

**Supplemental Material S2.** Types of outcome measures reported across domains of the Speech Outcome Reporting Taxonomy (SORT) for 220 peer-reviewed published articles on intervention for children with phonological impairment.<sup>1</sup>

Authors <sup>2</sup>	Year	N	Age <sup>3</sup> (min)	Age (max)	Domains of the Speech Outcome Reporting Taxonomy <sup>4</sup>										Tidier Rating <sup>6</sup>
					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Adams et al.	2000	65	42	60		S				S, Oth					63.6%*; 54.6%*
Allen	2013	54	36	65						S					100.0%*; 100.0%**
Almost & Rosenbaum	1998	26	33	61						S, Oth	S				54.6%*
Alsaad et al.	2019	1	50	50	S					S					81.8%*
Bagetti et al.	2012	7	46	81		S	S			S					36.4%*
Baker & McLeod	2004	2	52	57	S	S	S								72.7%*
Barberena et al.	2014	8	65 <sup>m</sup>	65 <sup>m</sup>		S	S								54.6%*
Barlow	2005	4	45	45	S		S								72.7%*
Bedore et al.	1994	1	52	52	S	S	S								72.7%*
Bellon-Harn & Credeur-Pampolina	2016	2	64	67	S	S				S	S				90.9%*
Bellon-Harn et al.	2013	2	50	56						S, Oth					100.0%*
Bellon-Harn et al.	2004	3	68	70	S, Oth	S, Oth				S					72.7%*
Bernhardt	1992	1	70	70	S	S	S								54.6%*
Bernhardt & Gilbert	1992	1	40	40	S	S	S								54.6%*; 54.6%*
Bernhardt & Major	2005	12	73	101						S, Oth	S, Oth				72.7%*; 72.7%*
Blache et al.	1981	7	64	79			S								45.5%*
Bowen & Cupples	1999 <sup>a</sup>	22	35	48						S, T					72.7%*
Bowen & Cupples	1999 <sup>b</sup>	1	53	53	S	S	S			S	S, Oth				63.6%*
Bowen & Cupples	1998	1	52	52		S	S			S	S, Oth				63.6%*
Broen & Westman	1990	20	43	60		S					S				63.6%*

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					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Broomfield & Dodd	2011	730	0	132						S					54.6%*
Bryan & Howard	1992	1	58	58	S	S				Oth					54.6%*
Camaratta	1993	2	46	51	S			S				D			91.70%
Ceron & Keske-Soares	2013	5	50	107		S	S		S						63.6%*
Ceron & Keske-Soares	2012	5	50	107					S						45.5%*
Ceron et al.	2010	21	67	67		S	S		S						27.2%*; 27.2%*; 27.2%*
Ceron et al.	2013	94	45	101					S						36.4%*; 36.4%*; 36.4%*
Checalin et al.	2010	3	72	84			S		S						27.2%*
Combiths et al.	2019	1	62	62			S		S						72.7%*
Conture et al.	1993	8	54	85		S			Oth						63.6%*
Crosbie et al.	2005	18	56	77					S						81.8%*; 81.8%*
Crosbie et al.	2006	1	84	84					S						81.8%*
Cullata et al.	2005	1	69	69					S						72.7%*
Cummings & Barlow	2011	4	36	81	S	S	S								72.7%*
Cummings et al.	2019	24	42	82	S	S			S						81.8%*
Dean et al.	1995	13	43	55		S	S								72.7%*
Denne et al.	2005	20	60	84					S	S, Oth					72.7%*
Dinnsen & Gierut	2008	1	59	59	T	S	S								45.5%*
Dinnsen et al.	1992	34	40	80	T				S						45.5%*
Dodd & Barker <sup>7</sup>	1990	11	25	59		S	S		S		S				63.6%*; 63.6%*
Dodd & Bradford	2000	3	41	51	S	S	S		S	Oth					54.6%*; 54.6%*; 54.6%*

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					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Dodd & Iacono	1989	7	36	57			S		S	S	S				72.7%*
Dodd et al.	2008	19	47	77					S						81.8%*; 81.8%*
Donicht et al.	2011	4	48	76		S	S		S						36.4%*; 36.4%*
Duan & Zhang	2020	40	72	89		S									18.2%*; 18.2%*
Dunn & Baron	1982	1	59	59	S	S	S, Oth								63.6%*
Eikeseth & Næssert	2003	2	64	72	S	S	S		S						100.0%*
Eiserman et al.	1990	40	37	58					S, Oth	S, Oth	S			M	81.8%*; 81.8%*
Eiserman et al.	1992	40	37	58						S, Oth				M	81.8%*; 81.8%*
Elbert	1983	1	46	46		S	S		S						72.7%*
Elbert & McReynolds	1985	4	42	57	T	S	S								54.6%*
Elbert et al.	1990	10	43	69		S			S						63.6%*
Elbert et al.	1991	19	42	80	T	T									72.7%*
Farquharson et al.	2020	126	60	96					S						36.4%*
Feehan et al.	2015	2	79	79		S, Oth	S		S, Oth						72.7%*; 72.7%*
Fey & Stalker	1986	1	81	81		S	S, Oth								72.7%*
Fey et al.	1994	26	40	77					S	Oth					54.6%*; 63.6%*
Flanagan & Ttofari Eecen	2018	5	39	59					S						72.7%*
Flint & Costello Ingham	2005	7	48	67		S	S								58.30%
Forrest & Elbert	2001	4	59	63		S									45.5%*
Forrest & Iuzzini-Seigel	2008	10	39	75		S	S								72.7%*; 72.7%*
Forrest et al.	1997	14	42	69		S									63.6%*

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					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Forrest et al.	2000	10	40	54		S			S						54.6%*
Geronikou et al.	2019	1	50	50	S	S, Oth	S, Oth		S, Oth						63.6%*
Gibbon et al.	1992	1	48	48					S						63.6%*
Gierut	1989	1	55	55		S	S								72.7%*
Gierut	1990	3	49	58		S	S								63.6%*; 63.6%*
Gierut	1991	3	50	64		S	S								72.7%*; 72.7%*
Gierut	1992	4	42	60		S	S								72.7%*; 72.7%*
Gierut	1994	15	41	68					S	S					27.3%*
Gierut	1996	7	40	68					S						45.5%*
Gierut	1998	6	38	87		S	S								63.6%*
Gierut <sup>7</sup>	1999	11	38	92	S	S	S								72.7%*; 72.7%*
Gierut & Champion	1999	2	48	56		S	S								45.5%*
Gierut & Champion	2000	1	53	53	S	S	S								45.5%*
Gierut & Champion	2001	8	40	75	S	S	S		S						50.0%*
Gierut & Dinnsen	1987	6	43	54		S	S		S						36.4%*
Gierut & Morrisette	1996	2	53	68	S	S			S						63.6%*
Gierut & Morrisette	2010	4	42	67	S										90.9%*
Gierurt & Morrisette	2012 <sup>a</sup>	10	46	71	S				S						54.6%*
Gierurt & Morrisette	2012 <sup>b</sup>	8	36	65					S						54.6%*
Gierut & Morrisette	2014	9	54 <sup>m</sup>	54 <sup>m</sup>	S, T	S									81.8%*
Gierut & Morrisette <sup>7</sup>	2015	12	40	65	S	S			S						90.9%*; 90.9%*
Gierut & Neuman	1992	1	56	56	S	S	S								63.6%*; 63.6%*

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					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Gierut et al.	1987	6	43	54		S	S								54.6%*
Gierut et al. <sup>7</sup>	1996	9	41	66		S	S		S						54.6%*; 54.6%*
Gierut et al.	1999	12	36	88	S	S									45.5%*
Gierut et al.	2010	60	37	89		S	S								45.5%*
Gierut et al.	2015	135	36	84	S, T				S						81.8%*
Gildersleeve-Neumann & Goldstein	2015	2	66	68		S	S		S						72.7%*
Gillon	2005	12	36	47					S, Oth	Oth					90.9%*; 90.9%*
Gillon	2000	91	60	90					S, Oth	Oth					72.7%*
Girolametto et al.	1997	25	23	33					S, Oth						81.8%*
Glaspey & MacLeod	2010	1	41	41		S				S					63.6%*
Glaspey & Stoel-Gammon	2005	1	43	43		S			S	S					54.6%*
Glaspey & Stoel-Gammon	2007	1	48	48					S	S					45.5%*
Glogowska et al.	2000	159	18	42					S	Oth		M	M		36.4%*
Goldstein	1996	1	41	41		S	S		S						36.4%*
Grawburg & Rvachew	2007	10	57 <sup>m</sup>	57 <sup>m</sup>		S			Oth						45.5%*
Grunwell & Russell	1990	1	51	51					S			D			54.6%*
Grunwell et al.	1988	1	60	60					S	S					54.6%*
Harbers et al.	1999	4	41	50		S, Oth									81.8%*
Hart & Gonzalez	2010	3	43	59	S	S			S						100.0%*
Hesketh et al.	2000	61	42	60					S, Oth	S					63.6%*; 54.6%*
Hesketh et al.	2007	42	48	54					S	Oth					70.0%**
Hodson	1983	1	47	47					S						63.6%*
Hodson et al.	1989	1	60	60					S	S					54.6%*

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					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Hoffman et al.	1990	2	49	49		S			S, Oth	S, Oth					72.7%*; 63.6%*
Hoffman et al.	1996	1	40	40					S, Oth	Oth					54.6%*
Holm & Dodd	2001	2	56	62	S	S	S								63.6%*; 36.4%*; 36.4%*
Holm & Dodd	1999	1	54	54	S		S		S						63.6%*
Holm et al.	1997	1	62	62		S	S		S						63.6%*; 72.7%*
Jarvis	1989	1	57	57					S						72.7%*
Jesus et al.	2019	22	42	75		S			S						90.9%*; 90.9%*
Keske-Soares et al.	2008	66	52	98					S						36.4%*; 27.3%*; 36.4%*
Klein	1996	35	36	70					T	S					45.5%*; 54.6%*
Kwiatkowski & Shriberg	1993	134	56 <sup>m</sup>	56 <sup>m</sup>	S					S					36.4%*
Lancaster et al. <sup>7</sup>	2010	27	40	70						S					63.6%*; 63.6%*
Leahy & Dodd	1987	1	44	44		S			S						63.6%*
Lee	2018	2	58	72		S	S		S	S	S				72.7%*
Leite et al.	2010	66	96	132					S						9.1%*
Leite et al.	2014	47	96	132					S						36.4%*
Lousada et al.	2013	14	48	79		S			S			D			90.9%*; 90.9%*
Lousada et al.	2014	14	48	79							S				72.7%*; 72.7%*
MacLeod & Glaspey	2014	3	36	36		S			S	S					45.5%*

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					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Major & Bernhardt	1998	19	36	59					S	Oth					63.6%*; 63.6%*
Masterson & Daniels	1991	1	44	44		S									72.7%*; 72.7%*
McIntosh & Dodd	2008	3	45	51	T	S			S						72.7%*
McKean et al.	2012	20	39	58	Oth				S	Oth					63.6%*
McLeod & Isaac	1995	1	60	60		S				S					36.4%*
McLeod et al.	2017	123	48	64					S	Oth	S	M	M		90.9%*
McLeod et al.	2020	101	36	72					S	Oth	S				72.7%*; 54.6%*; 63.4%*
Mecrow et al.	2010	35	50	82		S	S		S	Oth		D			63.6%*
Miccio & Elbert	1996	1	40	40		S	S								63.6%*
Miccio & Ingrisano	2000	1	63	63	S	S	S		S						72.7%*
Miccio et al.	1999	4	46	67	S	S	S		S						63.6%*
Monahan	1986	4	65	68		S			S	S					72.7%*
Montgomery & Bonderman	1989	9	37	58					S	S	S				63.6%*
Morrisette & Gierut	2002	8	46	64		S	S								45.5%*
Mota et al.	2005	4	63	89		S	S								36.4%*
Mota et al.	2007	21	48	94					S						27.3%*; 27.3%*; 27.3%*
Murphy et al.	2015	17	84	144					S, Oth	Oth					60.0%**; 60.0%**
Olswang & Bain	1985	3	48	57		S									54.6%*
Ottow-Henning & Keij	2020	31	28	46					S						54.6%*
Page et al.	1994	80	36	70		S									63.6%*

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					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Pagliarin et al.	2009	9	50	78					S						36.4%*; 36.4%*; 36.4%*
Pagliarin et al.	2011	9	50	78		S	S		S						36.4%*; 36.4%*; 36.4%*
Pagliarin et al.	2012	10	51	87			S								58.3%; 50.0%
Palle et al.	2014	6	49	67		S, T	S								45.5%*; 45.5%*; 45.5%*
Pascoe et al.	2018	1	36	36		S	S		S		S				66.70%
Pascoe et al.	2005	1	77	77	S, Oth	S, Oth	S, Oth		S	S, Oth					66.70%
Penney et al.	1994	1	59	59	S, Oth				S						45.5%*
Petinou & Theodorou	2019	1	54	54					S		S				72.7%*
Pieretti et al.	2015	2	49	51		S	S			Oth					54.6%*; 63.6%*
Pollock	1983	1	41	41	S				S						36.4%*
Powell	1991	1	68	68	S	S	S								45.5%*
Powell	1993	6	59	66	S	S	S		S						45.5%*
Powell & Elbert	1984	6	52	75		S	S								45.5%*
Powell et al.	1991	6	59	66	S, T	S	S								63.6%*
Powell et al.	1998	18	42	82	T	S				S					45.5%*; 45.5%*
Powell et al.	1999	5	46	69	S	S	S		S						50.00%
Qiu et al.	2004	24	48	300	S, T										18.2%*
Ray	2002	1	60	60		S			S	S	S				63.6%*
Robb et al.	1999	1	48	48		S	S		S						54.6%*
Rossouw & Pascoe	2018	1	50	50		S	S		S						54.6%*



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					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Rudolph & Wendt	2014	3	51	63		S			S						72.7%*
Ruscello	1995	36	96	144	S										36.4%*; 36.4%*; 18.2%*; 18.2%*
Ruscello et al.	1993	12	49	68					S						72.7%*
Rvachew	1994	27	42	66	S	S, Oth									83.30%
Rvachew & Bernhardt	2010	6	41	52					S						54.6%*
Rvachew & Brosseau-Lapre	2015	72	48	71					S	Oth					90.9%*; 90.9%*; 72.7%*; 72.7%*
Rvachew & Nowak	2001	48	49	51	S	S	S		S	S					63.6%*
Rvachew et al.	2004	34	41	59					S, Oth						63.6%*
Rvachew et al. <sup>7</sup>	1999	23	45	59		S									63.6%*; 63.6%*
Saben & Costello-Ingham	1991	2	45	52	S	S	S								75.00%
Seef-Garbiel et al.	2012	1	61	61	S, Oth	S, Oth	S, Oth		Oth						63.6%*
Shea & Tyler	2001	2	37	43		S	S								54.6%*
Shiller et al.	2010	1	52	52	S	S			S						45.5%*; 72.7%*
Shoaf et al.	2009	1	76	76	S	S	S				S				63.6%*
Shriberg & Kwiatkowski	1982	31	46	108	S, T										63.6%*; 63.6%*
Shriberg & Kwiatkowski	1987	73	33	114		S			S						54.6%*
Shriberg & Kwiatkowski	1990	8	44	67	S, T	S	S								72.7%*
Shriberg et al.	1989	18	42	105	S										81.8%*; 81.8%*

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					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Shriberg et al. <sup>7</sup>	1990	20	35	98	S										81.8%*; 81.8%*; 81.8%*
Smit et al.	2018	13	41	60					S						90.91* 90.91*
Smith et al.	1998	18	68	98						S					18.2%*; 36.4%*
Speake et al.	2012	2	127	127		S			S		S				63.6%*
Stoel-Gammon et al.	2002	1	48	48		S			S	S					45.5%*
Stringfellow & McLeod	1994	1	60	60		S									54.6%*
Sugden et al.	2020	5	39	71	S	S	S		S		S	M			100.0%*
Topbas & Unal	2010	2	72	72		S	S		S						81.8%*; 81.8%*
Tyler	2002	11	58 <sup>9</sup>	58					S, Oth	Oth					54.6%*
Tyler	1995	6	47	71		S	S		Oth						54.6%*
Tyler & Figurski	1994	2	32	34	S	S	S		S						63.6%*
Tyler & Lewis	2005	40	36	71					S						63.6%*; 63.6%*
Tyler & Sandoval	1994	6	42	56		S	S, Oth		Oth	Oth					63.6%*; 72.7%*; 63.6%*
Tyler & Watterson	1991	12	43	67		Oth			S, Oth						45.5%*; 54.6%*
Tyler et al.	1987	4	37	61		S	S								63.6%*; 63.6%*
Tyler et al.	1990	4	58	63		S	S		S						63.6%*
Tyler et al.	1993	7	46	66	T	S	S								63.6%*
Tyler et al.	2011	30	46	62		S, Oth			S, Oth	Oth					100.0%*; 90.9%*

Authors <sup>2</sup>	Year	N	Age <sup>3</sup> (min)	Age (max)	Domains of the Speech Outcome Reporting Taxonomy <sup>4</sup>										Tidier Rating <sup>6</sup>
					1	2a	2b	2c	3	4	5	6 <sup>5</sup>	7 <sup>5</sup>	8 <sup>5</sup>	
Tyler et al.	2002	27	36	71		Oth			S						72.7%*; 72.7%*
Tyler et al.	2003	47	36	71		Oth			S						72.7%*; 63.6%*
Tyler et al.	2003	40	36	71		Oth			S						72.7%*; 72.7%*
Tyler et al.	2006	20	24	71		S			S	S					63.6%*; 63.6%*
Unicomb et al.	2017	5	42	55	T			Oth	S, Oth	Oth					54.6%*
Unicomb et al.	2020	4	82	91				Oth	S, Oth	Oth					54.6%*
Waters et al.	1998	1	60	60								D			27.3%*
Weiner	1981	2	52	58	S	S									63.6%*
Williams	1991	9	44	69		S	S								54.6%*
Williams	2000 <sup>a</sup>	1	41	41	S	S			S						45.5%*
Williams	2000 <sup>b</sup>	10	48	77	T		T		S						54.6%*
Williams	2005	1	77	77	S	S	S		S						54.6%*; 54.6%*
Williams	2012	22	43	72	T				S						45.5%*; 45.5%*; 54.6%*
Wolfe et al.	1988	2	41	55	S	S									27.3%*
Wolfe et al.	2003	9	41	50		S, Oth				Oth					45.5%*; 72.7%*
Wren & Roulstone	2008	33	50	94		S			S	S					72.7%*; 63.6%*
Wren et al.	2001	23	NR	NR					S	Oth		D		D	27.3%*
Yoder et al.	2005	52	43	43	Oth				Oth		S				81.8%*
Young	1987	2	52	53	S	S			S						58.30%*

Note. <sup>1</sup> In this systematic search and review the term *phonological impairment* served as a cover term for a range of terms or diagnostic labels across four decades of research to refer to children reported to have difficulty learning the phonological system of their language.

<sup>2</sup>For formatting purposes, the first author is indicated for articles reporting three or more authors in keeping with APA 7th Edition Guidelines.

<sup>3</sup>Ages reported in whole months. The minimum and maximum age is the same for articles reporting a single case study or study involving twins.

<sup>4</sup>Speech Outcomes Reporting Taxonomy (SORT) Domains including 1 = Intervention data; 2a = Generalization of the intervention target to other response contexts (e.g., nontreatment words, other word positions, conversational speech); 2b = Generalization related to the target (e.g., generalization to other phonemes within and across sound classes); 2c = Stimulus generalization (e.g., generalization to other people and/or other places such as home or school); 3 = Broad measure of generalization in a meaningful context (e.g., percentage of consonants correct [PCC] during conversational speech or a single-word speech assessment; number of phonemes in the child's phonetic inventory); 4 = Broad measure of generalization based on a score (e.g., standard score or percentile rank); 5 = Intelligibility measure; 6 = Measure or description of activity and/or participation; 7 = Measure or description of the child's quality of life; 8 = Measure or description of the impact on others (family/others). Outcome domains 1–5 refer to measures of abilities: S = Speech production measure, T = Measure of Time to meet intervention criteria, Oth = Measure of another ability (i.e., not a measure of speech production). Outcome domains 6–8 refer to measure of the impact of the SSD: M = numerical measure in this domain, D = description capturing this domain.

<sup>5</sup>The tools used to measure the impact of intervention for Domains 6, 7, or 8 were as follows: Glogowska et al. (2000) used the Therapy Outcome Measures (TOMS) (Enderby & Johns, 1997) and McLeod et al. (2017) used the Australian Therapy Outcome Measures (AusTOMS; Perry et al., 2004) to measure children's activity and participation. These same articles also used these tools to report a broader measure of quality of life and/or well-being—Domain 7. McLeod et al. (2017) and Sugden et al. (2020) reported using the FOCUS (Thomas-Stonell et al., 2010) to measure children's activity and participation. McLeod et al. (2017) also reported using the Kiddy-Communication and Attitude Test (KiddyCAT; Vanryckeghem & Brutten, 2006) and Speech Participation and Activity Assessment of Children (SPAA-C; McLeod, 2004) as measures of children's participation and wellbeing. Measure of the impact of intervention on others (Domain 8) was reported by Eiserman and colleagues (1990, 1992) using the Parenting Stress Index (PSI; Abidin, 1990), and the Family Adaptability and Cohesion Evaluation Scales (FACES III; Olson et al. 1985).

<sup>6</sup>TIDieR refers to Hoffman and colleagues' (2014) Template for Intervention Description and Replication. The number of TIDieR ratings reported per article equates to the number of interventions reported in the article. All TIDieR percentages based on valid data. That is, where it may or may not have been appropriate to include an item on the checklist (e.g., Item # 9 on tailoring, and Item # 10 on modifications) this was not included, as we did not want to penalize a study for not including it, where it was not appropriate, in keeping with Sugden et al. (2016). Therefore, \*Tidier percentage based on 11 items deemed appropriate for the study; \*\*TIDieR percentage based on 10 items deemed appropriate for the study.

<sup>7</sup>Article reported > 1 study. Participant number and age range based on total participants in the article.

<sup>8</sup>Participants in Broomfield and Dodd (2011) were reported according to age groups, with the youngest age group 0 < 2 years, hence minimum age of 0.

<sup>9</sup>This is the age of the case study participant reported in Tyler (2002). Outcomes for another 10 children were reported, however their mean age or the age range was not reported.

<sup>m</sup>Mean; NR = not reported.

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