

Table 1. Levels of search terms.

Level 1	Developmental disorder	“development* disorder” OR autis* OR “autism spectrum” OR “asd”
Level 2	Early intervention	“early intervention” OR p?ediatric OR child* OR infant OR toddler OR pre?school OR “young child*” OR “early years”
Level 3	Communication therapy	“language acquisition” OR “language development*” OR “social?comm*” OR “pragmatic*” OR “communication” OR “interaction*”
Level 4	Parent-led	“parent-led” OR “self-directed” OR “parent-mediated” OR “parent-implemented” OR “parent-delivered” OR “parent training” OR “caregiver training”
Level 5	Bilingual	Bilingual* OR multilingual* OR “heritage language*” OR “first language” OR “home language” OR “community language” OR “culturally and linguistically diverse” OR CALD

Table 2. Summary of papers included for review.

Author/Year	Country of undertaking	Evidence source	PLT used	Aim	Design	Sample size	Service delivery	Participant L1 (n)	Participant L2 (n)	Lang. used in study
Abda et al, 2022	US	Dissertation	Pivotal Response Treatment (PRT)	Investigate the effectiveness of a 6-hour training program in Pivotal Response Treatment (PRT) for parents of young children with ASD on the increased use of social functional utterances by their children during play sessions.	SCED - multiple baselines	3 (fathers)	In-person	Arabic (3)	English	English
Bradshaw et al, 2017	US	Primary research article	Pivotal Response Treatment (PRT)	1. Conduct a preliminary investigation of the feasibility, effectiveness, and parent acceptability of a brief, parent-mediated intervention targeting verbal communication for toddlers exhibiting early symptoms of ASD. 2. Determine whether parent implementation of Pivotal Response Treatment (PRT) would result in changes in toddler verbal communication as measured by both the improvement in the frequency and quality of functional verbal communication as well as improvements on standardized tests.	SCED - non-concurrent multiple baselines	3 (2 mothers, 1 parent)	In-person	Unspecified (1) English (2)	English	English
Brian et al, 2022	Canada	Primary research article	The Social ABCs (adapted)	Explore whether there were any differences between in-person and virtual delivery of the group-based program in terms of outcomes, feasibility, or acceptability.	Multiple group comparison	82 (81 parents, 1 grand-mother)	In-person + virtual	Unspecified (21 - most common Spanish, Italian, Tamil, Cantonese, Portuguese) English (61)	English	English
Brown & Woods, 2015	US	Primary research article	KidTalk-TaCTICS Project (KTPP)	Evaluate the effects of a parent-implemented communication intervention on parent and child communication for toddlers with Down syndrome, ASD, and developmental delays.	SCED - non-concurrent multiple baselines	9 (mothers)	In-person	Luganda (1) English (8)	English	English
Coleman and Xu, 2020	US	Primary research article	Direct Trial Instruction (DTI) verbal mand intervention	Demonstrate a model for a parent-implemented DTI mand intervention intended to increase a child's ability to verbally request for preferred items.	SCED	1 (mother)	In-person	Unspecified (1)	English	English
Dodds, 2020	US	Research protocol	Helping Optimize Language Acquisition (HOLA)	1. Measure the effects of the HOLA intervention on parent knowledge of child development, parent PRT fidelity of implementation, and child social communication. 2. Measure parent satisfaction with the intervention and explore the impact of HOLA on parent stress, family empowerment, and child behavior. 3. Assess whether language has an impact on effectiveness of and satisfaction with HOLA.	Single group pre/post study design	n/a	Virtual	Spanish (n/a)	English	Participants' choice
Elder et al, 2003	US	Primary research article	Overt social reciprocity training	1. Heighten father awareness of child interactions. 2. Evaluate the effects of an in-home intervention for autistic children with four culturally different father-child dyads.	SCED - multiple baselines	4 (fathers)	In-person	Japanese (1) Spanish (1) English (2)	English	English
Ingersoll et al, 2016	US	Primary research article	ImPACT	Compare the effect of self-directed and therapist-assisted delivery models of ImPACT Online on key parent and child outcomes in preparation for a fully powered RCT.	RCT	27 (parents)	In-person	Unspecified (NR)	English	English
Liao et al, 2019	Taiwan + US	Secondary research	n/a	Review studies across cultures to summarize the characteristics of single-case studies on caregiver involvement in communication						

		article (systematic review)		interventions for CLD families of individuals with ASD and IDD for recommendations on culturally responsive practices.	n/a					
Lopez et al, 2019	US	Primary research article	Parents Taking Action (PTA)	Test the efficacy of a culturally tailored parent educational intervention for Latinx parents of children with ASD in a Southern California community.	RCT	27 (mothers)	In-person	Spanish (22) English (5)	English	Participants' choice
Meadan et al, 2020	US	Program evaluation article	Parent-implemented Communication Strategies (PiCS)	Evaluate a translated and modified version of the PiCS program to support Spanish-speaking families with young children with autism and other developmental disabilities.	SCED - multiple baselines	7 (mothers)	In-person + virtual	Spanish (7)	English	Participants' choice
Rahman et al, 2015	India + Pakistan	Primary research article	Parent-mediated intervention for Autism Spectrum disorder in South Asia (PASS) - adapted from Preschool Autism Communication Trial (PACT)	1. Assess the feasibility and acceptability of the parent-mediated intervention for autism spectrum disorder in South Asia in India and Pakistan.	RCT	65 (parents)	In-person	Hindi (16), Urdu (35), English (6), Konkani (6), Marathi (2).	Marathi/Konkani (1), English/Konkani (1), Urdu (35), English (5), Konkani (6), Marathi (1),	Participants' choice
Rollins, 2018	US	Primary research article	Pathways Early Autism Intervention (Pathways)	1. Evaluate efficacy of Pathways in remediating the core deficits of sharing emotions in toddlers with ASD when compared to an intervention group without the innovative protocol and a BAU (business as usual) group. 2. Evaluate the efficacy of Pathways and the intervention without the IP in facilitating communication in toddlers with ASD when compared to a BAU group.	RCT	34 (parents)	In-person	Spanish (one third) English (two thirds)	English	Participants' choice
Sengupta et al, 2020	India	Primary research article	Ummeed Parent Program for Autism (UPPA) - adapted from Improving Parents as Communication Teachers (ImPACT)	1. Examine if the content and structure of the intervention are acceptable to Indian parents. 2. Assess if Indian parents are able to implement the intervention. 3. Examine if parents observe any change in their children's social-communication skills after the intervention. 4. Identify if participation in the intervention had any outcome on parental stress.	Single group pre/post study design	114 (parents)	In-person	Unspecified (NR)	Hindi	Hindi
Shire et al, 2022	US	Primary research article	Joint Attention, Symbolic Play, Engagement and Regulation intervention (JASPER)	Explore strategies to support caregivers' intervention implementation with their young children who are at various stages of their ASD diagnostic evaluations in a provincial public social service system where they are eligible for early intervention services.	Multiple group comparison	56 (48 mothers, 6 fathers, 2 grandmothers)	In-person	Unspecified (NR)	English	English
Zeng et al, 2021	US	Primary research article	Parents Taking Action (PTA)	1. Examine maintenance of treatment effects in a culturally tailored parent education program for Latinx families of children with autism spectrum disorder using a behavior maintenance framework.	RCT	109 (mothers)	In-person	Spanish (93) English (16)	English	Participants' choice

Table 3. Description of characteristics of included papers.

Study characteristics	n / 16 (%)	Sample characteristics	n / 541 (%)
Type of evidence source		Caregiver who participated	
Experimental/quasi-experimental study	12 (75.0)	Parent	
Program evaluation	1 (6.3)	Mother	203 (37.5)
Research protocol	1 (6.3)	Father	13 (2.4)
Dissertation	1 (6.3)	Non-specified for gender	322 (59.5)
Systematic review	1 (6.3)	Grandmother	3 (0.6)
Region where the studies were conducted		L1 (home language)	
North America	13 (81.3)	Arabic (Libyan)	3 (0.6)
South Asia	2 (12.5)	English	118 (21.8)
Multiple regions	1 (6.3)	Hindi	130 (24.0)
Methodology used		Japanese	1 (0.2)
RCT ^a	5 (31.3)	Konkani	6 (1.1)
SCED ^b	6 (37.5)	Luganda	1 (0.2)
Single group pre/post study	2 (12.5)	Marathi	2 (0.4)
Multiple group comparison	2 (12.5)	Spanish	133 (24.6)
Systematic review	1 (6.3)	Urdu	35 (6.5)
Method of data collection		Not specified	112 (20.7)
Qualitative	0 (0)	L2 (societal language)	
Quantitative	6 (37.5)	English	363 (66.9)
Mixed/Multi-methods	10 (62.5)	Hindi	149 (27.5)
Average age of child in question		Urdu	30 (5.5)
< 1 year	0 (0)		
1-3 years	10 (62.5)		
4-6 years	5 (31.3)		
7+ years	0 (0)		
Not applicable	1 (6.3)		
Language of PLT delivery			
English	7 (43.7)		
Hindi	1 (6.3)		
Participants' choice	6 (37.5)		
Not applicable	2 (12.5)		

^a Randomised controlled trial

^b Single case experimental design

Table 4. PLT programs and bilingual participants in included papers.

Paper	PLT program	Total participants	Bilingual participants	Language adaptations provided?	Outcomes reported mono- vs bilingually?
Abda, 2021	Pivotal Response Treatment (PRT) ^a	3	3	Yes	No
Bradshaw et al, 2017	PRT ^a	3	1	No	No
Brian et al, 2022	Social ABCs* (adapted)	82	21	No	No
Brown and Woods, 2015	KidTalk-TaCTICS Project (KTTP)(A merger of Enhanced Milieu Teaching (EMT) ^a and Family-Guided Routines-Based Intervention (FGRBI) ^a)	9	1	No	No
Coleman and Xu, 2020	Direct Trial Intervention (DTI) verbal mand instruction	1	1	No	No
Dodds, 2020	Helping Optimize Language Acquisition (HOLA)	n/a – research protocol		Yes	n/a
Elder et al, 2003	Overt Social Reciprocity training (OSR)	4	1		No
Ingersoll et al, 2016	Improving Parents As Communication Teachers (ImPACT) ^a	27	Unspecified “other languages spoken in the home” (p.2277)	NR	No
Liao et al, 2021	n/a – systematic review				
Lopez et al, 2019	Parents Taking Action (PTA) ^b	27	22	Yes	No
Meadan et al, 2020	Parent-implemented Communication Strategies (PiCS)	7	7	Yes	No
Rahman et al, 2016	Parent- mediated intervention for Autism Spectrum disorder in South Asia (PASS) (adapted from Preschool Autism Communication Trial (PACT) ^c)	65	65	Yes	No
Rollins, 2018	Pathways Early Autism Intervention (Pathways) ^a	34	Unspecified “a third” (p.21)	Yes	No
Sengupta et al	Ummeed Parent Program for Autism (UPPA) (adapted from ImPACT ^a)	114	Unspecified (service delivered in Hindi, measures taken in English)	NR	No
Shire et al	Joint Attention, Symbolic Play, Engagement and Regulation intervention (JASPER) ^a	56	10 (inferred from “17.86%” (p.657))	NR	No
Zeng et al	PTA ^b	109	93	Yes	No

^a Program available as a clinical service provided by certified practitioners.

^b Broader than PLT to include psychoeducation, community advocacy, and other parent empowerment topics beyond support strategies training.

^c Clinically available as Paediatric Autism Communication Therapy (PACT).

Table 5. Summary of parent and child outcomes.

Paper	PARENT OUTCOMES					CHILD OUTCOMES				
	Increased responsiveness to child communication?	Increased use of intervention strategies?	Decreased parent stress?	Acceptable/feasible?	Positive satisfaction?	Increased language/communication opportunities?	Increased expression of needs and wants?	Increased exchange of information?	Increased responses to parent communication?	Increased spontaneous language/communication?
Abda, 2021	yes	yes	NR	yes	yes	yes	yes	NR	yes	yes
Bradshaw et al, 2017	yes	yes	yes (2 out of 3)	yes	yes	yes	yes	yes	yes	yes
Brian et al, 2022	NR	NR	yes	yes	yes	NR	NR	NR	yes	NR
Brown and Woods, 2015	yes	yes (8 out of 9)	NR	yes	yes	yes	NR	NR	yes	NR
Coleman and Xu, 2020	NR	yes	NR	yes	yes	yes	yes	NR	yes	yes
Dodds, 2020	RESEARCH PROTOCOL									
Elder et al, 2003	yes (3 out of 4)	yes (3 out of 4)	yes (3 out of 4)	yes	yes	NR	NR	NR	yes	NR
Ingersoll et al, 2016	NR	yes	yes	yes	yes	Improvement in VAB-2 ^a scores				
Liao et al, 2021	SYSTEMATIC REVIEW									
Lopez et al, 2019	yes	yes	yes	yes	yes	Improvement in SCQ ^b scores				
Meadan et al, 2020	yes	yes	NR	yes	yes	yes	NR	yes	yes	NR
Rahman et al, 2016	yes	yes	NR	yes	yes	Improvement in VABS-2 ^a and MBCDI ^c scores				
Rollins, 2018	yes	yes	NR	yes	yes	yes	NR	NR	yes	NR
Sengupta et al, 2020	yes	NR	yes	yes	NR	NR	NR	NR	yes	NR
Shire et al, 2022	NR	yes	NR	yes	NR	no	no	no	no	no
Zeng et al, 2022	NR	yes	NR	yes	yes	NR	NR	NR	yes	NR

NR: Not reported

^a Vineland Adaptive Behavior Scales-Second Edition

^b Social Communication Questionnaire

^c MacArthur-Bates Communicative Development Inventories

Figure 1. Search strategy.

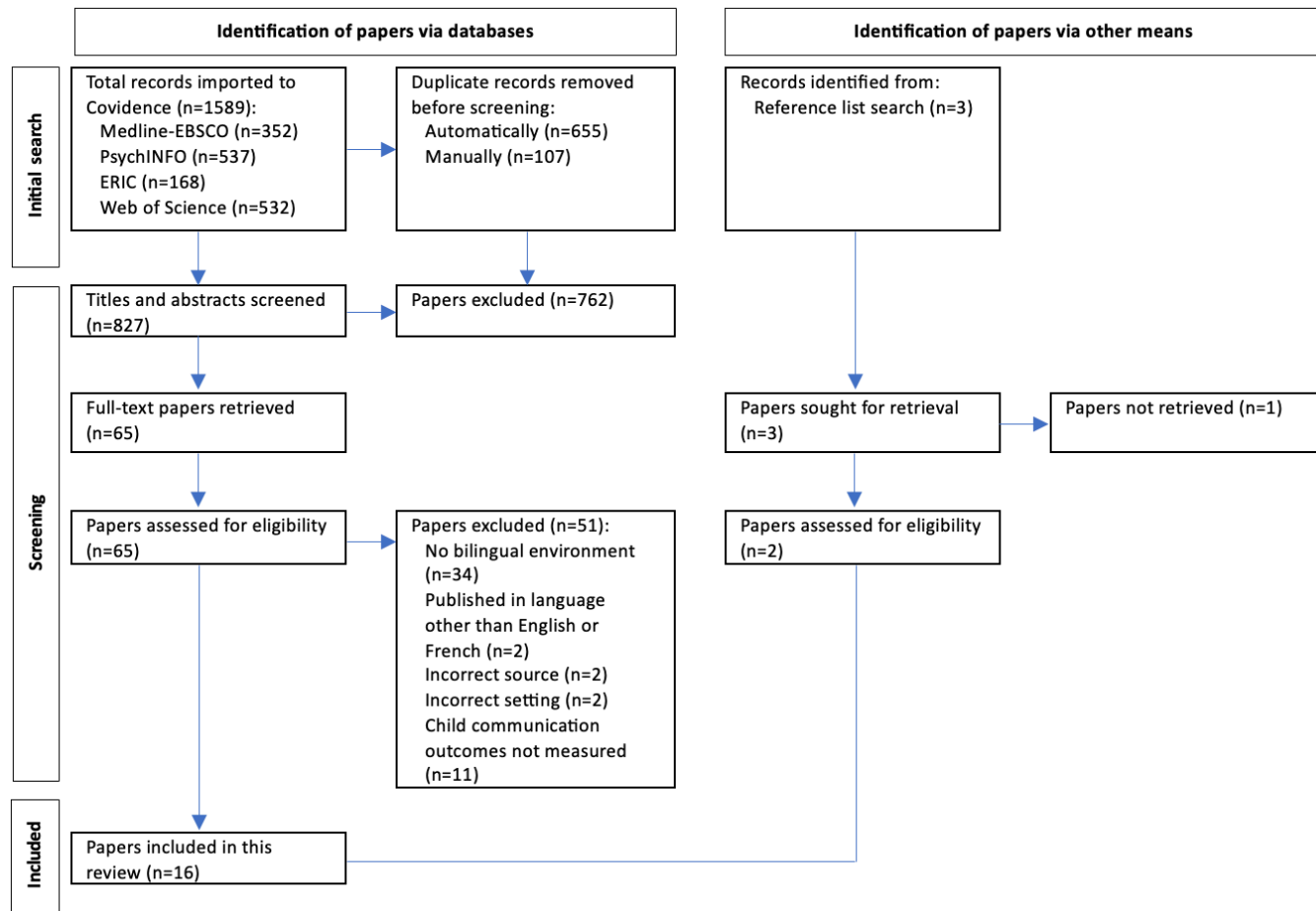


Figure 2. Timeline of publications of PLTs measured in bilingual environments.

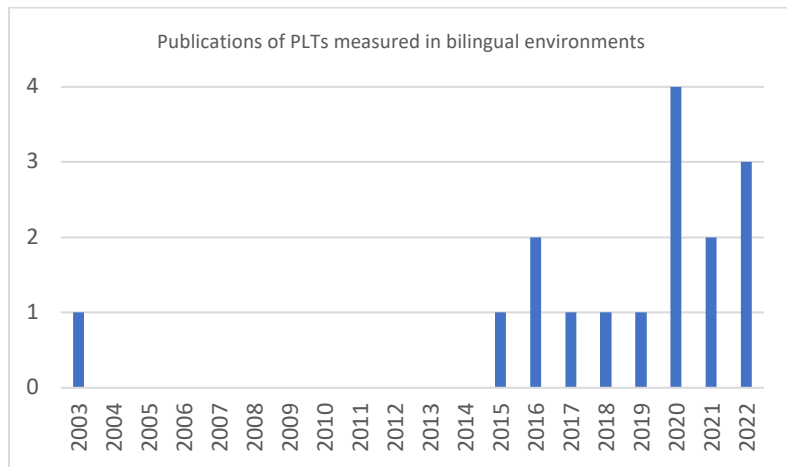


Figure 3. Timeline of sample size per publication.

