APPENDIX G: PARTICIPANTS CHARACTERISTICS

Methodology: Systematic Review and Meta-analysis of the AAC Literature for People with Autism Spectrum Disorder or Intellectual Disabilities who have Complex Communication Needs through 2020

Appendix G
Coding for Participants Characteristics

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Authors Contribution Statements using Contribution Roles Taxonomy (CRediT)

Authors were listed alphabetical order by tier with an explanation of the contributions that are indicated for each tier by using CRediT (Allen et al., 2019).

Tier 1: Ganz, Pustejovsky, Reichle, Vannest (Principal Investigators)

Tier 2: Pierson, Wattanawongwan (Project staff)

Tier 3: Chen, Foster, Fuller, Haas, Hamilton, Sallese, Smith, Yllades (Additional staff or investigators who contributed substantively)

Jay B. Ganz: Conceptualization (lead); formal analysis (supporting); funding acquisition (lead); investigation (supporting); methodology (lead); project administration and supervision (lead); writing - original draft preparation (lead); writing - review and editing (lead). James E. Pustejovsky: Conceptualization (supporting); data curation (equal); formal analysis (lead); funding acquisition (equal); investigation (supporting); methodology (equal); project administration and supervision (equal); resources (equal); software (lead); visualization (lead); writing - original draft preparation (supporting); writing - review and editing (equal).

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Appendix G

Coding for Participants Characteristics

(a) Diagnosis (i.e., ASD, IDD)

Definitions Related to Coding

- **Autism Spectrum Disorder** - is a developmental disorder of variable severity that is characterized by difficulties in social interaction and communication skills (with an emphasis on social skills) and by restricted or repetitive patterns of behavior. Described as having a diagnosis of autism spectrum disorder, autistic disorder/autism, high-functioning autism, or pervasive developmental disorder with or without ID

- **IDD** - intellectual and developmental disability
  - **Intellectual disability** - is a disability characterized by significant limitations in both intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills. This disability originates before the age of 18.
  - **Developmental disability** - Developmental disabilities are a group of conditions due to an impairment in physical, learning, language, or behavior areas. These conditions begin during the developmental period, may impact day-to-day functioning, and usually last throughout a person’s lifetime.

For both ID and DD participants were reported to have a diagnosis of intellectual disability or mental retardation, IQ score of less than 70, with commensurate limitations in adaptive behavior.

(b) Age (i.e., pre-k, elementary, secondary)

- Pre-kindergarten
- Elementary
- Secondary

(c) Number of words, symbols or signs used prior to intervention

**Words** - Combinations of consonants and vowels that comprise a word that is understood among users of a particular language. Words used prior to and subsequent to intervention were coded.

**Words/Symbols and Signs: Notes** Coders specified the number of words, graphic symbols, or gestures/signs broken down by communication mode; Words, graphic symbols or gestures/signs were coded as 0, 1-5, 6-10, 11-50, over 50, not specified

- 0
- 1-5 words
- 6-10 words
- 11-50 words
- Over 50 words
- Other/Not noted

(d) Combination of symbols, gestures or words to phrases or sentences prior to intervention
Combine symbols, gestures, words: Does the article report the participant combinations to phrases or sentences prior to intervention? Note: A free and bound morpheme dog (free) + s (bound morpheme) constitute a single word for this coding procedure.

(e) Communication assessment- Commonly used assessment protocols that were to characterize study participants skills in the areas of pragmatics, semantics and vocabulary, morphology, syntax.

The assessment name-version and year of the assessment were reported if gleaned from the assessment, standard score, percentile, and age equivalence were reported. Each communication assessment implemented was reported.

**Commonly Reported Communication Assessments**

- Clinical Evaluation of Language Fundamentals (CELF)
- Comprehensive Assessment of Spoken Language (CASL)
- Expressive One-Word Picture Vocabulary Test (EOWPVT)
- Functional Communication Profile (FCP)
- Goldman-Fristoe Test of Articulation (GFTA)
- Mullen Scales of Early Learning
- Oral and Written Language Scales (OWLS)
- Peabody Picture Vocabulary Test (PPVT)
- Preschool Language Assessment Instrument (PLAI)
- Preschool Language Scale (PLS)
- Receptive-Expressive Emergent Language Test (REEL)
- Receptive One-Word Picture Vocabulary Test (ROWPVT)
- Social Communication Questionnaire (SCQ)
- Social Responsiveness Scale (SRS)
- Test of Auditory Comprehension of Language (TASL)
- Test of Language Development-2 (TOLD-2)
- Test of Pragmatic Language, Second Edition

(f) Cognitive/IQ assessment - Any measure quantifying intellectual status of a participant. Instruments used may include those using elicitation procedures, checklists, interview assessments, direct observation or a combination of these strategies. Often the outcome of an assessment will permit a description of mild, moderate, severe, profound. (i.e. it is important to specify a diagnostic system that is referenced in describing disability as there is not uniformity across classification systems). The name of the assessment was entered. As was the case with communication assessment; when available, standard score, percentile, and age equivalent scores were recorded.

**Commonly reported cognitive and adaptive behavior assessments**

- Differential Ability Scales (DAS)
- Kaufman Assessment Battery for Children (K-ABC)
- Leiter International Performance Scale
- Stanford-Binet
- Wechsler WAIS
- Wechsler WISC
- Wechsler WPPSI
- Woodcock Johnson
- Vineland Adaptive Behavior Scales
(g) **ASD diagnostic assessment** - a comprehensive evaluation including the child’s behavior and development and interviewing the parents. It may include genetic testing, neurological testing among other areas.

**Commonly used assessments to qualify learner as having ASD include:**

- Autism Diagnostic Interview™, Revised (ADI-R)
- Autism Diagnostic Observation Schedule (ADOS)
- Autism Spectrum Rating Scales (ASRS)
- Childhood Autism Rating Scale (CARS)
- Gilliam Autism Rating Scale (GARS)

(h) **Communication mode used prior to study**

- Natural gestures that may or may not include a facial expression (e.g. head shake yes or no) but excluding intelligible manual signs or sign approximations. May include any of the following. Facial expression: one or more motions or positions of the muscles beneath the skin of the face that purposely conveys emotional state to a communicative partner (e.g. frowning, smiling). Contact gesture: an action intended to influence the behavior of another person that involves coming in direct contact with a referent (e.g. proffering a cup to have it refilled), or with a prospective communicative partner (e.g. leading an individual to a referent that is the focus of the communicative act). Distal gesture: an action intended to influence the behavior of another person that does not involve direct contact with a referent or the communicative partner (e.g. pointing at a referent). Typically, distal gestures involve a shift in eye gaze between referent and communicative partner. Idiosyncratic gesture: an action that has no conventional meaning but is used under a consistent set of circumstances that permits individuals to ascribe communicative meaning based on its history of use (e.g. putting fist on one’s nose to communicate “I need a tissue”).
- Manual sign language: an unaided system that relies on no equipment and instead relies on the learner’s own body to produce communicative acts. An action that includes a specific handshape, location where the sign is produced and movement pattern that adheres to a sign language or sign system
- Low-tech aided AAC: An application of a graphic communication mode that does not require electrical power or batteries to operate and do not have the capability to produce synthesized or digitized speech (e.g. graphic symbols housed in a wallet, a laminated card housing graphic symbols, a three-ring binder housing graphic symbols).
- Mid-to-high-tech aided AAC: An application of a graphic communication mode. High tech applications involve the use of electrical or battery power. Typically, they permit the use of digitized and synthesized text to speech, environmental control and may support email and computer access applications. Additionally, they allow unlimited vocabulary, encoding capability, prediction, a variety of access methods, and permit linking any symbol to any other symbol location displayed (e.g., Tobii Dynavox, Prentke Romich).
- Vocalization: production of sound, sound combinations that are not intelligible word approximations (Examples: Sound- Air passing that vibrates the vocal cords that can be heard. This excludes wheezing, snorting, grunting and whistling.)
- Verbalization: intelligible words or word approximations

(i) **Imitation**

Imitation: the learner replicates a modeled behavior within 5 seconds of a behavior modeled by another person. Prior to intervention, participant is said to be able to engage in:
• Imitation (gestural)-The replication or partial replication of an action produced by another within a short span of time. To be coded, it should be reported as a pre-intervention assessment (or baseline) implemented or a reliable report that occurred prior to the implementation of the independent variable.
• Imitation (vocal/verbal)-The replication or partial replication of sound, sound combinations, or spoken word approximations that was produced by another within a short span of time. To be coded it should be reported as a pre-intervention assessment (or baseline) implemented or a reliable report that occurred prior to the implementation of the independent variable.

(j) Joint attention

Joint attention: coordinated attention between social partners to share interest in entities, objects or events (Gillespie-Lynch, 2013). Joint attention can be initiated or responsive. Prior to intervention, participant is said to be able to engage in:

• Initiated joint attention: A volitional act consisting of alternated gaze between a referent and a communicative partner (e.g., Tommy establishes eye-contact with his father; he then shifts his focus to a referent in the environment (which may be accompanied by reaching or pointing behavior in the direction of the referent). If the child looks at the external/outside of itself.
• Responsive joint attention: A volitional act in which after the partner directs his/her gaze to a referent, the learner shifts his gaze to the referent (e.g., Mom points to a bird sitting on a tree and child immediately glances to the tree).