

**Twenty Years of
Communication Intervention Research
with
Individuals who have Severe Disabilities**

Marti Snell, Nancy Brady, Lee McLean, Bill
Ogletree, Ellin Siegel, Lorraine Slyvester,
Beth M. Mollica, Diane Paul-Brown, Mary Ann
Romski, & Rose Sevcik

**National Joint Committee for the Communication Needs of
Persons with Severe Disabilities**

Thanks to ASHA, Youngzie Lee, & Michael Barker



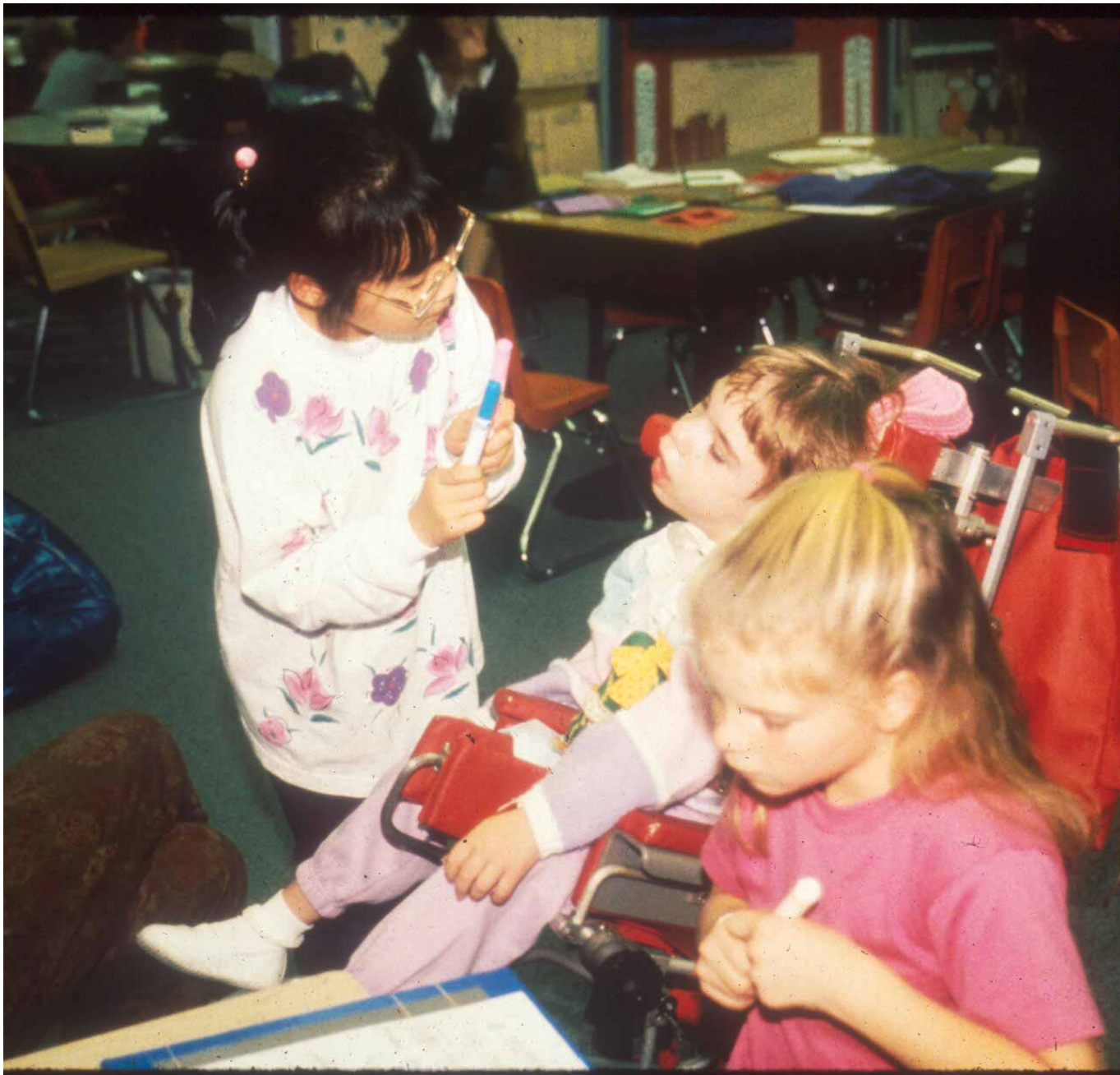
Reported in AJIDD

Snell, M. E., Brady, N., McLean, L., Ogletree, W., Siegel, E., Slyvester, L., Molica, B. M., Paul, D., Ronski, M. A., & Sevcik, R. (in press). Twenty years of intervention research on the communication interaction of individuals who have severe disabilities. *American Journal on Intellectual and Developmental Disabilities*.

National Joint Committee

- **National Joint Committee for the Communication Needs of Persons with Severe Disabilities (NJC)**
 - Formed in 1986 by ASHA & TASH
- Mission and purpose
 - Provide information and advocate for the communication needs of persons with severe disabilities
- Members represent 7 organizations
 - AAIDD, AOTA, ASHA, CEC-DCDD, RESNA, TASH, USSAAC

<http://www.asha.org/NJC/>



Communication Bill of Rights

Everyone has the right to:

- *Request what they want*
- *Refuse what they don't want*
- *Express preferences and feelings*
- *Be offered choices and refuse choices*
- *Request and get attention and interaction*
- *Request and get information about changes in routine or setting*
- *Get intervention to improve communication*



Communication Bill of Rights

Everyone has the right to:

- *Get a response to their requests, even if not fulfilled*
- *Get services and have communication aides at all times*
- *Be in settings with peers who don't have disabilities*
- *Be spoken and listened to with respect and courtesy*
- *Be spoken to directly, not talked about while present*
- *Have communication that is clear, meaningful, and culturally and linguistically appropriate*



The right to get intervention to improve communication

- Requires interventions based on evidence
- Research results are more believable when a study controls for threats to both
 - *Internal validity*: Are results actually attributable to the experimental procedures, as described?
 - *External validity*: Are results useful and generalizable to other members of the target population? (Tuckman, 1999)



Quality Indicators of Empirical Evidence

- Accurate, complete description of participant characteristics
- Replicable study procedures
 - Precise description of procedures
 - Intensity defined (how often? for how long?)
 - Duration of treatment defined (how many days/weeks/months?)
 - Procedure reliably implemented (treatment fidelity)
- Reliable data reported
- Treatment results generalize to participants' daily lives
- Results are perceived as valuable (social validity)

(Gersten, Fuchs, Compton, Coyne, Greenwood, & Innocenti, 2005;
Horner, Carr, Halle, McGee, Odom, & Wolery, 2005)

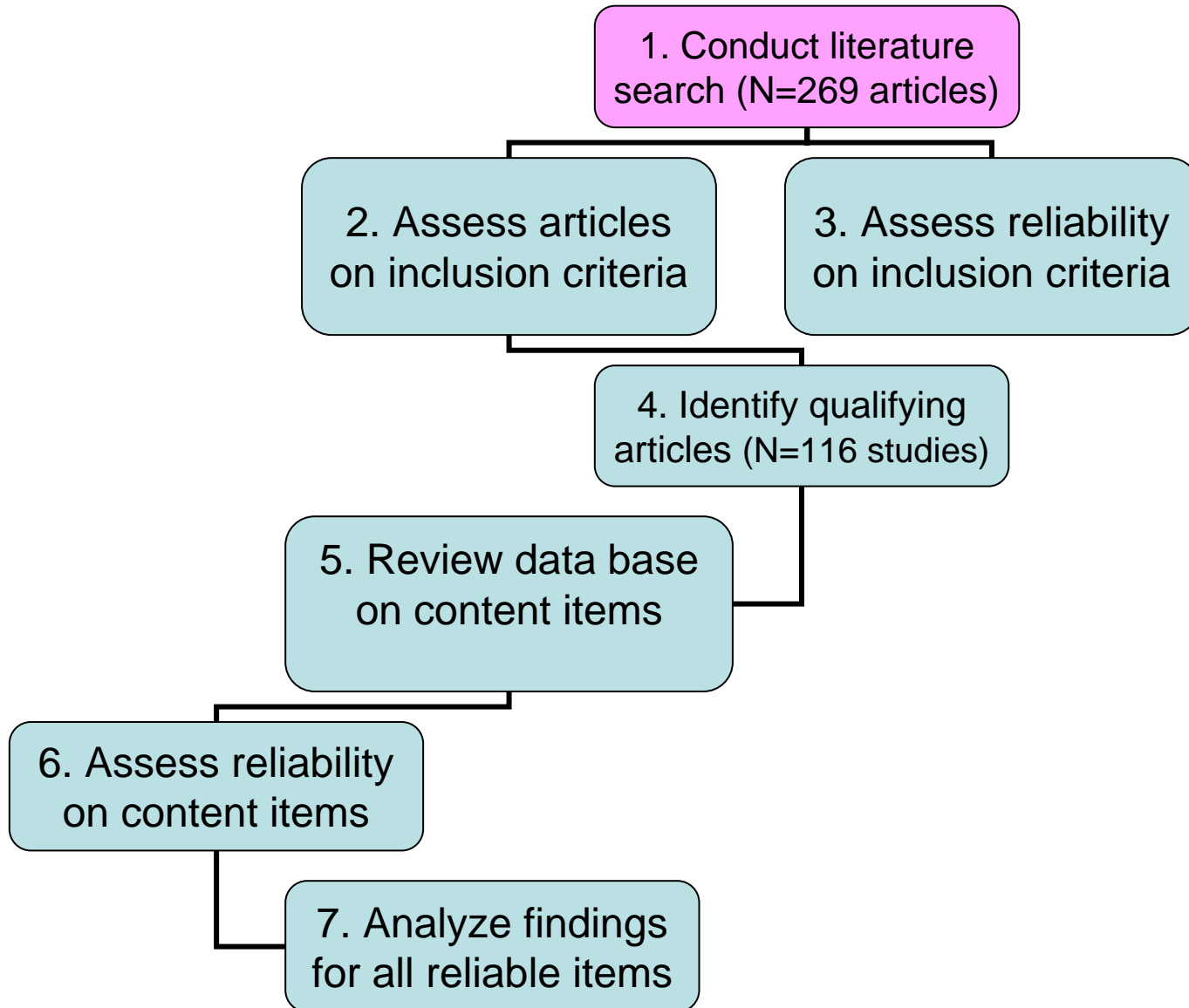


Thanks to Ann Kaiser

Questions addressed by the Literature Review

1. What research evidence supports the delivery of communication interventions to individuals with severe disabilities?
2. What is the nature and quality of that evidence?
3. How can these findings inform specific needs for future research?





1. Conduct Literature Search

- Articles published in peer-reviewed journals
- Written in English
- With participants having severe disabilities
- Intervention studies dealing with language or literacy outcomes
- Contained original data
- No case studies

Search Process

- 13 electronic data bases searched using 31 search terms to locate articles with general focus on:
 - Intervention studies
 - Participants with severe disabilities
 - Treatment addressing communication performance
- 47 expanded search terms created and applied
- Reference lists of relevant articles scanned for studies
- Searched publications of all NJC committee members

Yielded: Pool of 269 potentially relevant articles

NJC Evidenced-Based Practices Data Entry Instrument

- Part 1: reviewer and article information (1-2)
- Part 2: Criteria for inclusion (3-7)
- Part 3: Description of study (8-36)
- Part 4: Evaluation of quality of evidence (37-39)

NJC: EBP Data Entry Instrument (June 2008)

Question 1: PART I: REVIEWER & ARTICLE INFORMATION (Items 1 - 2)

For reliability put R by year and fax/email coding sheet to Nancy: 785-863-5323;
nbrady@ku.edu

1. Reviewer:

2: Article

Author(s):

Publication Year (Must be 1987 or later):

Journal:

Volume (Issue) numbers:

Pages:

PART II: CRITERIA FOR INCLUSION OF STUDY [Items 3 - 7]

Question 3: Does article describe an intervention or treatment? Note that we are not including descriptive studies of individual or population characteristics

Question 4: If you answered "No" to question # 3, was this article a systematic review of relevant communication intervention studies?

Question 4: Additional Comment

Question 5: Does study include one or more individuals, of any age, with severe disabilities, for whom intervention results can be identified and distinguished from those of any participants with mild or adult-onset disabilities? For purposes of this review, we are defining individuals with severe disabilities as: Individuals who have developmental or acquired disabilities, manifest before age 18, that result in severe socio-communication

Internet Survey

- Instrument placed on web-based platform
www.zoomerang.com
- Each study coded on all items
- Reviewers entered data into electronic data base
- Results downloaded in Excel*

*Thanks to Youngzie Lee,
doctoral student UVA





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JC: EBP Data Entry Instrument (June 2008)

[View Individual Responses](#)

Survey Results

1. PART I: REVIEWER & ARTICLE INFORMATION (Items 1 - 2) For reliability put R by year and fax/email coding sheet to Nancy: 785-863-5323; nbrady@ku.edu Reviewer:

[View 255 Responses](#)

2. Reference/Citation for Article to be Reviewed:

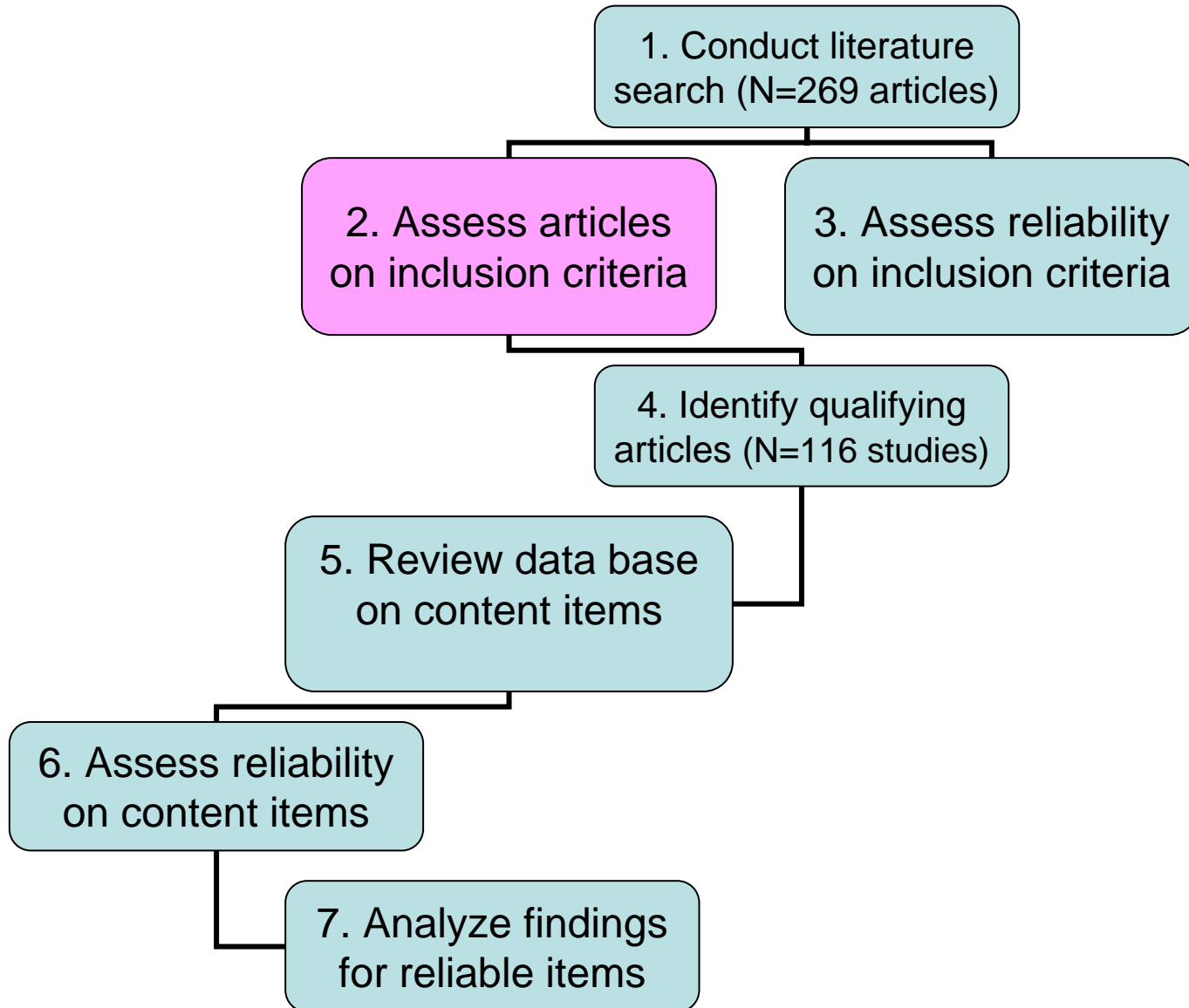
[View 255 Responses](#)

3. PART II: CRITERIA FOR INCLUSION OF STUDY [Items 3 - 7] Does article describe an intervention or treatment ? Note that we are not including descriptive studies of individual or population characteristics

Yes		209	85%
No		38	15%
Total		247	100%

4. If you answered "No" to question # 3, was this article a systematic review of relevant communication intervention studies?

Yes		12	33%
No		24	67%



2. Assess articles on inclusion criteria

- 269 articles examined against 3 inclusion criteria:
 - 1) Intervention study
 - 2) One or more participants with severe disabilities
 - 3) Applied an intervention addressing one or more areas of communication performance

Inclusion Criteria: Definition of Severe Disability

- Broad description
- Specific IQ cut-off
 - If IQ scores are given, scores must be 44 or below
 - No IQ scores, but described as having “severe disabilities”
- Language age guidelines aligned with CA
 - Age 5 or less: language age is half chronological age or less
 - Language age of 30 months (or less) for everyone over age 5 (receptive or expressive or both)

Inclusion Criteria: Communication Performance

- Learning to understand and/or produce communication messages to a communication partner, using any mode:
 - including graphic, natural gestures, sign language, speech, picture symbols, etc.,
- addressing one of the following functions:
 - requesting, commenting, protesting, conveying social niceties, answering questions, repairing after a breakdown

3. Assess reliability on inclusion criteria

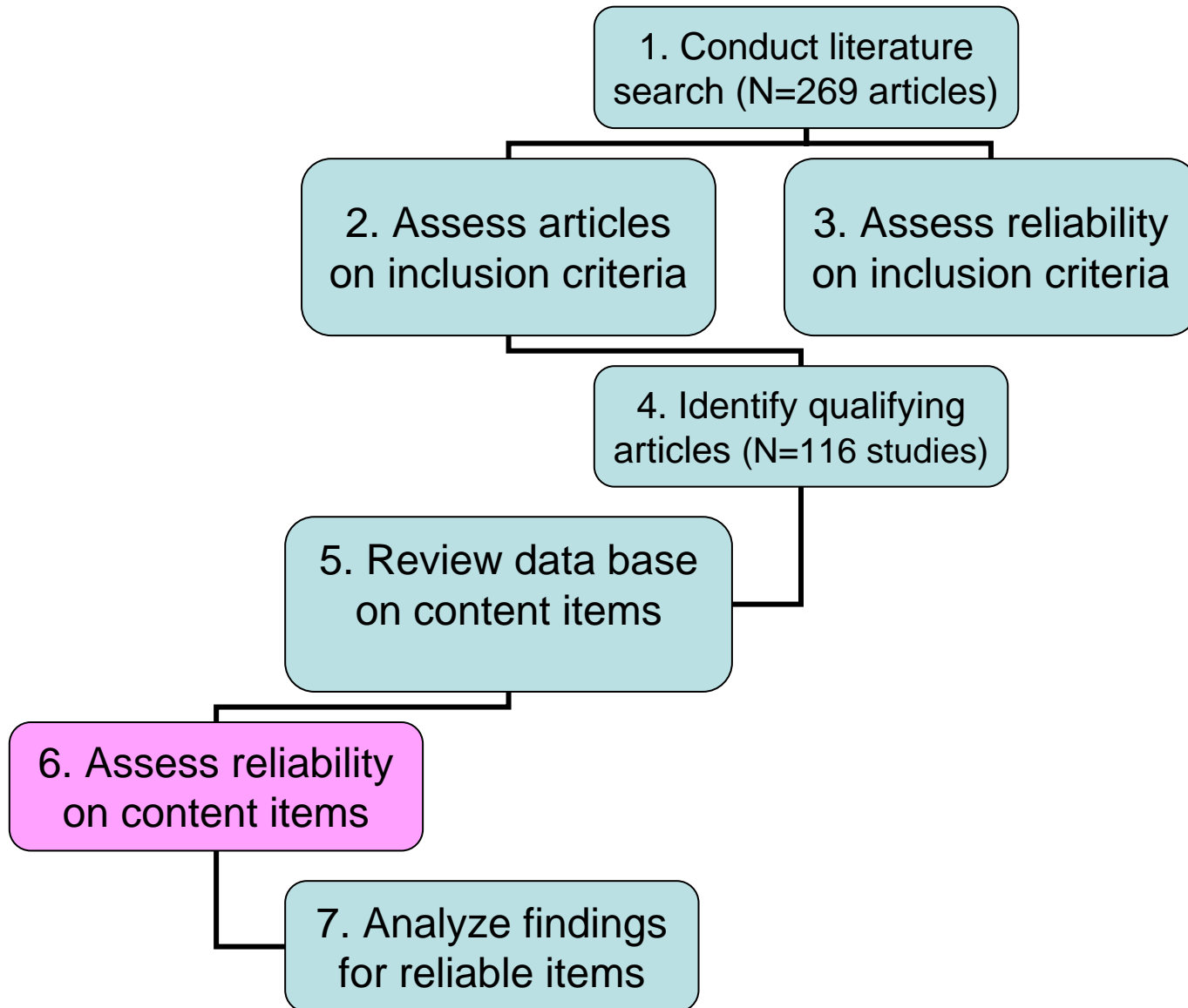
- Reliability conducted (N=71, 26.4% of 269)
- Three inclusion criteria:
 - 1) Intervention study **95.8%**
 - 2) One or more participants with severe disabilities **84.5%**
 - 3) Applied an intervention addressing one or more areas of communication performance **81.7%**

4. Identify qualifying research articles

- Database: **116** relevant articles that met inclusion criteria

5. Review/code database on content items

- Demographics
 - Number, age, diagnoses, pretreatment communication
- Dependent variables/measures
 - Targeted communication outcomes, mode, level, function
 - Maintenance, generalization, challenging behavior
- Independent variable features
 - Intervention setting, method, instructors, frequency, duration
- Study design
 - Experimental design
 - Reliability, social validity, fidelity of treatment, effects

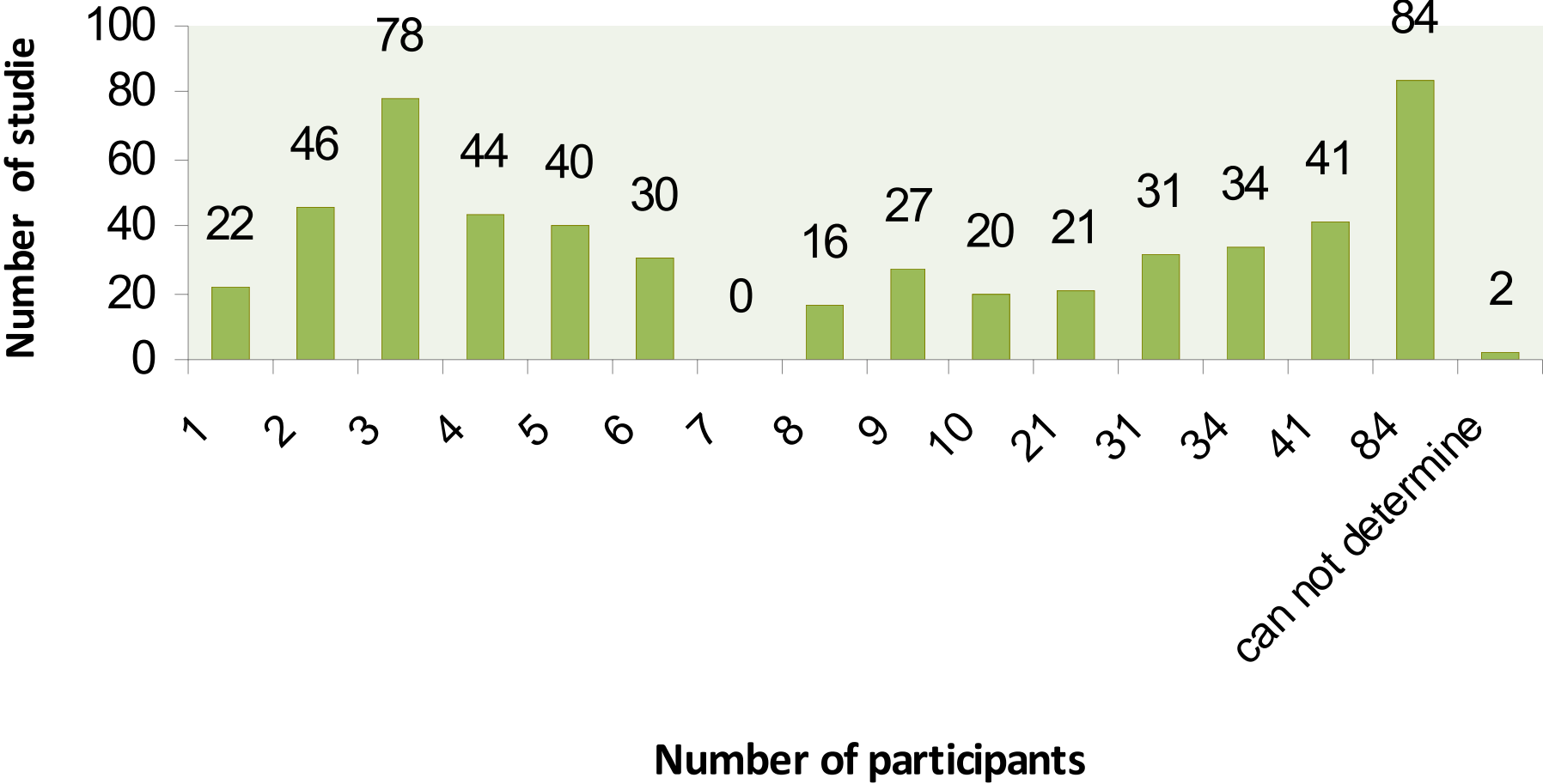


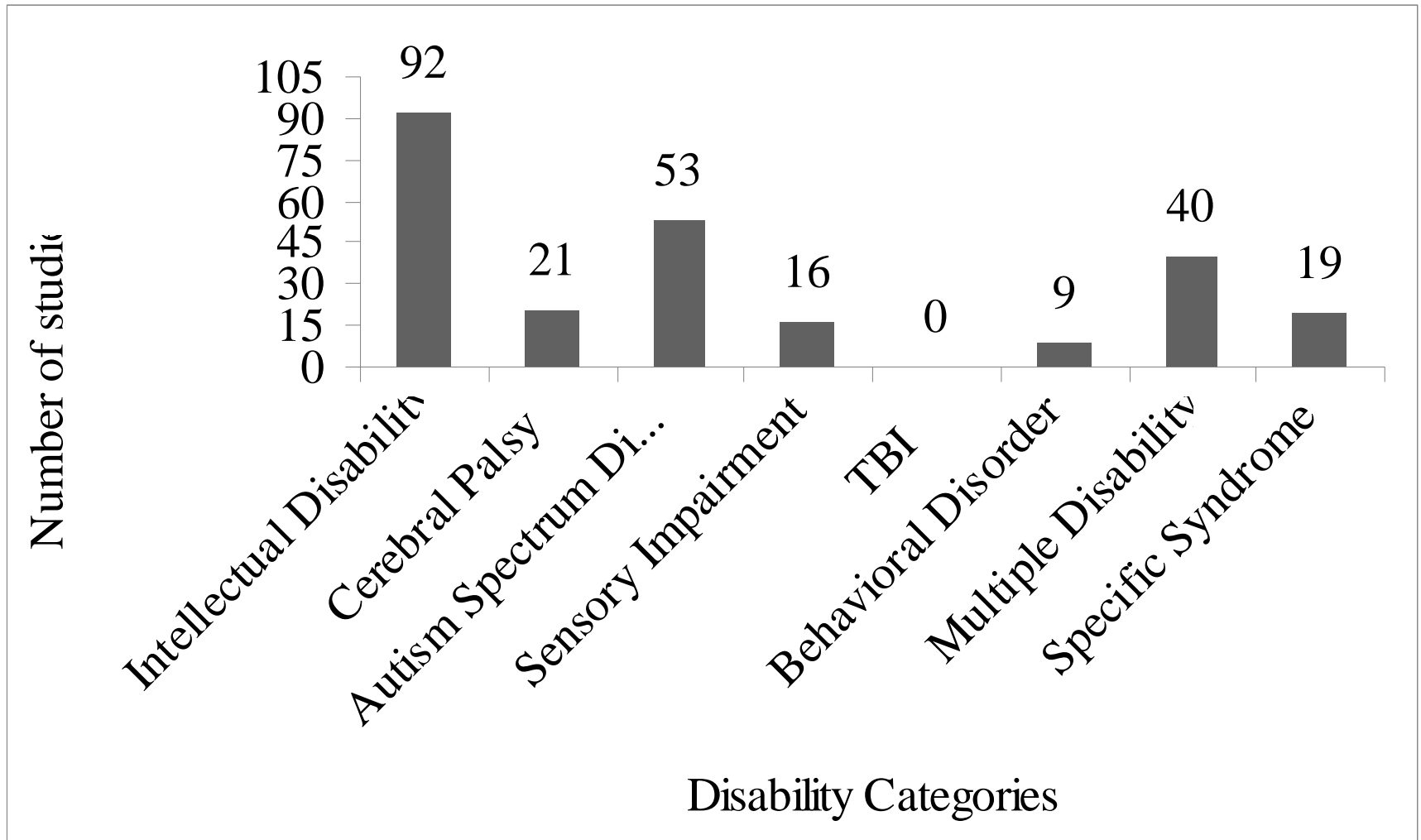
6. Assess reliability on content items

- 25% randomly assigned to two coders to assess inter-rater reliability
- % Agreement =
$$\frac{\text{Agreement}}{\text{Agreement} + \text{Disagreement}} \times 100$$
- Agreement criterion: 70% or better
- Moderate to strong agreement on 26 of 32 (81.3%) content items
 - And on 92 of 104 (88.5%) content sub-items

7. Analyze findings for all reliable items

Participants with Severe Disabilities





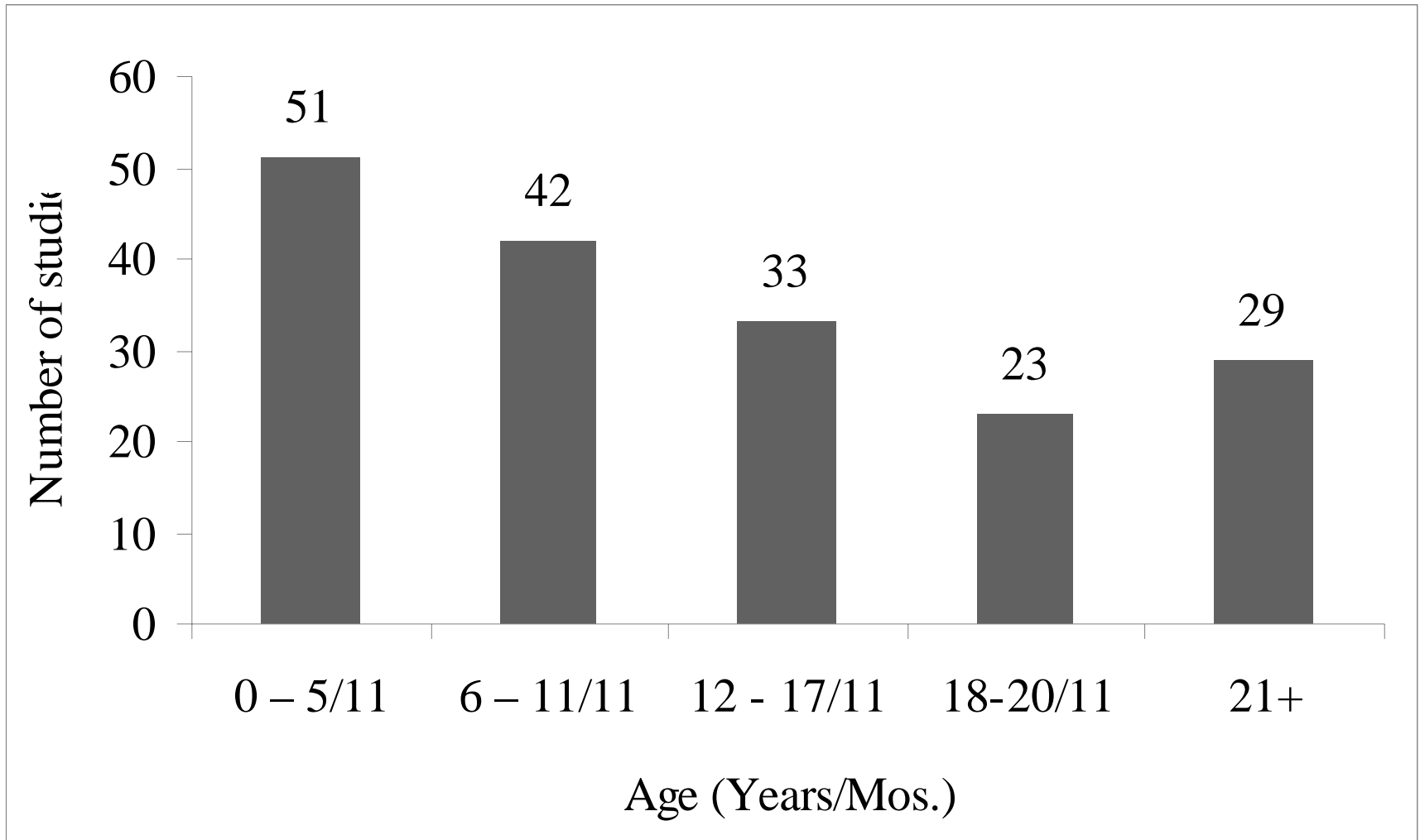


Table 1

Characteristics of Study Participants with Severe IDD

Characteristic	Number and Percent of Studies Reporting Participants of Each Type	
	N	%
Pre-treatment Communication Levels		
Pre-linguistic	77	66.4%
Emerging	60	51.7%
Multiple, non- <u>echolalic</u> words	7	6.0%
Other [<u>echolalia</u>]	11	9.5%
Pre-treatment Communication Modes		
Speech	57	49.1%
<u>AAC-Unaided</u>	20	17.2%
<u>AAC-Aided</u>	10	8.6%
<u>AAC-Aided,w/speech output</u>	5	4.3%
<u>Gestures/vocalizations</u>	69	59.5%
Other (incl. challenging behavior)	25	21.6%
Pre-treatment Receptive Communication Abilities		
Not responsive; RLA \leq 9 mo	13	11.2%
Simple directions; RLA 9-18 <u>mos</u>	37	31.9%
Single words; RLA 18-30 <u>mos</u>	26	22.4%
Grammar/syntax; RLA $>$ 30 <u>mos</u>	6	5.2%
Not reported	62	53.4%

Table 2

Dependent Variables Measured as Intervention Outcomes

Data Input Instrument Items	Number and Percent of Studies Reviewed	
	N	%
Aspects of communication performance measured as outcomes		
Expressive communication/expressive language	94	81%
Comprehension/Receptive language	8	6.9%
Interaction/ conversation	27	23.3%
Other	11	9.5%
Expressive mode targets		
Speech	48	41.4%
AAC-Unaided	25	21.6%
AAC-speech output	29	25%
AAC-aided, no speech output	42	36.2%
Non-symbolic (gestures, vocalizations)	NR ¹	NR
NA/ Not measured	8	6.9%
Receptive communication mode targets		
Speech	11	9.5%
AAC-unaided	3	2.6%
AAC-speech output	6	5.2%
AAC-aided, no speech output	6	5.2%
Gestural or contextual	4	3.4%
NA, not measured	96	82.8%

Table 2

Dependent Variables Measured as Intervention Outcomes

Data Input Instrument Items	Number and Percent of Studies Reviewed	
	N	%
Communication function targets		
Regulate behavior	62	53.4%
Engage another	25	21.6%
Establish joint attention	19	16.4%
NA/Not measured	37	31.9%
Interaction/ conversation targets		
Turn-taking	13	11.2%
Joint attention	11	9.5%
Imitation	8	6.9%
Initiation/Spontaneous	NR	NR
Repair	1	1%
Topic maintenance	2	1.7%
NA/ not measured	NR	NR
Other	16	13.8%

Characteristics of Study Interventions

Number and Percent of 116 Studies Reviewed

	Number and Percent of 116 Studies Reviewed	
	N	%
#29: Intervention settings		
Classroom	51	44%
Home	32	27.6%
Pull-out	40	34.5%
Community	6	5.2%
Other	34	29.9%

Characteristics of Study Interventions

Number and Percent of 116 Studies Reviewed

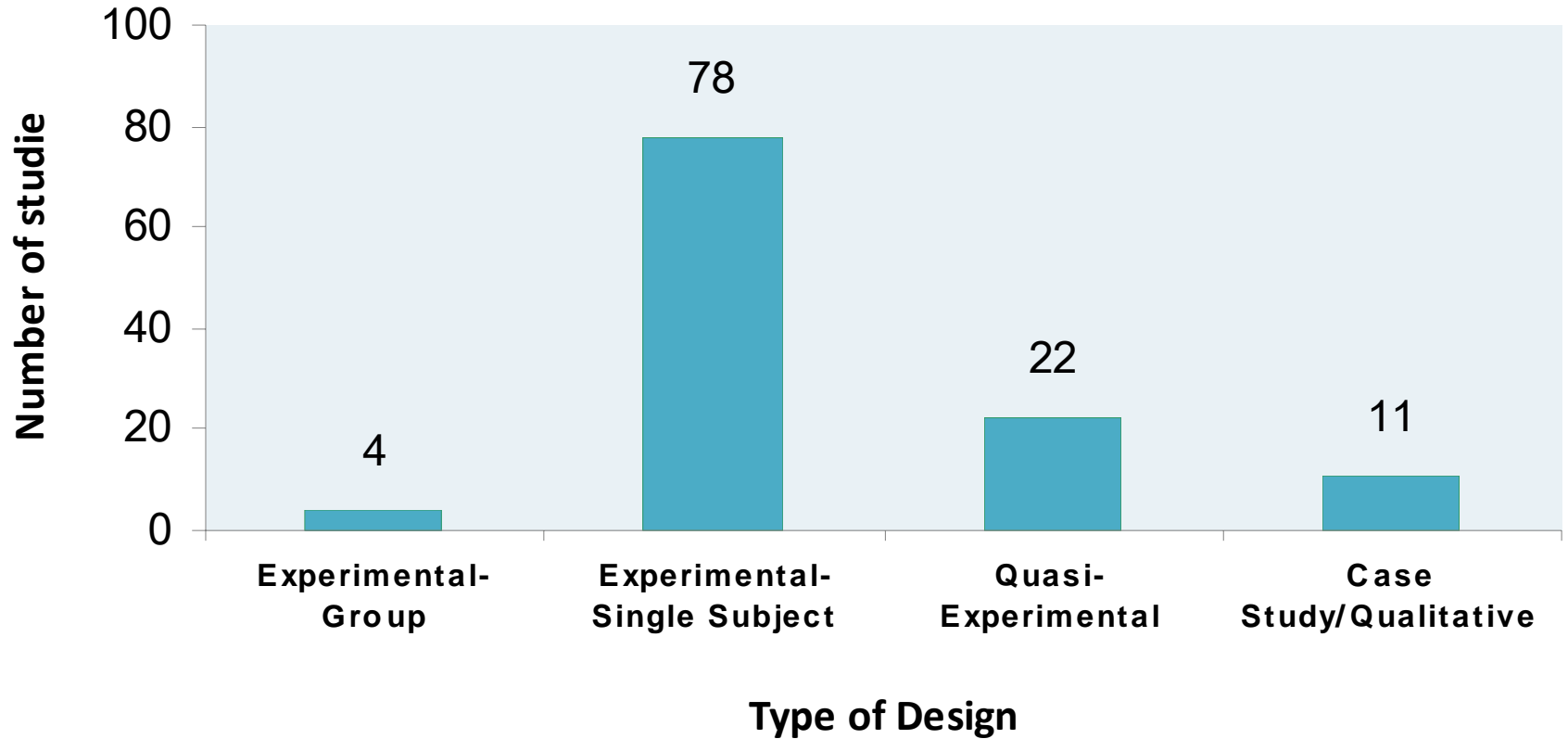
	N	%
#30: Implementation methods		
Individual/ one-to-one	102	87.9%
Group	11	9.5%
Massed trial	NR	NR
Distributed trial	53	45.7%
Decontextualized	46	39.6%
Contextualized	NR	NR
Other	4	3.4%

NR Inter-rater reliability <70%

Characteristics of Study Interventions	Number and Percent of 116 Studies Reviewed	
	N	%
#31: Person (s) delivering intervention		
Parent	19	16.4%
Teacher	41	35.3%
Paraprofessional	14	12.1%
Speech Language Pathologist	7	6%
Peer	11	9.5%
Experimenter	60	51.7%
Other	23	19.8%

Measure	Description	Percent of Studies
Inter-rater Reliability	Evidence that 2 independent coders would produce the same results when coding the same article	89.5%
Intra-rater Reliability	Evidence that raters were consistent over time; includes test-re-test reliability within a single individual	2.6%
Fidelity of Treatment	Evidence that experimental conditions were implemented as described	32.2%
Generalization	Transfer of target skills to new partners, settings, stimuli, responses, etc.	51.3%
Long Term Effects	Retention of target skills at least three months after all intervention completed	25.2%
Social Validity	Acceptability or benefit of intervention from perspective of others who interact with participant	16.8%

Experimental Design



Frequency and Duration of Training (not reliable)

- Frequency of training (2x/day to <once week):
 - Could not determine in ~38% of the research
- Duration of training (< month to > 2 years):
 - Could not determine in ~48% of the research

Of these 116 studies, the typical study...

- Used single subject experimental design (67.2%)
 - A mean of 4 school-aged participants (mean age 13.7 yrs)
 - With intellectual disability (79.3%)
 - Pretreatment expressive communication:
 - Emergent (66.4%) or prelinguistic skills (51.7%)
 - Nonsymbolic gestures and vocalizations most frequent mode (59.5%)
- Interventions aimed at expressive communication or interactions
 - Delivered one-to-one (87.9%), often using distributed trials (47.5%)
 - Usually in classroom or pull-out setting; 1/3 in more than one setting
 - Usually by experimenter
- 81% measured improvement in expressive communication

Discussion

1. What research evidence supports the delivery of communication interventions to individuals with severe disabilities?
2. What is the nature and quality of that evidence?
3. How can these findings inform specific needs for future research?

1. Characteristics of evidence that support delivery of communication interventions

- Researchers reported positive, immediate results in target skills following intervention in 95.7% of studies reviewed
 - Very positive outcomes partly due to selection biases in publications
 - But ... the published evidence clearly supports providing intervention to improve the communication skills of children and adults with severe disabilities.

2. What is the nature and quality of this evidence?

Challenges in applying “gold standards” to the studies reviewed

1. We tried but could not reliably judge summative ratings of internal/external validity
2. Experimental design: 67.8% single subject design
3.5% treatment comparison; moderate/strong effect sizes
3. Reliable ratings
Reliably evaluated 26 or 32 content items (81.3%)
OR 92 of 104 sub-items (88.5%)

Shortcomings of This Review

- Achieved reliability on most items in the instrument
 - But not the three summative ratings of research quality taken from the NRC report (2001)
 - However, most reviews do not report reliabilities on the selection criteria or the coded items
- We did not identify the distinct intervention practices used by the researchers in each study.
 - Wide range of interventions
- Unable to include research from the most recent year (2009)

3. How can these findings inform future research?

- Document treatment fidelity
 - Essential measure of consistency in independent variable
 - Many interventions are complex; multiple strategies
- Assess and report generalization and maintenance
 - generalization assessed only half the time
 - Maintenance less than 1/4th of the time
 - Social validity less than 1/6th
 - Similar to other recent communication reviews

3. How can these findings inform future research?

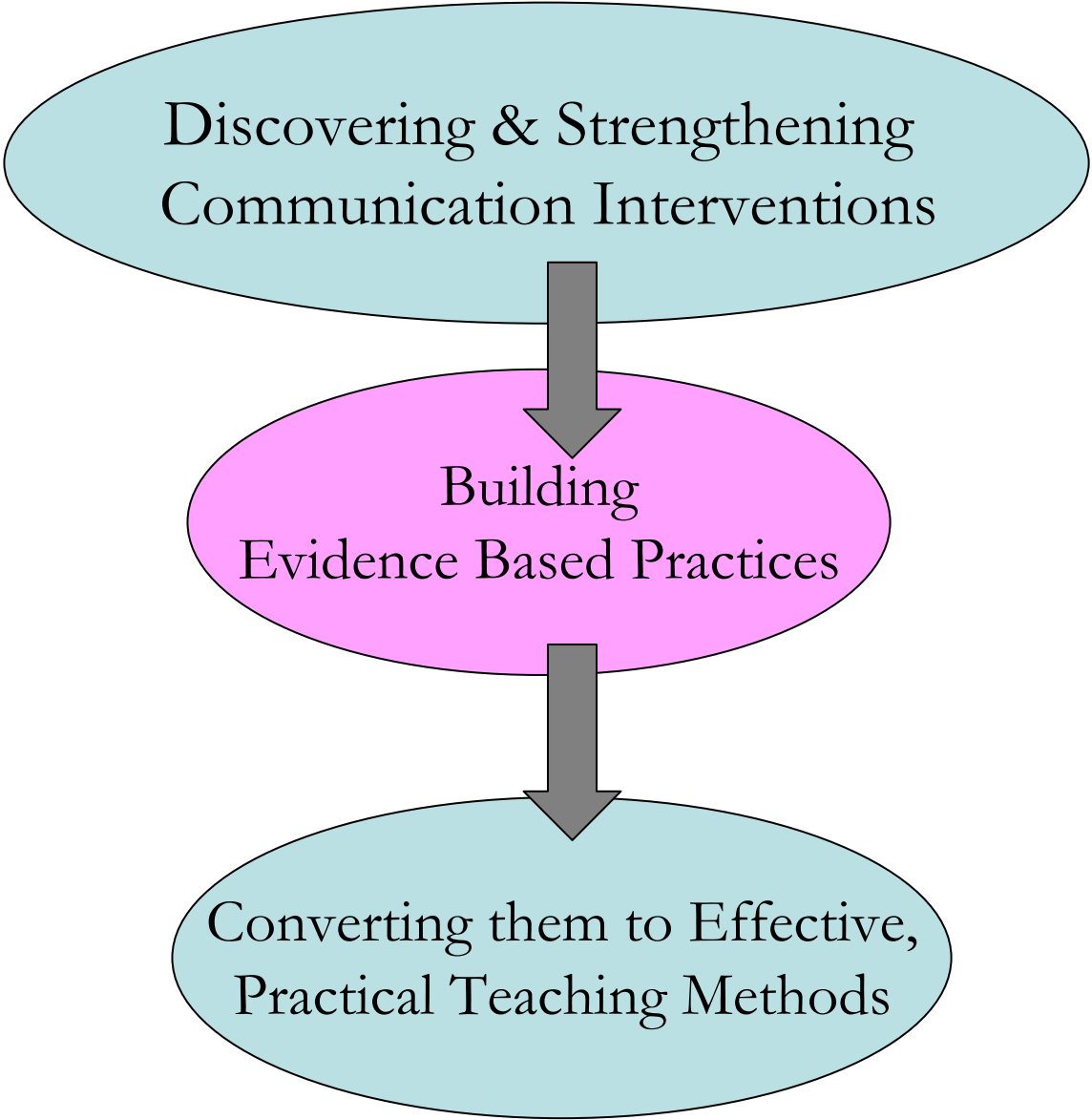
- Identify distinct intervention practices
 - We did not classify interventions by specific treatment components
 - Field needs taxonomy of methods (Hepting & Goldstein, 1996)
- Report treatment intensity & duration
 - Proved difficult to identify dosage of intervention
 - Similar problems reported by others (Howlin et al., 2009)
 - Necessary to understand interventions and their effects (Goldstein, 2002)
- Describe participants clearly

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graph TD; A([Discovering & Strengthening Communication Interventions]) --> B([Building Evidence Based Practices]); B --> C([Converting them to Effective, Practical Teaching Methods]);
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Discovering & Strengthening
Communication Interventions

Building
Evidence Based Practices

Converting them to Effective,
Practical Teaching Methods

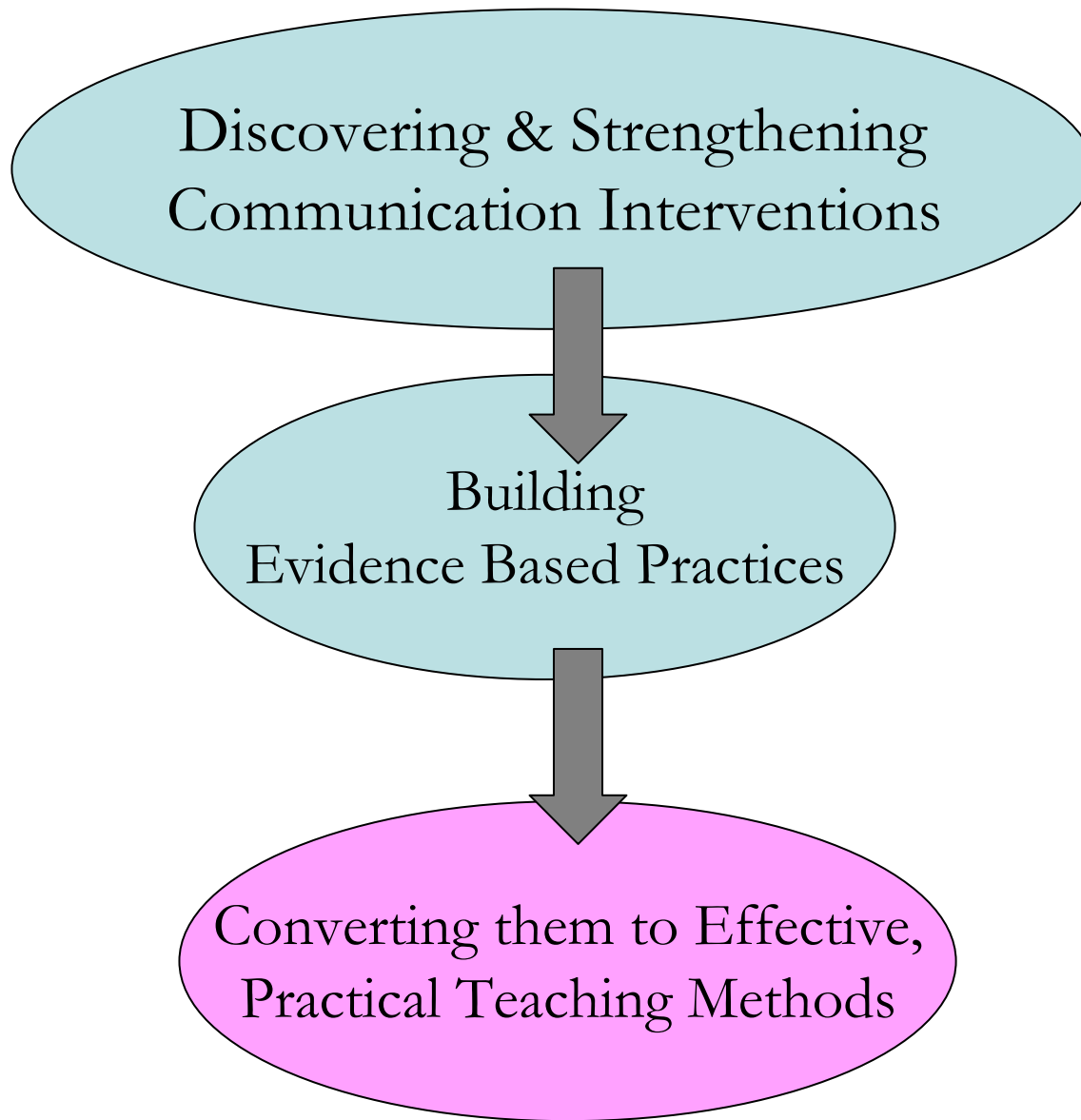


What makes an evidence-based practice ?

Criteria for single subject design research

1. *A series* of single-subject studies demonstrating positive effects for an intervention (more than 9)
2. Individual studies that have solid experimental design characteristics
3. Best if intervention is compared to another intervention or treatment, rather than to no treatment
4. Participants must be described clearly
5. Researchers must define treatment in replicable terms (measure and report acceptable procedural fidelity, use a treatment manual)

(Horner, Carr, Halle, McGee, Odom, & Wolery, 2005; Lonigan, Ebert, & Johnson, 1998)



Our teaching methods should be ...

Effective,
evidence-based

+

Practical / “Doable”

- Usable in classrooms (general education), homes, community settings
- By teachers, speech therapists, assistants, parents, maybe peers
- Defined in a manual...
- So it can be applied consistently
- Approaches described for getting skill maintenance and generalization

(Horner et al., 2005; Schlosser, 2003; Schlosser & Lee, 2003)

Future research

- Intervention packages & combinations of methods
 - Most interventions combine methods (i.e., mean 5.5, range 1-9: Snell, Chen, & Hoover, 2006)
 - Test intervention components: Which have effect? Are all necessary?
- Student preference for teaching methods: Motivation effect
 - Can we test and match?
- Methods fit some students better
 - Can we identify learner characteristics?
- Naturalistic approaches vs. isolated, massed “discrete trial” approaches
 - Contextualized, distributed trials, with choices, more than one student, functional goals, multiple settings and instructors, peers as partners
- The wide world of simple to use, portable, cheap technology



Message to go home with

- A database of 116 communication intervention studies
 - with individuals who have severe disabilities
 - conducted over the past two decades
 - demonstrates successful outcomes
- 95.7% of the studies reviewed reported
 - immediate and positive effects of the communication intervention on the participant with severe disabilities