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APPENDIX A: Systematic Review

1.1 List of included studies

1. Adamson, L. B., Romski, M., Bakeman, R., & Sevcik, R. A. (2010). Augmented language intervention and the emergence of symbol-infused joint engagement. *Journal of Speech, Language, and Hearing Research*, 53(6), 1769-1773.
2. Basil, C. (1992). Social interaction and learned helplessness in severely disabled children. *AAC: Augmentative and Alternative Communication*, 8(3), 188-199.
3. Calculator, S. N. (2002). Use of enhanced natural gestures to foster interactions between children with Angelman syndrome and their parents. *American Journal of Speech-Language Pathology*, 11(4), 340-355.
4. Calculator, S. N. (2016). Description and evaluation of a home-based, parent-administered program for teaching enhanced natural gestures to individuals with Angelman syndrome. *American Journal of Speech-language Pathology*, 25(1), 1-13.
5. Hancock, T. and Kaiser, A (1996) Siblings' Use of Milieu Teaching at Home. *Topics in Early Childhood Special Education Summer*, 16(2), 168-190.
6. James, S. D., & Egel, A. L. (1986). A direct prompting strategy for increasing reciprocal interactions between handicapped and nonhandicapped siblings. *Journal of Applied Behavior Analysis*, 19(2), 173-186.
7. Kent-Walsh, J., Binger, C., & Hasham, Z. (2010). Effects of parent instruction on the symbolic communication of children using augmentative and alternative communication during storybook reading. *American Journal of Speech-Language Pathology*, 19(2), 97-107.
8. Koppenhaver, D. A., Erickson, K. A., & Skotko, B. G. (2001). Supporting communication of girls with Rett syndrome and their mothers in storybook reading. *International Journal of Disability, Development and Education*, 48(4), 395-410.
9. Koppenhaver, D. A., Erickson, K. A., Harris, B., McLellan, J., Skotko, B. G., & Newton, R. A. (2001). Storybook-based communication intervention for girls with Rett syndrome and their mothers. *Disability and Rehabilitation*, 23(3-4), 149-159.
10. Romski, M., Sevcik, R. A., Adamson, L. B., Cheslock, M., & Smith, A. (2007). Parents can implement AAC interventions: Ratings of treatment implementation across early language interventions. *Early Childhood Services: An Interdisciplinary Journal of Effectiveness*, 1(4), 249-259.
11. Romski, M., Sevcik, R. A., Adamson, L. B., Cheslock, M., Smith, A., Barker, R. M., & Bakeman, R. (2010). Randomized comparison of augmented and nonaugmented language interventions for toddlers with developmental delays and their parents. *Journal of Speech, Language, and Hearing Research*, 53(2), 350-364.

12. Rosa-Lugo, L., & Kent-Walsh, J. (2008). Effects of parent instruction on communicative turns of Latino children using augmentative and alternative communication during storybook reading. *Communication Disorders Quarterly*, 30(1), 49-61.
13. Skotko, B. G., Koppenhaver, D. A., & Erickson, K. A. (2004). Parent reading behaviours and communication outcomes in girls with Rett syndrome. *Exceptional Children*, 70(2), 145.
14. Smith, A., Ronski and Sevcik (2013) Examining the role of communication on sibling relationship quality and interaction for sibling pairs with and without a developmental disability. *American Journal on Intellectual and Developmental Disabilities*, 118 (5):394-409.
15. Stiebel, D. (1999). Promoting augmentative communication during daily routines: A parent problem-solving intervention. *Journal of Positive Behavior Interventions*, 1(3), 159-169.
16. Thunberg, G., Ahlsén, E., & Sandberg, A. D. (2007). Children with autistic spectrum disorders and speech-generating devices: Communication in different activities at home. *Clinical Linguistics & Phonetics*, 21(6), 457-479.
17. Thunberg, G., Ahlsen, E., & Sandberg, A. D. (2009). Interaction and use of speech-generating devices in the homes of children with autism spectrum disorders--an analysis of conversational topics. *Journal of Special Education Technology*, 24(2), 1-16.
18. Trent-Stainbrook A, Kaiser AP, & Frey JR. (2007). Older siblings' use of responsive interaction strategies and effects on their younger siblings with Down syndrome. *Journal of Early Intervention*, 29(4), 273-286.
19. Tzuriel, D. and Hanuka-Levy, D. (2014) Siblings' Mediated Learning Strategies in Families With and Without Children With Intellectual Disabilities. *American Journal on Intellectual and Developmental Disabilities*, 119:6, 565-588.
20. Walton, K. & Ingersoll, B. (2012). Evaluation of a sibling-mediated imitation intervention for young children with autism. *Journal of Positive Behavior Interventions*, 14, 241-253.
21. Wright, C. A., Kaiser, A. P., Reikowsky, D. I., & Roberts, M. Y. (2013). Effects of a naturalistic sign intervention on expressive language of toddlers with Down syndrome. *Journal of Speech, Language, and Hearing Research*.

1.2 Excluded studies with reason

	Article	Reason for Exclusion	Code
1	Axelsson, A. K., Granlund, M., & Wilder, J. (2013). Engagement in family activities: A quantitative, comparative study of children with profound intellectual and multiple disabilities and children with typical development. <i>Child: Care, Health and Development</i> , 39(4), 523-534.	Comparative study not an intervention study	3
2	Baker, M. J. (2000). Incorporating the thematic ritualistic behaviors of children with autism into games: Increasing social play interactions with siblings. <i>Journal of positive behavior interventions</i> , 2(2), 66-84.	Intervention in university playrooms	2
3	Barton-Hulsey, A., Wegner, J., Brady, N. C., Bunce, B. H., & Sevcik, R. A. (2017). Comparing the Effects of Speech-Generating Device Display Organization on Symbol Comprehension and Use by Three Children With Developmental Delays. <i>American journal of speech-language pathology</i> , 26(2), 227-240.	Intervention focused on SGDs did not involve the family.	2
4	Berry, J. O. (1987). Strategies for involving parents in programs for young children using augmentative and alternative communication. <i>Augmentative and Alternative Communication</i> , 3(2), 90-93.	Research article not an intervention study	3
5	Binger, C., Kent-Walsh, J., Berens, J., Del Campo, S., & Rivera, D. (2008). Teaching latino parents to support the multi-symbol message productions of their children who require AAC. <i>Augmentative and Alternative Communication</i> , 24(4), 323-338.	Children do not have ID	2
6	Brady, N. C., Thiemann-Bourque, Fleming, K., & Matthews, K. (2013). Predicting language outcomes for children learning augmentative and alternative communication: Child and environmental factors. <i>Journal of Speech, Language, and Hearing Research</i> , 56, 1595-1612.	Intervention did not involve the family.	2
7	Brady, Warren, Fleming, Keller and Sterling (2014) Effect of Sustained Maternal Responsivity on Later Vocabulary Development in Children With Fragile X Syndrome. <i>Journal of Speech, Language, and Hearing Research</i> , February 2014, Vol. 57, 212-226.	Intervention did not involve the family.	2
8	Brian, J. A., Smith, I. M., Zwaigenbaum, L., Roberts, W., & Bryson, S. E. (2016). The SocialABCs caregiver-mediated intervention for toddlers with autism spectrum disorder: Feasibility, acceptability, and evidence of promise from a multisite study. <i>Autism Research</i> , 9(8), 899–912. https://doi.org/10.1002/aur.1582	Social ABCs not involving an AAC intervention.	1
9	Broberg, M., Ferm, U., & Thunberg, G. (2012). Measuring responsive style in parents who use AAC with their children: Development and evaluation of a new instrument. <i>AAC: Augmentative and Alternative Communication</i> , 28(4), 243-253.	Evaluation of an instrument – not an intervention study	2
10	Buschmann, A., Jooss, B., Rupp, A., Feldhusen, F., Pietz, J., & Philippi, H. (2009). Parent based language intervention for 2-year-old children with specific expressive language delay: a randomised controlled trial. <i>Archives of disease in childhood</i> , 94(2), 110-116.	HPLI language intervention not an AAC intervention study	1
11	Castorina, L. L., & Negri, L. M. (2011). The inclusion of siblings in social skills training groups for boys with Asperger syndrome. <i>Journal of Autism and Developmental Disorders</i> , 41(1), 73–81.	Pilot investigation. Sessions in psychology clinic. Participants have Asperger syndrome and are high functioning.	3
12	Chaabane, D. B., Alber-Morgan, S. R., & DeBar, R. M. (2009). The effects of parent-implemented PECS training on improvisation of mands by children with autism. <i>Journal of Applied Behavior Analysis</i> , 42(3), 671-677.	Children do not have ID	2
13	Cologon, K., Wicks, L., & Salvador, A. (2017). Supporting caregivers in developing responsive communication partnerships with their children: Extending a caregiver-led interactive language program. <i>Child Language Teaching and Therapy</i> , 33(2), 157–169.	ITTT intervention not involving AAC intervention	1
14	Cress, C. J., Moskal, L., & Hoffmann, A. (2008). Parent directiveness in free play with young children with physical impairments. <i>Communication Disorders Quarterly</i> , 29(2), 99-108.	observational study not an intervention study	3

15	Cress, C.J., Grabast, & Burgers Jerke (2013) Contingent Interactions Between Parents and Young Children With Severe Expressive Communication Impairments. <i>Communication Disorders Quarterly</i> 02/2013; 34(2):81-96	observational study not an intervention study	3
16	Cumley, G. D., & Swanson, S. (1999). Augmentative and alternative communication options for children with developmental apraxia of speech: Three case studies. <i>AAC: Augmentative and Alternative Communication</i> , 15(2), 110-125.	Case study	3
17	Del Giudice, E., Titomanlio, L., Brogna, G., Bonaccorso, A., Romano, A., Mansi, G., . . . Andria, G. (2006). Early intervention for children with down syndrome in southern Italy: The role of parent-implemented developmental training. <i>Infants & Young Children</i> , 19(1), 50-58. doi:10.1097/00001163-200601000-00006	CCITSN not an AAC intervention study	1
18	Dodd, S., Hupp, S. D., Jewell, J. D., & Krohn, E. (2008). Using parents and siblings during a social story intervention for two children diagnosed with PDD-NOS. <i>Journal of Developmental and Physical Disabilities</i> , 20(3), 217-229.	Children do not have IDD	2
19	Ferm, U., Ahlsén, E., & Björck-Åkesson, E. (2012). Patterns of communicative interaction between a child with severe speech and physical impairments and her caregiver during a mealtime activity. <i>Journal of Intellectual and Developmental Disability</i> , 37(1), 11-26.	Case study involving one child	3
20	Fey, M. E., Yoder, P. J., Warren, S. F., & Bredin-Oja, S. L. (2013). Is More Better? Milieu Communication Teaching in Toddlers With Intellectual Disabilities. <i>Journal of Speech, Language & Hearing Research</i> , 56(2), 679–693.	Milieu communication teaching not an AAC intervention	1
21	Fey, M., Warren, S., Brady, N., Finestack, L., Bredin-Oja, S., Fairchild, M., . . . Yoder, P. (2006). Early effects of responsivity education/prelinguistic milieu teaching for children with developmental delays and their parents. <i>Journal of Speech Language and Hearing Research</i> , 49(3), 526-547.	Milieu communication teaching not an AAC intervention.	1
22	Finke, E. H., Davis, J. M., Benedict, M., Goga, L., Kelly, J., Palumbo, L., ... & Waters, S. (2017). Effects of a least-to-most prompting procedure on multisymbol message production in children with autism Spectrum disorder who use augmentative and alternative communication. <i>American journal of speech-language pathology</i> , 26(1), 81-98.	Intervention did not involve the family.	2
23	Ganz, J. B., Heath, A. K., Rispoli, M. J., & Earles-Vollrath, T. L. (2010). Impact of AAC versus verbal modeling on verbal imitation, picture discrimination, and related speech: A pilot investigation. <i>Journal of Developmental and Physical Disabilities</i> , 22(2), 179-196.	single-case design comparing PECS with verbal modelling not involving the family.	2
24	Gengoux, G., Berquist, K., Salzman, E., Schapp, S., Phillips, J., Frazier, T., ... Hardan, A. (2015). Pivotal Response Treatment Parent Training for Autism: Findings from a 3-Month Follow-Up Evaluation. <i>Journal of Autism & Developmental Disorders</i> , 45(9), 2889–2898. https://doi.org/10.1007/s10803-015-2452-3	Pivotal response training not an AAC intervention	1
25	Goldbart, J., & Marshall, J. (2004). "Pushes and pulls" on the parents of children who use AAC. <i>AAC: Augmentative and Alternative Communication</i> , 20(4), 194-208.	Parent perceptions	2
26	Granlund, M., Björck-Åkesson, E., Wilder, J., & Ylvén, R. (2008). AAC interventions for children in a family environment: Implementing evidence in practice. <i>AAC: Augmentative and Alternative Communication</i> , 24(3), 207-219.	Research article	3
27	Green, J., Pickles, A., Pasco, G., Bedford, R., Wan, M. W., Elsabbagh, M., ... & Charman, T. (2017). Randomised trial of a parent-mediated intervention for infants at high risk for autism: longitudinal outcomes to age 3 years. <i>Journal of Child Psychology and Psychiatry</i> , 58(12), 1330-1340.	Parent-mediated intervention not an AAC intervention	1
28	Hanzlik, J. R. (1989). The effect of intervention on the free-play experience for mothers and their infants with developmental delay and cerebral palsy. <i>Physical & Occupational Therapy in Pediatrics</i> , 9(2), 33–51.	Free play experience not an AAC intervention.	1
29	Hodes, M. W., Meppelder, H. M., Schuengel, C., & Kef, S. (2014). Tailoring a video-feedback intervention for sensitive discipline to parents with intellectual disabilities: A process evaluation. <i>Attachment & Human Development</i> , 16(4), 387-401.	Video-feedback Intervention to promote Positive	1

		Parenting with additional focus on Sensitive Discipline; VIPP-SD. not an AAC intervention	
30	Huskens, B., Palmen, A., Van der Werff, M., Lourens, T., & Barakova, E. (2015). Improving collaborative play between children with autism spectrum disorders and their siblings: The effectiveness of a robot-mediated intervention based on Lego® therapy. <i>Journal of autism and developmental disorders</i> , 45(11), 3746-3755.	Children do not have an intellectual disability.	2
31	Ingersoll, B., & Gergans, S. (2007). The effect of a parent-implemented imitation intervention on spontaneous imitation skills in young children with autism. <i>Research in Developmental Disabilities</i> , 28(2), 163-175.	RIT not an AAC intervention	1
32	Ingersoll, B., & Wainer, A. (2013). Initial efficacy of Project ImPACT: A parent-mediated social communication intervention for young children with ASD. <i>Journal of Autism and Developmental Disorders</i> , 43(12), 2943-2952.	ImPACT not an AAC intervention	1
33	Johnson, S., Whitelaw, A., Glazebrook, C., Israel, C., Turner, R., White, I. R., ... & Marlow, N. (2009). Randomized trial of a parenting intervention for very preterm infants: outcome at 2 years. <i>The Journal of Pediatrics</i> , 155(4), 488-494.	PBIP not an AAC intervention	1
34	Jones, C. D., & Schwartz, I. S. (2004). Siblings, peers, and adults: Differential effects of models for children with autism. <i>Topics in Early Childhood Special Education</i> , 24(4), 187-198.	Interventions happened in the classrooms	2
35	Jonsson, A., Kristoffersson, L., Ferm, U., & Thunberg, G. (2011). The ComAlong communication boards: Parents' use and experiences of aided language stimulation. <i>AAC: Augmentative and Alternative Communication</i> , 27(2), 103-116.	Parents' perceptions	2
36	Jurgens, A., Anderson, A., & Moore, D. W. (2012). Parent-implemented picture exchange communication system (PECS) training: an analysis of youtube videos. <i>Developmental neurorehabilitation</i> , 15(5), 351-360.	No information about the participants	2
37	Kaale, A., Fagerland, M. W., Martinsen, E. W., & Smith, L. (2014). Preschool-based social communication treatment for children with autism: 12-month follow-up of a randomized trial. <i>Journal of the American Academy of Child & Adolescent Psychiatry</i> , 53(2), 188-198. https://doi-org.chain.kent.ac.uk/10.1016/j.jaac.2013.09.019	Joint attention intervention not an AAC intervention	1
38	Kaale, A., Smith, L., & Sponheim, E. (2012). A randomized controlled trial of preschool-based joint attention intervention for children with autism. <i>Journal of Child Psychology and Psychiatry</i> , 53(1), 97-105.	Joint attention intervention not an AAC intervention	1
39	Kaiser, A. P., & Roberts, M. Y. (2013). Parent-implemented enhanced milieu teaching with preschool children who have intellectual disabilities. <i>Journal of Speech, Language, and Hearing Research</i> , 56(1), 295-309.	Milieu teaching not an AAC intervention	1
40	Karaaslan, O., & Mahoney, G. (2013). Effectiveness of responsive teaching with children with down syndrome. <i>Intellectual and Developmental Disabilities</i> , 51(6), 458-469.	Responsive teaching not an AAC intervention	1
41	Karaaslan, O., Diken, I. H., & Mahoney, G. (2013). A randomized control study of responsive teaching with young turkish children and their mothers. <i>Topics in Early Childhood Special Education</i> , 33(1), 18-27.	Responsive teaching not an AAC intervention	1
42	Kasari, C., Freeman, S., & Paparella, T. (2006). Joint attention and symbolic play in young children with autism: A randomized controlled intervention study. <i>Journal of Child Psychology and Psychiatry</i> , 47(6), 611-620.	Joint attention intervention not an AAC intervention	1
43	Kasari, C., Gulsrud, A. C., Wong, C., Kwon, S., & Locke, J. (2010). Randomized controlled caregiver mediated joint engagement intervention for toddlers with autism. <i>Journal of Autism and Developmental Disorders</i> , 40(9), 1045-1056. https://doi-org.chain.kent.ac.uk/10.1007/s10803-010-0955-5	Joint engagement intervention not an AAC intervention	1
44	Kasari, C., Gulsrud, A., Paparella, T., Hellemann, G., & Berry, K. (2015). Randomized comparative efficacy study of parent-mediated interventions for toddlers with autism. <i>Journal of consulting and clinical psychology</i> , 83(3), 554.	Parent mediated intervention not an AAC intervention	1

45	Kasari, C., Lawton, K., Shih, W., Barker, T. V., Landa, R., Lord, C., ... Senturk, D. (2014). Caregiver-mediated intervention for low-resourced preschoolers with autism: An RCT. <i>Pediatrics</i> , 134(1), e72–e79. https://doi-org.chain.kent.ac.uk/10.1542/peds.2013-3229	Parent mediated intervention not an AAC intervention	1
46	Kim JM, Mahoney G. The effects of relationship focused intervention on Korean parents and their young children with disabilities. <i>Research in Developmental Disabilities</i> 2005;26(2):117-30.	Video feedback intervention RFI not an AAC intervention	1
47	Landa, R. J., Holman, K. C., O'Neill, A. H., & Stuart, E. A. (2011). Intervention targeting development of socially synchronous engagement in toddlers with autism spectrum disorder: A randomized controlled trial. <i>Journal of Child Psychology and Psychiatry</i> , 52(1), 13–21. https://doi-org.chain.kent.ac.uk/10.1111/j.1469-7610.2010.02288 .	Interpersonal synchrony not an AAC intervention	1
48	Law, G. C., Neihart, M., & Dutt, A. (2018). The Use of Behavior Modeling Training in a Mobile App Parent Training Program to Improve Functional Communication of Young Children with Autism Spectrum Disorder. <i>Autism: The International Journal of Research and Practice</i> , 22(4), 424–439	MAP4 Speech software for behaviour modelling not an AAC intervention	1
49	Liao, S., Hwang, Y., Chen, Y., Lee, P., Chen, S., & Lin, L. (2014). Home-based DIR/Floortime (TM) intervention program for preschool children with autism spectrum disorders: Preliminary findings. <i>Physical & Occupational Therapy in Pediatrics</i> , 34(4), 356-367.	DIR/Floortime intervention not an AAC intervention	1
50	Light, J., Binger, C., & Smith, A. K. (1994). Story reading interactions between preschoolers who use AAC and their mothers. <i>AAC: Augmentative and Alternative Communication</i> , 10(4), 255-268.	observational study not an intervention study	3
51	Light, J., Collier, B., & Parnes, P. (1985). Communicative interaction between young nonspeaking physically disabled children and their primary caregivers: I. discourse patterns. <i>AAC: Augmentative and Alternative Communication</i> , 1(2), 74-83.	observational study not an intervention study	3
52	Lorang, E., Sterling, A., & Schroeder, B. (2018). Maternal Responsiveness to Gestures in Children With Down Syndrome. <i>American journal of speech-language pathology</i> , 27(3), 1018-1029.	Comparative study not an intervention.	3
53	Mahoney, G., & Solomon, R. (2016). Mechanism of Developmental Change in the PLAY Project Home Consultation Program: Evidence from a Randomized Control Trial. <i>Journal of Autism & Developmental Disorders</i> , 46(5), 1860–1871. https://doi.org/10.1007/s10803-016-2720-x Secondary Analysis of data from Solomon et al. in <i>J Dev Behav Pediatr</i> 35:475-485,	PLAY project not an AAC intervention	1
54	McConkey, R., Truesdale-Kennedy, M., Crawford, H., McGreevy, E., Reavey, M., & Cassidy, A. (2010). Preschoolers with autism spectrum disorders: evaluating the impact of a home-based intervention to promote their communication. <i>Early Child Development and Care</i> , 180(3), 299-315.	Study does not involve children with ID	2
55	Medeiros, K. F., & Cress, C. J. (2016). Differences in maternal responsive and directive behavior during free play with and without aided AAC. <i>Augmentative and Alternative Communication</i> , 32(2), 151-161.	Comparative study not an intervention study	3
56	Moore, Barton and Chironis (2014) A Program for Improving Toddler Communication Through Parent Coaching. <i>Topics in Early Childhood Special Education</i> 33: 212-224.	LAPE not an AAC intervention	1
57	Nunes, D. R. P., Araújo, E. R., Walter, E., Soares, R., & Mendonça, C. (2016). Augmenting caregiver responsiveness: An intervention proposal for youngsters with autism in Brazil. <i>Early Childhood Education Journal</i> , 44(1), 39–49.	Parent guided intervention not an AAC intervention.	1
58	Oosterling I, Visser J, Swinkels S, Rommelse N, Donders R, Woudenbergh T, ... Buitelaar J. (2010). Randomized Controlled Trial of the Focus Parent Training for Toddlers with Autism: 1-Year Outcome. <i>Journal of Autism & Developmental Disorders</i> , 40(12), 1447–1458. https://doi.org/10.1007/s10803-010-1004-0	Joint attention intervention not an AAC intervention.	1
59	Pajareya, K., & Nopmaneejumruslers, K. (2011). A pilot randomized controlled trial of DIR/Floortime™ parent training intervention for pre-school children with autistic spectrum disorders. <i>Autism</i> , 15(5), 563-577.	DIR/Floortime not an AAC intervention.	1
60	Park, J. H., Alber-Morgan, S. R., & Cannella-Malone, H. (2011). Effects of mother-implemented picture exchange communication system (PECS) training on	Study does not involve children with ID	2

	independent communicative behaviors of young children with autism spectrum disorders. <i>Topics in Early Childhood Special Education</i> , 31(1), 37-47.		
61	Pennington L, Thomson K, James P, Martin L, & McNally R. (2009). Effects of It Takes Two to Talk--The Hanen Program for Parents of Preschool Children with Cerebral Palsy: findings from an exploratory study. <i>Journal of Speech, Language & Hearing Research</i> , 52(5), 1121–1138. https://doi.org/1092-4388(2009/07-0187)	Hanen program not an AAC intervention.	1
62	Peredo, T. N., Zelaya, M. I., & Kaiser, A. P. (2018). Teaching low-income spanish-speaking caregivers to implement EMT en español with their young children with language impairment: A pilot study. <i>American Journal of Speech - Language Pathology (Online)</i> , 27(1), 136-153. Language delayed only	EMT – children with disabilities were excluded	2
63	Pickard, K. E., Wainer, A. L., Bailey, K. M., & Ingersoll, B. R. (2016). A Mixed-Method Evaluation of the Feasibility and Acceptability of a Telehealth-Based Parent-Mediated Intervention for Children with Autism Spectrum Disorder. <i>Autism: The International Journal of Research and Practice</i> , 20(7), 845–855	Telehealth-based parent mediated intervention – parents’ perception	1
64	Pickles, A., Le Couteur, A., Leadbitter, K., Salomone, E., Cole-Fletcher, R., Tobin, H., ... Green, J. (2016). Parent-mediated social communication therapy for young children with autism (PACT): Long-term follow-up of a randomised controlled trial. <i>The Lancet</i> , 388(10059), 2501–2509. https://doi.org.chain.kent.ac.uk/10.1016/S0140-6736(16)31229-6	Parent mediated intervention not an AAC intervention.	1
65	Poslawsky, I. E., Naber, F. B., Bakermans-Kranenburg, M. J., van Daalen, E., van Engeland, H., & van IJzendoorn, M. H. (2015). Video-feedback Intervention to promote Positive Parenting adapted to Autism (VIPP-AUTI): A randomized controlled trial. <i>Autism</i> , 19(5), 588-603.	VIPP-AUTI video feedback intervention not an AAC intervention.	1
66	Rayner, C. (2011b). Teaching students with autism to tie a shoelace knot using video prompting and backward chaining. <i>Developmental Neurorehabilitation</i> , 14(6), 339–347.	Target behaviour addressed tying a shoelace knot. Intervention in schools.	2
67	Rickards, A. L., Walstab, J. E., Wright-Rossi, R. A., Simpson, J., & Reddiough, D. S. (2009). One-year follow-up of the outcome of a randomized controlled trial of a home-based intervention programme for children with autism and developmental delay and their families. <i>Child Care Health and Development</i> , 35(5), 593-602.	not an AAC intervention.	1
68	Rogers, S. J., Estes, A., Lord, C., Vismara, L., Winter, J., Fitzpatrick, A., ... Dawson, G. (2012). Effects of a Brief Early Start Denver Model (ESDM)-Based Parent Intervention on Toddlers at Risk for Autism Spectrum Disorders: A Randomized Controlled Trial. <i>Journal of the American Academy of Child & Adolescent Psychiatry</i> , 51(10), 1052–1065.	Early Start Denver Model not an AAC intervention.	1
69	Rogers, S. J., Vismara, L., Wagner, A. L., McCormick, C., Young, G., & Ozonoff, S. (2014). Autism Treatment in the First Year of Life: A Pilot Study of Infant Start, a Parent-Implemented Intervention for Symptomatic Infants. <i>Journal of Autism and Developmental Disorders</i> , 44(12), 2981–2995.	Early intervention study not an AAC intervention.	1
70	Ryan, S. E., Shepherd, T. A., Renzoni, A. M., Servais, M., Kingsnorth, S., Laskey, C., ... & Bradley, K. (2018). Responsiveness of a parent-reported outcome measure to evaluate AAC interventions for children and youth with complex communication needs. <i>Augmentative and Alternative Communication</i> , 1-11. -parents’ reports.	Study addressing Parent perceptions.	2
71	Schepis, M. M., Reid, D. H., Behrman, M. M., & Sutton, K. A. (1998). Increasing communicative interactions of young children with autism using a voice output communication aid and naturalistic teaching. <i>Journal of Applied Behavior Analysis</i> , 31(4), 561-578.	Training of a teacher and three assistants not a family focused intervention.	2
72	Shin, J. Y., & Nguyen Duc, S. (2017). The effects of a home-based intervention conducted by college students for young children with developmental delays in Vietnam. <i>International journal of developmental disabilities</i> , 63(2), 110-123.	not an AAC intervention.	1
73	Shin, J. Y., Nhan, N. V., Lee, S. -, Crittenden, K. S., Flory, M., & Hong, H. T. D. (2009). The effects of a home-based intervention for young children with intellectual disabilities in Vietnam. <i>Journal of Intellectual Disability Research</i> , 53, 339-352.	not an AAC intervention.	1

74	Shire SY, Gulsrud A, Kasari C. Increasing Responsive Parent-Child Interactions and Joint Engagement: Comparing the Influence of Parent-Mediated Intervention and Parent Psychoeducation. <i>Journal of Autism and Developmental Disorders</i> . 2016;46(5):1737-1747	JASPER not an AAC intervention.	1
75	Shire, S. Y., Shih, W., & Kasari, C. (2018). Brief report: Caregiver strategy implementation—Advancing spoken communication in children who are minimally verbal. <i>Journal of Autism and Developmental Disorders</i> , 48(4), 1228–1234.	Social communication intervention not an AAC intervention.	1
76	Siller, M., Hutman, T., & Sigman, M. (2013). A Parent-Mediated Intervention to Increase Responsive Parental Behaviors and Child Communication in Children with ASD: A Randomized Clinical Trial. <i>Journal of Autism & Developmental Disorders</i> , 43(3), 540–555.	FPI not an AAC intervention.	1
77	Siller, M., Swanson, M., Gerber, A., Hutman, T., & Sigman, M. (2014). A Parent-Mediated Intervention that Targets Responsive Parental Behaviors Increases Attachment Behaviors in Children with ASD: Results from a Randomized Clinical Trial. <i>Journal of Autism and Developmental Disorders</i> , 44(7), 1720–1732.	FPI not an AAC intervention.	1
78	Solomon, M., Ono, M., Timmer, S., & Goodlin-Jones, B. (2008). The effectiveness of parent–child interaction therapy for families of children on the autism spectrum. <i>Journal of autism and developmental disorders</i> , 38(9), 1767-1776.	Study addressing adaptive behaviour and function not an AAC intervention.	1
79	Solomon, R., Van Egeren, L. A., Mahoney, G., Huber, M. S. Q., & Zimmerman, P. (2014). PLAY project home consultation intervention program for young children with autism spectrum disorders: A randomized controlled trial. <i>Journal of Developmental and Behavioral Pediatrics</i> , 35(8), 475-485.	PLAY project not an AAC intervention	1
80	Spector V, Charlop MH. (2018) A Sibling-Mediated Intervention for Children with Autism Spectrum Disorder: Using the Natural Language Paradigm (NLP). <i>Journal of Autism and Developmental Disorders</i> ;48(5):1508-1522.	Study was all conducted in a centre with no generalisation in the homes.	2
81	Stadnick, N. A., Stahmer, A., & Brookman-Fraze, L. (2015). Preliminary Effectiveness of Project Impact: A Parent-Mediated Intervention for Children with Autism Spectrum Disorder Delivered in a Community Program. <i>Journal of Autism and Developmental Disorders</i> , 45(7), 2092–2104.	IMPACT not an AAC intervention	1
82	Tait, K., Sigafoos, J., Woodyatts, G., O'Reilly, M., & Lancioni, G. (2004). Evaluating parent use of functional communication training to replace and enhance prelinguistic behaviours in six children with developmental and physical disabilities. <i>Disability and Rehabilitation: An International, Multidisciplinary Journal</i> , 26, 1241–1254.	FCT not an AAC intervention	1
83	Taylor, B. A., Levin, L., & Jasper, S. (1999). Increasing play-related statements in children with autism toward their siblings: Effects of video modeling. <i>Journal of developmental and Physical disabilities</i> , 11(3), 253-264.	Study did not involve children with ID.	2
84	Thompson, G. A., McFerran, K. S., & Gold, C. (2014). Family-centred music therapy to promote social engagement in young children with severe autism spectrum disorder: A randomized controlled study. <i>Child: Care, Health and Development</i> , 40(6), 840–852. https://doi-org.chain.kent.ac.uk/10.1111/cch.1212	Music therapy not an AAC intervention Therapy	1
85	Tsao, L., & Odom, S. L. (2006). Sibling-mediated social interaction intervention for young children with autism. <i>Topics in Early Childhood Special Education</i> , 26(2), 106-123.	Children did not have an ID	2
86	van Balkom, H., Verhoeven, L., van Weerdenburg, M., & Stoep, J. (2010). Effects of parent-based video home training in children with developmental language delay. <i>Child Language Teaching and Therapy</i> , 26(3), 221-237. doi:10.1177/0265659009349978	PVHT - Video home training not an AAC intervention	1
87	Warren, S. F., Fey, M. E., Finestack, L. H., Brady, N. C., Bredin-Oja, S., & Fleming, K. K. (2008). A randomized trial of longitudinal effects of low-intensity responsivity education/prelinguistic milieu teaching. <i>Journal of Speech, Language, and Hearing Research</i> , 51(2), 451-470.	Prelinguistic teaching not an AAC intervention	1
88	Watson, L. R., Crais, E. R., Baranek, G. T., Turner-Brown, L., Sideris, J., Wakeford, L., ... Nowell, S. W. (2017). Parent-Mediated Intervention for One-Year-Olds Screened as At-Risk for Autism Spectrum Disorder: A Randomized Controlled Trial. <i>Journal of Autism and Developmental Disorders</i> , 47(11), 3520–3540	ART responsive teaching not an AAC intervention	1

89	Wetherby, A. M., Guthrie, W., Woods, J., Schatschneider, C., Holland, R. D., Morgan, L., & Lord, C. (2014). Parent-implemented social intervention for toddlers with Autism: an RCT. <i>Pediatrics</i> , peds-2014.	ESI not an AAC intervention	1
90	Wilder, J., Axelsson, C., & Granlund, M. (2004). Parent-child interaction: A comparison of parents' perceptions in three groups, Taylor & Francis Ltd.	Parent perceptions	2
91	Wong VCN, & Kwan QK. (2010). Randomized controlled trial for early intervention for autism: a pilot study of the autism 1-2-3 project. <i>Journal of Autism & Developmental Disorders</i> , 40(6), 677–688.	not an AAC intervention	1
92	Yang, Y. H. (2016). Parents and young children with disabilities: The effects of a home-based music therapy program on parent-child interactions. <i>Journal of music therapy</i> , 53(1), 27-54.	Music-therapy program not an AAC intervention.	1
93	Zhou, B., Xu, Q., Li, H., Zhang, Y., Wang, Y., Rogers, S. J., & Xu, X. (2018). Effects of parent-implemented early start denver model intervention on Chinese toddlers with autism spectrum disorder: A non-randomized controlled trial. <i>Autism Research</i> .	P-ESDM not an AAC intervention.	1

1	Not a study involving AAC OR sibling study
2	Studies focusing on parent perceptions, teacher training only, comparing devices, no family involvement, development of new evaluation instrument, studies involving typical developing children only, children do not have IDD, studies did not happen in the homes.
3	study protocol, observational studies, case studies, case series, research articles, narrative studies, single case designs, pilot investigation,
4	Articles in other languages.

1.3 Characteristics of included studies (Cochrane Handbook, 2011)

ID No	001
Author:	Adamson 2010
Methods	Randomized study of three parent-coached language interventions was observed both interacting with their parents using a Communication Play Protocol that produced communication samples related to social interacting, requesting, and commenting.
Participants	57 Toddlers 53 mothers 4 fathers Developmental delays
Interventions	pre- and post-intervention/randomized study
Outcomes	Symbol-infused joint engagement of children in all 3 intervention groups increased significantly from pre- to post-intervention. The amount of symbol-infused joint engagement observed post-intervention was significantly associated with whether or not the child produced spoken words and, for children in the 2 augmented conditions, the number of augmented words used during the last intervention session.
Notes	The effects of parent-coached augmented language interventions generalize to children's engagement in child-parent interactions outside the intervention context in ways that may facilitate additional language acquisition.
Validity	Correlations with supported and coordinated joint engagement were .35 and .02, ps=.027 and .88, respectively.
ID No	002
Author:	Basil, C. (1992)
Methods	A Controlled before and after study comparing communication strategies of trained parents versus untrained teachers as communication partners.
Participants	3 mothers and one father of four Catalan, Spanish children 4 children with cerebral palsy (aged 7,4 to 8,8) Children: 3 F, 1M with CP. Cognitive abilities difficult to assess.
Interventions	Use of PCS symbols (58-188 symbols available on communication boards), Use of one graphic symbol. Use of unaided means of communication such as vocalisations, eye contact, and facial expressions. Children had been using board between 1-2 years before study. Information on communicative and cognitive abilities are unavailable. Parents had received oral and written instructions about the use of Communication boards but never had received direct training. Data on communicative interaction was obtained before and after family training program. Data was collected at home and school. Training program: 4 family training sessions, the first one at the centre and the rest, at each child's home. The group session focused on using communication boards (slowing speech rate, prompting

	<p>AAC use, asking open ended questions, increase opportunities for communication, selection of symbols) followed by 3 home visits teaching family interaction skills and interactive patterns.</p> <p>Observational visits: consisted of 3 pre and 3 post home and school visits of 20min each (12 sessions per child). The frequency of adult initiations, responses and non-responses, open and closed questions, modes of communication were measured.</p>
Outcomes	<p>Interaction between children using communication boards and parents/teachers tended to be dominated by adults, who occupy more of the conversational space (66.6%) and initiate topics. Increases in parent responsiveness after the introduction of the training program seemed to result in increases in the frequency of responses by the child, reducing learned helplessness but NOT learned dependency. As far as initiations, the family program didn't facilitate child initiations, suggesting learned dependency.</p>
Notes	<p>No details provided on parents and teachers. Number of controls (teachers) not specified.</p> <p>Pennington et al. 2011 (p27) reports that home visits' duration was unspecified. Home visits were specified.</p> <p>Unclear protocol. Blinding, unclear.</p>
Validity	<p>Selection bias – parents were trained but teachers weren't.</p> <p>IOA 0.98, 0.92, 0.90</p>
ID No	003
Author:	Calculator (2002)
Methods	Explored the acceptability and feasibility of a home based teaching program using enhanced natural gestures (ENGs).
Participants	nine US children with Angelman syndrome & their parents. 5M and 4 F. Age between 3;3 and 10;5; severe to profound intellectual disability (5months to 1;8 with most children in the 9-15 months range), none of the children had any functional speech. Communication skills between 6-12 months. Use a range of VOCAS, signs, PECS, gestures and vocalisations.
Interventions	<p>Training conducted at home with four visits each home during the 8 to 10 week in which the first four phases of the program were administered by the investigator. The fourth phase concluded with an additional 12-14 weeks of implementation of the program. Parents were taught to recognize & then enhance their children's use of natural gestures as enhanced natural gestures (ENGs). During phase 3, parents were taught to use four primary teaching techniques: environmental sabotage, mand-model, expectant delay, & mand-model (molding-shaping), & then to use these techniques over a period of 16 to 18 weeks to foster their child's use of ENGs. A questionnaire Enhanced Natural Gestures-Acceptability Rating Form (ENG-ARF), was administered to evaluate the feasibility and effectiveness of the program.</p>
Outcomes	<p>Most parents described this method as acceptable, effective, reasonable, & easy to teach others, and were willing to teach the program to others. They still felt that a lot of time has to be dedicated to the program.</p>
Notes	<p>Descriptive information (not demographic data) about each child's communication skills and means of communication.</p> <p>Not specified how many of the participants are male and female. 'Bailey' seems to be a female name but could be a male name as well.</p>
Validity	<p>inter-rater reliability checks of a minimum of 3 checks in two different situations (e.g outdoor play, free indoor play, mealtime,) until there was a reliability check of 80%.</p>

	<p>The investigator is the author</p> <p>The observers were invited by the parents (could be SLP, teacher etc..) Observer was present for parent training in phase 1.</p>
ID No	004
Author:	Calculator (2016)
Methods	quasi-experimental "B" design in which parents self-administered an instructional program to teach their children to use enhanced natural gestures at home and/or in the community.
Participants	18 US children with Angelman syndrome & parents. 11M and 7F.
Interventions	2 teaching methods, Mand-Model with time delay and Molding-Shaping, into their everyday interactions with their children.
Outcomes	Parents reported outcomes of the program through goal attainment scaling and completion of the ENG Acceptability Rating Form. Children's overall achievements acquiring ENGs generally met or exceeded program (and parent) expectations. Most parents reported little difficulty self-administering the ENG program with their children and regarded the program positively across multiple dimensions.
Notes	
Validity	
ID No	005
Author:	Hancock and Kaiser (1996)
Methods	A single-subject, multiple baseline design across subjects was used to determine the effects of the intervention on the behaviour of the siblings and the target children.
Participants	<p>3 older siblings 8-12 years</p> <p>3 children with CP, DD and William Syndrome (males) (41/2-6 years) mild to moderate range of MR.</p>
Interventions	This study examined the effects of teaching 3 older siblings to use two milieu teaching procedures, modeling and mand modeling, with their younger siblings who exhibited language delays. Siblings were able to apply milieu teaching techniques and responsiveness to the target children's verbal initiations also increased. The target children learned to use their targeted utterances in response to teaching attempts by their siblings and used the target spontaneously. Additionally, the interactions between the children became more positive and balanced during the intervention.
Outcomes	Generally, all the siblings and target children maintained the changes in their behaviour. Two of the three dyads generalised the behavioural changes to a snack setting.
Notes	<p>Teaching of modeling and mand modeling</p> <p>Generalisation + 3 mnths follow -up</p>
Validity	Interobserver agreement was assessed for behaviours 90% for sibling teaching behaviors; 91% for sibling consequence and acknowledgment; 89% for sibling instructions and yes/no questions; 89% for target child responses (target correct, correct, partial, incorrect, and unintelligible responses); 90% for target child initiations (target initiations and initiations); and 89% for target child total utterances. Interobserver agreement for sibling utterances averaged 90% and interobserver agreement on target child utterances averaged 86%
ID No	006

Author:	James and Egal (1986)
Methods	Multiple baseline design across three sibling pairs training procedure, consisting of direct prompting and modeling to increase reciprocal interactions between siblings.
Participants	<p>girl 4;2 ID IQ=32, one word utterances and stereotypic behaviour</p> <p>girl 4;4 CP IQ=36 spontaneous use of 15 signs and used SVO constructed sentences. Points to pictures on communication board.</p> <p>boy 4;6 IQ=38 CP gestures and single word object labelling</p> <p>siblings (2 girls and one boy) 6,10-8,1)</p> <p>2 peers, friends of the children with disabilities (female, 7,5 and 7,3)</p> <p>No peer available for the boy with disability</p>
Interventions	Free play, training, generalisation and follow-up sessions for sibling pairs in their respective homes. Four toys were available (car, ball, doll, block). Sibling training was provided through two conditions, Modeling, practice with feedback. Probes: free-play, generalisation probes, stimulu control probes, follow up probes,
Outcomes	Positive changes between the siblings during free play. The sibling pairs increased their positive reciprocal interactions during play and retained this level of reciprocal interactions 6 months after the instruction.
Notes	<p>Demographic data available</p> <p>Follow up probes after 6 months</p> <p>Social validity measures</p>
Validity	<p>Reliability: 5 trained observers obtained reliability scores of 80% for three consecutive 10min videotaped pilot sessions.</p> <p>Reliability scores for each behaviour category averaged over 90%</p>
ID No	007
Author:	Kent-Walsh, J., Binger, C., & Hasham, Z. (2010)
Methods	Two single-subject multiple-probe-across-participants designs were used to evaluate the effects of the IMPAACT program with US families.
Participants	<p>3 European American parents, 3 African American parents between 29-43 yrs.</p> <p>Children: 4 Male and 2 Female, 3 CP and 3 DS. Maximum number of symbols 10-40. Communication modes: natural speech, vocalisations, gestures, communication boards, SGDs.</p>

Interventions	<p>A preferred children’s book series was chosen (Little Critter, Clifford the Big Red Dog, Little Bill). A minimum of 10 books were used with each child. Communication displays were created accordingly including wh questions, using the Fitzgerald keys. Each dyad used one book series for the baseline, instruction and intervention and a different set of books for generalisation. There were two dependent variables, the parent dependent measure and the child dependent measure for each ten minute story reading session. The child measure was the total number of communicative turns (comments or questions) using different modes. The different semantic concepts during the session were measured.</p> <p>A focus group consisting on three African American culture experts reported the use of the communication instructional program.</p> <p>A minimum of three baseline probes for each dyad were collected in the parents’ homes. Each mother read the story and the SGD was available. The reading sessions for each phase were videotaped, transcribed and coded by trained SLP students.</p> <p>A questionnaire containing 7 questions was conducted to obtain feedback on the program. Two randomly selected, randomly ordered 5min. pre and post instructional videos were shown to the respective spouses/partners. Then they filled in questionnaires regarding child’s participation.</p>
Outcomes	<p>All 6 parents learned to implement the communication partner interaction strategy accurately follow a brief training program of 2-2.5hrs. All 6 children who used AAC increased their communicative turn taking and their language use determined by the semantic concepts registered.</p>
Notes	<p>Demographic data supplied.</p> <p>Intervention was addressed to a story book activity, other contexts should be introduced to increase generalisation.</p> <p>Similar instructional procedures as Kent-Walsh (2003), RosaLugo and Kent-Walsh (2003) totalling 13 children participating in the three studies.</p> <p>Procedural reliability of 100%</p>
Validity	<p>Parent transcript reliability was 93%</p> <p>Child transcript reliability was 89%</p> <p>Interrater agreement on parent data 0.96, child data 99%</p> <p>Social validity – parent questionnaires</p>
ID No	008
Author:	Koppenhaver, D. A., Erickson, K. A., Harris, B., McLellan, J., Skotko, B. G., & Newton, R. A. (2001)
Methods	<p>A multiple baseline design across behaviours to evaluate how the use of (i) resting hand splints, (ii) VOCAs & symbols, & (3) parent training can support interactions between mothers and their daughters.</p>
Participants	<p>6 girls with Rett Syndrome, age 3,6-7 years, limited/no intelligible speech, use of gestures, vocalisations, eye gaze. Age equivalent scores 5-19 months (Bayley).</p> <p>Severe to profound ID.</p> <p>6 Mothers were Caucasian</p>

Interventions	Baseline and three intervention sessions. Families attended 5, individual monthly assessment sessions throughout the four months of the study. The first author met the participants individually to explain the program, and the 3 other authors conducted literacy assessment activities with the children on an individual basis. Each session lasted 2 hrs. Mothers & daughters were videotaped as they read familiar & unfamiliar storybooks in their homes. More than 30 children's storybooks were displayed. The study consisted of 4 phases including the baseline phase, the splints, technologies and training. Training consisted of modeling, practicing and asking questions. Strategies included i) attributing meaning to child's attempts ii) prompting through questions and comments not commands iii) waiting time and modeling correct response iv) selection of vocabulary for voice output.
Outcomes	girls became more active & successful participants in the interactions during storybook reading through supports. The girls employed a wider range of communication modes & increased the frequency of their labeling. Familiar storybook reading encouraged more symbolic communication than unfamiliar storybooks in half the girls.
Notes	Part of a larger investigation of story book reading in the home. No demographic data supplied
Validity	Interobserver agreement 0.91 or better. Inter-rater agreement ???
ID No	009
Author:	Koppenhaver, D. A., Erickson, K. A., & Skotko, B. G. (2001)
Methods	Multiple baseline design. Mother-child storybook reading was explored as a context within which to support early symbolic communication of girls with Rett syndrome. (as above)
Participants	4 girls with Rett syndrome (3,6 – 7.0) use of gestures and vocalisations. Age equivalent scores on Bayley (5-19 mths) Severe to profound ID. 4 Caucasian mothers
Interventions	Baseline measures of mother-daughter interaction were gathered as mothers read familiar and unfamiliar storybooks with their daughters. Then three experimental interventions were studied in the homes of 4 girls as per previous study. A total of 195 storybook interactions with over 20 hours of data, focusing on modes of communication, communication attempts and functions of communication.
Outcomes	Access to devices, symbols, & training increased the frequency of each of the girls' labeling & symbolic communication during storybook reading. Children and parents found single switch activation useful and functional.
Notes	Part of a larger investigation by Koppenhaver et al, 2001 Are the participants the same ??
Validity	Interobserver agreement (reliability coefficients were 0.91 or better
ID No	010
Author:	Romski, Sevcik, Adamson, Cheslock & Smith (2007)
Methods	Comparison of a parent and interventionist program of three beginning language interventions including two augmented language interventions.

Participants	<p>30 US parents (27 mothers, 3 fathers) mean age 37.5 years</p> <p>3 female interventionists (mean age 25.6 years)</p> <p>30 Children (24-35 months) 24 children with developmental delay, 23 male, 7 female.</p>
Interventions	<p>Parent-child pairs were randomly selected to one of the three interventions (augmented communication input (AC-I), augmented communication output (AC-O), or spoken communication (SC) interventions), the latter being the contrast group. Interventionist and parent encouraged children in the SC group to produce spoken words. For the children in the ACI, parents and interventionists used a SGD, visual graphic symbol set for targeted vocabulary and spoken words. Children in the ACO were encouraged to use SGDs, visual graphic symbol set for targeted vocabulary and spoken words. The child-parent dyads participated in 24 intervention sessions with 18 sessions in a lab and 6 sessions in the homes. Sessions were 30min in length and consisted of 3 10min sessions of play, book reading and snack routines. The parents and SLP observed the interventionists working with the child for the first 8 weeks. Week 9, the parents intervened for the last ten minutes and simultaneously received training on the intervention strategies. Week 16 onwards, the parent continued with the sessions.</p>
Outcomes	<p>Interventions for AC-I, AC-O and SC were implemented reliably across the three intervention groups. Parents implemented the use of the SGD, integrating it across AC-I and AC-O. Children in the AC-I and AC-O groups acquired a slightly larger percentage of vocabulary use.</p>
Notes	<p>Same sample as Ronski, Sevcik, Adamson, Cheslock, Smith, Barker et al (2007)</p> <p>Demographic data includes child Mullen Early Learning composite, Expressive language age, Mean SICD RL and EL.</p>
Validity	<p>The Treatment Implementation Rating Scale (TIRS) was used to rate videotapes of randomly selected intervention sessions. An independent observer reviewed 25% of videotapes, randomly. Overall Kappa was 0.81.</p> <p>The Systematic Analysis of Language Transcripts (SALT) was used to identify mean percentage across SCI, ACI and ACO interventions. Overall level of successful implementation was above 90%.</p>
ID No	011
Author:	Ronski, Sevcik, Adamson, Cheslock, Smith, Barker & Bakeman (2010)
Methods	<p>Contrast group design with random assignment to group. This study compared how well parents and interventionists implemented three beginning language interventions including two augmented language interventions over a 5 year period.</p>
Participants	<p>3 intervention groups from Atlanta.</p> <p>62 children (91% of those who commenced the intervention 43 boys, 19 girls mean age 29.60 months range 21-40 months. African American (18) Asian (7) Caucasian (37). Etiology (Down syndrome, CP, unknown conditions)</p> <p>58 mothers and 4 fathers (mean age 37.33 years range: 31-45 years)</p> <p>6 female interventionists (mean age 25.6 years) with Bachelor degree in psychology or communication.</p>

Interventions	Each child and parent participated in the pre-intervention assessments and then randomly selected to one of the three interventions (augmented communication input (AC-I), augmented communication output (AC-O), or spoken communication (SC) interventions). The child-parent dyads participated in 24 intervention sessions with 18 sessions in a lab and 6 sessions in the homes. Sessions were 30min in length and consisted of 3 10min sessions of play, book reading and snack. Interventions consisted of four components: target vocabulary, parent coaching, mode, and strategies. Language transcripts were created pre-intervention, during 18 th session in lab and the 24 th session at home. Differences in performance on augmented and spoken word size and use, vocabulary size, and communication interaction skills were examined.
Outcomes	All children in the AC-O and AC-I intervention groups used augmented and spoken words for the target vocabulary items, whereas children in the SC intervention produced a very small number of spoken words. Vocabulary size was substantially larger for AC-O and AC-I than for SC groups. This study found that augmented language interventions that include parent coaching have a positive communication effect on young children with developmental delays who begin with fewer than 10 spoken words.
Notes	Study linked with Adamson et al 2010; Ronski 2007. Use of MLU calculating number of morphemes for children and parents. Partial demographic data
Validity	The Treatment Implementation Rating Scale (TIRS) was used to rate videotapes of randomly selected intervention sessions. Intervention protocols for all three intervention groups were implemented reliably across interventionist only, parent supported, and parent led sessions. Kappa groups were 0.80, 0.83 and 0.92 for each session respectively. The overall Kappa was 0.83 (over 0.75 is excellent). Nine transcribers masked to the research questions transcribed and coded the samples according to the Systematic Analysis of Language Transcripts (SALT). Three independent reviews were undertaken to ensure reliability of transcriptions. Kappas were 0.98, 0.97 and 1.00 for AC-I, AC-O and SC respectively. Overall Kappa was 0.97.
ID No	012
Author:	Rosa-Lugo, L., & Kent-Walsh, J. (2008)
Methods	Two single-subject multiple-probe-across-participants designs were used to evaluate the effects of US Latino parent instruction during a storybook reading task.
Participants	33 year old Puerto Rican mother and daughter, 6;10 Cystichyroma. Use of natural speech, gestures, signs and VOCA 45 year old Puerto Rican mother and son 6;8 Developmental delay. Use of natural speech, gestures and VOCA.
Interventions	A preferred children's book series was chosen (Dora the Explorer and Curious George). A minimum of 10 books were used with each child. Communication displays were created accordingly. Sessions were conducted at home. Parents were asked to read to their children. Baseline measures were taken. A focus group made up of a parent an SLP and a researcher who discussed the training program and intervention strategies. The discussions were video recorded.
Outcomes	Changes in turn-taking rates and the expression of different semantic concepts in children using AAC were assessed in storybook-reading activities. the effects of a communication partner instruction strategy for parents of children using augmentative and alternative communication (AAC) on the communicative turn taking of their children.
Notes	Demographic data available

Validity	<p>Ecological validity issues addressed.</p> <p>20% of video taped sessions were randomly selected and evaluated by a reliability coder, 99.2% considered high procedural integrity.</p> <p>Interrater agreement with average reliability scores of 100% established for parent and child dependent variables.</p> <p>Social validation (a family member) of randomly selected videotapes to determine functionality and participation.</p>
ID No	013
Author:	Skotko, B. G., Koppenhaver, D. A., & Erickson, K. A. (2004)
Methods	Multiple baseline design. The level of interaction and communication was measured in a storybook reading activity.
Participants	<p>Four girls with RS from North Carolina (age 3.6-7,0 years). Limited or no functional speech, gestures, and vocalisations.</p> <p>Mental retardation 5-19 months</p>
Interventions	Four girls with RS and their mothers attended five individual sessions in a clinic. They then participated in 2 hourly weekly sessions for 4 months across 4 phases of story book reading at home. The four phases were video recorded and coded 195 interactions. These were coded for child behaviours (e.g., use of AAC devices, attention to book, or vocalizations) and parent behaviors (e.g., pointing or asking leading questions).
Outcomes	Correlation and multiple regression analyses of these variables revealed that girls with RS can learn to communicate in meaningful ways through storybooks. Mothers need to engage in different strategies to facilitate better use of augmentative strategies (e.g. to elicit labeling and commenting).
Notes	<p>part of a larger study on storybook reading at home as a precursor for the emergence of communication and early literacy skills (Koppenhaver et al 2001).</p> <p>Child characteristics not reported in this study.</p>
Validity	<p>Interobserver agreement: one researcher coded all the videotapes while the other randomly coded 20% from each phase. Reliability coefficients were 0.91 or higher.</p> <p>Mixed stepwise multiple regression analysis was utilised as a predictor to various behaviours (e.g. labeling, commenting)</p>
ID No	014
Author:	Smith, Ronski and Sevcik (2013)
Methods	Non randomized controlled trial. This study examines the characteristics of sibling communication interaction patterns the role of communication skills in the quality of the sibling relationship using both self-report and observational measures.
Participants	<p>30 mixed and same-sex sibling dyads from the US.</p> <p>21 same; 9 mixed</p> <p>9 girls and 21 boys (6-15 years) 80% white, 20% African American /Black.</p>

	<p>Children exhibited a range of etiologies including Down syndrome, autism, cerebral palsy, Williams syndrome, Angelman syndrome, and a developmental or intellectual disability of unknown origin.</p> <p>Typically developing siblings (18 boys and 12 girls) age 10-17 years.</p> <p>28 mothers, 1 father, 1 grandma.</p>
Interventions	<p>Following a parent demographic form, children with disabilities were placed into three communication status groups according to their communication skills (emerging communicators, context-dependent communicators and independent communicators). The primary investigator visited the families in their home. The child closest to the age of the sibling with disability was selected. The sibling dyads engaged in a 10 min semi-structured activity where they made a snack together (decorating and eating cookies together). A script was provided to the sibling (greeting and reason for activity, invitation to participate, a discussion what will take place, problem solving opportunities, initiation, preparation and eating snack, cleanup, goodbye, exit). After the activity, the typically developing sibling completed a measure while the primary investigator completed a vocabulary assessment of the child with disability. Parents completed the Vineland Adaptive Behaviour Scales, siblings completed the Sibling Relationship Questionnaire SRQ-R). Transcription was completed by investigator and research assistant.</p>
Outcomes	<p>While there is an overall asymmetry in sibling communication, independent communicators exhibited interactions with their siblings that were similar in terms of lexical complexity but typically developing siblings exhibited highest level of asymmetry.</p>
Notes	<p>Demographic data includes information of 3 communication groups</p>
Validity	<p>Research assistant transcribed the 10 min video which was checked by investigator. No independent reliability was calculated.</p>
ID No	<p>015</p>
Author:	<p>Stiebel, D. (1999)</p>
Methods	<p>Multiple baseline design of teaching parents a problem-solving intervention that can promote child spontaneous picture card use and parent-provided communication opportunities during daily routines.</p>
Participants	<p>3 children with ASD (Males, 4;2 6;8 4;6) all with significant cognitive delays,</p>
Interventions	<p>Sessions conducted in homes and community settings during 5 different family routines (kitchen, dining room, bedroom, café) using <u>picture cards</u>, games (Connect 4), manipulatives (Lego), snacks (cracker, juice). Four pretest sessions (Phase 1) were conducted on a weekly basis for 15-30 min to obtain communication skills level and teach children how to use the cards. Parents were instructed to encourage child in play interaction using the Natural Language Teaching Paradigm (NLP) which included a fading technique. In the second phase, a problem solving intervention was introduced, using baseline, treatment and follow-up. The problem solving intervention included one or two training sessions lasting 60-90 minutes, following the eight components of their workbook. Data was recorded including follow up data to assess use of cards over time.</p>
Outcomes	<p>Results show increases in the child's use of cards and in the parent's use of communication opportunities following the problem solving intervention. Parent and child behaviour was maintained over time. There was an increase in the parent's perception of their child's communication skills and their own skills.</p>
Notes	<p>4-6 weeks maintenance</p>
Validity	<p>Reliability of dependent measures recorded by two independent observers who recorded at least 25% of the sessions for each dependent measure. Interrater agreement for spontaneous card use average 94%, communication across sessions for parents 96%, 96% and 94% respectively.</p>
ID No	<p>016</p>

Author:	Thunberg, G., Ahlsén, E., & Sandberg, A. D. (2007)
Methods	Pre- and post-test multiple case study design. Mixed methods case study analysis using the Activity based analysis method. Children supplied with a speech-generating device (SGD) in three different activities in their home environment: mealtime, story reading and sharing experiences of schooling.
Participants	four Swedish boys with ASD (4;11, 5;6, 7;0, 7;6) Communication: vocalisations, 1-2 word utterances. Symbols: PCS, photos, clicker symbols. Use of SGDs. Number of SGD messages (6-279) mild to moderate MR for two boys.
Interventions	All parents received training/guidance of how to use SGDs in daily activities using the System for Augmenting Language (SAL) integrating the SGD in functional communicative interactions. Parents recorded the interactions themselves. The coded communicative behaviours were engagement in activity, role in turn-taking, form, function and effectiveness of communication. Coded material consisted of 11 hours of collated data.
Outcomes	An increase in communicative effectiveness was more noticeable when the SGDs could be used to fulfil goals and roles within the activity. The instruction to the parents to use the SGDs in their communication with the child had an important influence on the activities.
Notes	Check repetition of data across both studies. Demographic data available.
Validity	Inter-observer agreement: random selection of 10% of video recordings and coded by an independent observer. Weak agreement for communicative function 67% possibly due to personal interpretation.
ID No	017
Author:	Thunberg, G., Ahlsen, E., & Sandberg, A. D. (2009)
Methods	A single subject design of type AB to investigate the use of SGDs during mealtimes, story reading and sharing experiences.
Participants	four Swedish boys with ASD (4;11, 5;6, 7;0, 7;6) communication: vocalizations, 1-2 word utterances. Symbols: PCS, photos, clicker symbols. Use of SGDs. Number of SGD messages (6-279). mild to moderate MR for two boys.
Interventions	Video recordings of child-parent dyads were recorded by the parents themselves. Families recorded chosen sessions, once a week for at least 15 minutes before and during interventions for 4 occasions. An analysis of conversational topics between child-parent dyads was undertaken. Contributions were devised according to topic segments and analysed accordingly (9 hours 20minutes over 47 occasions). Results consisted of number of topic segments, number of contributions, topic length and parent-child initiatives (Ferm2006).
Outcomes	Introduction to the SGD increased conversational interaction, determined by topic length, for all children in all activities except one. Topic maintenance using SGDs increased while irrelevant speech used by the two verbal children was reduced.
Notes	Same sample data. PPVT available for 2 of the children.
Validity	Inter-observer agreement: random selection of 10% of video recordings and coded by an independent observer (SLP). Interobserver agreement was reached for topic determination (93%) and 100% for topic segments.
ID No	018
Authors	Trent-Stainbrook 2007

Methods	Multiple baseline
Participants	3 sibling dyads DS
Interventions	Intervention sessions were conducted twice each week in the home and each lasted 30 to 60 min. Older siblings were taught to use two responsive interaction strategies through the use of written materials, modeling, role play, and oral feedback.
Outcomes	Following training, older siblings increased their use of mirroring and verbal responding. Intentional communicative behaviours increased among their younger siblings. One-month follow-up observations indicated that older siblings maintained their use of the responsive interaction strategies, but the effects of the intervention did not appear to generalize to an untrained setting.
Notes	
Validity	In an assessment of social validity, blind observers found sibling interactions to appear more positive and reciprocal following intervention than during baseline. Procedural fidelity ranged between 86% and 100% for the three dyads across mirroring training and responding training sessions (M = 96%).
ID No	019
Author:	Tzuriel and Hanuka-Levy (2014)
Methods	Group study design. The ID group was compared with typically developing sibling dyads matched on mental age (n 5 25) and chronological age (n 5 25). Mediation strategies were analyzed by the Observation of Mediation Interaction scale (OMI)
Participants	Israel - Younger siblings with ID (25) 11 boys and 14 girls in Israel. 72% and 28% ID. IQ =55-69. Typically developing siblings (50)
Interventions	Free play and structured play situations. Mediation strategies, activation, and anti-mediation behaviours of older siblings and younger siblings' responsiveness to mediation were observed.
Outcomes	The ID group scored highest on mediation strategies and lowest on activation and anti-mediation behaviours. Younger siblings' responsiveness to mediation was highest among the ID group. Mediation for Intentionality and Reciprocity and Meaning were positively associated with the verbal responsiveness of the younger siblings. Activation and anti-mediation behaviours were negatively associated with the verbal responsiveness.
Notes	Descriptive information available
Validity	?Kappa ?Treatment fidelity Interrater reliability:
ID No	020
Author:	Walton and Ingersoll (2012)
Methods	a multiple-baseline design to evaluate the efficacy of sibling-implemented reciprocal imitation training.
Participants	4 children with Autism and 6 typically developing siblings Siblings 8-13 years
Interventions	Trainer (first author) visited participants' homes twice a week throughout baseline and treatment. To facilitate sibling learning, the intervention techniques were introduced in 4 phases (Phase I (2 weeks), Phase II (2 weeks), Phase III (3 weeks) and Phase IV (3 weeks).

Outcomes	All six typically developing siblings were able to learn and use contingent imitation, four of the six siblings were able to learn and use linguistic mapping, and all six siblings increased their use of at least one component of the imitation training procedure. Three of the four children with autism showed increases in overall imitation and joint engagement.
Notes	Social validity: Parents and siblings reported high satisfaction with the intervention. Ratings by naïve observers indicated significant changes from pre- to post treatment.
Validity	Cohen's Kappa was 0.63 for contingent imitation, 0.58 for linguistic mapping, and 0.72 for joint engagement. Pearson's r was used to calculate interrater reliability, correlation between raters were 0.64 for modeling, 0.82 for prompting, 0.83 for praise, and 0.81 for imitation. All correlations were significant at $p < 0.001$ and follow up t tests indicated no significant differences between raters. Fidelity of implementation of the intervention technique. One month maintainance
ID No	021
Author:	Wright, Kaiser, Reikowsky and Roberts (2013)
Methods	multiple-baseline, across participants design. An evaluation of the effects of Enhanced Milieu Teaching blended with Joint Attention, Symbolic Play, and Emotional Regulation to teach spoken words and manual signs to young children with Down syndrome
Participants	Four toddlers (ages 23–29 months) with DS 3 mothers, 1 father.
Interventions	Following baseline, 20 play-based treatment sessions (20–30 min each) occurred twice weekly. Spoken words and manual signs were modeled and prompted by a therapist who used EMT/JASPER teaching strategies. The authors assessed generalization to interactions with parents at home.
Outcomes	functional relation between the therapist's implementation of EMT/JASPER Words + Signs and all 4 children's use of signs during the intervention. Gradual increases in children's use of spoken words occurred, but there was not a clear functional relation. All children generalized their use of signs to their parents at home. The infusion of manual signs with verbal models within a framework of play, joint attention, and naturalistic language teaching appears to facilitate development of expressive sign and word communication in young children with DS.
Notes	SLP + early interventionist
Validity	Inter-rater reliability: IOA >80% Randomly selected sessions. Interventions naïve to coding. Fidelity of implementation

1.4 Systematic review Intervention settings and treatment details

Study	Intervention setting	Treatment implementation methods	Frequency of training	Duration of training	Maintenance of effect of intervention
Adamson	Home/lab	24 sessions of 30 minutes each			
Basil 1992	Home/child rehabilitation centre	12 sessions per child @ 20min	4 training sessions	6 sessions before and 6 sessions after	None
Calculator 2002	home	4 phases for a period of 18 weeks	4 visits for 8-10 weeks		16 to 18 weeks to maintain technique
Calculator 2016	home		10 week intervention		
Hancock 1996	home				Generalization + 3 months follow up
James 1986	home				6 months after instruction
Kent-Walsh 2010	home		2 -2.5 hrs training		
Koppenhaver 2001	home				
Koppenhaver 2001	home				
Romski 2007	Home/lab	18 lab sessions 6 home sessions @ 30min			
Romski 2010	Home/lab	24 sessions@30min			
Rosa-Lugo 2008	home				Social validity Ecological validity
Skotko 2004	Home/clinic		2 hr sessions per week for 4 months		
Smith 2013	home				
Stiebel 1999	Home/ community		One to two training sessions of 60-90 minutes		Parent and child behaviour maintained over time
Thunberg 2007	home				

Thunberg 2009	home			11 hours	
Trent-Stainbrook 2007	home		2 weeks of 30-60 minutes		1 month follow up.
Tzuriel 2014	home				
Walton 2012	home	Twice a week for 10 weeks			
Wright 2013	Clinic/ home	20 treatment sessions @ 20-30 min			

1.5 Quality appraisal of studies (Group Studies)

RCT	Score: 12	Non-RCT	Score: 10
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Study	Random allocation	Concealed allocation	Group similarity	Blinding participants	Blinding therapists	Blinding assessors	Inter observer agreement	Treatment integrity	Measure of key outcome	Intention to treat	Between intervention statistics	measures of variability	PEDro Scale
Romski 2007	Y	N	Y	N	N	Y	Y	N	Y	Y	Y	Y	8
Romski 2010	Y	N	Y	N	N	Y	Y	N	Y	Y	Y	Y	8
Adamson 2010	Y	N	Y	N	N	N	Y	N	Y	Y	Y	Y	8
Tzurriel 2014			Y	N	N	N	Y	N	Y	Y	Y	Y	6
Smith 2013			Y	N	N	Y	N	N	Y	N	Y	Y	5
Basil 1992			Y	N	N	N	Y	N	Y	N	N	Y	4

1.6 Quality Appraisal of the Studies: Single Subject Experimental Design (SSED)

Study	Group similarity	Blinding participants	Blinding therapists	Blinding assessors	Interobserver agreement	Treatment integrity	Measure of key outcome	Intention to treat	Between intervention statistics	measures of variability	PEDro Scale /10
Walton 2012	Y	N	N	Y	Y	Y	Y	Y	Y	Y	8
Trent-Stainbrook 2007	Y	N	N	Y	Y	N	Y	Y	Y	Y	7
James 1986	Y	N	N	Y	Y	N	Y	Y	Y	Y	7
Wright 2013	Y	N	N	Y	Y	Y	Y	Y	N	N	6
Kent-Walsh 2010	Y	N	N	N	Y	Y	Y	Y	N	Y	6
Skotko 2004	Y	N	N	N	Y	N	Y	Y	Y	Y	6
Thunberg 2009	Y	N	N	N	Y	N	Y	Y	N	Y	5
Stiebel 1999	Y	N	N	N	Y	N	Y	Y	N	Y	5
Hancock 1996	Y	N	N	N	Y	N	Y	Y	N	Y	5
Koppenhaver 2001	Y	N	N	N	Y	N	Y	Y	N	Y	5
Koppenhaver 2001	Y	N	N	N	Y	N	Y	Y	N	Y	5
Rosa-Lugo 2008	Y	N	N	N	Y	N	Y	Y	N	Y	5
Calculator 2002	Y	N	N	N	Y	N	Y	Y	N	N	4
Calculator 2016	Y	N	N	N	Y	N	Y	Y	N	N	4
Thunberg 2007	Y	N	N	N	Y	N	Y	Y	N	N	4

1.7 Quality Appraisal Tools

Quality appraisal tools consist of checklists of factors that determine the methodological quality of studies. There are as many as twenty appraisal tools that can be used to evaluate the quality of the studies (Schlosser and Wendt, 2008). Despite all these tools, no consensus seems to exist on which the ideal checklist and scale are. Some quality appraisal tools assign a numerical scale, wherein global numerical assessments of quality may be obtained for each study. Checklists usually address a number of factors that could bias the results of the study. Four types of bias commonly reported amongst checklists include selection bias, performance bias, attrition bias and measurement bias. Generic protection mechanisms secure each type of bias. For instance, measurement bias uses 'blinding' as a protection mechanism, which is used to ensure that neither the participant nor the researcher knows which treatment a participant is being assigned to. Guides and quality appraisal tools have been identified in the course of this review. These included the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement (2009), the Cochrane Reviewers' Handbook (2011), the National Joint Committee (NJC) Evidence-Based Practices Data Entry Instrument (2008), CONSolidated Standards of Reporting Trials CONSORT (2010), Critical Appraisal Skills Programme CASP, Grading of Recommendations Assessment, Development and Evaluation (GRADE) and The Centre for Reviews and Dissemination (CRD) Guidelines (2008) and the PEDro scale. The PEDro (Physiotherapy Evidence Database) Scale consists of 11 yes/no type questions used as a valid measure of the methodological quality of clinical trials. The scale addresses questions about the blinding of subjects, blinding of therapists, placement of subjects into treatment and control groups, attrition, and analysis. It provides an appraisal of the studies by awarding a score of '1' for each question answered 'yes' and a score of '0' for 'no'.

The highest score which may be achieved is eight, and this signifies strong clinical evidence. A lower PEDro Scale score indicates weak evidence. An adapted version of PEDro Evidence in Augmentative and Alternative Communication (EVIDAAC) includes the Single-Subject

Scale (Schlosser, 2011) and the Comparative Single-Subject Experimental Design Rating Scale (CSSEDARS, Schlosser et al. 2009). This EVIDAAC scale provides a measure of quality for randomised controlled trials (RCTs), non-randomised controlled trials (non RCTs), single-subject experimental designs (SSED) and case series (Schlosser et al. 2009).

1.8 Systematic review - Standalone strategies and interventions used for the studies

<p>EMT</p> <p>Enhanced Milieu Teaching (Hancock & Kaiser, 2006)</p>	<p>It consists of a naturalistic communication intervention that incorporates environmental arrangement, responsive interaction, and milieu strategies to increase the child's language skills. It involves manipulating or arranging stimuli in the child's natural environment to create a setting that encourages them to engage in a targeted behaviour.</p>
<p>ENG</p> <p>Enhanced natural gestures (Calculator, 2002)</p>	<p>Are intentional behaviours that already exist or can be taught based on the child's existing motoric skills. They are a form of unaided means of communication. ENGs do not rely on the actual referent and are distal in nature. They have to be understood by at least two out of three persons who could understand the behaviour (e.g. cupping one's hand and lifting it towards the mouth to request a drink). Two methods of teaching ENG include Mand-Model with Time Delay (MMT) and Molding-Shaping (MS).</p>
<p>Hanen It Takes Two to Talk (Pepper & Weizman, 2004).</p>	<p>An eclectic approach based on parent-child interaction which encourages parents to be more responsive to their child. Parents are explicitly taught to follow their child's attentional lead and respond contingently to the child's behaviour and interests. Modelling, recasting, and expansions of the child's communication attempts are taught and encouraged while the use of directives such as prompting and questioning are discouraged.</p>
<p>IMPAACT (Improving Partner Applications of Augmentative Communication Techniques)</p> <p>(Binger et al., 2008; Kent-Walsh, 2003)</p>	<p>is designed to teach communication partners to facilitate the early language and communication skills of children who use AAC. It is an 8 stage program teaching communication partners to facilitate the early language and communication skills by supplementing the adult's spoken language with use of the child's device as well as pause time to allow the child to respond. Pause time (expectant delay) is the action of waiting for a specific period for the individual to communicate or complete a target skill. During this time, the communication partner uses an expectant facial expression, such as eyebrow raising, and changing the body posture by leaning forward. This delay further indicates that it is the individual's turn to communicate.</p>
<p>JASPER</p> <p>Joint Attention, Symbolic Play, and Emotional Regulation (Kasari, Freeman, & Paparella, 2006).</p>	<p>An intervention program which combines behavioural and developmental principles. It targets symbol infuse[d joint engagement and symbolic play within a framework of play, joint attention, and naturalistic language teaching. It uses naturalistic strategies to increase the rate and complexity of social communication. The approach supports implementation of intervention to promote generalization across settings and activities and to ensure maintenance over time.</p>
<p>Keyhole</p>	<p>Based around TEACCH approaches, Hanen and PECS (all described separately).</p>
<p>PECS (Frost and Bondy, 1994).</p>	<p>Picture Exchange Communication System (PECS) is based on applied behaviour analysis promotes non-verbal communication intent and initiation as well as facilitating the development of spoken words. The structural elements of the program target functional activities, reinforcement systems, functional communication, identification and replacement of contextually inappropriate behaviours. Training techniques include strategies such as chaining, prompting/cuing, modelling, and environmental engineering.</p>
<p>LAPE</p> <p>Learning and Playing Everyday</p>	<p>This program focuses on increasing parents' use of naturalistic language-enhancing strategies and improving communication skills in their toddlers' with expressive communication delays. It provides opportunities for the child to communicate and also teaches a core vocabulary of functional new words. LAPE strategies include waiting and responding, use of short simple sentences, choice making, responding and interpreting the child's communicative attempts.</p>
<p>TEACCH (Mesibov, 1997).</p>	<p>Treatment and Education of Autistic and related Communications handicapped children (TEACCH) is based on visually mediated learning and the structuring of the learning environment to cue targeted behaviours. TEACCH combines developmentally appropriate practice with behavioural techniques (e.g., environmental control/structure), family collaboration and involvement.</p>

<p>Responsivity Education/Prelinguistic milieu teaching (PMT)</p>	<p>Play based child directed intervention establishing a repertoire of early communication skills, contingent responsiveness and high rate of child centered engagement. Steps are taken to teach gestures, vocalisations and coordinated eye gaze behaviour. Implementation of RE/PMT used prompting, imitation of vocalisations,</p>
<p>Reciprocal Imitation Training (RIT) (Ingersoll & Lalonde, 2010).</p>	<p>A naturalistic behavioural intervention that teaches imitation to children within a social- communicative context. This approach is similar to Responsive Teaching and the Hanen Approach. The technique consists of a description and modelling of the imitation skill followed by pause time and prompt imitation.</p>
<p>Responsive Teaching (Mahoney & MacDonald, 2007)</p>	<p>a developmental intervention that is designed to promote children's cognitive, communicative, and social emotional functioning. Responsive Interaction (RI) strategies are used to increase parents' level of responsiveness with their children. It consists of at least five distinct components of interactive behaviour: reciprocity, contingency, shared control, affect, and matching interactions according to the child's interests, style and developmental level. Sensitive responsiveness strategies are incorporated within family routines and social interactions.</p>
<p>SAL System for Augmenting Language (Ronski and Sevcik, 1996).</p>	<p>Also known as augmented language input, aided language stimulation, modelling, aided language modelling can be used as a tool for both language input and output. The components include speech-output communication device, an individualized vocabulary, opportunities for communication and partner-communicated augmented input. The concept of using picture communication symbols is demonstrated through a modelling process. Modeling is used when the communication partner activates a symbol on the child's AAC device, in conjunction with Augmentative Communication Input and Output respectively to speak the word or message simultaneously.</p>

APPENDIX B: Examples of Raw Data

2.1 Procedural Guidelines for the Pilot Study (Study 1)

1. The three families were contacted by phone in order to agree on a suitable time to meet them in their homes.
2. During the first session, the researcher explained what the study entailed and went over the information sheets and consent forms with the mother and siblings.
3. Once consent was gained, the researcher conducted the background questionnaires with the mother. This took around 30 minutes to complete.
4. Once siblings consented, the researcher conducted the interviews with the siblings. This required around 20 minutes to complete.
5. Following initial analysis of the replies obtained during the questionnaires and interviews, the researcher contacted the families again to discuss the first filming together. A suitable time was found to ensure that the sibling was also there and that the time was convenient for all the family including the focal child. The researcher suggested to the parents the possibility of having a carer / family member in his/her acquaintance to supervise the focal child prior /while other family members are being filmed. The researcher liaised with the family to find the most convenient time to them so as not to invade their usual family routine
6. The researcher discussed the proposed activities to be filmed with each family, and which activities were to be conducted in dyads or triads. The location within the family's home where the activity took place, was discussed with the family member, as well and which activities were chosen by the families.
7. For the first filming activity, the following footage was followed by the families. Families were allowed to make changes in the order of the footage according to their specific needs and constraints.

Mother – focal child interactions

Sibling – child interactions

Mother-child-sibling interactions

Approximately 11 minutes of preferred activities for each dyad and triad were filmed. The first minute from each video were discarded so that families could be

acclimatized with the video camera as well as the presence of the researcher in the room.

8. Following completion of this data set, tentative dates for the next two visits were discussed and set up. The same format and procedural guidelines were used for each visit.

2.2 Example of a Family Profile

Family structure

Family 1 is made up of four persons, the father, mother and two daughters. They live in an apartment in the south area of the island. Both parents completed compulsory education and both work 30 to 40 hours per week. Both parents hold executive posts. Their two daughters are 13 and 9 years old. Both daughters attend compulsory schooling. Neither of the daughters attend after school hour programs or respite care.

Medical Diagnosis

The elder sibling is diagnosed with Global Development Delay with a history of perinatal asphyxia. She has visual impairment. She also suffers from Gastro-esophageal reflux and at times this causes her severe pain. She exhibits stiffness in four limbs particularly on her right side. She uses a wheelchair and she cannot stand unaided.

Physical status

She has full range of movement in all joints and generalised increased tone in upper and lower limbs. Her head is flexed forward due to rounded shoulders and a slight kyphotic back. Arms are kept in midline with a tendency to keep fingers flexed. She sits in her own buggy in class and she is encouraged to use upper limbs in a functional way during activities. She can press a switch attached to her left wheelchair arm using her palm. If the switch is mounted on a wedge on the table, she normally uses the upper side of her wrist, turning her palms upwards. She needs hand over hand support to grasp an object in her hand. Finger isolation is difficult.

Language and Communication

She enjoys interaction and smiles when talked to. She recognizes familiar voices and names. She enjoys playing, especially with her sister. She shows that she enjoys the presence of her peers by smiling or laughing when they make noises. She shows she is irritated when her face is wiped and when she is not given full attention during feeding. Although she tolerates new situations she communicates through body language and/or facial expressions. If she is not interested or stimulated by what is going on around her, Tina gets engrossed in licking her hand.

Otherwise she lifts her head up, laughs heartily and stays alert throughout the activity. She also cries if she gets tired from sitting on her buggy or if wet. She can express her basic needs through her AAC device (Tobii 36) which she always carries with her. She has 16

pre-recorded messages through which she can scan using a medium switch attached to the left arm of her wheelchair. Tina is able to press the switch to start scanning and press again for the desired message. She hears the voice output through an earphone on her right ear. She can convey a message appropriately if given sufficient time. She is able to initiate greetings (Hello! /Good Morning! /Bye) and also ask for a drink, for food or to hear music. Sometimes Tina can also associate a message on her device with a situation. Tina has also been exposed to ITalk2 – a two switch device which is normally used for comprehension. However, this is rather challenging because Tina finds difficulty to press the switch on the right with her right hand and may opt to try and reach out and cross over with her left. Also, the device needs to be kept stable in one place so that Tina does not lose focus on the position of the switch. She understands simple instructions, stories and questions. She can answer appropriately using her AAC device if given sufficient time.

Mother-child perspectives

The mother described the child as having sleeping difficulties and the child complains of stomach pains. At home they use Maltese with some English even with their mother. With their father they use mostly English with some Maltese. She has 3 hours of physiotherapy, swimming and ICT per week. The mother describes a happy, trustworthy, secure and firm relationship with her daughter. She reports that the child likes to listen to music, do her stretching, take part in the kitchen activities, listening to her mother cooking and does some steps on the walker.

Child-sibling relationships

The younger sibling reported that during the week they go to school and do their homework but during the weekends they “go out as a family and have fun”. When she is on her own she likes reading and watching TV. When asked what she does with their older sister, she likes sharing hobbies like reading to her on a daily basis. She also likes listening to music. Every week she likes to visit restaurants and cafes, go to the playground and playpark and also visit family and friends. Once a week she helps with the housework while her sister is involved in kitchen activities. The sibling reported that they don’t fight but that her sister cries when she puts on the sound of the TV up. She reported that she needs help during the day especially with daily living such as dressing, washing, eating, feeding and walking. She also helps her with computer activities. The sibling reported that she uses a voice output communication aid to communicate with her. She also uses physical communication by hugging, tickling, rolling around together as well as the italk2. When asked how she sees herself with her sister she said she thinks she is a caring sister.

2.3 An example of Detailed Analysis based on EAS criteria

Being Attentive

The mother looked interested with a physical posture to accommodate the child. She gave her time and space to respond. She gave her a lot of instructions “Ejja, Tina head up” implying that the mother is being directive in her style. Mother enjoys watching her child working on the computer. She was aware that Tina prefers a different access method.

In the child-sibling interactions, the sibling volunteered to do physical exercises on the floor with her sister. She positioned herself on the floor facing her sister and looked at her with a friendly posture. The younger sibling was physically taking Tina’s limbs and shaking them vigorously. She waited for her sister to respond and Tina was laughing and giggling with pleasure. The younger sister seemed to be aware that this is an activity that Tina enjoys and she commented prior to selecting the activity at hand.

During triadic interactions, the mother took over most of the interactions and initiatives. She used a lot of the directiveness and issuing a number of commands. She was issuing most of the directives like “come on Tina, press the switch”, while the younger sibling was patiently waiting until she could also join in the activities. The young sibling tried several times to join in but could not find the opportune moment to start reading the story. Evidently, the mother took control of the interactions, not allowing much opportunities for the younger sibling to interact.

Encouraging Initiatives

The mother waited patiently while her daughter responded while pressing the switch or the space bar. She showed varying levels of intensity and loud noises to accompany the sound effects of “10 fat sausages”. She made loud accompanying noises which made Tina smile and laugh. She used playful intonation appropriately. She kept naming what child might be thinking or feeling. She was consistently looking for initiatives while prompting her.

During sibling interactions, she used some waiting skills to allow Tina respond. She listened actively to her vocalisations and laughter. She used emotional warmth through intonation when she was playing with her and also when she was reading books to her. She also used playful intonation during rough play so Tina could respond with playful vocalisations.

During mother-child-sibling interactions, the mother felt pressurised, so her daughter could press the switch to listen to the story. She was using a lot of directives like “come on Tina press the switch”. At times, limited emotional warmth through intonation was observed and rather the mother’s tone was mostly authoritative and dominant when compared with other video clips. She was also directive when she asked the child to make choices during story telling sessions. It was then that she prompted the younger sibling to read the passages from the book and also directed her to how to join actively in rough play activities which Tina likes.

Receiving initiatives

Mother showed she has heard and noticed her daughter's initiatives by encouraging her to put her head up and press the switch. She also encouraged her to continue pressing the switch to continue with the sequence of activities. Mother shows playful and casual mode of interacting with her child.

While she cannot initiate or maintain eye contact, the mother maintains bodily contact with her daughter both in table task activities and also when she is involved in tumble play and rough play. During child-sibling interactions, the younger sibling was calling her sister and shows her she has noticed her bodily movements meaning that she wanted more rough play. Tina was showing responsiveness and attunement by smiling, chuckling, and turning her head from side to side. No AAC device was used during these interactions and Tina could not respond actively to her sister's initiatives.

During triadic interactions, the mother attended and confirmed Tina's communication when the child eventually pressed the switch to confirm that she wanted to continue the activity. She repeated digitised utterances from her device and also asked questions in relation to the story. She could not return eye-contact, nor smile or nod in response since the child is visually impaired. The parent had to adjust physically to the child by supporting the child from her back and arms.

Developing Attuned Interactions

The mother was looking for opportune moments where she can receive feedback from her daughter during switch related activities. She then responded as soon as the child interacts either by pressing the switch or when she responds to her mother's tickles and rough play. Mother waits attentively while her daughter takes a turn with her switch. Both are taking part in the activities, but their participation is highly asymmetric. There is an element of cooperation from the mother, helping the child to find the space bar which seemed to be a more preferred access mode rather than the switch.

During child-sibling interactions, the sibling was intuitively waiting for Tina to take a turn by waiting expectantly so that she responds by smiling and chuckling. After analysis of some of the videos, it was clear that taking turns was somewhat dependent on the type of activity and whether this was highly appealing to the child. There was evidence of both siblings giving and taking short turns although the younger sibling had to intuitively respond, give and take short turns. However there was an asymmetry in the interactions and the siblings could not contribute equably to the interaction.

During triadic interactions, the majority of the interactions were led by the mother who used a lot of directives to direct attention and prompt Tina to respond. The mother seems under pressure to make the child respond and had to repeat instruction several times during the interactions. There was an asymmetry in the interactions and a marked dominance from the mother who controlled the majority of the interactions. Co-operating and helping each other in triadic interactions was observed in some instances when the sibling read the story, and asked questions while the mother programmed the italk 2 with set phrases. She then prompted the child to press the correct answers in multiple choice answers but selection was evidently dependent on the child's interest and motivation to participate. At times the mother used coaxing and persuasion to try and motivate Tina to participate more actively.

2.4 Example of Observation Sheet (EAS score)

Attuned interactions	Mother and child	Sibling and child	Mother, sibling and child
Context	Singing and playing musical instruments. Board game.	Role play.	Making pancakes. Making sandwiches. Reading stories
Being attentive	Mother and child are at the kitchen table. Mother has a guitar in her arms and turns towards the child and shows her a range of percussion instruments. She prompts her to name a few instruments and asks her to retrieve some colours. The mother playing the guitar, the child playing percussion. Mother stops at times so that child joins in.	Both sibling and child are at the kitchen table are playing with Tweetie and some of Tweetie's toy including a potty chair, some utensils, and a makeshift carton oven. The younger sibling asks her sister to name some of the objects that Tweetie is playing with. Sibling asks Sara to put Tweetie on the potty chair and Sara squeals in delight to indicate a yes.	Mother, sibling and child are in the kitchen to make a pancake. Mother gives some directions to the sibling to get the ingredients and mix them together. Both siblings are watching each other and their mother. Mother asks Sara to join in the activity.
Encouraging initiatives	Mother asks the child some of the instrument names. She waits while the child answers back. She talks warmly to her daughter. She names what the child is naming even if this is highly unintelligible.	The younger sibling waits and listens while Sara uses unintelligible and slow slurred speech to talk. The younger sibling does this using friendly and playful intonation often with giggles and smiles. She repeats what her sister is saying and plays with her and takes turns.	Mother asks both girls towards the kitchen and the pancake activities. Mother asks both girls to take part in the activity. She gives them different roles in the kitchen. Ana helps with pouring the milk and beating the eggs. Sara watches on. Mummy talks to Sara and asks her if she wants a pancake. She takes turns to involve both siblings.
Receiving initiatives	Mother makes eye-contact, smiling, nodding in response to the playful songs and music they are playing. The mother receives what her daughter is saying with words. She responds to her daughter and waits for her to answer back.	The younger sibling shows that she has heard, noticed and responded to her sister's initiatives such as vocalisations, single words and laughter. Sister is friendly and playful with her sibling. She plays together with her and pretends to put Tweety on the potty chair. They feed Tweety some toast while smiling and nodding to each other. They feed Tweety some toast while smiling and nodding to each other. Sara is putting bread in the toaster and Ana is turning the toast right way up. Ana encourages Sara by saying "ehhh brava ghandna l-bajda". "Itfagghom hawn ha, ha ha, ha ha. At times she repeats single words to confirm what she said.	Both the mother and sibling are friendly and playful during the activity. They all return eye contact and smile and nod in response to each other.
Developing attuned interactions	The mother waits for Sara to respond. She waits for her turn. Both of them are smiling at each other and are enjoying the activity. They both	Younger sibling receives spoken feedback from her sibling and responds back to her. She waits attentively for her turn and both evidently have fun playing with	Mother and younger sibling pay attention to Sara. They both check if Sara is understanding and mother waits for her turn. She gives

	<p>contribute to the interaction equally. They co-operate and help each other.</p>	<p>Tweety. They put Tweety on the potty, and then prepare some toast for Tweety. The younger sibling gives further turns on the same topic. Aimee continues to show Sara how to feed Tweety and prepare toast for her.</p>	<p>both siblings further turns. They all help each other and involve Sara in their activities.</p>
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2.5 An Example of the RAACS score

<i>Statements</i>	<i>Minute</i>										<i>S</i>	<i>M</i>	
Baseline measure 1	Score Statements 1 – 7 minute-by-minute, according to the 3-point scale for each item in the Coding Scheme.							Score Statements 8 and 9 globally, according to the 3-point scale					
1 = Never, 2 = Sometimes, 3 = Often. Obtain sum of Statements 1 – 7, calculate the means by dividing by number of coded minutes. Add the means from Statements 1 – 7 and the sum of Statement 8 and 9 to get the overall RAACS score.	1	2	3	4	5	6	7	8	9	10			
1. The parent/sibling attends to and confirms the child’s communication	1	1	1	1	1	1	1	1	1	1	10	1	
2. The parent/sibling adjusts physically to the child	1	1	1	1	1	1	1	1	1	1	10	1	
3. The parent/sibling gives the child space to communicate	1	1	2	1	2	1	1	2	1	2	14	1.4	
4. The parent/sibling clarifies his or her own communication	1	1	1	1	1	1	1	1	1	1	10	1	
5. The parent/sibling communicates according to the child’s focus of interest or conversational topic	1	1	2	1	2	1	1	2	1	2	14	1.4	
6. The parent/sibling expands on the child’s communication	0	0	0	0	0	0	0	0	0	0	0	0	
7. The parent/sibling uses AAC	0	0	0	0	0	0	0	0	0	0	0	0	
8. The parent/sibling adapts and is engaged	1 Never_____ 2 Sometimes_____ 3 Often 3												
9. The parent/sibling adjusts to the communicative level of the child	1 Never_____ 2 Sometimes 2 3 Often_____												

2.6 An example of the EAS score

<i>Score</i>	7	7	3	3	3	3	3	29	7
<i>family</i>	<i>Affect</i>	<i>Clarity of Perceptions</i>	<i>Timing</i>	<i>Flexibility</i>	<i>Acceptance</i>	<i>Amount of Interaction</i>	<i>Conflict</i>	<i>Total Score</i>	<i>Direct score</i>
1	4	6	3	3	2	3	3	24	6
2	5	6	3	3	3	3	3	26	7
3	5	5	3	3	3	3	3	25	6
	<i>Guidance</i>	<i>Success</i>	<i>Amount of Structuring</i>	<i>Limit Setting</i>	<i>Firm in Pressure</i>	<i>(Non)verbal structuring</i>	<i>Peer vs. Adult</i>	<i>Total score</i>	<i>Direct score</i>
1	6	4	3	3	3	3	3	25	4
2	6	6	3	3	3	3	3	27	6
3	6	4	2	3	2	3	3	23	4
	<i>Following C leads</i>	<i>Ports of entry</i>	<i>Commands</i>	<i>Talking</i>	<i>Didactic Teaching</i>	<i>Interferences</i>	<i>Feel Intrusive</i>	<i>Total score</i>	<i>Direct score</i>
1	1	1	1	2	2	1	2	10	1
2	4	4	2	3	3	1	2	19	3
3	1	1	2	2	2	1	2	11	3
	<i>Lack negativity</i>	<i>Lack ridiculing</i>	<i>Lack threats of separation</i>	<i>Loose cool</i>	<i>Frightening</i>	<i>Silence</i>	<i>Themes</i>	<i>Total score</i>	<i>Direct score</i>
1	4	3	3	2	2	3	3	20	5
2	5	6	3	3	3	3	3	26	5
3	4	3	3	3	3	3	3	22	5
	<i>Affect</i>	<i>Responsiveness</i>	<i>Autonomy</i>	<i>Physical Positioning</i>	<i>Role-reversal</i>	<i>Lack of avoidance</i>	<i>Task oriented</i>	<i>Total score</i>	<i>Direct score</i>
1	4	4	1	2	3	2	3	19	4
2	6	6	3	3	3	3	1	25	5
3	5	5	2	2	3	2	2	21	3
	<i>Simple Initiative</i>	<i>Elaborative Initiative</i>	<i>Use of Adult</i>	<i>Lack of over-involvement</i>	<i>Eye contact</i>	<i>Body positioning</i>	<i>Verbal involvement</i>	<i>Total score</i>	<i>Direct score</i>
1	1	1	1	3	1	2	1	10	4
2	4	4	2	3	2	2	2	19	6
3	2	2	2	3	2	2	1	14	3

2.7 Frequency of Directives across dyads and triads

Supportive directive utterances: SDU				Mother-focal child: M+C					
Intrusive Behavioural Directives: IBD				Sibling-focal child: S+C					
				Mother-sibling-focal child: M+S+C					
Category	Family 1			Family 2			Family 3		
	M+C	S+C	M+C+S	M+C	S+C	M+C+S	M+C	S+C	M+C+S
SDU	8	1	10	5	18	5	2	10	1
IBD	0	0	0	0	0	0	0	0	0

2.8 Example of part of a Transcription

Time	Person	Broad Transcript in Maltese	Translation to English
00.00			
00.02	Ana	Laura, trid nilaghbu l-logħba ta' Tweetie	Laura, do you want to play the Tweetie game
00.05	Laura	Ija (iva)	yes
00.05	Ana	Ija ? (iva?)	Yes?
00.07	Laura	ehhh	
00.08	Ana	Aw - zomm l-Tweetie, zommu	Here, hold Tweetie, Hold it
00.09	Laura	Ehhh ehhhh	
00.10	Ana	Muumy irrid nilbes, irrid immur fil-?, trid nilbsuh ?	Mummy I want to dress up, I want to go ?, shall we dress
00.15	Laura	Ijaa (iva)	yes
00.17	Ana	Imma ikun irid jilbes	But it would want to dress up
00.17	Laura	Ehhh (Laura starts laughing)	
00.19	Ana	Ha ha ha ara għandu l-?, zommuli, zommuli l-Tweetie	Here, here, here he has the ? Hold it, hold Tweetie for me
00.23	Laura	Laughter....ahhh, ahhh, ahhh	
00.26	Ana	Żommuli sew.....ekkk	Hold it properly...like that
00.29	Ana	Ħares lejh!	Look at it !
00.30	Ana	zommuli	Hold it for me
00.30	Laura	Ehhhhh	
00.32	Ana	Ara libbisnih, kemm hu helu hu	Look we dressed him up, how sweet he is.
00.34	Laura	Ehhhh	
00.37	Ana	Ija ?	Yes?
00.38	Laura	Ija !	yes
00.39	Ana	Nitfghuh ġos-sodda issa	Shall we put him to bed ?
00.41	Laura	Ija	
00.42	Laura	Mela-ilma (medicina)	medicine
00.43	Ana	Ija imbagħad intih il-medicina	Yes, we will give him the medicine
00.47	Ana	Mela din is-sodda ta' Tweetie ara	So this is Tweetie's bed
00.50	Laura	laughter	
00.53	Ana	Ejja ara Ħa !	Come and see
00.53	Ana	Itfaghli l-Tweetie ġos-sodda, trid ?	Do you want to put Tweetie to bed?
00.57	Laura	Ija, aaaa!	
00.59	Ana	Itfghu fis-sodda aaaa	Put him in bed
01.00	Ana	Itfghu ġos-sodda	Put him in bed

01.02	Laura	Oooo, oooo	
01.04	Ana	Hekk ha jorqod	Like that, so he sleeps
01.06	Laura	ija	
01.08	Ana	Trid qabel naħsulu snienu?	Shall we brush his teeth ?
01.00	Laura	Ija (sigh)	
01.12	Ana	Imma t-toothbrush u t-toothpaste ta' Tweetie	But the toothbrush and the toothpaste are Tweetie's
01.13	Laura	"imma"	
01.15	Ana	Mela ara, għandna din halli naghmluhielu halli joqgħod bil-qieghda fuqha trid ?	Now look, we have this which we can put for him so he can sit on it.
01.20	Laura	ija	
01.21	Ana	Ok ok itfaghħielu ha ha ha	Ok, ok, put it there, take it, take it, take it
01.23		(Laura puts the white cushion in Tweetie's bed)	
01.25	Ana	Brava	Well done
01.27	Ana	Issa itfaghli l-Tweetie, itfaghli l-Tweetie	Now put Tweetie, put Tweetie
01.30	Ana	Hekk hu għamli hemm brava....	That's it put it there, well done
01.33	Ana	Kemm hu helu hux	How sweet he is
01.33	Laura	Laughing.....	
01.37	Ana	Ha nistenna.	I'm going to wait.
01.39	Ana	Din it-toothbrush ara ghax ahna ha naħsulu snienu	This is the toothbrush; look because we are going to brush his teeth
01.41	Laura	Ija	yes
01.41	Ana	orrajt	okay
01.43	Ana	U għandna t-toothpaste ta' Tweetie ara hawnhekk	We have Tweetie's toothpaste here
01.45	Laura	Ehhhh	
01.46	Ana	Joghgbok?	Do you like it?
01.49	Ana	Ejja naghmluhu naqra toothbrush, toothpaste	Let's put some toothbrush, toothpaste
01.50	Laura	(Laura switches on the toothbrush)	
01.51	Ana	Mhux għalissa nixghela toothbrush	We don't switch the toothbrush on now
01.53	Ana	l-ewwel naghmlulha naqra toothpaste	First we put some toothpaste
1.55	Ana	Aghmillu naqra toothpaste, aghfashulu, aghfashulu t-toohpaste.	We put some toothpaste, squeeze it, squeeze the toothpaste.
1.59	Ana	Le mhux taghfashulu trid taghmilulu fuq il-....	No you don't press it, you have to put it on the.....
2.00	Ana	ħares lejħ	look at it
2.01	Ana	Għafsu, għafsu	Squeeze it, squeeze it
2.04	Ana	Hekk għamilnieħa naqa....	Yes, we did a bit...
2.05	Ana	Issa ixegħla ixegħla	Now switch it on, switch it on
2.06	Laura	<i>laughing</i>	
2.08	Ana	Kemm hu helu Tweetie	How sweet Tweetie is
2.09	Laura	Ija!	yes
2.10	Ana	Ixegħlu, ixegħlu, ixegħlu	Switch it on, switch it on, switch it on
2.11	Ana	Hekk, hekk, hekk, hekk	Like that, like that, like that, like that
2.14	Ana	Ejja aħsillu snienu isa isa....	Come on, come on, brush his teeth
2.15	Ana	Ejja ha ntellgħuh naqra hawnhekk, ejja	Let's lift him up a bit, come on
2.17	Ana	Aħsillu snienu	Brush his teeth
2.19	Ana	Ehh aħsilulu	Come on brush it
2.21	Ana	Issa naghmlulu naqra sew ta'	Now we do them properly
2.22	Ana	Naħslulu naqra d-dras ta'	We brush his molars
2.24	Laura	<i>screaming</i>	
2.26	Laura	<i>unintelligible</i>	
2.28	Ana	Ibqa' aħsilhom, ibqa' aħsilhomlu	Continue brushing, continue brushing them.
2.32	Ana	Ma hu li qi (unintelligible)	
2.33	Ana	Bravu, bravu Tweetie	Well done, well done Tweetie
2.37	Ana	Hekk issa waqqfu naqa - waqqfu	Yes, now lift him up a bit.

2.41	Ana	Trid intuh l-medičina halli jorqod ?	Shall we give him the medicine, so he sleeps ?
2.43	Laura	Ija!	
2.43	Ana	Ija?	
2.44	Laura	Moq ne (Monte)	
2.46	Ana	Ehh intuh l-Monte	Okay, we give him Monte (yoghurt)
2.48	Laura	Ija	iva
2.48	Ana	Ejja ha ntuh l-Monte imbaghad intuh l-medičina	Let's give him the Monte, then we give him the medicine
2.50	Laura	laughter	
2.52	Ana	Ejja (Ana gets up from her chair to get the Monte from the fridge)	Come
2.55	Ana	Inġibulu l-Monte	Let's bring him the Monte
2.55	Laura	Vocalising - laughing	
2.58	Ana]	Kučcarina tal-Minnie Mouse (Ana got a spoon from the drawer)	A Minnie mouse spoon
3.00	Ana	Hekk ha (Ana helping Laura to pretend to spoon the Monte)	Like this look
3.04	Ana	U din, tihulu, tihulu	And this, give it to him, give it to him
3.07	Ana	Tihulu	Give it to him
3.07	Laura	Squealing (and feeding Tweetie)	
3.09	Ana	Naqa ma jiflahx ha ttiħ l-medičina	He's a bit sick, give him some medicine
3.11	Laura	Ija	Yes
3.11	Ana	Orrajt	Ok
3.13	Laura	(Laura mumbling and vocalising)	
3.15	Ana	Ejja ha, ha, ha tih l-pillola, tih l-Monte	Come on, here, here, here, give him the medicine, give him the Monte.
3.19	Laura	(Laura laughing and feeding the spoonful to Tweetie)	
3.21	Laura	Laura vocalising	
3.21	Ana	Mill-ewwel l-hawn kielu kollu l-Monte	He ate all his Monte.
3.33	Ana	Ejja Laura nraqqduħ	Come on Laura, let's put him to sleep
3.36	Mummy	(Mummy prompting Ana) "tiħ wahidha"	Let her feed him herself
3.38	Ana	Ehe trid ittiħ wahdek	Ok do you want to feed him alone ?
3.40	Laura	Me- laaa (medičina)	
3.41	Ana	Ok, tieħielu, tieħielu	Ok, give it to him, give it to him
3.44	Ana	Tieħielu, tieħielu, ha,ha,ha	Give it to him, give it to him, here, here, here
3.45	Ana	Ha..tiħ l-medičina	Here...give him the medicine
3.46	Ana	Mħux tikoħha inti ta	Don't eat it yourself !
3.48	Ana	Tieħielu, tieħielu	Give it to him, give it to him
3.50	Ana	U ħija, ħija naqa naqa	That's fine, little by little
3.53	Ana	Hekk Bravu	Like that well done
3.55	Ana	Tieħulu	Give it to him
3.57	Ana	Bravu, kielha kollha.	Well done. He ate it all.
4.00	Ana	Bravu Tweetie. Inraqqduħ ?	Well done Tweetie. Shall we put him to sleep ?
4.02	Laura	mmmmm	
4.04	Ana	Sa jaqbad jibki issa	He's going to cry now
4.06	Ana	Meta joqġħod jibki joħodli rasi ħien ta.	When he cries he gives me a headache
4.08	Ana	Ehe, shhh (Ana lowers her voice) ġħax jekk naghmlu hafna storbu inqajmuh. Daqt irridu norqdu ahna	Yes, shhhh because if we make alot of noise we will wake him up. We soon need to go to sleep.
4.18	Ana	Ejja ntuh naqra ilma	Let's give him some water
4.20	Ana	Tih naqa inti ilma	Give him some water
4.22	Ana	ħa tih naqa inti	Here, you give him some
4.25	Ana	Mħux inti tixrob	Don't drink it yourself
4.27	Ana	Tih tih tih - uuuuuuuu	Give him, give him, give him - enough
4.29	Ana	Uuuuu kemm ha jixrob	Enough – how much is he going to drink !

4.30	Ana	Kemm hu helu	He's so sweet
4.35	Ana	Mela, ejja inraqquduh	So, let's put him to sleep
4.37	Laura	ija	Yes
4.37	Ana	Mela, mela ejja hi johdilna rasna, jibda jibki u ma nkunux nistghu norqdu	He will give us a headache, he starts crying and we will be unable to sleep
4.42	Ana	(Ana lowers her voice) noqoghdu kwieti	We stay quiet
4.44	Ana	Ha, ha, ha issa naghmlu s-sodda	Here, here, here, let's do the bed
4.45	Laura	aaaaa	
4.47	Ana	Din issa itfaghulu hawnhekk din	Now this, put it here, this
4.52	Ana	Hekk brava	That's it, clever
4.53	Ana	Nitfghu lil Tweetie, itfghu inti, itfghu inti	Let's put Tweetie in. Put him in, put him in.
4.56	Ana	U jorqod	So he sleeps
4.57	Laura	mmmmaa	
4.59	Ana	Naghmlulu l-kutra	Let's cover him with a blanket
5.00	Ana	U ghadu lanqas raqad	Oh! He hasn't slept yet.
5.04	Ana	Hallih ha jorqod inkella joghqod igerger	Let him sleep otherwise he will start grumbling.
5.05	Laura	Mur iiiieeee (bottle?)	
5.07	Ana	Naf, naf, naf, ha ntuh naqra bottle	I know, I know, I know, let's give him a bottle
5.13	Ana	Tih, tih	Give him, give him
5.14	Ana	Hekk, hekk, hekk, raqad	Like that, like that, like that, he slept
5.15	Ana	Raqad, shhh, shhh, shhh (Ana's voice is lowered)	He slept. Shh, shhh, shhh
5.19	Laura	(Laura starts touching her head with her hand)	(Here Laura is possibly asking Ana to massage Tweetie's head)
5.20	Ana	Oqghod fissdu fitit	Caress him
5.21	Ana	Hokklu naqra rasu halli jorqod	Scratch his head so he sleeps
5.23	Laura	(Laura starts scratching her head)	
5.25	Ana	Hekk ha torqod ghadek.	You're still are going to sleep
5.26	Ana	iva oqghod ghax ha tqajmu issa	Now stop it because you are going to wake him up.
5.29	Laura	(Laura places her finger over her lips shushing her sister)	
5.31	Ana	Hokkielu, hokkielu, hokkielu	Scratch it, scratch it, scratch it.
5.35	Ana	Hekk oqghod hokkielu ghax ghadu baby dak	Yes, scratch his head, he's still a baby
5.39	Laura	Immi ummmaaaaa (Laura vocalising)	
5.41	Ana	Kemm tahseb li ghandu zmien Tweetie ?	How old do you think Tweetie is ?
5.43	Laura	Semmin (Seven)	
5.43	Ana	Hux Seven !	He's not Seven !
5.44	Ana	Two ghandu, ghadu baby dak	He's two, he's still a baby.
5.47	Laura	Eeee-eeee-eeee	
5.48	Ana	Mhux ghalissa fadallu	Not now
5.55	Ana	Ghadu baby	He's still a baby
5.56	Laura	(Laura places her finger over her lips shushing her sister)	
5.58	Ana	Raqdu, raqdu, raqdu, raqdu	Put him to sleep, Put him to sleep, Put him to sleep, Put him to sleep,
6.00	Ana	Ara l-ohra ha tqajmu	You're going to wake him up
6.03	Ana	Tweetie qbadtu minn rasu	You grabbed Tweetie from his head
6.04	Ana	raqdu	Put him to sleep
6.05	Laura	(Laura touches her hair)	
6.09	Ana	U le jahasra (Ana arranges her hair)	Oh no
6.11	Ana	Ejja fissdu fissdu halli jorqod	Caress him, caress him so he sleeps
6.14	Ana	Bravu. Kemm hu helu Tweetie	Clever. How sweet Tweetie is.
6.17	Laura	Ma ma saaa	
6.19	Ana	Ehe bravu bravu, nohdud l-hemm imur jorqod?	Yes, he's clever, clever, shall we take him away so he sleeps ?
6.21	Laura	ija	yes

6.22	Ana	orrajt	okay
6.24	Laura	vocalising	
6.25	Ana	Ahhh, ha tqajmu	You're going to wake him up
6.26	Laura	aqqqqqq	
6.27		(Ana gets up to take Tweetie away)	
6.29	Laura	Heavy breathing and vocalises	
6.30	Ana	(Ana stops) xhiex, xhiex, xhiex ?	What, what, what ?
6.34	Ana	Nhallih ?	I leave him here ?
6.35	Laura	ija	
6.36	Ana	Ejja nhallih, ejja nhallih	Let me leave him here,
6.43	Ana	Ara l-ohra	Look at her

APPENDIX C: Study 3 Data

3.1 Study 3: Study component

Session (10 minutes)	Dyad	Activity
Baseline		
Activity 1	child-sibling	e.g. Board game: snakes & ladders, Ludo,
Activity 2	child-sibling	e.g. Strategy game: Guess Who, Connect four, Uno, Scrabble, iPad games.
Activity 3	child-sibling	e.g. An activity in the house: making sandwiches, decorating biscuits, making pizza, making fruit salad/fruit kebabs.
Intervention		<p>3 shared review sessions of 1 hour each.</p> <p>Session 1: Discussion about the process of communication and goal setting tasks. Filling in of the goal setting worksheets with the siblings.</p> <p>Session 2: Video feedback interventions (watching video clips chosen by the siblings).</p> <p>Session 3: Comparison of feedback from session 1 and 2 (self-monitoring exercise) and revision of goals if necessary together with parents and siblings.</p>
Post Intervention session		
Activity 4	child-sibling	suggested activities: Board game: snakes & ladders, Ludo,
Activity 5	child-sibling	suggested activities: Strategy game: Guess Who, Connect four, Uno, Scrabble, iPad games.
Activity 6	child-sibling	suggested activities: An activity in the house: making sandwiches, decorating biscuits, making pizza, making fruit salad/fruit kebabs.
Post intervention session		<p>Filling up of the sibling questionnaires. In-depth interviews with mothers/fathers and siblings/focal child.</p> <p>Procedural self-monitoring checklists.</p>

3.2 Procedural Guidelines for the Studies

- i. The families were contacted by phone in order to agree on a suitable time to meet them in their homes.
- ii. During the first visit, the researcher explained what the study entailed and went over the information sheets and consent forms with the mother and siblings.
- iii. Once consent was gained, the researcher conducted the background questionnaires with the mother. This requires around 45 minutes to complete.
- iv. Once siblings assented, the researcher conducted the interviews with the siblings. This requires around 45 minutes to complete.
- v. Following initial analysis of the replies obtained during the questionnaires and interviews, the researcher contacted the families again to discuss the filming together. A suitable time was found to ensure that the sibling was also there and that the time was convenient for all the family including the focal child. The researcher liaised with the family to find the most convenient time to them so as not to invade their usual family routine.
- vi. The researcher discussed with the family the proposed activities filmed. The location within the family's home where the activity took place, was discussed with the family member.

Whilst every effort was taken to follow the schedule, this may be altered in accordance to the families' requirements. For each dyad approximately 11 minutes of activities in the house were filmed. The first minute from each video was discarded so that the siblings could be acclimatized with the video camera as well as the presence of the researcher in the room.

3.2.1 Procedural self-monitoring Checklist for Researcher

	Task	Achieved (please tick)
1	Contact families, distribute information packs and obtain consent	
2	Conduct background questionnaires and sibling interviews	
3	Collect 3 baseline measures	
4	Discuss communication goals	
5	Write Goals (refer to Goal setting procedure)	
6	View Videos with the families	
7	Revisit and revise Goals	
8	Collect 3 post intervention measures	
9	Conduct post-intervention interviews and questionnaires with families	
10	Conduct fidelity treatment questionnaire to check for proximity	

3.2.2 Checklist for Siblings

		Observed/not observed	Comments
1	Get focal child attention		
2	Use multi-modal means of communication		
3	Use questions		
4	Wait for focal child to respond while looking at him/her		
5	Provide physical/verbal support		
6	Respond to focal child initiations		

adapted from McConachie & Pennington (1997)

3.2.3 Checklist for Caregivers

		Observed/not observed	Comments
1	Enable proximity to sibling/focal child		
2	Support sibling to create opportunities for interaction		
3	Provide additional support		

Adapted from Carter et al. (2009)

3.2.4 Goal Setting Procedure

Goal writing may set the scene to meaningful language experiences whether family members are going to use a toy, a game or for any other activity in the house. Sample goals can serve as encouragement to develop specific, measurable, individualized AAC goals.

How to ask Siblings about writing Goals:

Before starting with this it is important first to have a discussion on what they mean by communication.

Tell me about the way you communicate with your brother/sister. Would you like to set a goal on how you can communicate better with him/her?

Examples of Goals:

- By next week I would like to learn 5 new signs and then teach them to my brother/sisters.
- I want to give more time to my brother/sister to press the big Mack
- I would like to teach my brothers/sister to find a new word on his device.
- I want to teach my brother/sister to spell a new word for me.
- I want to ask my brother something and he can press it for me.
- I want to record something on his VOCA and then I teach him how to find it.
- I want to record a phrase from a game like Uno or Snap so he can participate in board games with me.
- I want my brother to sing with me using readymade phrases from his big Mack/using some keywords.
- I want to program the VOCA with readymade phrases so my brother/sister can answer questions from the book.
- I want to record some commands on his VOCA so when we play car races, he can say “stop”, “crash” etc.....

3.2.5 Goal setting worksheet for Study 3

Goal Setting Worksheet

Date: _____



You can DRAW or WRITE

My Goal for _____ is:

I can help him/her reach this goal by:

- 1.
- 2.

These people or things will help me reach this goal:

- 1.
- 2.

This is how I feel when I reach this goal:

This is what I think _____ will feel when the goal is reached:

I will know this because...

3.3 Total Frequency Count of reciprocal interactions (study 3)

		Activity 1		Activity 2		Activity 3	
	Phase	baseline	Post-intervention	baseline	Post-intervention	baseline	Post-intervention
Average and Range % of Intervals e.g. 0 (0-0)							
Interactions							
Whole interval recording every 10 seconds	Focal child-initiations						
	Sibling-initiations						
Communication Mode							
Event recording (frequency)	signs						
	vocalisations						
	speech						
	Use of aided communication						
	Number of SGD messages						
Mother's/Father's Prompts							
Whole interval recording every 10 seconds	father's total prompts						
	Father's prompt to sibling initiations						
	Father's prompt to focal child initiations						
	Mother's total prompts						
	mother's prompt to sibling initiations						
	mother's prompt to focal child initiations						
Proximity							
Momentary time sampling every 20 seconds	Proximity to AAC system						
	Proximity to sibling						
	Proximity to mother						
	Proximity to father						

3.4 Event Recording – Description & Procedures (study 3)

Event Recording Form

Directions

Record the time the observation begins

Write a tally mark for each occurrence of the behaviour

Record the time the observation ends

Count the number of tally marks (occurrences) and record the total number

Calculate the length of observation and the rate of occurrences ($\text{Rate} = \frac{\text{number of occurrences}}{\text{length of observation}}$) during the time period/length of observation

3.5 Momentary Time Sample – Description & Procedures (Study 3)

At the end of each 20 seconds time interval:

- Look and see if the behaviour is occurring at that particular time interval.
- If the behaviour is occurring at that moment, place checkmark (X) for that interval.
- If the behaviour is not occurring at that moment, place an O for that interval.

Child:

Date:

Activity:

Interval	Proximity to AAC system	Proximity to sibling	Proximity to father	Proximity to mother
0:20				
0:40				
1:00				
1:20				
1:40				
2:00				
2:20				
2:40				
3:00				
3:20				
3:40				
4:00				
4:20				
4:40				
5:00				
5:20				
5:40				
6:00				
6:20				
6:40				
7:00				
7:20				
7:40				
8:00				
8:20				
8:40				
9:00				
9:20				


9:40				
10:00				
Total times the behaviour occurred				
% of intervals				

APPENDIX D: Ethics

4.1 Ethics Approval Tizard Centre, University of Kent



Tizard Ethics Feedback Form

Student Name:	Marica Gatt	
Supervisor:	Jill Bradshaw & Nicola Grove	
Title:	<i>“Exploring interactions between mothers, siblings and children with communication disabilities”</i>	
<p>The Chair of the Ethics Committee has considered the amendments to the proposal and we can now confirm that this has been approved.</p> <p>Signed: J.Ruffels Date: 07.04.16</p> <p>On behalf of Tizard Ethics Committee</p>		
Alterations approved by Supervisor	Signature	Date
Final approval On behalf of Tizard Ethics Committee	 Paraskevi Triantafyllopoulou Date 07.04.16	

4.2 Ethics Approval UREC, University of Malta



**University Research Ethics
Committee (UREC)**

University of Malta,
Msida MSD 2080, Malta

urec@um.edu.mt

www.um.edu.mt/urec

To whom it may concern,

This is to certify that Ms Marica Gatt, a PhD student at the University of Kent, submitted an application for Research Ethics clearance for a study titled '*Exploring interactions between mothers, siblings and children with communication disabilities*' which was approved by the University Research Ethics Committee on the 1st June 2016, under the Research Ethics regulations operative at that time.

A handwritten signature in blue ink, appearing to read 'Patrick J. Schembri', enclosed within a blue oval shape.

Prof. Patrick J. Schembri

Chairperson, UREC

10th June 2021

4.3 Information Pack for Families

Information Sheet for Mothers (focus dyads)

TIZARD
University of Kent

Tizard Centre
University of Kent
Woodlands, Giles Lane
Canterbury, Kent CT2 7LR

Student: Marica Gatt Tel: +356 79335043 mg423@kent.ac.uk

Supervisor: Dr Jill Bradshaw Tel: +44 7710088477 j.bradshaw@kent.ac.uk

Tizard Ethics Committee Secretary: Tel: +44 1227827955 J.Ruffels@kent.ac.uk

Dear Mothers

My name is Marica Gatt and I would like to tell you about a project I am working on. I am interested to know more about the interactions between mothers, siblings and children who have communication disabilities. The project will run for one year until June 2017. Ethical approval has been granted by the Tizard ethics committee and the University Research Ethics Committee (UREC).



I would like to know more about how you communicate with your children and how your children communicate with each other. I would like to ask you some questions and take some videos of your son/daughter and yourself playing together in your home. We will then watch the videos together and talk about what worked well and what could improve. We will also play some simple games and take part in some leisure activities.



A report will be written about the findings but no names will be mentioned. If you would like to take part please sign the consent form attached with this letter.



If you need to ask any questions or would like more information about the project you can contact me by email or phone.

Thank you

Marica Gatt

email: mg423@kent.ac.uk

Tel: +356 79335043

Għaziza

Jien jisimni Marica Gatt u nixtieq ngħidlek dwar proġett li qed naħdem fuqu. Jien interessata insir naf aktar dwar l-interazzjonijiet bejn l-omm, l-aħwa u tfal b'diffikultajiet fil-komunikazzjoni. Dan il-proġett se jieħu madwar sena u jitlesta f'Ġunju tal- 2017. Dan il-proġett għandu l-approvazzjoni tal-bord tal-etika tat-Tizard Centre u UREC.



Jien nixtieq insir naf aktar dwar kif inti tikkomunika ma' uliedek u kif uliedek jikkomunikaw flimkien. Nixtieq nistaqsik xi mistoqsijiet u niġbed xi videos tiegħek u uliedek tagħmlu xi attivitajiet flimkien fid-dar. Imbagħad se naraw dawn il-videos u nitkellmu dwar x'osservajna u kif nistgħu ntejbu l-komunikazzjoni ta' bejnetna. Se nieħdu sehem ukoll f'xi logħob sempliċi u f'attivitajiet interattivi.



Ser jinkiteb rapport dwar ir-rizultati tal-istudju. L-ebda isem mhux se jiġi ippubblikat. Jekk tixtieq tiegħu sehem, jekk jogħġbok iffirma l-ittra ta' kunsens mehmuza ma' din l-ittra.



Jekk tixtieq tistaqsi xi haġa dwar dan il-proġett tista' tikkuntattjani b'email jew permezz tat-telefon.

Grazzi

Marica Gatt

[email: mg423@kent.ac.uk](mailto:mg423@kent.ac.uk)

Tel: +356 79335043

Information Sheet for Mothers (typically developing children=TD)

TIZARD
University of Kent

Tizard Centre
University of Kent
Woodlands, Giles Lane
Canterbury, Kent CT2 7LR

Student: Marica Gatt Tel: +356 79335043 mg423@kent.ac.uk
Supervisor: Dr Jill Bradshaw Tel: +44 7710088477 j.bradshaw@kent.ac.uk
Tizard Ethics Committee Secretary: Tel: +44 1227827955 J.Ruffels@kent.ac.uk

Dear Mothers,

My name is Marica Gatt and I would like to tell you about a project I am working on. I am interested to know more about the interactions between mothers, siblings and children who have communication disabilities. In order to do this I would also like to work with families of typically developing children. I would like to know more about how you communicate with your children and how your children communicate with each other. I would like to ask you some questions and take some videos of your son/daughter and yourself playing together in your home. The project will run for one year until June 2017. Ethical approval has been granted by the Tizard ethics committee and the University Research Ethics Committee (UREC).



A report will be written about the findings but no names will be mentioned. If you would like to take part please sign the consent form attached with this letter. If you need to ask any questions or would like more information about the project you can contact me by email or phone.

Thank you

Marica Gatt

email: mg423@kent.ac.uk

Tel: +356 79335043

Information Sheet for Mothers (TD_MIt)

Għaziza

Jien jisimni Marica Gatt u nixtieq ngħidlek dwar proġett li qed naħdem fuqu. Jien interessata insir naf aktar dwar l-interazzjonijiet bejn l-omm, l-aħwa u tfal b'diffikultajiet fil-komunikazzjoni. Biex nagħmel dan, nixtieq insir naf aktar dwar kif tikkomunika ma' uliedek u kif uliedek jikkomunikaw miegħek. Dan il-proġett se jiehu madwar sena u jitlesta f'Ġunju tal- 2017. Dan il-proġett għandu l-approvazzjoni tal-bord tal-etika tat-Tizard Centre u UREC.



Ser jinkiteb rapport dwar ir-rizultati tal-istudju. L-ebda isem mhu se jigi ippubblikat. Jekk tixtieq tieħu sehem, jekk jogħġbok iffirma l-ittra ta' kunsens mehmuza ma' din l-ittra. Jekk tixtieq tistaqsi xi haġa dwar dan il-proġett tista' tikkuntattjani b'email jew permezz tat-telefon.

Grazzi

Marica Gatt

[email: mg423@kent.ac.uk](mailto:mg423@kent.ac.uk)

Tel: +356 79335043

Information Sheet for Siblings

Exploring interactions between mothers, siblings and children with communication disabilities

My name is Marica Gatt and I would like to know how you communicate with your mother and your brother/sister.



I would like to ask you some questions about you and your brother/sister. I will take notes so I will not forget what you said.



I will come to your house and take some videos of you, your mother and your brother/sister playing together.



We will also take part in some games so you can learn more about how to communicate with your brother/sister.



Then I will visit your house again and take some more videos of you playing with your brother/sister.



You can say **NO** to taking part in this project.



You can decide to stop at any time.



I will then write a report. Your name will not be mentioned anywhere.



If you want more information about the study you can email me at mg423@kent.ac.uk or phone me on 79335043.



Thank you

Marica Gatt

Information Sheet for Sibling participant.

Exploring interactions between mothers, siblings and children with communication disabilities

Jien jisimni Marica Gatt u nixtieq inkun naf iktar kif tikkomunika ma' ommok u ma' huk/oħtok.



Nixtieq nistaqsik xi mistoqsijiet dwar kif tikkomunika ma' huk/oħtok. Se nieħu xi noti ħalli dak li tgħidli ma ninsieħx.



Se niġi d-dar tiegħek u se nieħu xi videos tiegħek tieħu sehem f'xi attivitajiet ma' ommok u huk/oħtok.



Se nilagħbu xi logħob biex nitgħallmu aktar dwar kif nistgħu nikkomunikaw aħjar.



Imbagħad se nerga' niġi d-dar tiegħek u se nieħu aktar videos tagħkom tilagħbu flimkien.



Tista' tgħid LE jekk ma tridx tieħu sehem.



Tista' tieqaf meta trid.



Jien se nikteb rapport. Ismek mhux se jidher imkien.



Jekk tixtieq aktar informazzjoni dwar l-istudju tista' tibgħatli email fuq mg423@kent.ac.uk jew iċċempilli fuq 79335043.



Grazzi

Marica Gatt

Easy to Read Information Sheet for Siblings (TD dyads)



Tizard Centre
University of Kent
Woodlands, Giles Lane
Canterbury, Kent CT2 7LR

Student: Marica Gatt Tel: +356 79335043 mg423@kent.ac.uk
Supervisor: Dr Jill Bradshaw Tel: +44 7710088477 j.bradshaw@kent.ac.uk
Tizard Ethics Committee Secretary: Tel: +44 1227827955 J.Ruffels@kent.ac.uk

Information Sheet for Sibling participant.

Exploring interactions between mothers, siblings and children with communication disabilities

My name is Marica Gatt and I would like to know how you communicate with your mother and your brother/sister.



I would like to ask you some questions about you and your brother/sister. I will take notes so I will not forget what you said.



I will come to your house and take some videos of you, your mother and your brother/sister playing together.



You can say **NO** to taking part in this project.



You can decide to stop at any time.



I will then write a report. Your name will not be mentioned anywhere.



If you want more information about the study you can email me at mg423@kent.ac.uk or phone me on 79335043.



Thank you

Marica Gatt

Information Sheet for Sibling participant.

Exploring interactions between mothers, siblings and children with communication disabilities

Jien jisimni Marica Gatt u nixtieq inkun naf iktar kif tikkomunika ma' ommok u ma' ħuk/oħtok.



Nixtieq nistaqsik xi mistoqsijiet dwar kif tikkomunika ma' ħuk/oħtok. Se nieħu xi noti ħalli dak li tgħidli ma ninsieħx.



Se niġi d-dar tiegħek u se nieħu xi videos tiegħek tieħu sehem f'xi attivitajiet ma' ommok u ħuk/oħtok.



Tista' tgħid LE jekk ma tridx tieħu sehem.



Tista' tieqaf meta trid.



Jien se nikteb rapport. Ismek mhu se jidher imkien.



Jekk tixtieq aktar informazzjoni dwar l-istudju tista' tibgħatli email fuq mg423@kent.ac.uk jew iċċempilli fuq 79335043.



Grazzi

Marica Gatt

Easy to Read Information sheet for Child Participants (focus dyads)



Tizard Centre
University of Kent
Woodlands, Giles Lane
Canterbury, Kent CT2 7LR

Student: Marica Gatt Tel: +356 79335043 mg423@kent.ac.uk
Supervisor: Dr Jill Bradshaw Tel: +44 7710088477 j.bradshaw@kent.ac.uk
Tizard Ethics Committee Secretary: Tel: +44 1227827955 J.Ruffels@kent.ac.uk

Information Sheet for Child Participants

Exploring interactions between mothers, siblings and children with communication disabilities

This transcript will also be recorded so it can be shown to the child participant.

Hello, my name is Marica



Today I would like to make a film of you and your family playing together.



It is a very short film.



You can say **NO** if you don't want.



In the end we can watch it together

Is it okay ?



Child's response :

Tizard Centre
University of Kent
Woodlands, Giles Lane
Canterbury, Kent CT2 7LR
Student: Marica Gatt Tel: +356 79335043 mg423@kent.ac.uk
Supervisor: Dr Jill Bradshaw Tel: +44 7710088477 j.bradshaw@kent.ac.uk
Tizard Ethics Committee Secretary: Tel: +44 1227827955 J.Ruffels@kent.ac.uk

Information Sheet for Child Participant

Exploring interactions between mothers, siblings and children with communication disabilities

This transcript will also be recorded so it can be shown to the child participant.

Jien jisimni Marica



Illum nixtieq niġbed film tiegħek tilgħab ma' ommok u ħuk/oħtok.



Huwa film qasir ħafna.



Tista' tgħid LE jekk ma tridx.



Fl-aħħar naraw il-film flimkien.

Okey ?



Ir-risposta tat-tifel/tifla:

4.4 General Consent Forms



Tizard Centre
University of Kent
Woodlands, Giles Lane
Canterbury, Kent CT2 7LR

Student: Marica Gatt Tel: +356 79335043 mg423@kent.ac.uk
Supervisor: Dr Jill Bradshaw Tel: +44 7710088477 j.bradshaw@kent.ac.uk
Tizard Ethics Committee Secretary: Tel: +44 1227827955 J.Ruffels@kent.ac.uk

General Consent Form for Participants

Title of Project: Exploring interactions between mothers, siblings and children with communication disabilities.

Name of Researcher: MARICA GATT

School: Tizard Centre, University of Kent

Participant (volunteer)

Please read this and if you are happy to proceed, sign below.

The researcher has given me my own copy of the information sheet which I have read and understood. The information sheet explains the nature of the research and what I would be asked to do as a participant. I understand that the research is for a student project and that the confidentiality of the information I provide will be safeguarded unless subject to any legal requirements. She has discussed the contents of the information sheet with me and given me the opportunity to ask questions about it. I agree to take part as a participant in this research and I understand that I am free to withdraw at any time without giving any reason, and without detriment to myself.

Signed:.....Date:.....

Family Name BLOCK LETTERS:

If the participant is under the age of eighteen or otherwise he/she is a vulnerable adult, the parent/guardian has to fill this section.

Name & Surname.....Signed.....

Relationship to participant Date.....

Researcher

I, the researcher, confirm that I have discussed with the participant the contents of the information sheet.

Signed.....Date.....

Formola ta' Kunsens ghal Partecipanti li qed jieħdu sehem fi Proġetti ta' Riċerka.

Titlu tal-Proġett: Exploring interactions between mothers, siblings and children with communication disabilities.

Isem ir-Riċerkatur: MARICA GATT

Fakulta: Tizard Centre, University of Kent

Partecipant

Jekk jogħġbok aqra dan il-paragrafu u jekk inti sodisfatt/a, iffirmah.

Ir-riċerkatur tani l-kopja tiegħi ta' informazzjoni li jien qrajt u fhimt. Din l-informazzjoni tispjega n-natura tar-riċerka u x'qed inkun mitlub/a nagħmel bhala partecipant/a. Jiena nifhem li r-riċerka hija għal proġett ta' studenta u l-kunfidenzjalita ta' l-informazzjoni li jien provdejt tiġi protetta sakemm ma taqax taħt rekwisiti legali. Hi ddiskutiet il-kontenut ta' *l-information sheet* miegħi u tatni l-opportunita li nsaqsi mistoqsijiet dwarha. Jien naċċetta li nieħu sehem bhala partecipant f'dan l-istudju u nifhem li jien hieles/hielsa li nwarrab mingħajr ma għandi bżonn nagħti l-ebda raġuni u mingħajr detriment għalija nnifsi.

Nom u Kunjom.....Firma.....

Data:.....

Jekk il-partecipant huwa taħt it-tmintax –il sena jew adult vulnerabbli, ġenitur/kustodju jew adult responsabbli jrid jiffirma l-formola.

Nom u Kunjom.....Firma.....

Relazzjoni mal-partecipant..... Data.....

Ir-Riċerkatur

Jien, ir-riċerkatur nikkonferma li jien iddiskutejt mal-partecipant, il-kontenut tal-information sheet.

Firma.....Data.....

Tizard Centre
University of Kent
Woodlands, Giles Lane
Canterbury, Kent CT2 7LR

Student: Marica Gatt Tel: +356 79335043 mg423@kent.ac.uk
Supervisor: Dr Jill Bradshaw Tel: +44 7710088477 j.bradshaw@kent.ac.uk
Tizard Ethics Committee Secretary: Tel: +44 1227827955 J.Ruffels@kent.ac.uk

Consent Form for Participants

Title of Project: Exploring interactions between mothers, siblings and children with communication disabilities

Name of Researcher: MARICA GATT

School: Tizard Centre, University of Kent

Please tick

I have read and understood the information letter attached for the above study.	
I understand that my participation is voluntary and that I am free to stop at any time without giving any reason.	
I am satisfied with how the study has been explained to me.	
I agree to take part in this study.	
I agree to my son/daughter taking part in the study.	
I find no objection that the researcher talks to my son/daughter and asks them if they want to take part in the study.	

Signature of the Participant: _____ Date: _____

Name (in block capitals) _____

I have explained the study to the participant and he/she has agreed to take part.

Signature of researcher: _____ Date: _____

Consent Form for Participants

Titlu tal-Proġett: Exploring interactions between mothers, siblings and children with communication disabilities

Isem ir-riċerkatur: MARICA GATT

Ċentru: Tizard Centre, University of Kent

Jekk jogħġbok ittikkja

Jien qrajt u fhimt l-informazzjoni kollha meħmuża ma' din l-ittra.	
Jien fhimt li l-parteciġpazzjoni tiegħi hija volontarja u li nista' nieqaf x'ħin irrid mingħajr ma nagħti l-ebda raġuni.	
Jien sodisfatt/a bl-informazzjoni li ngħatajt.	
Jien naqbel li nipparteċipa f'dan l-istudju.	
Jien naqbel li ibni/binti tiegħi sehem fl-istudju.	
Jien ma nsib l-ebda oġġezzjoni li r-riċerkatur/a titkellem ma' uliedi u tistaqsihom xi mistoqsijiet.	

Firma tal-partiċipant: _____ Data: _____

Isem u Kunjom _____

Jien spjegajt l-istudju lill-parteciġpant/a u aċċetta/t li t/jieħu sehem

Firma tar-riċerkatur: _____ Data: _____

Video Taking Consent Form (ENG)



Tizard Centre
University of Kent
Woodlands, Giles Lane
Canterbury, Kent CT2 7LR

Student: Marica Gatt Tel: +356 79335043 mg423@kent.ac.uk
Supervisor: Dr Jill Bradshaw Tel: +44 7710088477 j.bradshaw@kent.ac.uk
Tizard Ethics Committee Secretary: Tel: +44 1227827955 J.Ruffels@kent.ac.uk

Video Consent Form for Participants

We, _____ and _____ give our permission to Marica Gatt to record our son / daughter _____ and _____. We give our permission for the data collected to be used by her for her research project. Our son's / daughter's and the family identity will not be published, nor will any other personal family details. In the case of a video or DVD recording we DO / DO NOT give our permission for the video / DVD itself to be shown during talks about communicative interactions. We understand that should these videos be so used, these will be treated in strictest confidence.

Signature : _____ Date: _____

Signature : _____ Date: _____

I, Marica Gatt, a student at the University of Kent, agree to use the recording as indicated above. I will not publish the name of the child, the family or any other personal details apart from the age of the child and that of his/her sibling. Pseudonyms will be used for all participants.

Signature : _____

Date: _____

Video Taking Consent Form (MLT)



Tizard Centre
University of Kent
Woodlands, Giles Lane
Canterbury, Kent CT2 7LR

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Supervisor: Dr Jill Bradshaw Tel: +44 7710088477 j.bradshaw@kent.ac.uk
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Formola ta' Kunsens għal Partecipanti li qed jieħdu sehem fil-Proġett ta' Riċerka.

Aħna, _____ u _____ nagħtu l-permess lil Marica Gatt biex tirrikordja lit-tfal tagħna _____ u _____. Nagħtu l-permess tagħna biex il-materjal irrikordjat jintuża għall-istudju ta' Dottorat. L-identità tat-tifel/tifla tagħna u dettalji personali oħra li ngabru għall-istudju ma jiġux ippublikati.

Fil-każ ta' data rrikordjata fuq vidjow aħna nagħtu / ma nagħtux il-permess li jintużaw partijiet minn dan il-vidjow bħala eżempju ta' interazzjonijiet komunikattivi. Aħna nifhmu li jekk jintużaw dawn il-partijiet, dawn jinżammu anonimi kemm jista' jkun.

Isem : _____ Firma : _____

Isem : _____ Firma : _____

Jiena Marica Gatt, studenta tal-Università ta' Kent, nagħti kelmti li nuża r-rikording kif inhu indikat hawn fuq u li ma nuzax isem it-tifel/tifla u d-dettalji personali tiegħu/tagħha hlief l-eta tiegħu/tagħha.





Firma: _____








Data: _____








APPENDIX E: Parent questionnaires and sibling interviews

5.1 Sibling interview




1. Tell me about your brother/sister. [Younger siblings can draw their brother/sister and themselves].
2. Imagine you are writing in your diary about your daily activities. What are the things that you do with **your family** during the day / during the week?
3. What do you like to do when you are **on your own**? (e.g. watch TV, play on the Wii, play on the tablet).
4. I'm going to ask you some questions about you and your brother/sister.

	What do you like to do with your brother/sister	Every day	Every week	Every month	I don't do this often
	Indoor games (e.g. board games, chess)				
	Sports (e.g. football, bowling, horse riding, swimming)				
	share hobbies (e.g. reading, collecting stickers).				
	Playing on the computer / ipad /tablet				

	<p>Watch TV and films</p>				
	<p>playing with the xBox/Wii</p>				
	<p>Listening to music</p>				
	<p>Cooking, gardening,</p>				
	<p>Visit restaurants, cafes</p>				
	<p>Special holiday trips (e.g. travelling abroad, going to Gozo)</p>				
	<p>Attending birthday parties</p>				

	<p>Visiting family / friends</p>				
	<p>Going to the playground / park</p>				
	<p>Playing with toys (e.g. trains, blocks, dolls)</p>				
	<p>Helping with housework (e.g. dusting, sweeping, washing up, tidying room,)</p>				
	<p>walking, camping, birdwatching,</p>				
	<p>Going to the cinema / theatre</p>				
	<p>Go shopping</p>				





5. Do you ever fight with each other? Yes/No What do you fight about?
6. Does your brother/sister need help during the day?
7. What kind of things does your brother/sister need help with

Daily living e.g. dressing, washing, eating,	
School activities e.g. help with homework, studying.	
Help with hobbies e.g. sports, computer classes, horse riding.	
other	

8. Tell me how does _____ communicate?
9. Which language do you use with _____ (e.g. Maltese or English)?
10. Tell me how you communicate with each other? Do you use
 - i. speech.
 - ii. signs / gestures
 - iii. eye pointing / eye gaze
 - iv. bodily movements.
 - v. objects, pictures, symbols.
 - vi. tablets, i-Pad
 - vii. physical communication - hugs, tickling, rolling around together.

viii. I don't think we really communicate at all.

11. How do you see yourself and _____?

I think I'm like a helper	
I think I'm like a friend	
I think I'm like a babysitter	
I think I'm just a brother and/or sister	

12. What are your hopes and dreams for _____?

13. Is there anything else you would like to tell me about _____?

5.2 Background and Caregiver Baseline Questionnaire

Mother's age: <input type="checkbox"/> 25-35 <input type="checkbox"/> 36-45 <input type="checkbox"/> 46 years over	race: <input type="checkbox"/> white <input type="checkbox"/> Asian <input type="checkbox"/> African <input type="checkbox"/> other	highest level of education: <input type="checkbox"/> completed compulsory education <input type="checkbox"/> certificate / diploma <input type="checkbox"/> degree / post graduate degree	occupation: _____	<input type="checkbox"/> full time <input type="checkbox"/> part time Number of hours working _____
Father's age: <input type="checkbox"/> 25-35 <input type="checkbox"/> 36-45 <input type="checkbox"/> 46 years over	race: <input type="checkbox"/> white <input type="checkbox"/> Asian <input type="checkbox"/> African <input type="checkbox"/> other	highest level of education: <input type="checkbox"/> completed compulsory education <input type="checkbox"/> certificate / diploma <input type="checkbox"/> degree / post graduate degree	occupation: _____	<input type="checkbox"/> full time <input type="checkbox"/> part time Number of hours working _____

Locality:	Type of household: <input type="checkbox"/> apartment/flat <input type="checkbox"/> maisonette <input type="checkbox"/> townhouse <input type="checkbox"/> other:
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How many people live in the same house:
Are there any other adults living with you (e.g. grandparents)?:
Do these grown ups need any special care?:

Can you tell me about your children?	When they they born	Age	Male or female	Where do they go to school ?	Do they attend any before/after school programme / respite (how many hours per week). (e.g. breakfast club, Klabb 3 to 16, Nwar).
Name	Day/month/year				
1 st					
2 nd					
3 rd					
4 th					

Is there anyone in the family who has:

		Describe who the family member is and what difficulties does he/she have:
difficulty with using speech / finds it difficult to understand language.	yes/no	
Problems with hearing.	yes/no	
Difficulties at school (e.g. learning how to read and spell, work out sums).	yes/no	
Difficulties with learning how to walk, talk, run, write etc...).	yes/no	

What language do you speak at home?

<input type="checkbox"/>	a. Maltese only	<input type="checkbox"/>	d. mostly Maltese with some English
<input type="checkbox"/>	b. mostly English with some Maltese	<input type="checkbox"/>	e. English Only

<input type="checkbox"/>	c.both Maltese and English		
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What language do you speak to the children?

<input type="checkbox"/>	a.Maltese only	<input type="checkbox"/>	d.mostly Maltese with some English
<input type="checkbox"/>	b.mostly English with some Maltese	<input type="checkbox"/>	e.English Only
<input type="checkbox"/>	c.both Maltese and English		

What language does the father speak to the children ?:

<input type="checkbox"/>	a.Maltese only	<input type="checkbox"/>	d.mostly Maltese with some English
<input type="checkbox"/>	b.mostly English with some Maltese	<input type="checkbox"/>	e.English Only
<input type="checkbox"/>	c.both Maltese and English		

Developmental History (fill in this page for each child)

Child No: (please indicate) _____

How was the pregnancy and birth?

Did you have any difficulties before/during/after birth?

-

Do you remember when your child first:

crawled	sat up alone	stand	walked independently
babbled	said first words	put two words together	spoke in short sentences
self-fed	dressed self	used the toilet	grasped crayon/pencil

Medical History

Has your child had any of the following?

allergies	frequent colds	breathing difficulties
head injury	sleeping difficulties	bed wetting
frequent ear infections	vision difficulties	high fever

Has your child been ill in the past: _____

Has your child complained of hearing loss: _____

Was your child hospitalised/has undergone surgery: _____

Is your child on any medication: _____

Use of Language

What language do you speak to the child?

<input type="checkbox"/>	a. Maltese only	<input type="checkbox"/>	d. mostly Maltese with some English
<input type="checkbox"/>	b. mostly English with some Maltese	<input type="checkbox"/>	e. English Only
<input type="checkbox"/>	c. both Maltese and English		

Activities

What activities does your child like to do during the day?

1	
2	
3	
4	
5	

Describe your relationship with your child.

Describe the relationship of your child with _____ (the focal child).

Is there anything else you would like to tell us about your child?

Focal Child _____

Diagnosis (tick all that apply)

<input type="checkbox"/>	Autism Spectrum Disorder:	<input type="checkbox"/>	Down Syndrome:
<input type="checkbox"/>	Cerebral Palsy (please specify):	<input type="checkbox"/>	Sensory impairment (please specify):
<input type="checkbox"/>	Developmental Delay:	<input type="checkbox"/>	Other (please specify):

Can you make a list of the therapies received by your child or family in the last year (e.g. services in a Resource Centre, Hanen program, ABA, sports, drama, music therapy, speech therapy etc.)

Name of programme	Start date	End date	Hours per week	place	Person in charge of the programme	Any behaviours in your child/family you have noticed after the programme.

What activities does your child like to do during the day?

1	
2	
3	

4	
5	

Describe your relationship of your child (focal child).




Describe the relationship of your child with his/her brothers & sisters.

Describe how you spend the day/rest of the week with your family?

What are your dreams for your child?

Is there anything else you would like to tell us about your child?

5.3 Post-intervention Sibling Questionnaire

	Yes	I don't know	No
			
I am happy with the training I received.			
I understand _____ much better after the training.			
I am learning to communicate better with _____ .			
The goals I set for _____ worked well.			

5.4 In-depth Interview with the mothers and siblings at post-intervention stage

1. Can you describe how _____ has responded to being at home during lockdown?
2. Has _____'s communication changed during this time? (If yes, can you describe how?)
3. What else might have contributed to these changes during the lockdown period?
4. What would you have changed from this training?

5.5 Post-intervention Interview for Focal Child

- 1) Did you enjoy talking & doing activities with _____? (Yes/No)
2. Would you like to do more activities with _____ ? (Yes/No).