is off-screen if the examiner verifies the object's presence either before or after the child's communication act. To get credit for attending to an *auditory* event, the child must provide evidence of attending to the event *and* actively seek out the source of the noise (e.g., look for noisemaker item). Socially significant and/or repetitive adult actions may be considered an event, as long as the event does not occur near the adult's face (e.g., *walking fingers, itsy-bitsy spider, tickle game, bumble bee*).

Coordinated attention to object and person. This ability can be shown simultaneously (as in give object to person) or sequentially (as in shifting gaze from object to person). Often it is shown sequentially (i.e., attention to object occurs within 3 seconds of attention to adult). The order of the sequential attention to adult and object does not matter. The most temporally proximal component of coordinated attention must be within 3 seconds of the communicative core behavior (i.e., gesture, vocalization, imitative sign or imitative word). If the child shifts his gaze to look at both an object or event and the adult, the gaze shifts must occur within 3 seconds of one another. To count as an intentional act, a gesture and attention to adult must occur within 3 seconds of each other, and these two components cannot be separated by an intervening stimulus such as a noise or influencing adult behavior (see pg. 19). For example, if attention to adult occurs first, it does not matter if this is caused by the adult. On the other hand, if adult attention is established there can be no other stimulus (e.g., noise and/or motions by the adult) which could be the cause of the gesture and considered part of a complete, intentional act.

Example:

- The child is looking at the adult. The child then independently shifts his/her attention to the elephant and vocalizes within a three second period of time. These gaze shifts would be considered coordinated.

Nonexample:

- The child is playing with an object and vocalizes. The adult begins to lean forward into the child's space and the child then looks up at the adult. Because the adult's movement toward the child may have caused the look to the adult, this would not be coded as an act. The child's shift in gaze focus is not considered "coordinated" because the adult used an "influencing behavior".
 - The following are the exclusive list of adult "influencing behaviors": (1) Gross movements in head (e.g., getting up out of seat, moving head, shoulders, trunk to examine or get something on other surface). (2) Vocal or verbal communication acts. (3) Moving object of interest to square near face.

A nonword vocalization is a sound, other than a word, in which there is evidence of voicing. Voicing occurs when the vocal folds vibrate to give voice to a sound. We included as vocalizations, voiced laughs, voiced sighs, and voiced cries. These are included as nonword vocalizations because we have difficulty distinguishing these from other nonword vocalizations reliably.

An imitative word is a word approximation that meets the definition of a word (see below) except that it is an exact or reduced imitation of an immediately preceding adult verbal utterances. Exact or reduced imitation: The child's utterance must not add additional words to the adult's utterance, but may contain only a portion of the adult's utterance. The degree to which the child approximation is like the adult model need only meet the phonetic requirements for words (i.e., functionally equivalent vowel nucleus (see item 3 below) in correct position, at least one target or child-like substitution for the consonant in appropriate position). Immediately preceding: within three seconds following an adult utterance containing the same word. Within 3 seconds of vocalization means that the vocalization needs to have begun within 3 seconds of the closest component of coordinated attention to object and person.

Nonexamples of vocalizations include whispers and unvoiced consonants without vowels (e.g., "p", "f", "t", "k", or "h"). Unvoiced sounds are hard to get reliable on if that is the only sound made. Other mouth sounds that are not considered vocalizations because they are not voiced include trills, raspberries, and clicks with tongue.

Tips for coding adult response column.

1. All intervals with a lead ((a)ttentional or (c)ommunication) are considered an “opportunity” for a "response" (r) code.
2. Either type of lead is an opportunity for a "linguistic response" code.
3. The “response” cell for an interval should be left blank if linguistic response does not occur in the interval after the child lead.
4. Code as a linguistic response if ...
 - a. the utterance occurs AFTER the child lead but within the same interval
AND
 - b. The utterance contains words that refer to some aspect of the child's current or immediately preceding (within 1 second and within the same interval) focus of attention or communicative referents AND
 - c. Linguistic information is added to the child's behavior that is considered the "lead". These can be distinguished conceptually (but not in terms of recording separate codes) by those that follow child attentional lead and those that follow child communication acts.
 - i. Linguistic information is added to children's attentional lead when...
 1. the referent (message, object, or person) of the adult's utterance is the same as the child's focus of attention:
 - a. has the same label as the child's referent (i.e. “juice”) **OR**
 - b. is spatially proximal to the child's referent/ in the child's field of vision **OR**
 - c. is related (through the parent's words or actions) to the child's focus of attention
 - ii. Linguistic information is added to children's communication act when the adult utterance...
 1. puts into words the presumed meaning of the child's preceding (but in same interval) nonverbal intentional communication act by labeling the referent, verb, or function word implicit in the child's act **OR**
 2. repeats the child's word approximation but using adult pronunciation. **OR**
 3. expands (i.e., adds words to) or recasts (changes the word order of) the child's utterance attempt.
5. The parent can comment on a specific item or action, as well as the entire item or set of actions within the child's focus of attention. For example, if the child is looking at the bowl and the parent picks up a spoon from the set, places it next to

or in the bowl (within the child's field of vision) and says, "Here is the spoon," this would be a follow-in comment.

6. If at least one utterance meets the criteria for "linguistic response", code the interval as containing a linguistic response (a max of one "r" is coded in each interval) even if there are (a) many adult utterances between the child lead and the adult linguistic response, (b) more than one adult utterance that meets the criteria for linguistic response.
7. If you cannot determine what the parent has said after listening to the utterance three times, the utterances will not be marked as a linguistic response.
8. Certain adult utterance types are EXCLUDED if the only thing the adult says during the interval is one of the following because they are deemed to provide insufficient linguistic information to be facilitative of early vocabulary.

a. Acknowledgment, Affirmative, and Negative Response Words Not Counted as Follow-in Utterances in the absence of a specific reference to the child's lead:

1. Allright
2. No (or any form reflecting simple negation, like "nah," "nope" and "uhn-uhn").
3. Okay (used as a simple response to a request [Child: "Get that." Adult: "Okay"; or as a conversational device, "Okay, let's try."])
4. Right
5. Sure
6. Yes (or any form of the simple affirmative, like "yeah," "yep," "uh-huh").
7. Yay (as praise or celebration of child's action)
8. Good job.
9. That's right.
10. Way to go.
11. You got it.

b. Interjections and Vocatives Not Counted as Linguistic Responses:

1. Ah (screaming sound; satisfaction, delight, pain)
2. Eh? (as in requesting clarification)
3. Ha (resentment, wonder, triumph)
4. Hey
5. Hu (expression of surprise or fright - vocalized intake of breath)
6. Huh? (as in requesting clarification)
7. Um
8. Oh
9. Uh

c. Routinized Forms, Stories, and Songs Not Counted as Linguistic Responses

1. Counting (rote counting or counting with one-to-one correspondence)
2. Alphabet (rote alphabet saying with or without one-to-one correspondence)
3. Songs
4. Rhymes
5. Fingerplays
6. Routinized word(s) or phrase(s) said in a sing-song like manner (e.g., rockyrockyrocky, teetertotterteetertotter)
7. Utterances consisting of all or part of a story text

d. Utterances containing only pronouns and/or linking verbs

1. What/When/Where is that?
2. That's mine.
3. She is./Those are./They will.
4. That is yours.
5. How is that?

Acceptable linguistic responses using pronouns and a helping verb (they ALSO include main verbs):

1. What do you *want*?
2. Do you *want* to *eat*?
3. What would you *like*?
4. You *like* that.
5. *Here* you *go*
6. You *do* it.
7. What do you *see*?
8. *Want* that?
9. Can I *have* one?

Save the file: Press the SAVE button. SAVE FREQUENTLY. Many coders save after every coding decision.

To exit ProcoderDV. Go to the toolbar, select, “file”, “save and close”.

If you don't have INTMAN, download it from:

http://kc.vanderbilt.edu/tapp/intman_setup.exe

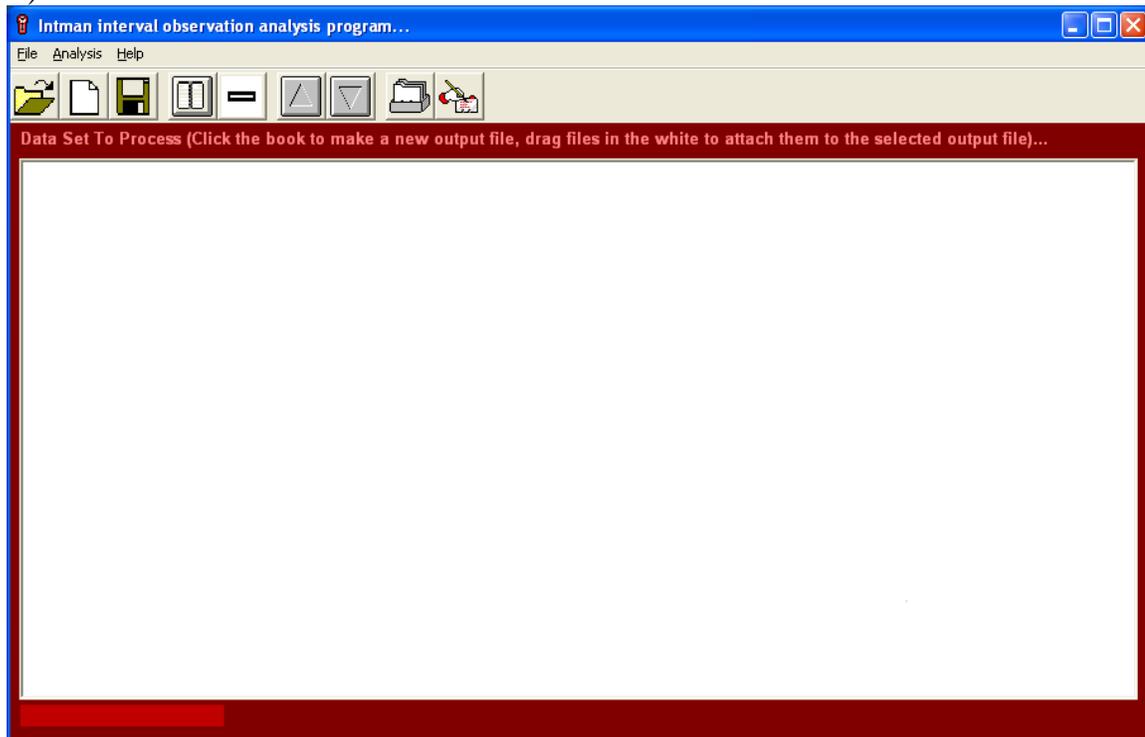
To "activitate", select "help", enter my email:

Paul.Yoder@vanderbilt.edu

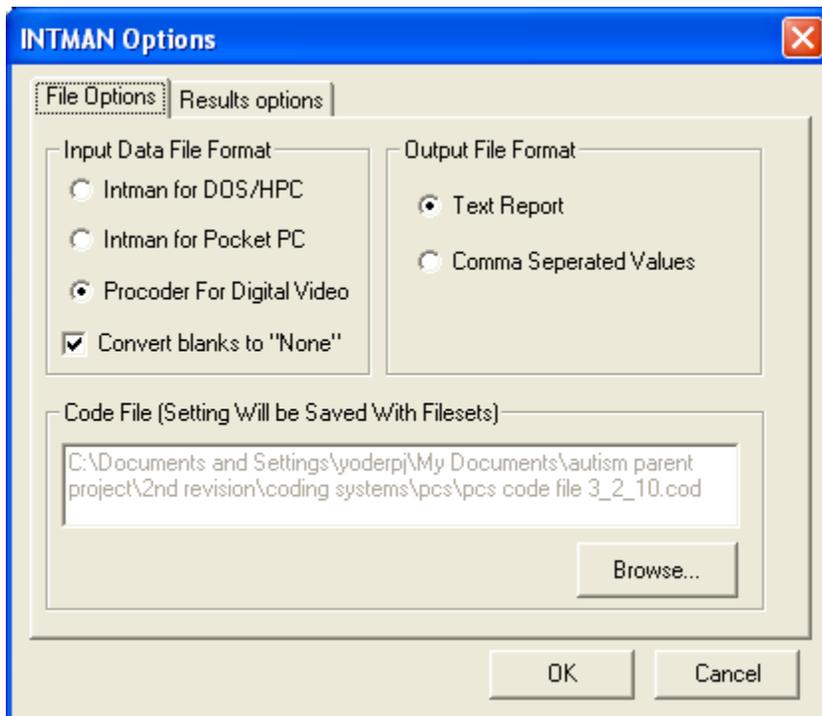
Enter "02" in 2nd box.

Use INTMAN to count

1. The number of low codability intervals (l)
 2. The number of high codability intervals (h).
 3. The number of attentional leads (a).
 4. The number of communication acts (c).
 5. The number of responses (r).
 6. The number of communication acts (c) in same interval with response (r).
1. Boot INTMAN by 2-clicking on left mouse button on INTMAN icon (grandfather clock).

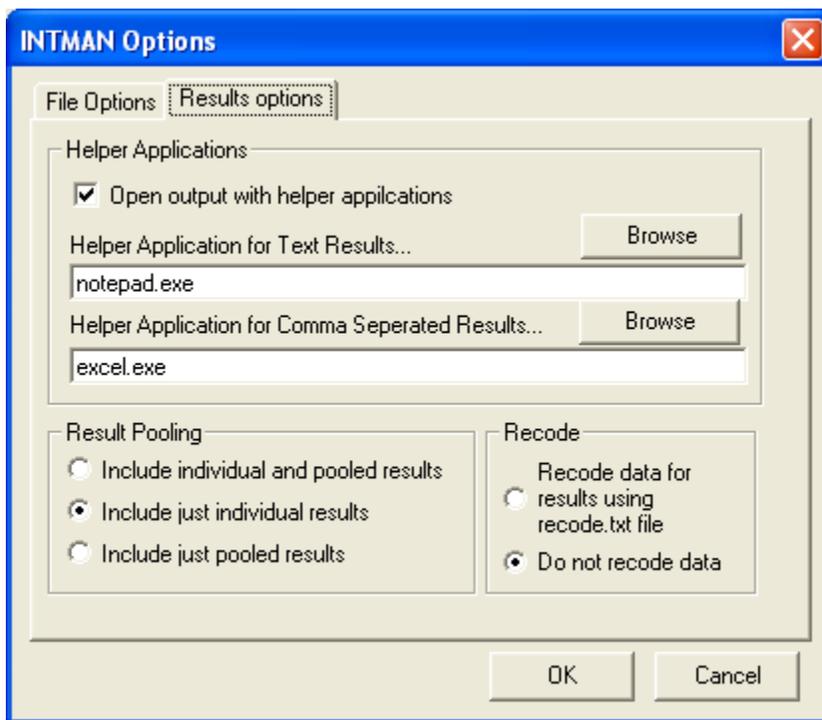


1. Select File, then Preferences. Under the File Options tab, check boxes as follows (it is CRITICAL that "convert blanks to "none" be selected):



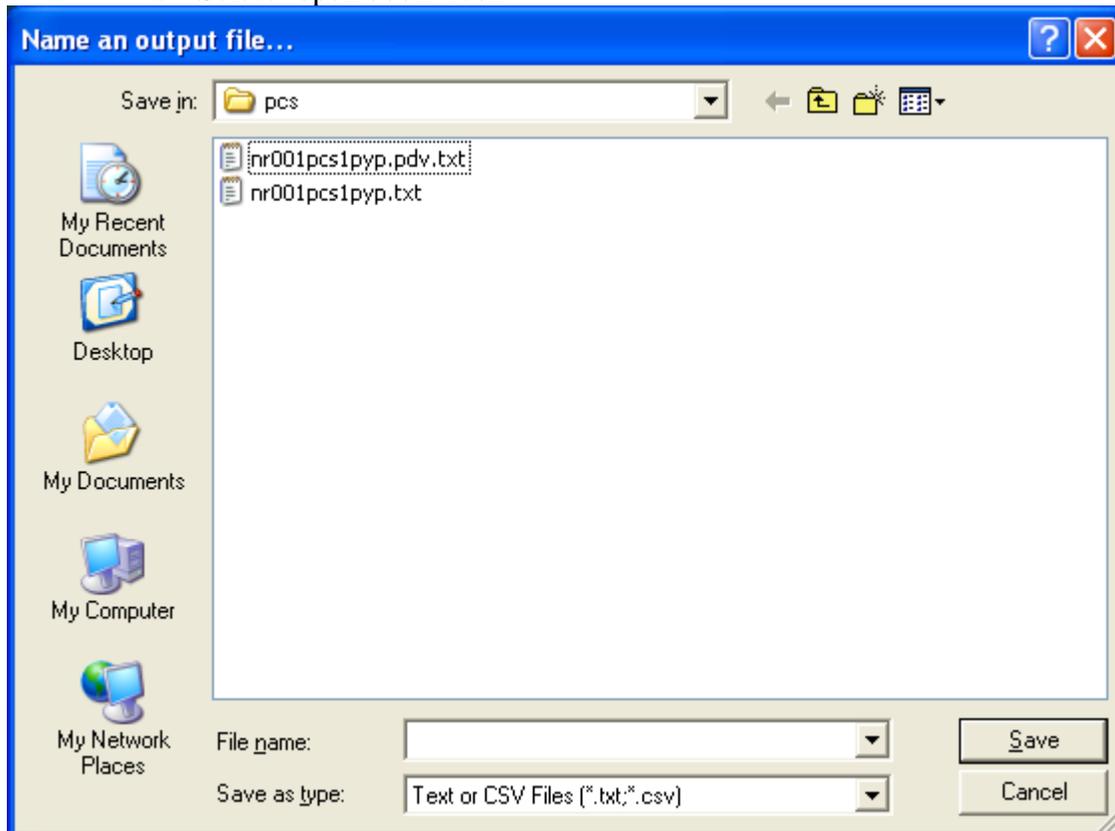
Make sure you browse to select the code file.

You won't usually need to change the preferences in the Results options. But just in case, that tab should look like the following:

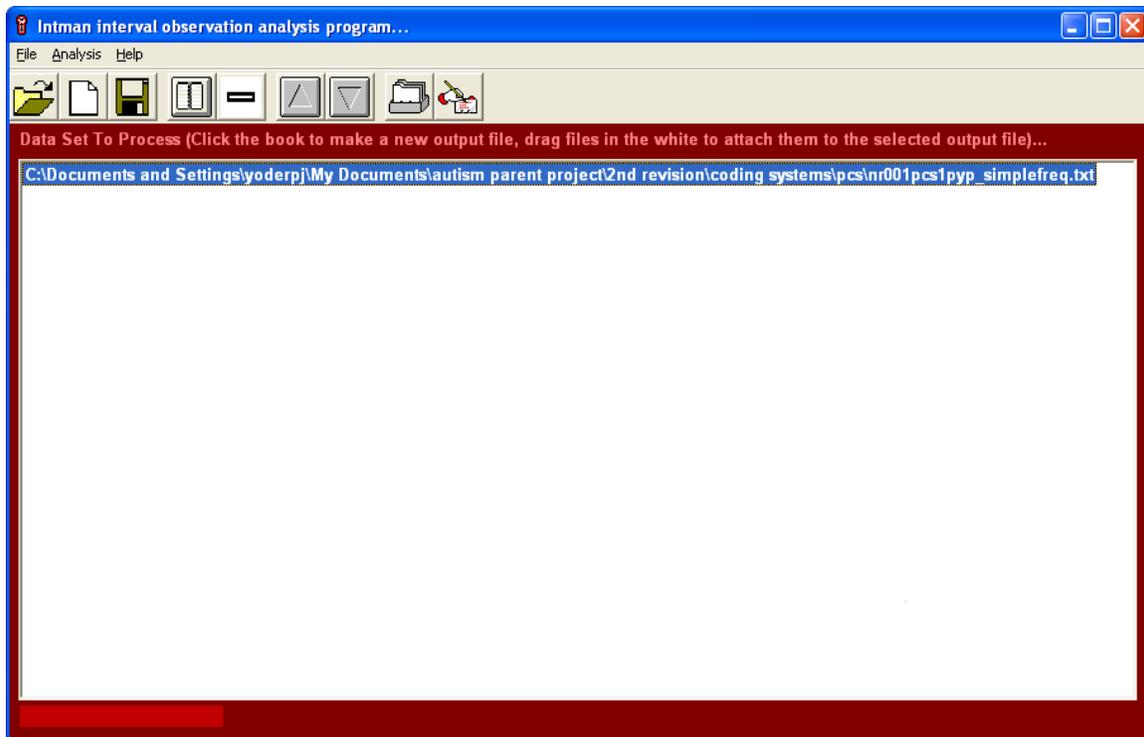


Press ok.

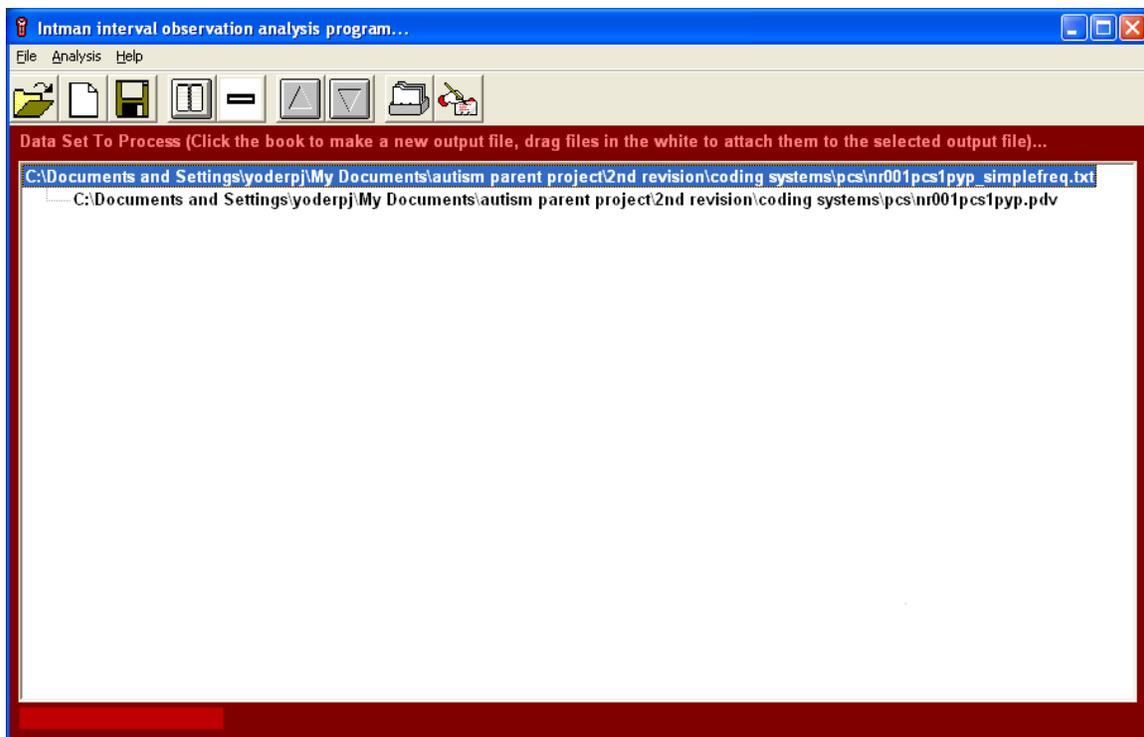
2. Get simple frequencies of codes.
 - a. Select "open book" icon.



In the "file name" box, type in the filename_simplefreq. The program will put the extension on for you. You'll get a window that looks like this:



- b. Drag the procoder data file into the white space. The window will then look like this:



Select *Analysis* from drop down menus at top of INTMAN window. Then select *Coder frequencies*.

Select *Analysis* from drop down menus again and select *Run selected analysis on set*. You'll get something like the following:

```

nr001pcs1pyp_simplefreq.txt - Notepad
File Edit Format View Help
***** INTMAN Frequency Report. Created: 3/3/2010 2:21:10 PM *****
File: nr001pcs1pyp.pdv
Report for Category: codeability (2)
      Code          Freq          Prop
low codability      5          .3846
high codability     6          .4615
None                2          .1538

Report for Category: opportunity type (3)
      Code          Freq          Prop
child attentional lead 3          .2308
child communication act 4          .3077
None                6          .4615

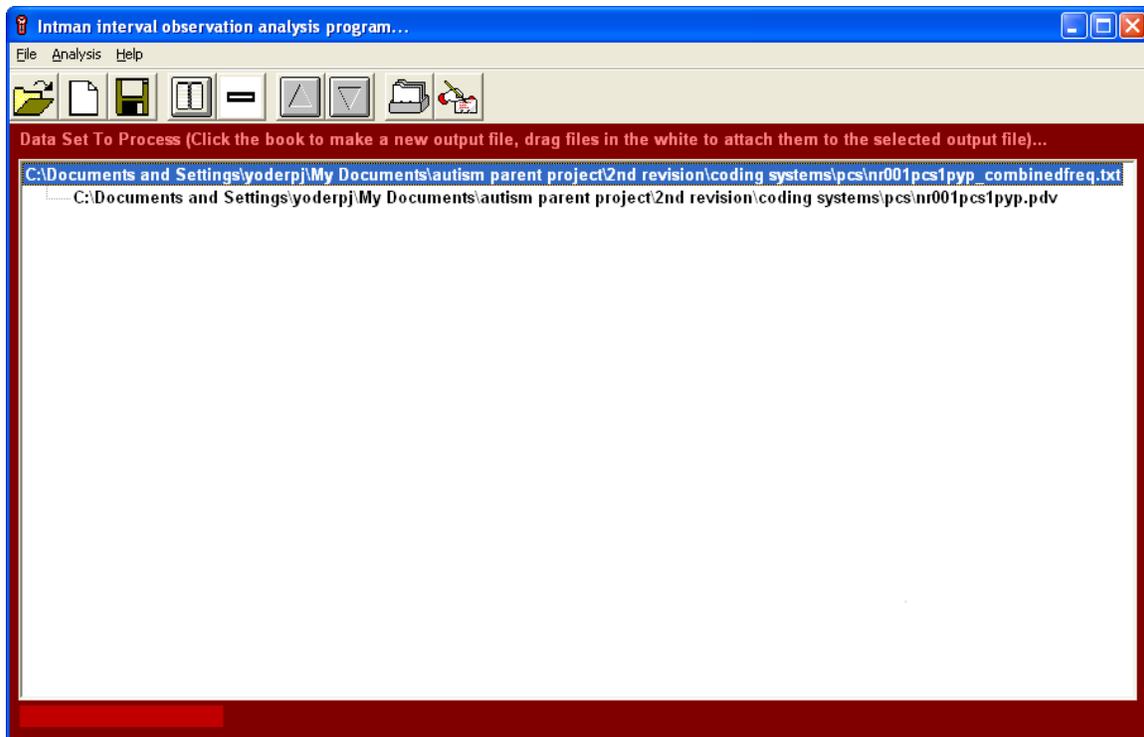
Report for Category: response (4)
      Code          Freq          Prop
ental linguistic response 3          .2308
None                10         .7692

```

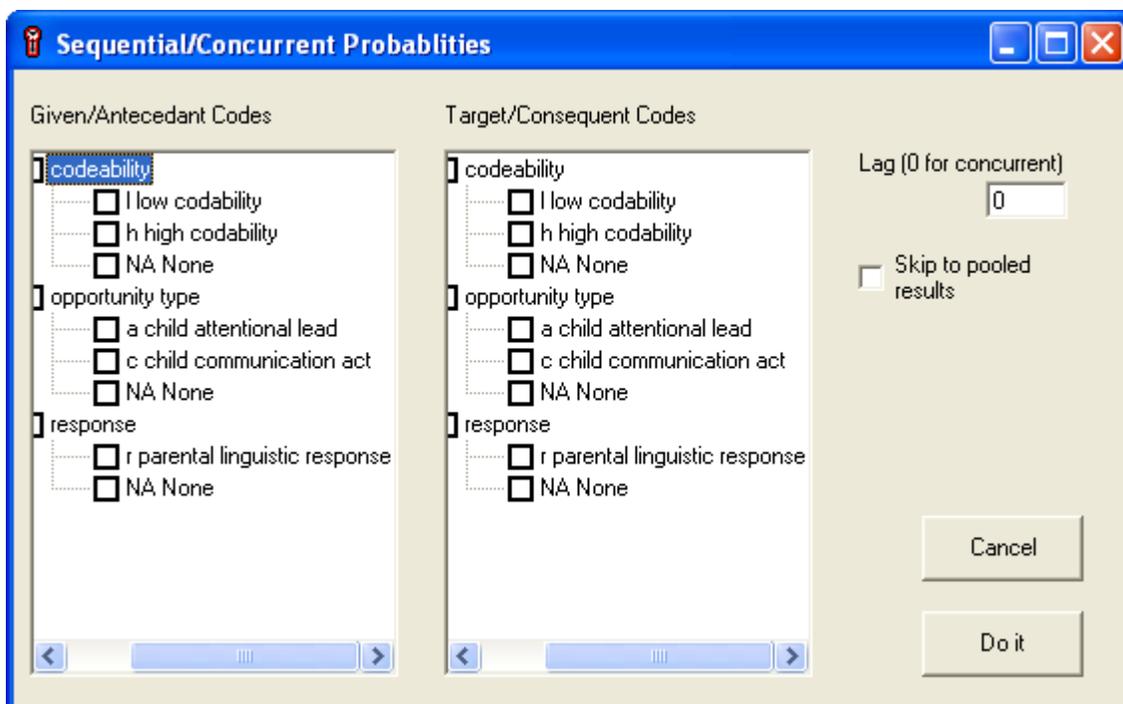
Only the frequency counts for each code is useful. The durations and percentages are incorrect. We don't need "none" in any "category".

c. Save this analysis text file for this particular coded session on the network under analyzed files for PCS data.

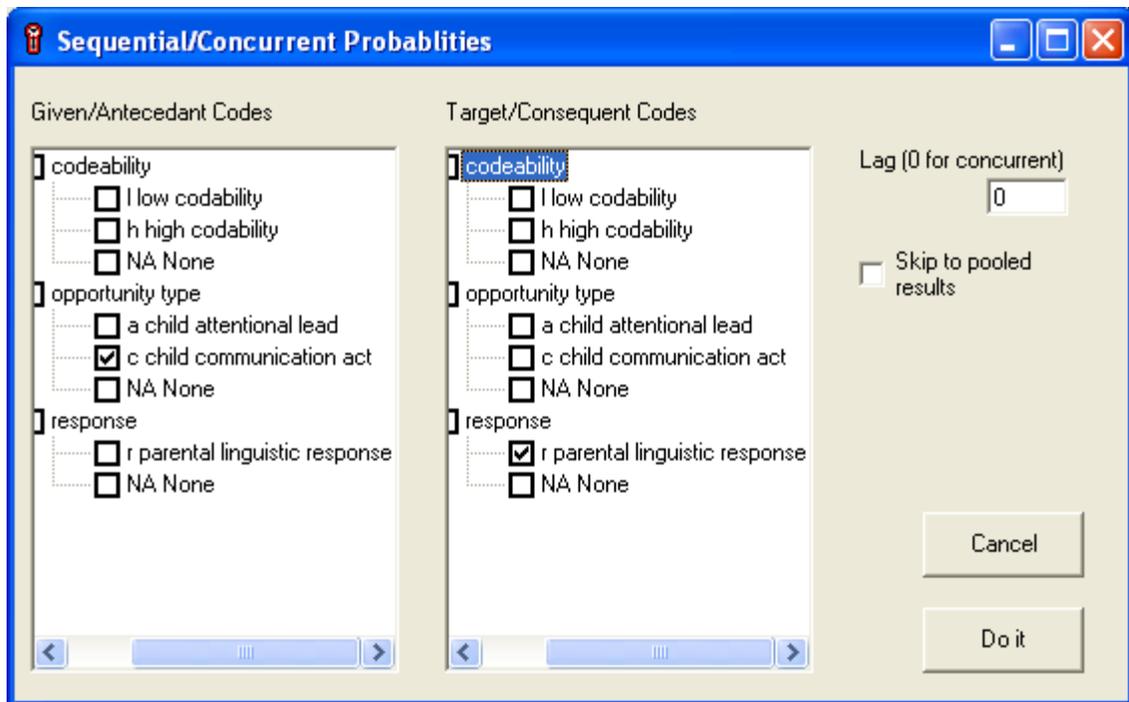
d. Get the frequency of intervals with communication acts AND responses. Delete the output name that was there for simple frequencies and create one for combined frequencies as indicated below (i.e., press open book icon, navigate to where the output file will be stored, indicate name as filename_combinedfreq_C. Drag and drop the procoder data file into the white space as you did before.



e. Select "analyze", *sequential/concurrent probabilities*. Run selected analysis on set. You'll get something like the following:



Under "given/antecedant codes" select "c". Under "target/consequent" codes, select "r". Under "lag" select "0".



The dialog box is titled "Sequential/Concurrent Probabilities" and has a blue header bar with standard window controls (minimize, maximize, close). It is divided into three main sections: "Given/Antecedent Codes", "Target/Consequent Codes", and a control area on the right.

Given/Antecedent Codes: This section contains three expandable categories:

- codeability:** Includes checkboxes for "l low codability", "h high codability", and "NA None".
- opportunity type:** Includes checkboxes for "a child attentional lead", "c child communication act" (checked), and "NA None".
- response:** Includes checkboxes for "r parental linguistic response" and "NA None".

Target/Consequent Codes: This section contains three expandable categories:

- codeability:** Includes checkboxes for "l low codability", "h high codability", and "NA None".
- opportunity type:** Includes checkboxes for "a child attentional lead", "c child communication act", and "NA None".
- response:** Includes checkboxes for "r parental linguistic response" (checked) and "NA None".

Control Area: On the right side, there is a "Lag (0 for concurrent)" label above a text input field containing the number "0". Below this is a checkbox labeled "Skip to pooled results" which is currently unchecked. At the bottom right are two buttons: "Cancel" and "Do it".

Press "do it".

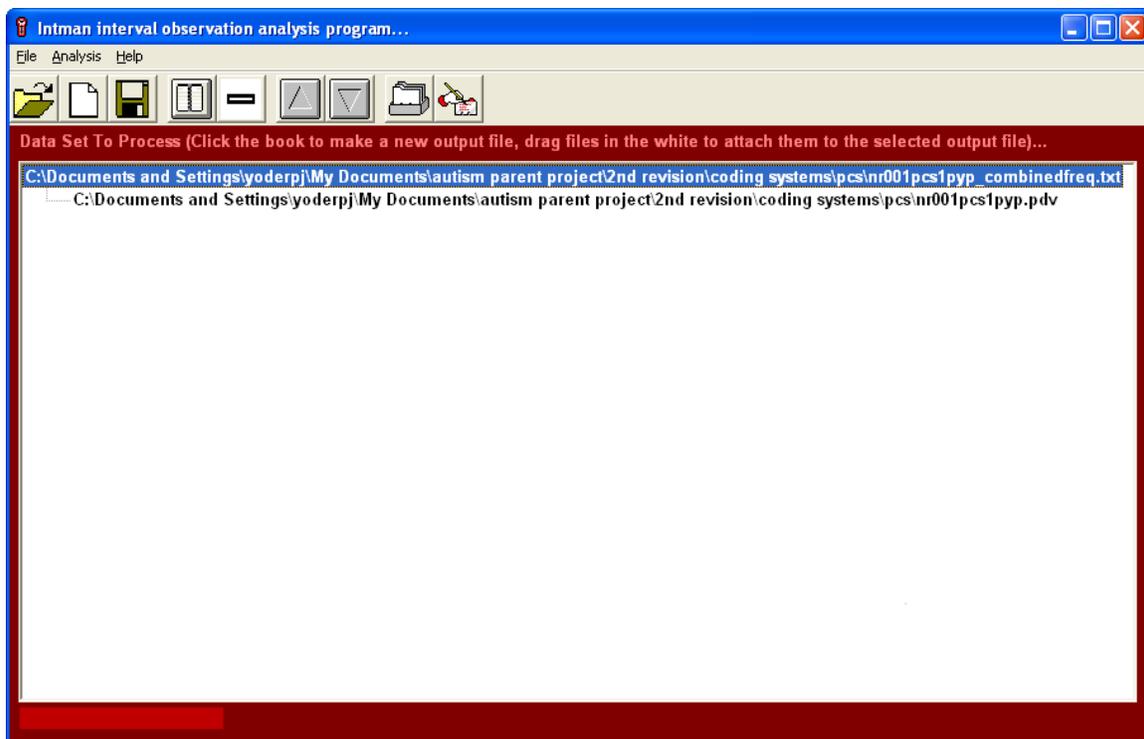
```

nr001pcs1pyp_combinedfreq.txt - Notepad
File Edit Format View Help
***** INTMAN Conditional Frequencies Report. Created: 3/3/2010 2:34:
File: nr001pcs1pyp.pdv
Given Codes:
| c child communication act |
Target Codes:
| r parental linguistic response |
Observed Frequencies...
-----
          TY |      TN |
-----
GY |         1 |         3 |
GN |         2 |         7 |
-----
Expected Frequencies...
-----
          TY |      TN |
-----
GY |         0.9 |         3.1 |
GN |         2.1 |         6.9 |
-----
Observed Probabilities...
-----
          TY |      TN |
-----
GY |    0.0769 |    0.2308 |    0.3077
GN |    0.1538 |    0.5385 |    0.6923
-----
          0.2308 |    0.7692 |
-----
Statistics:
Allison Liker's Z:  0.0962
Yule's Q:  0.0769

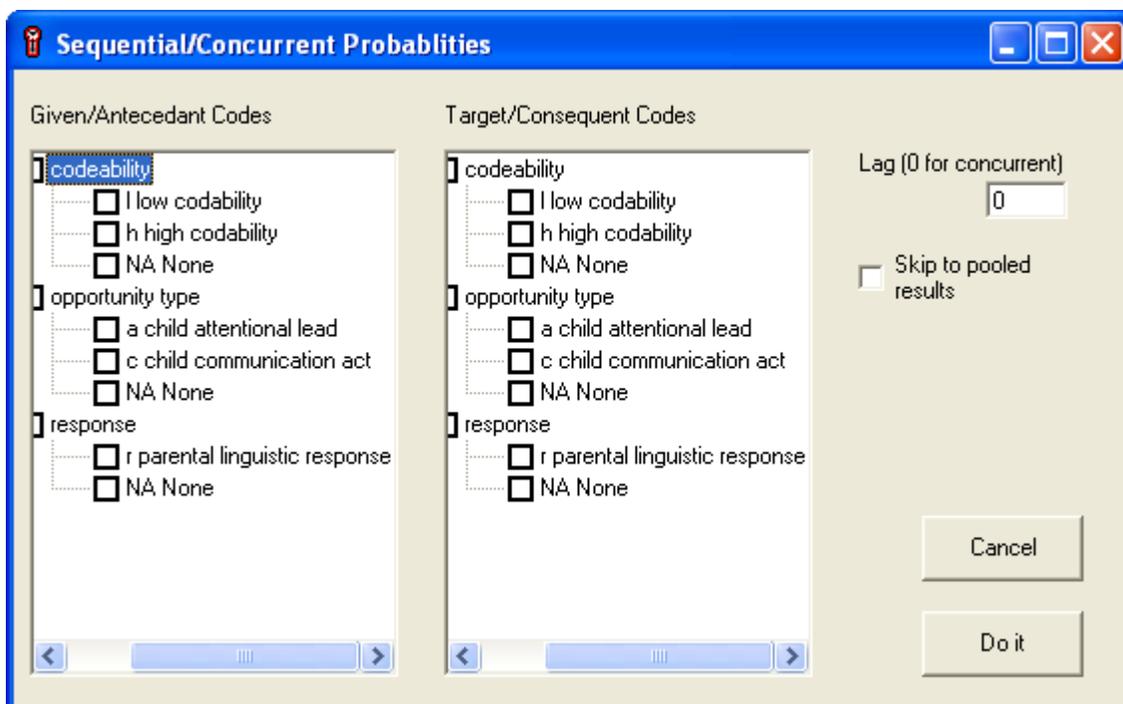
```

The number in the upper left corner of the "observed frequencies" 2x2 table is the one we want.

- f. Save this file in the directory on the secure text server in which combined frequency INTMAN output is saved for particular sessions (indicated by participant, procedure and period).
- g. Get the frequency of intervals with attentional leads AND responses. Delete the output name that was there for communication acts and responses and create one for combined frequencies as indicated below (i.e., press open book icon, navigate to where the output file will be stored, indicate name as filename_combinedfreq_A. Drag and drop the procoder data file into the white space as you did before.



e. Select "analyze", *sequential/concurrent probabilities*. Run selected analysis on set. You'll get something like the following:



Under "given/antecedent codes" select "a". Under "target/consequent" codes, select "r". Under "lag" select "0".

The screenshot shows a dialog box titled "Sequential/Concurrent Probabilities". It has two main columns: "Given/Antecedent Codes" and "Target/Consequent Codes".

Given/Antecedent Codes:

- codeability
 - l low codability
 - h high codability
 - NA None
- opportunity type
 - a child attentional lead
 - c child communication act
 - NA None
- response
 - r parental linguistic response
 - NA None

Target/Consequent Codes:

- codeability
 - l low codability
 - h high codability
 - NA None
- opportunity type
 - a child attentional lead
 - c child communication act
 - NA None
- response
 - r parental linguistic response
 - NA None

Other controls:

- Lag (0 for concurrent):
- Skip to pooled results
- Buttons: Cancel, Do it

Press "do it".

```

V134-2PCSnt_combinedfreq_A.txt - Notepad
File Edit Format View Help
***** INTMAN Conditional Frequencies Report. Created: 10/14/2010 10:55:29 AM *****

File: v134-2PCSnt-8th.pdv
Given Codes:
| a child attentional lead |
Target Codes:
| r parental linguistic response |
Observed Frequencies...
-----
      TY |      TN |
-----
GY |      20 |      66 |
GN |       3 |      20 |
-----
Expected Frequencies...
-----
      TY |      TN |
-----
GY |     18.1 |     67.9 |
GN |       4.9 |     18.1 |
-----
Observed Probabilities...
-----
      TY |      TN |
-----
GY |  0.1835 |  0.6055 |  0.7890
GN |  0.0275 |  0.1835 |  0.2110
-----
      0.2110 |  0.7890 |
-----
Statistics:
Allison Liker's Z: 0.9471
yule's Q: 0.3378

```

The number in the upper left corner of the "observed frequencies" 2x2 table is the one we want.

f. Save this file in the directory on the secure text server in which combined frequency INTMAN output is saved for particular sessions (indicated by participant, procedure and period).

3. Indicate on the task tracking chart that you've completed coding for that particular PCS session.
4. For the USS project, another person will enter the data.
 - a. The variables eventually derived for analysis from the PCS are:
 - i. Number of intervals ($l + h$), in case we pro-rate by these.
 - ii. Number of high codability intervals (h), in case we pro-rate by these.
 - iii. Number of responses (r).
 - iv. Proportion of leads to which there are responses ($r/(a+c)$)
 - v. Proportion of communication acts to which there are responses (number of intervals with r in same interval as c /number of intervals with c).
 - vi. Proportion of attention leads to which there are responses (number of intervals with r in same interval as a /number of intervals with a).

Appendix B

Functional Equivalence of Vowels

- a. When the child produces a vocalization that is a potential word, first determine what word the child is attempting.
- b. Next, pronounce the *target* vowel of the word the child is possibly attempting.
- c. Find the target vowel on the vowel chart below and note the numbers beside the vowel.
- d. Pronounce the adult vowel that is the closest possible to the child's actual production.
- e. Find the child's production on the chart and determine whether any of the numbers on the chart match one of the numbers for the *target* vowel.
- f. If the child's vowel is functionally equivalent to the adult target and all other semantic, pragmatic, and phonetic (e.g., consonantal) criteria have been met, transcribe the child's production as a word.

Front Vowels

i (1, 6) (as in “he” or “heed”)
“sued”)

I (1, 6) (as in “hit” or “him”)
“should”)

e (1, 2) (as in “hay” or “say”)
“soap”)

E (2, 3, 6)
“ball”)
(as in “head” or “said”)

⊙ (2, 3)
“dot”)
(as in “hat” or “Sally”)

Central Vowels

∅ (3, 4)
(as in “hut” or “hum”)

TM (3, 4)
(as in “her” or “hurt”)

α (3, 4)
(as in “hi” or “bye” in
many Southern dialects)

Back Vowels

ʊ (5) (as in “who” or

Y (5) (as in “hood” or

o (4, 5) (as in “hoe” or

□ (4, 5) (as in “call” or

A (3, 4) (as in “hot” or

Diphthongs (Note that diphthongs in Southern dialects tend to be produced as single vowels. Many single vowels in Southern dialects are *heavily* diphthongized.)

aI (3, 4) (as in “hi” or “bye” in standard dialects)

αY (3, 4) (as in “how” or “bounce”)

□I (3, 4) (as in “boy” or “toy”)

APPENDIX C
 The Most Common Speech Sound Errors Found
 in Young Children’s Early Meaningful Speech Productions

Lip Sounds

<i>Target Sound</i>	<i>Produced as</i>
m	m (i.e., usually correct)
w	w (i.e., usually correct)
p	b, at the beginning or middle of a word (e.g., “pie” → “bye” or “happy” → “habby”)
b	p, at the end of a word (e.g., “bib” → “bip”)
f	p or b (e.g., “fat” → “pat” or “five” → “bibe” or “knife” → “nipe”)
v	p or b (e.g., “very” → “beree” or “five” → “bibe”)

Tongue on Teeth Sounds

“th,” as in “ <u>th</u> ink”	t or d or f or s (e.g., “bath” → “bat,” “bad,” “baf,” or “bas”)
“TH” as in “ <u>th</u> is”	d or t (e.g., “that” → “dat” or “tat”)

Tongue Behind the Teeth Sounds

t	d, at the beginning and middle of words (e.g., “toy” → “doy,” “top” → “dop”)
d	t, at the end of words (e.g., “bad” → “bat,” “hide” → “hite”)
s	t or d (e.g., “see” → “tee” or “dee,” “miss” → “mitt,” “missing” → “mitting” or “mittee”)
z	t or d

- (e.g., “zoo” → “too” or “doo,” “fuzzy” → “puddy”
 “bust” → “biddy,” or “buzz” → bud)
 l d or w or “y,” at the beginnings or middle of words; usually
 omitted or changed to a vowel, like “oh” at the end of
 words
 (e.g., “lime” → “dime” or “yime” or “wime,” “bubble” →
 “bubboh,” “call” → “kaw” or “kaoh”)

Tongue on the Mid-Palate Sounds

- “sh” t or d
 (e.g., “shoe” → “too” or “doo,” “washing” → “wating” or
 “wadding,” and “push” → “put”)
- “ch” t or d
 (e.g., “chew” → “too,” “watch” → “watt,” or “match” →
 “mat”)
- “j” t or d
 (e.g., “jam” → “dam,” “badge” → “bad,” or “judge” →
 “dud”)
- “y” y (i.e., usually correct), sometimes d
 (e.g., “you” → “doo,” “yoyo” → “dohdoh,” or “yeah” →
 “dae”)
- “r” w, at the beginning and middle of words, usually omitted at
 the end of words
 (e.g., “run” → “won,” “mirror” → “miwoh,” “ride” →
 “wide,” or “car” → “kaw” or “kaoh”)

Tongue on the Back-Palate Sounds

- k t or d
 (e.g., “key” → “tea” or “dee,” “kick” → “tit” or “dit,”
 “back” → “bat,” or “yucky” → “yutty” or “yuddy”)
- g t or d
 (e.g., “go” → “doe,” “get” → “tet,” “give” → “tive,” or
 “gar” → “daw”)
- “ng” (as in “king”) n
 (e.g., “king” → “keen,” “bang” → “ban,” or “song” →
 “tawn,”)

Other Patterns to Look for

Final Consonants	Often omitted altogether (<i>Final consonant deletion</i>) (e.g., “car” → “kaw” or “bad” → “bae” or “knife” → “nye”)
Unstressed syllables	Often omitted altogether (<i>Weak syllable deletion</i>) (e.g., “around” → “wound,” “tomato” → “mato” “banana” → “nana,” or giraffe → “waef”)
Consonant blends	Often changed to a single consonant (<i>Cluster reduction</i>) (e.g., “please” → “peas” or “pea,” “blue” → “boo,” “sky” → “kye” or “gye,” “friend” → “fen” or “pen”)
Words with two or more consonants	One sound is often changed to be the same as or similar to another, yielding a within-word consonant repetition or “near” repetition. (<i>Assimilation or Consonant Harmony</i>) (e.g., “dog” → “dod” or “gog,” “kitty” → “kicky” or “titty,” “money” → “mummy”)

Remember that more than one of these changes can occur in a single word, (e.g., “Susan” → “tutu” (s → t plus *consonant harmony*); “laughing” → “yappee” (l → “y”, f → p, and *Final consonant deletion*)

Common sound substitutions for “n” and “h” sounds have been omitted in the above because they are so rarely misarticulated.

These two sounds are among the five or 10 most frequently BABBLED sounds across all languages of the world. So, they’re usually there in English kids first words.

When SUBSTITUTION errors do occur, [m] would be the most common substitution for [n]. Nasals are readily confused.

For [h], the most common error is omission in which case you just have a vowel. Another consonant substituted for [h] is extremely rare. Some kids have strong patterns of favorite sounds; so [t] might substitute for a whole lot of sounds, including [h]. But there’s no obvious substitution alternative for this sound.