Case Study 1: Evidence Based Practice Report

Theme: Interventions implemented by parents.

How Effective are Video-Feedback Interventions with Parents at Improving the

Social Communication of Autistic Children?

Summary

There is an interest in improving autistic children's social communication due to the relationship with improved life satisfaction for these individuals (Kim & Bottema-Beutel, 2019). Recently, video-feedback interventions with parents have been adapted to promote improved outcomes specifically with autistic children (Aldred et al., 2018). Video-feedback interventions promote parents attuned interactions to enable them to mediate their children's learning, through collaborative reviews between a parent and therapist of video-recorded play sessions (Kennedy et al., 2017). These interventions could be a valuable part of educational psychologist's practice in working with parents. However, the effectiveness of these interventions to promote the social communication of autistic children has not yet been systematically reviewed. Therefore, this review sought to address this.

Systematic searching of Web of Science, PsycInfo and Medline databases identified six studies that met the inclusion criteria to contribute to this review. The research was then reviewed for methodological quality (WoE A),

methodological relevance (WoE B) and topical relevance (WoE C) (Gough, 2007). This review did not identify evidence that video-feedback interventions with parents are effective in improving the social communication skills of autistic children. The implications of these findings for practice and recommendations for future research are discussed.

Introduction

Autistic Spectrum Disorder (referred to as 'autism' throughout this review) is identified as a persistent difficulty with social communication, as well as restrictive and repetitive behavioural patterns (American Psychiatric Association, 2013). Identity first language, for example 'autistic person', will be employed throughout this review based on preferences shared by autistic people (Kenny et al., 2016).

Autism is associated with lower quality of life (van Heijst & Geurts, 2015) and a regression meta-analysis attributed this to lower social functioning (Kim & Bottema-Beutel, 2019). As well as having a biological origin, autistic individuals development is impacted by environmental factors, such as their social experiences (Mandy & Lai, 2016). Therefore, there is an interest in improving environments to optimise autistic children's social development.

Parents are key to the social development of autistic children (Bottema-Beutel et al., 2014; Caplan et al., 2019; Rabin et al., 2019; Siller & Sigman, 2002). The 'Double Empathy Problem' posits that a child's lack of social insight combined with a parent's lack of insight in to their autistic children impacts on the quality of their interactions (Milton, 2012). This was supported as increased controlling behaviour of parents of autistic children was moderated by children's developmental ability, suggesting parents over compensate for children's atypical behaviours (Ku et al., 2019). Therefore, parents are an influencing factor in autistic children's development, and this may be particularly important because of their atypical responses negatively impacting parenting behaviours.

Based on this evidence, there is an interest in developing interventions to support parents of autistic children. Parent interventions to support autistic children have demonstrated effectiveness in improving their social skills (Cheng et al., 2022). Parent interventions also have benefits for parental mental health and wellbeing (Merriman et al., 2020). Additionally, parent intervention may reduce autistic individuals negative experience of direct intervention during childhood (Anderson, 2022). Therefore, there is promising evidence for the value and importance of parent interventions with autistic children.

Video-feedback is a parent intervention that has been shown to be effective in improving parental sensitivity (O'Hara et al., 2019), parenting behaviour (van IJzendoorn et al., 2022) and child outcomes (Fukkink, 2008). The intervention aim is to support parents to develop an attuned relationship, whereby they are responsive to their child, so they can engage with them effectively and then build their skills through mediating their learning (Kennedy et al., 2017). For example, an attuned interaction can be developed through being playful and receiving the child's actions through words. Therefore, the key theoretical basis is in attachment theory, whereby social development of children is dependent on a secure, responsive relationship with an attachment figure (Bowlby, 1999). Another contributing theory is sociocultural learning theory (Vygotsky, 1980). Accordingly, through video-feedback adults develop attentiveness to recognise the skills that the child is capable of developing with adult support. Another contributing theory is Social Learning Theory (Bandura, 1977), whereby the importance of the

social context for learning is recognised in the promotion of modelling strategies for teaching infants new skills. In practice, an interaction between a parent and child is recorded and then reviewed collaboratively between a parent and therapist to promote reflection and share insight (Kennedy et al., 2017). Video-feedback interventions are unique in allowing parents to observe their own behaviour to identify a difference between the behaviour they want to show and how they actually behave, which is supposed to motivate them to change their behaviour (Kennedy et al., 2017). Video-feedback interventions have been developed to improve autistic children's skills through improving parental behaviours. An examination of three studies, looked at the effectiveness of video-feedback with parents as an early intervention for autistic children, and found evidence for a positive impact on parent behaviour and children's social interaction (Aldred et al., 2018). Therefore, video-feedback interventions are a unique, effective parent intervention, rooted in psychological theory, that are adaptable to parents of autistic children and show promise in improving autistic children's outcomes.

Video-feedback interventions with parents of autistic children could be valuable for the practice of educational psychologists (EPs), as part of a bioecological approach whereby they work with the systems around a child to promote change (Bronfenbrenner & Ceci, 1994). This is relevant to EP practice which has undergone a prolonged shift towards a broader remit beyond individual assessment (Gillham, 1978), with this shift continuing under present legislation introducing a 'traded' role for EPs (Lee & Woods, 2017). The value of video-feedback within EP practice, has been laid out in a

series of case studies which established the unique position of video-feedback to allow EPs to improve parent-child relationships based on important relational theories, through an effective reflexive process (Williams et al., 2017). Additionally, the importance of establishing an evidence-base for this approach was highlighted, to show the value to those that commission EPs within the context of traded practice. As social communication skills appear to be meaningful for the quality of life of autistic people (Kim & Bottema-Beutel, 2019), this could be a focus of EP video-feedback sessions with parents. However, there is yet to be an up-to-date systematic appraisal of the emerging evidence related to improving the social communication skills of autistic children. Therefore, the current review addresses the question, 'How effective are video-feedback interventions with parents at improving the social communication of autistic children?'.

Critical Review of Evidence

Systematic Literature Search

A systematic search of the literature was completed on the 13th December 2022. The Web of Science, PsycInfo and Medline databases were searched, using the terms presented in Table 1 within 'All Fields'. In the Medline and PsycInfo databases, the map to subject heading function was used to increase the sensitivity of the search strategy, as shown in Table 1. The mapped subject headings were exploded to also search for narrower subject headings within that category.

Table 1

Search Terms Applied on the Web of Science, PsycInfo and Medline

Databases

Database(s)	Intervention type		Intervention delivery		Participants
Web of Science, PsycInfo and Medline	"Video feedback" OR "Video interacti*" OR "Video guidance" OR "PASS" OR "PACT" OR "VIPP"	AND	"Parent* implemented" OR "Parent* training" OR "Parent* mediated" OR "Home based"	AND	ASD OR ASC OR Autis*
PsycInfo	OR Exp Video-Based Interventions OR Exp Videotape Instruction		OR Exp Parent Training		OR Exp Autism Spectrum Disorders
Medline					OR Exp Autism Spectrum Disorder

Note: Truncation (*) was used in search terms to include all words that start

with these letters. Additional 'exp' search terms were applied using an 'OR'

function on PsycInfo and Medline, whereby all terms within these broad

categories were also searched.

These searches produced a combined total of 67 records. Once these records had been screened for duplicates, 36 records remained. The studies were then screened at title level, following which 31 records remained. They were then screened at the abstract level based on the inclusion and exclusion criteria presented in Table 2, which were applied hierarchically. An exclusionary criterion for date of publication was not included following the initial searches, as the relevant studies were identified to have been published recently. An exclusionary criterion for language was also not included as all studies identified were written in English. Following this, eight studies remained, which were screened at a full-text level. Based on this, two were excluded, references for these studies and the reasons for exclusion are presented in Appendix A. This screening process is outlined in Figure 1. As a result of this search, six studies remained for review and the details of these are presented in Table 3.
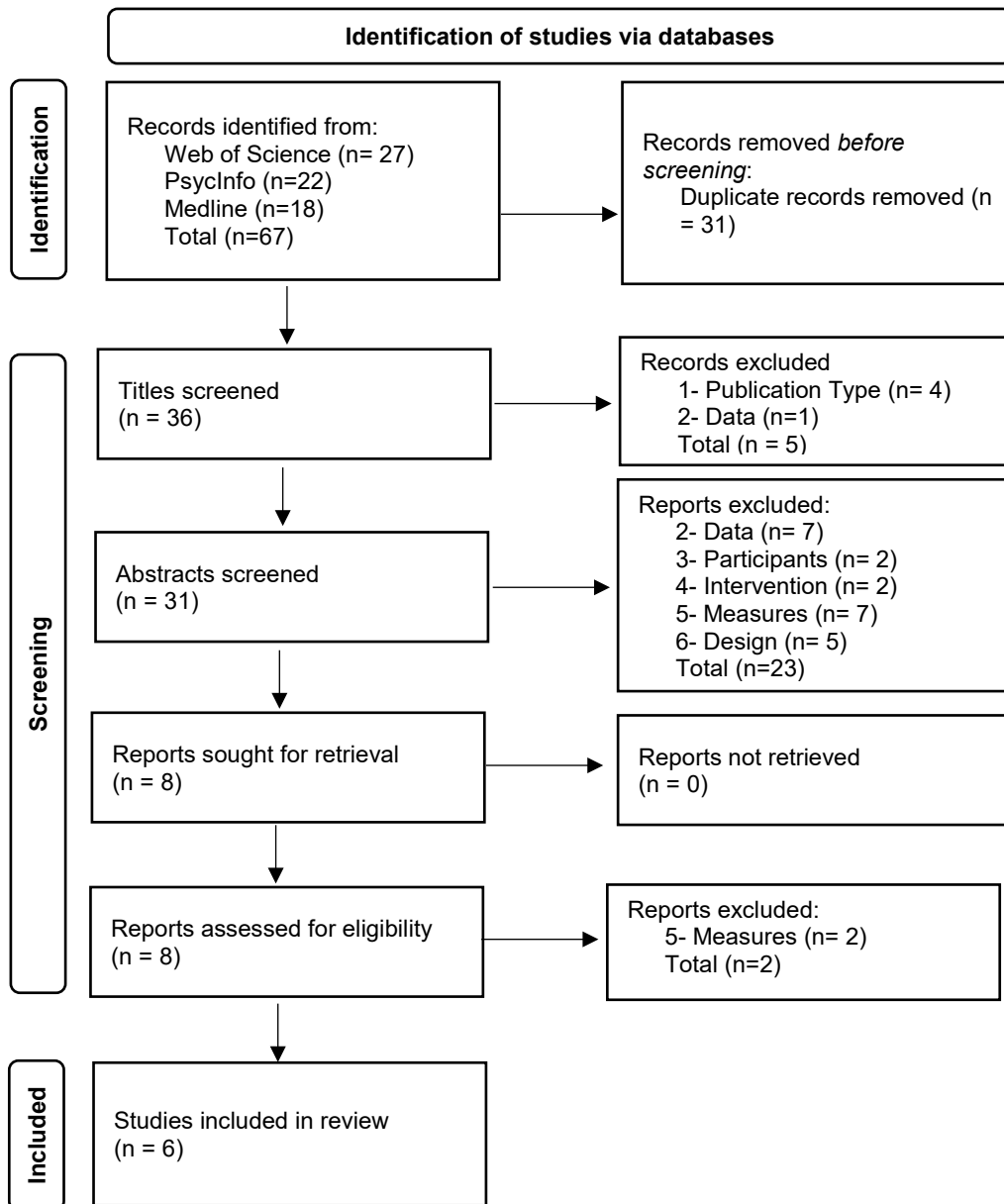
Table 2

Inclusion and Exclusion Criteria with Rationale

	Inclusion criteria	**Exclusion criteria**	**Rationale**
1. Publication type	Published in a peer reviewed journal	Not published in a peer reviewed journal	To ensure the methodological quality of research
2. Data	Primary, quantitative data	Follow-up studies or studies that only collect qualitative data	Follow-up studies are excluded as longitudinal data is not the focus. Quantitative data is needed to assess the effectiveness of the intervention (Petticrew & Roberts, 2003)
3. Participants	Parents or carers of children at risk of developing autism or with a diagnosis of autism	Any other participants	This is the group of interest to the review
4. Intervention	Video-feedback intervention with parents	Any other intervention	This is the topic of interest to the review
5. Measures	Child social communication related outcomes independent from parent interactions or reports	Any other measures	Children's outcomes are the focus of this review. Parent interactions are assumed to be a mediating variable in these studies, therefore measures involving their interactions or based on their observations would not be appropriate
6. Design	Randomized Control Trial design (RCTs)	Any other design	RCTs are the most appropriate studies for establishing the effectiveness of interventions (Petticrew & Roberts, 2003)

Figure 1

A Flow Diagram Showing the Literature Searching and Screening Process

Identification of studies via databases	

Identification	Records identified from:
	    Web of Science (n= 27)
	    PsycInfo (n=22)
	    Medline (n=18)
	    Total (n=67)
		Records removed *before screening*:
		    Duplicate records removed (n = 31)

Screening	Titles screened
	(n = 36)
		Records excluded
		    1- Publication Type (n= 4)
		    2- Data (n=1)
		    Total (n = 5)

	Abstracts screened
	(n = 31)
		Reports excluded:
		    2- Data (n= 7)
		    3- Participants (n= 2)
		    4- Intervention (n= 2)
		    5- Measures (n= 7)
		    6- Design (n= 5)
		    Total (n=23)

	Reports sought for retrieval (n = 8)	Reports not retrieved (n = 0)

	Reports assessed for eligibility
	(n = 8)
		Reports excluded:
		    5- Measures (n= 2)
		    Total (n=2)

Included	Studies included in review (n = 6)	

Note. This is an adapted PRISMA flow diagram (Page et al., 2021).

Table 3

List of Studies Included in this Review

Full reference of included studies
1   Divan, G., Vajaratkar, V., Cardozo, P., Huzurbazar, S., Verma, M., Howarth, E., Emsley, R., Taylor, C., Patel, V., & Green, J. (2019). The Feasibility and Effectiveness of PASS Plus, A Lay Health Worker Delivered Comprehensive Intervention for Autism Spectrum Disorders: Pilot RCT in a Rural Low and Middle Income Country Setting. *Autism Research*, *12*(2), 328–339.
2   Green, J., Charman, T., Pickles, A., Wan, M. W., Elsabbagh, M., Slonims, V., Taylor, C., McNally, J., Booth, R., Gliga, T., Jones, E. J. H., Harrop, C., Bedford, R., & Johnson, M. H. (2015). Parent-mediated intervention versus no intervention for infants at high risk of autism: A parallel, single-blind, randomised trial. *The Lancet Psychiatry*, *2*(2), 133–140.
3   Green, J., Charman, T., McConachie, H., Aldred, C., Slonims, V., Howlin, P., Le Couteur, A., Leadbitter, K., Hudry, K., Byford, S., Barrett, B., Temple, K., Macdonald, W., & Pickles, A. (2010). Parent-mediated communication-focused treatment in children with autism (PACT): A randomised controlled trial. *Lancet*, *375*(9732), 2152–2160
4   Klein, C. B., Swain, D. M., Vibert, B., Clark-Whitney, E., Lemelman, A. R., Giordano, J. A., Winter, J., & Kim, S. H. (2021). Implementation of Video Feedback Within a Community Based Naturalistic Developmental Behavioral Intervention Program for Toddlers With ASD: Pilot Study. *Frontiers in Psychiatry, 12*, 763367
5   Poslawsky, I. E., Naber, F. B. A., 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. *Autism, 19*(5), 588–603.
6   Whitehouse, A. J. O., Varcin, K. J., Alvares, G. A., Barbaro, J., Bent, C., Boutrus, M., Chetcuti, L., Cooper, M. N., Clark, A., Davidson, E., Dimov, S., Dissanayake, C., Doyle, J., Grant, M., Iacono, T., Maybery, M., Pillar, S., Renton, M., Rowbottam, C., … Hudry, K. (2019). Pre-emptive intervention versus treatment as usual for infants showing early behavioural risk signs of autism spectrum disorder: A single-blind, randomised controlled trial. *The Lancet. Child & Adolescent Health*, *3*(9), 605–615.

Mapping the Field

This systematic literature search led to the identification of six studies that

adopted a Randomized Control Trial (RCT) design, to establish the

effectiveness of video-feedback to improve the social communication of

autistic children or those with an increased likelihood of developing autism.

The details for each of the six included in the review are presented in Table

4.

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Table 4

Information on Study Design, Participants, Intervention and Outcome Measures for the Studies Included in the Review

Author (Date) & Country	Study Design & Sample	Participants	Intervention	Outcomes
Divan et al. (2019) India	RCT Sample size: 40 Treatment group: 19	Age: 2-9-year olds Gender: 85% (34) males Diagnosis of autism. Identified through a community screening programme, development clinics and specialist schools.	Parent mediated intervention for Autism Spectrum Disorder Plus (PASS Plus) intervention. Modified Preschool Autism Communication Trial (PACT) intervention for South Asian countries. Individual video-feedback to parents on play sessions with children. Also, modules to support with specific comorbidities which were delivered during 8 sessions for 15-30 minutes. Number of sessions: 12 Duration of intervention: 6 months Duration of sessions: <1 hour Delivered by: Health workers trained and supervised to deliver the intervention. Setting: Delivered in the family home. Comparison group: No intervention.	Brief Observation of Social Communication Change (BOSCC)- assesses autism symptoms based on a videoed naturalistic interaction between an administrator and child. Dyadic Social Communication Measure for Autism (DCMA)- assesses parent-child communication based on interaction during a videoed play session. Developmental Behaviour Checklist (DBC)- assesses mental health comorbidity through a structured parent interview. Vineland Adaptive Behaviour Scale (VABS)- measures adaptive child behaviours through parent report.

Author (Date) & Country	Study Design & Sample	Participants	Intervention	Outcomes
		Parent education: 60% of mothers completed a degree

SES: not reported | Other treatment: All participants received their usual treatments unrelated to the study. | Patient Health Questionnaire-9 (PHQ-9) - measures parental mental well-being.

Parent perception of their own capacity e.g. their knowledge, using an adapted measurement from another study |
| Green et al. (2015)

UK | RCT

Sample size: 54

Treatment group: 28 | Age: 7-10 months

Gender: 46% (12) males

Children at high risk of autism based on their sibling having autism.

Identified as being siblings of an autistic child through a different | Modified Video Interaction for Promoting Positive Parenting (iBASIS- VIPP)- uses video-feedback to support parents to improve their interaction with their children to promote their development.

Number of sessions: 6-12
Duration of intervention: 5 months
Duration of sessions: unknown
Delivered by: Speech and language or psychology graduates that were trained and supervised on delivering the intervention.

Setting: Delivered in the family home.

Comparison group: No intervention. | Manchester Assessment of Caregiver- Infant Interaction (MACI) to assess parent-child interactions based on videotaped play sessions.

Autism Observation Scale for Infants (AOSI)- semi-structured observation of risk markers for ASD by an assessor.

Gap-overlap task- measures attention disengagement skills of infants.

Auditory oddball event-related-potential to speech sounds paradigm- measures ability to detect and respond speech sounds.

Mullens Scale of Early Learning (MSEL)- standardised assessment of child development. |

Author (Date) & Country	Study Design & Sample	Participants	Intervention	Outcomes
		longitudinal study. Parent education: 46% of mothers completed degree SES: 41% earning >£40,000 annually Race: 74% of mothers white	Other treatment: Preventative intervention therefore, participants unlikely to be receiving treatment outside of the study.	Vineland Adaptive Behaviour Scale (VABS-II)- measures adaptive child behaviours through parent report. MacArthur-Bates Communicative Development Inventory (MCDI)- measures child vocabulary and gesture development based on parent reports.
Green et al. (2010) UK	RCT Sample size: 152 Treatment group: 77	Age: 2-4 years 11 months Gender: 91% (138) males Diagnosis of autism.	Preschool Autism Communication Trial (PACT)- video-feedback sessions aim to improve parent-child interactions. Also promote strategies for developing the child's communication. Number of sessions: 18 Duration of intervention: 12 months Duration of sessions: 2 hours	Autism Diagnostic Observation Schedule- Generic (ADOS-G) –a measurement of the severity of autism symptoms based on assessor administered play-based assessment. Rated video recordings- to assess quality of parent-child interactions during play sessions. Preschool Language Scales- child language and communication assessed by researcher.

Author (Date) & Country	Study Design & Sample	Participants	Intervention	Outcomes
		Children identified through specialist autism centres.	Delivered by: Speech and language therapists, who were trained and supervised by senior speech and language therapists.	MacArthur Communicative Development inventory (MCDI)- parent report of child language and social communication.
		Parent education: 74%, one parent with qualifications past 16 years of age	Setting: Delivered at a clinic (93%) or at home for practical reasons (7%) Comparison group: No intervention.	Vineland Adaptive Behaviour Scale (VABS)- Teacher Rating Form to assess adaptive function in school.
		SES: 63% high	Other treatment: All participants received their usual treatments unrelated to the study.	
		Race: 57% both parents white		
Klein et al. (2021) USA	RCT Sample size: 15 Treatment group: 8	Age: mean 26.84 months Gender: 67% (10) males Diagnosis of autism.	Naturalistic Developmental Behavioural Interventions (NBDI) - 6 hours a week of group intervention for the child and 3 hours a week of parent coaching. As well as, video-feedback sessions which focused on improving parent-child interactions. Number of sessions: 24 Duration of intervention: 6 months	Brief Observation of Social Communication Change (BOSCC) - assesses autism symptom severity based on a videoed naturalistic interaction between an administrator and child, they also conducted observations based on interactions between the caregiver and child.

Author (Date) & Country	Study Design & Sample	Participants	Intervention	Outcomes
		Identified through a state funded Naturalistic Developmental Behavioural Interventions programme. Parent education: 87% had a degree SES: 93% earning > $81,000 Race: 67% caregivers white	Duration of sessions: 10-15 mins Delivered by: Qualified clinicians e.g. a Psychologist. Setting: Delivered at the family home or at a clinic. Comparison group: Same intervention without video-feedback element. Other treatments: All participants received their usual treatments unrelated to the study.	Mullens Scale of Early Learning (MSEL) or Differential Abilities Scale (DAS-II)- measures children's verbal and non-verbal development. Vineland Adaptive Behaviour Scale (VABS, 2nd and 3rd edition)- measures adaptive child behaviours through parent report. Rated video recordings of parent-child interaction to assess caregiver NBDI implementation.
Poslawsky et al. (2015) Netherlands	RCT Sample size: 78	Age: 2-6 years Gender: 86% (67) males	Video-feedback Intervention to Promote Positive Parenting adapted to Autism (VIPP-AUTI)- uses video-feedback to improve interaction between the parent and child. Sessions had themes e.g. joint attention.	Parental Emotional Ability Scales- coded videotaped interactions between a parent and child to assess parenting behaviour.

Author (Date) & Country	Study Design & Sample	Participants	Intervention	Outcomes
	Treatment group: 40	Diagnosis of autism. Identified when newly diagnosed at a department of Psychiatry. Parent education: not reported SES: 96% middle to high	Number of sessions: 5 Duration of intervention: 3 months Duration of sessions: 60-90 minutes Delivered by: Professional clinicians with experience and relevant degree. Setting: Delivered at the family home. Control group: Received treatment as usual which was home-based intervention to support with the care of an autistic child. Other treatments: All participants received their usual treatments unrelated to the study.	Child Emotional Ability Scales- coded videotaped interactions between a parent and child to assess child responsiveness. Parental Efficacy Questionnaire – self-report questionnaire measuring parent's feelings of competence in parenting. Parental Daily Hassles (PDH)- parent rated frequency of daily hassles. Client Satisfaction Questionnaire- parent-reported satisfaction with the treatment. Early Social and Communication Scales (ESCS) videotaped semi-structured interaction between an experimenter- measuring child's joint attention and social interaction. Play behaviour assessed through 15-minute recorded child free play – measures play level e.g. manipulative or symbolic.

Author (Date) & Country	Study Design & Sample	Participants	Intervention	Outcomes
Whitehouse et al. (2019) Australia	RCT Sample size: 103 Treatment group: 50	Age: 1-2-year olds Gender: 68% (70) males Showed behavioural risk markers for autism. Identified through a government service for children with developmental delays. Parent education: 60% of mothers completed a degree	Modified Video Interaction for Promoting Positive Parenting (iBASIS- VIPP)- uses video-feedback to support parents to improve their interaction with their children to promote their development. Number of sessions: 10 Duration of intervention: 5 months Duration of sessions: Unknown Delivered by: Trained therapists. Setting: Delivered at the family home. Comparison group: No intervention. Other treatments: All participants received their usual treatments unrelated to the study.	Autism Observation Scale for Infants (AOSI)- semi-structured observation of risk markers for ASD by an assessor. Manchester Assessment of Caregiver- Infant Interaction (MACI) to assess parent-child interactions based on videotaped play sessions. Mullens Scale of Early Learning (MSEL) or Differential Abilities Scale (DAS-II)- measures children's verbal and non-verbal development. Vineland Adaptive Behaviour Scale (VABS)- measures adaptive child behaviours through parent report MacArthur Communicative Development inventory (MCDI)- parent report of child vocabulary and gestures. Parent Sense of Competence (PSOC) scale- measures parents' feelings of efficacy in parenting.

Author (Date) & Country	Study Design & Sample	Participants	Intervention	Outcomes
		SES: 91% earning > $50,000		

Note. RCT: Randomised Control Trial, SES: Socioeconomic status.

Weight of Evidence

A Weight of Evidence (WoE) review (Gough, 2007) was conducted to establish the quality and relevance of the studies for this review.

WoE A was an assessment of the methodological quality of each study, as detailed in Appendix B. An assessment was made based on an adapted coding protocol for group-design studies specific to school psychology (Kratochwill & Stoiber, 2002). The adaptions with rationale are presented in Table B1. An example coding protocol can be found in Appendix C.

WoE B assessed the methodological relevance of each study for the review question, as laid out in Appendix D. The criteria were developed by the author and are presented in Table D1.

WoE C was an assessment of the topic relevance of each study, as presented in Appendix E. The criteria were established by the author and are shown in Table E1.

The ratings for each of the studies based on WoE A, B and C, as well as the average of these scores to establish an overall WoE D score, are presented in Table 5. The descriptors for the WoE D ratings are narrow to allow for discrimination between the papers based on their similarity.

Table 5

Weight of Evidence D Ratings for Each Study

Study	WoE A	WoE B	WoE C	WoE D	Description
Divan et al. (2019)	2.25	2	2	2.1	Medium
Green et al. (2015)	2.5	2	1.6	2	Low
Green et al. (2010)	2.5	2	2.3	2.3	Medium
Klein et al. (2021)	2.5	1.7	2	2	Low
Poslawsky et al. (2015)	2.8	1.3	3	2.4	High
Whitehouse et al. (2019)	2.5	1.7	2	2.1	Medium

Note. The description for each of the Weight of Evidence score, is based on the criteria of ≤2 as low, 2.1-2.3 as medium and ≥2.4 as high.

Sample.

In the six studies reviewed, there were a total of 442 participants. The sample size of the studies ranged from 15 to 152. Attrition prior to measurement of post-intervention outcomes, was below 20% in all studies, leading to no penalties for WoE A. Clear reporting of a priori power analysis, with an accordingly large sample size, resulted in a higher WoE B score for one study (Green et al., 2010). In two studies, power analysis was conducted to establish that sample size was adequate with unclear origins for the effect size calculations (Green et al., 2015; Whitehouse et al., 2019). The inadequate sample size in the other three studies (Divan et al., 2019; Klein et al., 2021; Poslawsky et al., 2015), reduces the power of the studies to identify true effects, which led to a WoE B penalty.

Participant characteristics.

The age of children included in the reviewed studies ranged from seven months old to nine years old (Table 4). In each study, there was a higher percentage of boys, with the overall percentage of boys equal to 75% (Table 4). Many of the studies did not report the characteristics of the parent that engaged with the video-feedback intervention. In the studies that reported information, the majority of parents engaged were mothers; 90% (Poslawsky et al., 2015) and 93% (Klein et al., 2021). The characteristics of the participants have implications for the generalisability of the review findings beyond the groups represented in the samples.

The review aimed to be generalisable to children with autism, therefore participants diagnosed as autistic were most relevant to this review, as in four of the studies (Divan et al., 2019; Green et al., 2010; Klein et al., 2021; Poslawsky et al., 2015). One of the studies identified individuals showing behavioural risk markers for autism (Whitehouse et al., 2019), which lowered the WoE C score. One of the studies identified participants that were at risk of developing autism due to an external factor i.e. that they had an autistic sibling (Green et al., 2015), this lead to a greater penalty for WoE C.

Participant demographics.

The studies were conducted across 5 countries, India, UK, Australia, USA and Netherlands (Table 4). Studies that reported relevant information, identified the majority of participants were white (Table 4). Based on the studies that reported relevant information, there appears to be a majority of participants from educated backgrounds and with higher socioeconomic status (Table 4). The demographics of the participants have implications for the generalisability of the findings beyond western cultures (Henrich et al., 2010), white individuals, well-educated individuals and higher socioeconomic status individuals.

Design.

According to Petticrew and Roberts' (2003) hierarchy of evidence, RCTs are the best quality to establish the effectiveness of an intervention. Therefore, only studies that adopted an RCT design were reviewed. Accordingly, all

studies had an intervention and control group, into which participants were randomised.

Different treatment of the comparison group resulted in different WoE ratings. Four of the studies utilised a no-intervention control group, leading to a score of two (promising) for the 'comparison intervention' component of the WoE A rating. The studies with an active control group consisting of a typical intervention, such as parent teaching on behavioural strategies, without video-feedback sessions received a higher score to contribute to the WoE A rating (Klein et al., 2021; Poslawsky et al., 2015). An active control group is favoured as this demonstrates larger effects in the intervention group are not just because of a general placebo effect, but more likely to be specific to video-feedback. In all studies, both the control groups and intervention groups received their treatment as usual that took place externally from the study, as shown in Table 4.

Intervention content and fidelity.

The relevance of the intervention was reflected in WoE C scores, with the highest scores when video-feedback was the main focus of the intervention. The lowest score was given to the study that used video-feedback to augment another intervention (Klein et al., 2021), whereas the studies that applied video-feedback with additional components received a smaller penalty (Divan et al., 2019; Green et al., 2010).

The fidelity of intervention implementation was considered in WoE A, with only one study receiving a penalty due to no indication that there was a

manual for video-feedback session delivery (Klein et al., 2021). Additionally, within the WoE A rating for implementation fidelity, the person delivering the intervention was considered. All studies used trained professionals, therefore no studies were penalised for this. As the purpose of the review is to consider delivery by an EP, this suggests it is generalisable to them.

All studies were rated as a two (promising) for external validity, which contributed to WoE A. To obtain this score all studies had a detailed description of the context of intervention delivery, as well as a clear sampling procedure or clear inclusion criteria to support with understanding the characteristics to which the outcomes are generalisable.

The setting of intervention delivery was not of interest to the review, although the majority of intervention sessions were delivered in the family home (Table 4), reducing the generalisability of the findings outside of this setting.

Outcome measures.

Studies were only included for review that gathered a measure of children's outcomes independently of parent interactions and parent report. This was an inclusion criterion, as the focus of this review is on a parent-mediated intervention, therefore an independent measure reduces bias based on parent's perception of the intervention impact, as parents could not be blind to condition. Additionally, a measure beyond interactions with their parents suggests that the findings are generalisable beyond this relationship, therefore more meaningful for autistic individuals. In all studies, the assessors for the outcomes of interests to the review were blind to the

participants condition, also reducing the effect of researcher bias. As this was consistent across all studies, it did not result in WoE A penalties.

As the review is focused on children's social communication, this was the outcome of interest. When studies directly measured social communication this was reflected in a higher WoE C score (Poslawsky et al., 2015). In studies that did not measure social communication directly but reported it as a separate score from autism symptoms there was a small penalty for WoE C (Green et al., 2010; Klein et al., 2021). When studies only reported social communication as part of a general measure of autism symptoms or risk markers they received the biggest penalty for WoE C (Divan et al., 2019; Green et al., 2015; Whitehouse et al., 2019). Additionally, as the studies were completed over a short time period, outcome measures needed to be sensitive to small changes. Therefore, the appropriateness of the measures of interest for detecting these small changes was reflected in the WoE B rating.

The reliability of the measurements was considered in WoE A with the majority of studies receiving a three (strong) indicating that the majority of the measurements produced reliable scores, multiple-methods were used, multiple sources were used and the measures were valid for the participants. However, one study received a score of two for 'promising' as a measure had to be adapted to the specific population but then the validity for this group was not reported (Divan et al., 2019).

Effect sizes.

Cohen's d effect sizes (Cohen, 1988) (see Table 6 for descriptors) related to the post- intervention measures for the participants in the control and treatment group, which accounted for pre-intervention scores to reduce the bias of a difference in pre-test measures (Morris, 2008), were of interest to this review. Studies that conducted this analysis received a higher WoE B score, whilst those that had sufficient data for calculations only received a small penalty and it was calculated using Psychometrica (Lenhard & Lenhard, 2017). In one study, this calculation was not possible as treatment effects were only reported within-subjects (Klein et al., 2021), resulting in a larger penalty for WoE B. This effect size was converted to Cohen's d using Psychometrica and reported in Table 7 however, this is not comparable to other studies.

Findings.

In all studies, a treatment effect of the video-feedback intervention was reported in the outcomes identified as relevant to this review, which is shown in Table 7. In one study, the treatment effect along with three other variables was significant (p= .009) and there was a medium effect size for autism risk markers specifically, although the confidence intervals went across zero (-0.15 to 1.08) suggesting this could be a false positive finding (Green et al., 2015), additionally this study had a low WoE D rating. The treatment effects in the other studies were non-significant and the effect sizes identified were minimal or small, this is important considering these studies had medium or high WoE D ratings (Divan et al., 2019; Green et al., 2010; Poslawsky et al.,

2015; Whitehouse et al., 2019). The significant effects and large effect sizes identified in one study were related to within-subject change, and the similarity of the effect between groups, suggests no additional impact of the video-feedback augmenting the intervention (Klein et al., 2021).

Table 6

Descriptors for Cohen's d (Cohen, 1988)

Effect size	Descriptor
.2	Small
.5	Medium
.8	Large

Table 7

Effect Sizes for the Outcome Measures Relevant to the Review

Study	N	Outcome measure	Findings	Effect size description	Effect size	WoE D rating
Divan et al. (2019)	40	**Brief Observation of Social Communication Change (BOSCC)** Method: Coded assessor-child interaction Measures: Autism symptoms Score and interpretation: Overall score, decrease showing reduced symptoms	Intervention group showed a larger reduction in autism symptoms	Between-group post intervention difference (accounting for baseline scores)	-0.36 Small	2.1 Medium
Green et al. (2015)	54	**Autism Observation Scale for Infants (AOSI)** Method: Coded assessor-child interaction Measures: Risk markers of autism. Score and interpretation: Overall score, decrease showing reduced risk markers	Intervention group showed a larger reduction in autism risk markers	Between-group post intervention difference (accounting for baseline scores)	-0.50 Medium	2 Low
Green et al. (2010)	152	**Autism Diagnostic Observation Schedule-Generic (ADOS-G)** Method: Coded assessor child interaction Measures: Social interaction quality Score and interpretation: Social domain, decrease showing improved social interactions	Intervention group showed a larger reduction in difficulty with social interaction	Between-group post intervention difference (accounting for baseline scores)	-0.30 Small	2.3 Medium

Study	N	Outcome measure	Findings	Effect size description	Effect size	WoE D rating
Klein et al. (2021)	15	**Brief Observation of Social Communication Change (BOSCC)** Method: Coded assessor-child interaction Measures: Autism symptoms Score and interpretation: Social communication score, decrease showing improvement in social communication	Control group showed a reduction in difficulty with social interaction	Within-group pre-post difference in control condition	-2.90* Large	2 Low
			Treatment group showed a reduction in difficulty with social interaction	Within- group pre-post difference in treatment condition	-3.00* Large	
Poslawsky et al. (2015)	78	**Early Social and Communication Scales (ESCS)** Method: Coded assessor child interaction Measures: Joint attention and social interaction Score and interpretation: Initiating joint attention score, increase shows improvement in joint attention	Intervention group showed a larger improvement in initiating joint attention	Between-group post intervention difference (accounting for baseline scores)	0.01 Minimal	2.4 High
		Score and interpretation: Responding joint attention score, increase shows improvement in joint attention	Control group showed a larger improvement in responding to joint attention	Between-group post intervention difference (accounting for baseline scores)	-0.18 Minimal	

33

Study	N	Outcome measure	Findings	Effect size description	Effect size	WoE D rating
		Initiating joint attention score 3-month follow-up	Intervention group showed a larger improvement in initiating joint attention	Between-group follow-up difference (accounting for baseline scores)	0.29 Small	
		Responding joint attention score 3-month follow-up	Control group showed a larger improvement in responding to joint attention	Between-group follow-up difference (accounting for baseline scores)	0.08 Minimal	
Whitehouse et al. (2019)	103	**Autism Observation Scale for Infants (AOSI)** Method: Coded assessor-child interaction Measures: Risk markers of autism Score and interpretation: Overall score, decrease showing reduced risk markers	Intervention group showed a larger reduction in autism risk markers	Between-group post intervention difference (accounting for baseline scores)	-0.20 Small	2.1 Medium

Note: An * indicates that the effect size is not comparable as it represents a within-group effect.

Conclusions and Recommendations

This review aimed to assess the effectiveness of video-feedback interventions with parents to improve social communication of autistic children, as this outcome is likely to have implications for the life satisfaction of autistic individuals (Kim & Bottema-Beutel, 2019). Inclusion criteria were applied to examine findings of studies with an RCT design for the highest quality of evidence for answering this question (Petticrew & Roberts, 2003). Specifically, this review considered outcomes independent of parent interactions, to demonstrate generalisability outside of these relationships. It also focused on outcome measures independent of parent's ratings to reduce bias, as parents could not be blinded to the condition in these studies, which could lead to placebo effects. A WoE D rating was assigned based on each study's methodological quality, methodological relevance and topical relevance to answering this review question. None of the studies found evidence of a significant treatment effect, although the effect sizes ranged from minimal to medium, the non-significance suggests these could be false positive findings (Divan et al., 2019; Green et al., 2010, 2015; Klein et al., 2021; Poslawsky et al., 2015; Whitehouse et al., 2019). Importantly, this included the studies with high WoE D ratings, showing they had the best methodological quality and relevance to the review. Therefore, this review finds no evidence for the effectiveness of this parent intervention for improving the social communication skills of autistic children. This is an important finding considering the measures considered were deemed to show generalisability for participants skills and reduce bias based on parent

reports. Accordingly, EPs need to take caution in adopting this intervention to improve the social communication of children. A previous review of three of these studies found a significant positive effect of video-feedback, as an early intervention for parents of autistic children, on parent outcomes and child-parent interactions (Aldred et al., 2018). The current review is important to consider alongside this, as these interventions may change parental behaviour but not improve children's social communication independently of their interactions with parents. Additionally, there is qualitative evidence from case studies that video-feedback is effective in EP practice (Williams et al., 2017). However, this review highlights that there is no evidence for effectiveness in the specific context of improving social communication of autistic children through video- feedback with their parents.

Limitations related to the studies need to be considered along with this conclusion. The review looked at social communication specifically, which some of the studies did not consider directly (Divan et al., 2019; Green et al., 2015; Whitehouse et al., 2019). This may have influenced the findings, although the studies that assessed social communication directly also found no effects, suggesting this may not be a fruitful area for further research. Additionally, two of the studies included children as participants based on autism risk as an early intervention, rather than individuals diagnosed with autism (Green et al., 2015; Whitehouse et al., 2019). However, no effect was found for any of the populations studied. Again, this does not suggest this could be a promising area for further research, but this also needs to be considered as a limitation of the review.

Additionally, in three of the studies, the lack of significant findings may have been related to an inadequate sample to identify effects (Divan et al., 2019; Klein et al., 2021; Poslawsky et al., 2015). Therefore, further research with adequate power would be beneficial within this research. Also, the characteristics and demographics of the participants across the studies were restricted along many variables as discussed previously. Further research beyond these characteristics and demographics may be valuable to understand if it has usefulness in other contexts.

It is also important to consider that, although not the topic of the current review, the mechanisms of change within this intervention could be further explored. Establishing the extent to which parent's behaviour changed within each study is important to consider when assessing the impact on children's behaviour. If further review identifies effectiveness of the interventions for changing parent's behaviour, this suggests the ways in which parenting behaviour is changed are not appropriate at improving children's social communication. Alternatively, if parent behaviour is not improving then the effectiveness of video-feedback for this purpose should be reconsidered. Therefore, this area should be explored in further research.

Another area that was not the focus of the current review but could have impacted on the non-significant findings is the point at which change in behaviour was measured in children. Previous studies on video-feedback interventions have shown changes after a longer time period, suggesting that the parent behaviour needs time to impact on the children's outcomes (Klein

Velderman et al., 2006). One of the studies reported follow-up data after 3 months (Table 7) and the treatment effects were non-significant (Poslawsky et al., 2015). A follow-up which was reported separately from the Green et al., (2015) study identified a non-significant treatment effect for reducing autism risk markers at 27 and 39 months (Green et al., 2017). However, there was an overall significant effect of the intervention on reducing autism risk markers when combining information from baseline and follow-up, with a Cohen's d effect size of 0.32 (small). Additionally, another separately reported follow-up of Green et al., (2010) around five years later identified a non-significant impact of the intervention on reducing autism symptoms (Pickles et al., 2016). However, there was an overall significant effect of the intervention on reducing autism symptoms across both time points, with a Cohen's d effect size of 0.28 (small). Therefore, there is promising evidence that looking at the effects at baseline as well as at follow-up identifies a significant effect of video-feedback interventions on social communication related outcomes. So, future research should also consider the follow-up data related to children's social communication.

In conclusion, this review did not find video-feedback interventions with parents of autistic children to be effective in improving children's social communication. This suggests there is not sufficient evidence to justify the use of this intervention in EP practice. However, recommendations for future research have been made. Research should be conducted on adequate sample sizes, with participants with a broader range of characteristics and with different demographic groups. Additionally, reviews of the evidence

related to parental behavioural change and long-term effectiveness could be beneficial. Based on this evidence, considerations could be made as to the specific contexts in which it may be appropriate in EP practice.

References

Aldred, C., Taylor, C., Wan, M. W., & Green, J. (2018). Using Video Feedback Strategies in Parent-Mediated Early Autism Intervention. In M. Siller & L. Morgan (Eds.), *Handbook of Parent-Implemented Interventions for Very Young Children with Autism* (pp. 221–239). Springer International Publishing Ag. https://doi.org/10.1007/978-3-319-90994-3_14

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*. American Psychiatric Publishing.

Anderson, L. K. (2022). Autistic Experiences of Applied Behavior Analysis. *Autism*. https://doi.org/10.1177/13623613221118216

Bandura, A. (1977). *Social learning theory*. Prentice Hall. http://www.gbv.de/dms/bowker/toc/9780138167448.pdf

Bottema-Beutel, K., Yoder, P. J., Hochman, J. M., & Watson, L. R. (2014). The role of supported joint engagement and parent utterances in language and social communication development in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *44*(9), 2162–2175. https://doi.org/10.1007/s10803-014-2092-z

Bowlby, J. (1999). *Attachment and loss* (2nd ed). Basic Books.

Bronfenbrenner, U., & Ceci, S. (1994). Nature-Nurture Reconceptualized in Developmental Perspective—A Bioecological Model. *Psychological*

Review, *101*(4), 568–586. https://doi.org/10.1037/0033-295X.101.4.568

Caplan, B., Blacher, J., & Eisenhower, A. (2019). Responsive Parenting and Prospective Social Skills Development in Early School-Aged Children with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, *49*(8), 3203–3218. https://doi.org/10.1007/s10803-019-04039-4

Cheng, W. M., Smith, T. B., Butler, M., Taylor, T. M., & Clayton, D. (2022). Effects of Parent-Implemented Interventions on Outcomes of Children with Autism: A Meta-Analysis. *Journal of Autism and Developmental Disorders*. https://doi.org/10.1007/s10803-022-05688-8

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed). L. Erlbaum Associates.

Divan, G., Vajaratkar, V., Cardozo, P., Huzurbazar, S., Verma, M., Howarth, E., Emsley, R., Taylor, C., Patel, V., & Green, J. (2019). The Feasibility and Effectiveness of PASS Plus, A Lay Health Worker Delivered Comprehensive Intervention for Autism Spectrum Disorders: Pilot RCT in a Rural Low and Middle Income Country Setting. *Autism Research*, *12*(2), 328–339. https://doi.org/10.1002/aur.1978

Fukkink, R. G. (2008). Video feedback in widescreen: A meta-analysis of family programs. *Clinical Psychology Review*, *28*(6), 904–916. https://doi.org/10.1016/j.cpr.2008.01.003

Gillham, B. (1978). *Reconstructing educational psychology / edited by Bill Gillham.* Croom Helm.

Gough, D. (2007). Weight of evidence: A framework for the appraisal of the quality and relevance of evidence. *Research Papers in Education*, *22*(2), Article 2. https://discovery.ucl.ac.uk/id/eprint/1548262/

Green, J., Charman, T., McConachie, H., Aldred, C., Slonims, V., Howlin, P., Le Couteur, A., Leadbitter, K., Hudry, K., Byford, S., Barrett, B., Temple, K., Macdonald, W., & Pickles, A. (2010). Parent-mediated communication-focused treatment in children with autism (PACT): A randomised controlled trial. *Lancet*, *375*(9732), 2152–2160. https://doi.org/10.1016/S0140-6736(10)60587-9

Green, J., Charman, T., Pickles, A., Wan, M. W., Elsabbagh, M., Slonims, V., Taylor, C., McNally, J., Booth, R., Gliga, T., Jones, E. J. H., Harrop, C., Bedford, R., & Johnson, M. H. (2015). Parent-mediated intervention versus no intervention for infants at high risk of autism: A parallel, single-blind, randomised trial. *The Lancet Psychiatry*, *2*(2), 133–140. https://doi.org/10.1016/S2215-0366(14)00091-1

Green, J., Pickles, A., Pasco, G., Bedford, R., Wan, M. W., Elsabbagh, M., Slonims, V., Gliga, T., Jones, E., Cheung, C., Charman, T., & Johnson, M. (2017). Randomised trial of a parent-mediated intervention for infants at high risk for autism: Longitudinal outcomes to age 3 years. *Journal of Child Psychology and Psychiatry*, *58*(12), 1330–1340. https://doi.org/10.1111/jcpp.12728

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not

       WEIRD. *Nature*, *466*(7302), Article 7302.

       https://doi.org/10.1038/466029a

Kennedy, H., Ball, K., & Barlow, J. (2017). How does video interaction

       guidance contribute to infant and parental mental health and well-

       being? *Clinical Child Psychology and Psychiatry*, *22*(3), 500–517.

       https://doi.org/10.1177/1359104517704026

Kenny, L., Hattersley, C., Molins, B., Buckley, C., Povey, C., & Pellicano, E.

       (2016). Which terms should be used to describe autism? Perspectives

       from the UK autism community. *Autism*, *20*(4), 442–462.

       https://doi.org/10.1177/1362361315588200

Kim, S. Y., & Bottema-Beutel, K. (2019). A meta regression analysis of

       quality of life correlates in adults with ASD. *Research in Autism*

       Spectrum Disorders, *63*, 23–33.

       https://doi.org/10.1016/j.rasd.2018.11.004

Klein, C. B., Swain, D. M., Vibert, B., Clark-Whitney, E., Lemelman, A. R.,

       Giordano, J. A., Winter, J., & Kim, S. H. (2021). Implementation of

       Video Feedback Within a Community Based Naturalistic

       Developmental Behavioral Intervention Program for Toddlers With

       ASD: Pilot Study. *Frontiers in Psychiatry*, *12*, 763367.

       https://doi.org/10.3389/fpsyt.2021.763367

Klein Velderman, M., Bakermans-Kranenburg, M. J., Juffer, F., Van

       IJzendoorn, M. H., Mangelsdorf, S. C., & Zevalkink, J. (2006).

Preventing preschool externalizing behavior problems through video-feedback intervention in infancy. *Infant Mental Health Journal*, *27*(5), 466–493. https://doi.org/10.1002/imhj.20104

Kratochwill, T. R., & Stoiber, K. C. (2002). Evidence-based interventions in school psychology: Conceptual foundations of the Procedural and Coding Manual of Division 16 and the Society for the Study of School Psychology Task Force. *School Psychology Quarterly*, *17*, 341–389. https://doi.org/10.1521/scpq.17.4.341.20872

Ku, B., Stinson, J. D., & MacDonald, M. (2019). Parental Behavior Comparisons Between Parents of Children with Autism Spectrum Disorder and Parents of Children Without Autism Spectrum Disorder: A Meta-analysis. *Journal of Child and Family Studies*, *28*(6), 1445–1460. https://doi.org/10.1007/s10826-019-01412-w

Lee, K., & Woods, K. (2017). Exploration of the developing role of the educational psychologist within the context of "traded" psychological services. *Educational Psychology in Practice*, *33*(2), 111–125. https://doi.org/10.1080/02667363.2016.1258545

Lenhard, W., & Lenhard, A. (2017). *Computation of Effect Sizes* [Data set]. Unpublished. https://doi.org/10.13140/RG.2.2.17823.92329

Mandy, W., & Lai, M.-C. (2016). Annual Research Review: The role of the environment in the developmental psychopathology of autism spectrum condition. *Journal of Child Psychology and Psychiatry*, *57*(3), 271–292. https://doi.org/10.1111/jcpp.12501

Merriman, K., Burke, T., & O'Reilly, G. (2020). A systematic review of the effectiveness and efficacy of clinicianled psychological interventions for parents of children with ASD. *Research in Autism Spectrum Disorders*, *76*, 101584. https://doi.org/10.1016/j.rasd.2020.101584

Milton, D. E. M. (2012). On the ontological status of autism: The 'double empathy problem'. *Disability & Society*, *27*(6), 883–887. https://doi.org/10.1080/09687599.2012.710008

Morris, S. B. (2008). Estimating Effect Sizes From Pretest-Posttest-Control Group Designs. *Organizational Research Methods*, *11*(2), 364–386. https://doi.org/10.1177/1094428106291059

O'Hara, L., Smith, E. R., Barlow, J., Livingstone, N. A., Herath, N. I. N. S., Wei, Y., Spreckelsen, T. F., & Macdonald, G. (2019). Video feedback for parental sensitivity and attachment security in children under five years. *Cochrane Database of Systematic Reviews*, *11*, CD012348. https://doi.org/10.1002/14651858.CD012348.pub2

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *British Medical Journal*, *372*, n71. https://doi.org/10.1136/bmj.n71

Petticrew, M., & Roberts, H. (2003). Evidence, hierarchies, and typologies:

   Horses for courses. *Journal of Epidemiology and Community Health*,

   57(7), 527–529. https://doi.org/10.1136/jech.57.7.527

Pickles, A., Le Couteur, A., Leadbitter, K., Salomone, E., Cole-Fletcher, R.,

   Tobin, H., Gammer, I., Lowry, J., Vamvakas, G., Byford, S., Aldred, C.,

   Slonims, V., McConachie, H., Howlin, P., Parr, J. R., Charman, T., &

   Green, J. (2016). Parent-mediated social communication therapy for

   young children with autism (PACT): Long-term follow-up of a

   randomised controlled trial. *Lancet*, *388*(10059), 2501–2509.

   https://doi.org/10.1016/S0140-6736(16)31229-6

Poslawsky, I. E., Naber, F. B. A., 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. *Autism*, *19*(5), 588–603.

   https://doi.org/10.1177/1362361314537124

Rabin, S. J., Bamberger, E., Mor-Snir, I., Feldman, R., & Golan, O. (2019).

   Parent–Adolescent Reciprocity in a Conflictual Situation Predicts Peer

   Interaction in Adolescents With ASD. *Autism Research*, *12*(2), 263–

   273. https://doi.org/10.1002/aur.2047

Rahman, A., Divan, G., Hamdani, S. U., Vajaratkar, V., Taylor, C., Leadbitter,

   K., Aldred, C., Minhas, A., Cardozo, P., Emsley, R., Patel, V., &

   Green, J. (2016). Effectiveness of the parent-mediated intervention for

   children with autism spectrum disorder in south Asia in India and

Pakistan (PASS): A randomised controlled trial. *Lancet Psychiatry*,
3(2), 128–136. https://doi.org/10.1016/S2215-0366(15)00388-0

Siller, M., & Sigman, M. (2002). The behaviors of parents of children with
autism predict the subsequent development of their children's
communication. *Journal of Autism and Developmental Disorders*,
32(2), 77–89. https://doi.org/10.1023/a:1014884404276

van Heijst, B. F., & Geurts, H. M. (2015). Quality of life in autism across the
lifespan: A meta-analysis. *Autism*, *19*(2), 158–167.
https://doi.org/10.1177/1362361313517053

van IJzendoorn, M. H., Schuengel, C., Wang, Q., & Bakermans-Kranenburg,
M. J. (2022). Improving parenting, child attachment, and externalizing
behaviors: Meta-analysis of the first 25 randomized controlled trials on
the effects of Video-feedback Intervention to promote Positive
Parenting and Sensitive Discipline. *Development and
Psychopathology*, PII S0954579421001462.
https://doi.org/10.1017/S0954579421001462

Vygotsky, L. S. (1980). *Mind in Society: Development of Higher
Psychological Processes* (M. Cole, V. John-Steiner, S. Scribner, & E.
Souberman, Eds.). Harvard University Press.

Whitehouse, A. J. O., Varcin, K. J., Alvares, G. A., Barbaro, J., Bent, C.,
Boutrus, M., Chetcuti, L., Cooper, M. N., Clark, A., Davidson, E.,
Dimov, S., Dissanayake, C., Doyle, J., Grant, M., Iacono, T., Maybery,
M., Pillar, S., Renton, M., Rowbottam, C., … Hudry, K. (2019). Pre-

emptive intervention versus treatment as usual for infants showing

early behavioural risk signs of autism spectrum disorder: A single-

blind, randomised controlled trial. *The Lancet. Child & Adolescent*

Health, *3*(9), 605–615. https://doi.org/10.1016/S2352-4642(19)30184-

1

Williams, A., Billington, T., Goodley, D., & Corcoran, T. (2017). *Critical*

educational psychology / edited by Antony Williams, Tom Billington,

Dan Goodley and Tim Corcoran. Wiley-Blackwell.

Appendix A

Excluded studies

Table A1

Studies excluded at full-text level and reason for exclusion

Study	Exclusion criteria
Rahman, A., Divan, G., Hamdani, S. U., Vajaratkar, V., Taylor, C., Leadbitter, K., Aldred, C., Minhas, A., Cardozo, P., Emsley, R., Patel, V., & Green, J. (2016). Effectiveness of the parent-mediated intervention for children with autism spectrum disorder in south Asia in India and Pakistan (PASS): A randomised controlled trial. *Lancet Psychiatry*, *3*(2), 128–136.	Child outcome measures not collected independent of interaction with parents
Togashi, K., Minagawa, Y., Hata, M., & Yamamoto, J. (2022). Evaluation of a Telehealth Parent-Training Program in Japan: Collaboration with Parents to Teach Novel Mand Skills to Children Diagnosed with Autism Spectrum Disorder. *Behavior Analysis in Practice*, *101515653*, 1–12.	Child outcome measures not collected independent of interaction with parents

Appendix B

Weight of Evidence A

WoE A is a calculation of the methodological quality of the studies (Gough, 2007). An established group-design coding protocol (Kratochwill & Stoiber, 2002) was adapted, with the changes and rationale presented in Table B1. The scores for each of the studies are presented in Table B2. An example coding protocol can be found in Appendix C.

Table B1

Changes to the Group-Design Coding Protocol

Section removed	Rationale
I. A: General Study Characteristics	Addressed in the review.
I. B: General Design Characteristics: B2: Non-randomized designs	Not relevant to the review.
I. C: Data analysis, C7 and C8 for qualitative data analysis methods	Only quantitative methodology included for review.
II. A: Research Methodology	Not relevant to the review or will be addressed in the review.
II. B: Measurement: B4. Extent of engagement. B6: Cultural Appropriateness of Measures and B7: Measures of key outcomes linked to conceptual model	Not relevant to the review.
II. D: Outcomes are Statistically Significant	Addressed in the review.
II. E: Cultural Significance	Not relevant to the review.
II. F: Educational/ Clinical Significance	Addressed in the review.
II. G. External Validity Indicators: G1.5 Recruitment procedures congruent	Not relevant to the review.

Section removed	Rationale
with group. G6 participant perceptions of intervention.	
II. H: Durability/ Generalization of Intervention and Outcomes	Not relevant to the review.
II. I: Identifiable Intervention Components	Not relevant to the review.
II. J: Implementation Fidelity: J4.1 Implementer characteristics J4.4 Participant-implementer relationship. J4.7 Dosage response. J4.10 Cost analysis. J4.11 Training and support resources. J4.12 Feasibility.	Not relevant to the review.
II. K: Replication	Not relevant to the review.
II. L: Site of Implementation	Not relevant to the review.

Section added	Rationale
Measurement: one source of measurement conducted by assessors blind to participant condition	In RCTs, changes between groups based on measurements conducted by researchers, may be observed due to researcher bias on their expectation for individual's improvement. Having a measurement conducted by researchers that are blind to condition reduces bias

Table B2

Woe A Ratings for Each Study

Study	Measurement	Comparison Group	External Validity	Implementation Fidelity	WoE A Score (Descriptor)
Divan et al. (2019)	2	2	2	3	2.25 (Medium)
Green et al. (2015)	3	2	2	3	2.5 (High)
Green et al. (2010)	3	2	2	3	2.5 (High)
Klein et al. (2021)	3	3	2	2	2.5 (High)
Poslawsky et al. (2014)	3	3	2	3	2.8 (High)
Whitehouse et al. (2019)	3	2	2	3	2.5 (High)

Note: The overall WoE A score was calculated by averaging the scores in each of the four areas. The description for the overall WoE A score, is based on the criteria of ≤2 as low, 2.1-2.3 as medium and ≥2.4 as high.

Appendix C

Example Coding Protocol for WoE A

Name of Coder: xxx   Date: 7/1/2022

Full Study Reference in proper format: Divan, G., Vajaratkar, V., Cardozo, P., Huzurbazar, S., Verma, M., Howarth, E., Emsley, R., Taylor, C., Patel, V., & Green, J. (2019). The Feasibility and Effectiveness of PASS Plus, A Lay Health Worker Delivered Comprehensive Intervention for Autism Spectrum Disorders: Pilot RCT in a Rural Low and Middle Income Country Setting. *Autism Research*, *12*(2), 328–339.

Intervention Name (*description of study*): Parent mediated intervention for Autism Spectrum Disorder Plus (PASS Plus). *(Modified version of the Preschool Autism Communication Trial (PACT) intervention for South Asian countries. Consists of individual video-feedback to parents on play sessions with children to improve their interaction with the child.)*

Study ID Number: 1

Type of Publication:
☐ Book/Monograph
☒ Journal Article
☐ Book Chapter
☐ Other (specify):

1. General Characteristics

A: General Design Characteristics

A1. Random assignment designs (if random assignment design, select one of the following)
☐ Completely randomized design
☒ Randomized block design (between participants variation)
☐ Randomized block design (within participants)
☐ Randomized hierarchical design

A2. Overall confidence of judgment on how participants were assigned (select one of the following)

☐ Very low (little basis)
☐ Low (guess)
☐ Moderate (weak inference)
☐ High (strong inference)
☒ Very high (explicitly stated)
☐ N/A
☐ Unknown/unable to code

B. Participants

Total size of sample (start of study): 40

Intervention group sample size: 19

Control group sample size: 21

C. Type of Program

☐ Universal prevention program
☐ Selective prevention program
☐ Targeted prevention program
☒ Intervention/Treatment
☐ Unknown

D. Stage of Program
☒ Model/demonstration programs
☐ Early stage programs
☐ Established/institutionalized programs
☐ Unknown

E. Concurrent or Historical Intervention Exposure
☐ Current exposure
☐ Prior exposure
☒ Unknown

F. Appropriate Statistical Analysis

Analysis 1: ANCOVA
☒ Appropriate unit of analysis
☐ Familywise/experimenter wise error rate controlled when applicable
☐ Sufficiently large N

2. Key Features for Coding Studies and Rating Level of Evidence/Support

(Rating Scale: 3= Strong Evidence, 2=Promising Evidence, 1=Weak Evidence, 0=No Evidence)

A. Measurement (Estimating the quality of the measures used to establish effects)

A1 The use of the outcome measures produce reliable scores for the majority of the primary outcomes
☒Yes
☐No
☐Unknown/unable to code

A2 Multi-method (at least two assessment methods used)
☒ Yes
☐ No
☐ N/A
☐ Unknown/unable to code

A3 Multi-source (at least two sources used self-reports, teachers etc.)
☒ Yes
☐ No
☐ N/A
☐ Unknown/unable to code

A4 One source of measurement conducted by assessor's blind to participant condition
☒ Yes
☐ No
☐ N/A
☐ Unknown/unable to code

A5 Validity of measures reported (well-known or standardized or norm-referenced are considered good, consider any cultural considerations)

☐ Yes validated with specific target group
☐ In part, validated for general population only

☒ No
☐ Unknown/unable to code

Overall rating for Measurement: 2

B. Comparison Group

B1 Type of Comparison Group (Select one of the following)

☐ Typical intervention (typical intervention for that setting, without additions that make up the intervention being evaluated)
☐ Attention placebo
☐ Intervention element placebo
☐ Alternative intervention
☐ Pharmacotherapy
☒ No intervention
☐ Wait list/delayed intervention
☐ Minimal contact
☐ Unable to identify type of comparison

B2 Overall confidence of judgment on type of comparison group

☐ Very low (little basis)
☐ Low (guess)
☐ Moderate (weak inference)
☐ High (strong inference)
☒ Very high (explicitly stated)
☐ Unable to identify comparison group

B3 Counterbalancing of change agent (participants who receive intervention from a single therapist/teacher etc were counter-balanced across intervention)

☐ By change agent
☐ Statistical (analyse includes a test for intervention)
☐ Other
☒ Not reported/None

B4 Group equivalence established (select one of the following)

☒ Random assignment

☐ Posthoc matched set
☐ Statistical matching
☐ Post hoc test for group equivalence

B5 Equivalent mortality
☒ Low attrition (less than 20 % for post)
☐ Low attrition (less than 30% for follow-up)
☒ Intent to intervene analysis carried out?

Overall rating for Comparison Group: 2

C. External Validity Indicators.

C1. Sampling Procedures

C1.1 Sampling procedures described in detail.
☒ Yes
☐ No (incomplete or no evidence)

C1.2 Rationale for sample selection specified
☐ Yes
☒ No (incomplete or no evidence)

C1.3 Rationale for sample size specified
☐ Yes
☒ No (incomplete or no evidence)

C1.4 Evidence provided that sample represents target population
☐ Yes
☒ No (incomplete or no evidence)

C1.5 Inclusion/exclusion criteria specified
☒ Yes
☐ No

C1.6 Inclusion/exclusion criteria similar to school practice
☒ Yes
☐ No

C1.7 Specified criteria related to concern

☒ Yes
☐ No

C2. Adequately reported characteristics of participants/sample. Adequate level of detail in description of participants.

☐ Yes
☒ No (incomplete or no evidence)

C3. Details are provided regarding variables that:
C3.1 Have differential relevance for intended outcomes

☐ Yes
☒ No

C3.2 Have relevance to inclusion criteria

☐ Yes
☒ No

C4. Transferability of the intervention.

☒ Complete and detailed description of the context within which the intervention occurs.
☐ Detailed description of some but not all contextual components
☐ Provides overview of contextual components but lacks details
☐ No description of context

Overall rating for External Validity: 2

D. Implementation Fidelity

D1. Evidence of Acceptable Adherence (check all that apply)

☒ Ongoing supervision/consultation
☒ Coding intervention sessions/lessons or procedures
☐ Audio/video tape implementation
    ☐ Entire intervention
    ☐ Part of intervention

D2. Manualization (check all that apply)

☒ Written material involving a detailed account of the exact procedures and the sequence in which they are to be used
☒ Formal training sessions that includes a detailed account of the exact procedures and the sequence in which they are to be used

☐ Written material involving an overview of broad principles and a description of the intervention phases

☐ Formal or informal training session involving an overview of broad principles and a description of the intervention phases

D3. Adaptation procedures are specified

☒ Yes

☐ No

D4. Implementation Context

D4.1 Adaptations in Implementation

☐ Detailed account of the implementation and adaptations to fit the context or target population

☐ Detailed account of the implementation but not of the adaptations to fit the context or target population

☒ Partial description of the implementation and/or adaptations to fit the context or target population

☐ Vague or no account of the implementation

D4.2 Relationship of researcher to intervention

☐ Detailed description of the researchers level of involvement and safeguards used to minimize the bias of the researcher

☐ Detailed description of the researcher's level of involvement, but minimal description of safeguards to minimize the bias of the researcher

☐ Minimal description of the researcher's level of involvement and of safeguards to minimize the bias of the researcher

☒ No information provided

D4.3 Length of Intervention

☐ Unknown/insufficient information provided

☒ Information provided. Please specify: 6 months

D4.4 Intensity of intervention

☐ Unknown/insufficient information provided

☒ Information provided

Please specify length of intervention sessions: Less than 1 hour for first 3 sessions, then an additional 15-30 min component is added in last 9 sessions.

Please specify frequency of intervention session: Fortnightly (12 sessions total)

D4.5 Programme Implementer (check all that apply)

- ☐ Research staff
- ☐ School specialty staff
- ☐ Teachers
- ☐ Educational Assistants
- ☐ Parents
- ☐ College Students
- ☐ Peers

Indicator	Overall evidence rating 0-3	Description of evidence (Strong, Promising, Weak, No/limited evidence)
Key features		
Measurement	2	Promising
Comparison group	2	Promising
External Validity Indicators	2	Promising
Implementation Fidelity	3	Strong
Average	2.25	

- ☒ Other: Health workers (college graduates)
- ☐ Unknown/insufficient information provided

D4.6 Intervention Style or Orientation (check all that apply)

- ☐ Behavioural
- ☐ Cognitive-behavioural
- ☐ Experiential
- ☒ Humanistic/interpersonal
- ☐ Psychodynamic/insight oriented
- ☐ Other (specify):
- ☐ Unknown/insufficient information provided

Overall rating for Implementation Fidelity: 3

Summary of Evidence

Appendix D

Weight of Evidence B

WoE B is an assessment of the methodological relevance of the studies to the review question (Gough, 2007). The criteria, therefore, assessed the methodological relevance of each study for determining the effectiveness of video-feedback interventions with parents to improve the social communication of autistic children. The criteria were established by the author in relation to the specific review question as presented in Table D1. The scores for each of the studies for WoE is presented in Table D2.

Table D1

Weight of Evidence B Criteria

Criteria		Weight and descriptor	Rationale
Statistical analysis	3	Effect size for between-group differences has been calculated, accounting for baseline differences	Effect size is needed for comparison of studies and it is important to reduce the bias of baseline differences in calculations (Morris, 2008)
	2	Effect size for between-group differences has not been calculated, accounting for baseline differences, but there is sufficient data for completing this analysis	
	1	Does not provide sufficient data for completing this analysis	
Outcome measure	3	Adapted social communication measure (independent of parents) to be sensitive to small changes over time	Studies look at changes over a short time, measures need to detect changes
	2	Rationale given for the social communication measure (independent of parents) based on previous research showing it to be adaptive to small changes over time	

Criteria	Weight and descriptor	Rationale
	1 Social communication measure (independent of parents) not adapted or this is not specified	
Power analysis	3 A-priori power analysis is reported and sample size is adequate to detect an effect based on previous studies	Studies should be adequately powered to detect effects
	2 Power analysis is reported and sample size is adequate to detect a stated effect size, although origin of this effect size is unclear	
	1 Sample size is inadequate for any analyses or insufficient data for calculation is provided	

Table D2

Summary of Scores for Woe B for Each Study

Study	Statistical analysis	Outcome measures	Power analysis	WoE B score (Descriptor)
Divan et al. (2019)	2	3	1	2 (Low)
Green et al. (2015)	3	1	2	2 (Low)
Green et al. (2010)	2	1	3	2 (Low)
Klein et al. (2021)	1	3	1	1.7 (Low)
Poslawsky et al. (2014)	2	1	1	1.3 (Low)
Whitehouse et al. (2019)	2	1	2	1.7 (Low)

Note: The overall WoE B score was calculated by averaging the scores in each of the three areas. The description for the overall WoE B score, is based on the criteria of ≤2 as low, 2.1-2.3 as medium and ≥2.4 as high.

Appendix E

Weight of Evidence C

WoE C, is an assessment of the study for relevance in answering the specific review question (Gough, 2007). Therefore, the relevance of each study for determining the effectiveness of video-feedback interventions with parents of autistic children to improve their social communication, is appraised through this criteria. The criteria were established by the author and are presented in Table E1. The scores for each of the studies for WoE C are presented in Table E2.

Table E1

WoE C Criteria

Criteria		Weight and descriptor	Rationale
Participants	3	Diagnosis of autism	Review considers the impact on autistic individuals, need to ensure the sample have autism for generalisability
	2	Clear risk markers of autism identified	
	1	Identified as potentially at risk based on external factors (e.g. sibling with diagnosis)	
Intervention	3	Primary focus on video-feedback as an intervention	Review focuses on video-feedback interventions, so this should be the main focus of the intervention
	2	Focus on a video-feedback intervention with additional components	
	1	Video-feedback to augment another intervention	
Outcome measures	3	Social communication as a specific measure	Review focuses on social

Criteria	Weight and descriptor		Rationale
	2	Social communication as part of autism symptomology/ risk score but reported separately	communication, as this has relevance to life satisfaction for autistic people (Kim & Bottema-Beutel, 2019)
	1	Social communication part of an overall autism symptomology /risk score and not reported separately	

Table E2

Summary of Scores for Weight of Evidence C for Each Study

Study	Participants	Intervention	Outcome	WoE C score (Descriptor)
Divan et al. (2019)	3	2	1	2 (Low)
Green et al. (2015)	1	3	1	1.6 (Low)
Green et al. (2010)	3	2	2	2.3 (Medium)
Klein et al. (2021)	3	1	2	2 (Low)
Poslawsky et al. (2014)	3	3	3	3 (High)
Whitehouse et al. (2019)	2	3	1	2 (Low)

Note: The overall WoE C score was calculated by averaging the scores in each of the three areas. The description for the overall WoE C score, is based on the criteria of ≤2 as low, 2.1-2.3 as medium and ≥2.4 as high.