Case Study 1: An Evidence-Based Practice Review Report

Theme: School (setting) based interventions for children with special educational needs (SEN)

How effective is the Secret Agent Society Programme for improving social skills of children with Autism Spectrum Disorder?

1.1 Summary

This review aimed to explore the effectiveness of the Secret Agent Society programme for targeting the social and emotional skills of children aged 8 to 12 years with autism spectrum disorder (ASD). The programme follows a structured social-emotional curriculum with ongoing skill development through the use of the programme computer game and in-person practice at home and school.

A systematic literature search yielded six studies which met the inclusion criteria. These studies are evaluated using a Weight of Evidence framework (Gough, 2007). All studies reported positive gains in social skills post-intervention, however limitations in methodological study design and statistical analysis made it difficult to make conclusions regarding the generalisability of these findings. Future recommendations for research are outlined.

support to develop their social skills, helping them to access and navigate the social world around them.

2.2 Secret Agent Society (SAS) Programme

The Secret Agent Society (SAS) Programme was developed by Dr Renae Beaumont, a Clinical Psychologist in Australia to support the social and emotional skills of children aged 8 to 12 years with autism spectrum disorder. The programme typically consists of group meetings for the child, delivered between 11 and 22 sessions for a total of 45-90 minutes. There are an additional two to four sessions post intervention for skill maintenance. These sessions are designed to cover the main components of the Secret Agent Society social and emotional curriculum (The Social Skills Training Institute, 2019), summarised in table 1 below.

Table 1

	Components
1.	Recognising emotions in themselves and others
2.	Expressing their feelings appropriately
3.	Coping with feelings of anger and anxiety, including the use of specific relaxation techniques
4.	Understanding friendship
5.	Communicating and playing with others
6.	Coping with teamwork, games and competitiveness
7.	Building and maintaining friendships

and weak central coherence. The programme also adopts principles, such as applied behavioural analysis and cognitive behavioural therapy.

Theory of Mind is described as the ability to impute mental states to oneself and others (Premack et al., 1978). It is an important skill that we use in everyday life, particularly when communicating and interacting with others. Individuals with autism tend to experience difficulty with theory of mind tasks (Baron-Cohen, 1985) where the adoption of a view other to their own is required. The SAS programme aims to address these needs by teaching children how to detect their own thoughts and feelings as well as those of others.

Executive functioning skills are commonly agreed as mental processes that encompass working memory, flexible thinking and self-control. Many)

sought by schools on the best guidance and evidence-based interventions to support these children effectively within their settings. This literature review will support EPs to make an informed judgement about the effectiveness of the Secret Agent Society programme for supporting the social skills of children with autism. Therefore, the question of this literature review is ‘How effective is the Secret Agent Society Programme for improving social skills of children with autism spectrum disorder?’

2.5 Literature Search

It is important to note that within the DSM-5 (American Psychiatric Association, 2013), the terms ‘Autistic Disorder’, ‘Asperger syndrome’, ‘Rett’s Disorder’, ‘Childhood Disintegrative Disorder’ and ‘Pervasive Developmental Disorder – not otherwise specified (PDD-NOS)’ were replaced by the term ‘Autism Spectrum Disorder’. Therefore, studies which were conducted before the change in DSM criteria for autism will be included as long as they would now be classified within ‘Autism Spectrum Disorders’. In addition, the term ‘ASD’ or ‘autism’ will be used throughout this literature review to refer to all Autism Spectrum Disorders.

Table 3

Study feature	Inclusion criteria	Exclusion criteria	Rationale
1. Intervention	The study must follow the main theoretical components of the social skills ‘Secret Agent Society’ intervention or ‘Junior Development Training Programme’. Adaptions to interventions are acceptable as long as they do not change the theoretical or curriculum components of the programme	The study does not use the ‘Secret Agent Society’ as the	

Study feature	Inclusion criteria	Exclusion criteria	Rationale
4. Study design and methodology	The study must use a group-based or single case experimental study design	The study does not use a group-based or single case experimental design study design	To ensure the reviewer can critically evaluate the effectiveness of the intervention by comparing outcomes between or within participants
5. Type of article	The articles must be published in peer-reviewed journals	The articles were not published in a peer reviewed journal	To ensure the studies have been reviewed by independent researchers in the field and are of high-quality
6. Setting and delivery	The study must be delivered within a school, research or home setting by school staff, therapist(s) or parent(s) and	The study is not delivered within a school, research or home setting by school staff, therapist(s) or parent(s) and carer(s)	To allow generalisation of results to school settings and home environments

Study feature	Inclusion criteria	Exclusion criteria	Rationale

Figure 1

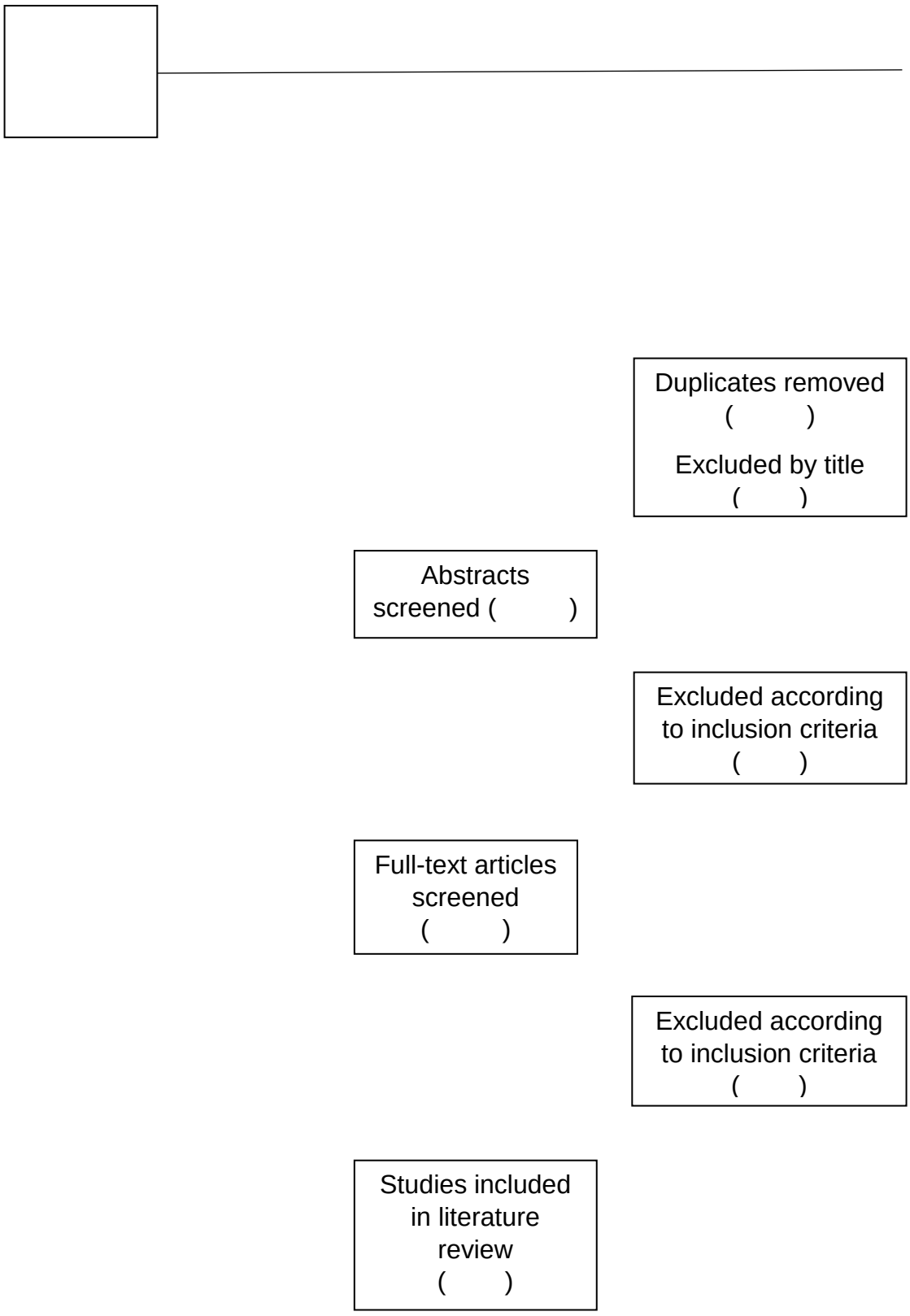
Duplicates removed
( )
Excluded by title
( )
Abstracts screened ( )
Excluded according to inclusion criteria
( )
Full-text articles screened
( )
Excluded according to inclusion criteria
( )
Studies included in literature review
( )

Table 4

Study Reference

5. Sofronoff, K., Silva, J., & Beaumont, R. (2017). The Secret Agent Society Social-Emotional Skills Program for Children With a High-Functioning Autism Spectrum Disorder: A Parent-Directed Trial.

Table 5

Author	Study Design	Location	Participants	Intervention	Outcome Measures	Key Findings
Beaumont et al. (2015)	Quasi-experimental design	Mainstream school context Australia	69 children (64 males; 5 females) Aged 7-12 Autism Spectrum Disorder diagnosis with a full-scale IQ score of 79 or higher on Wechsler Abbreviated Scale of Intelligence Assigned into two conditions: Intervention 35 Control 34	Secret Agent Society 10-week programme with adjustments made for school setting Delivered by school staff 10 x 90-minute / 20 x 45-minute sessions 10-week existing social skills programme in school with flexible use of Secret Agent Society Computer Game Pack materials	Social Skills Questionnaire parent version (SSQ-P) Social Skills Questionnaire teacher version (SSQ-T) Measures pre and post intervention and at 6-week follow-up	Parent reported social skill gains post-intervention. Gains maintained at follow-up Teacher reported social skill gains post-intervention. Slight social skill gains at follow-up

Author	Study Design	Location	Participants	Intervention	Outcome Measures	Key Findings
Einfeld et al. (2018)	Quasi-experimental design	ASD primary and secondary ‘satellite’ classes run by specialist Autism educators Australia	84 children (75 male; 9 female) Aged 8-14 Autism Spectrum Disorder diagnosis Assigned into two conditions: Intervention 26 Waitlist 58	Secret Agent Society programme delivered over 10-13 weeks Delivered by school staff 9 x 90-minute sessions Treatment as usual – Aspect Comprehensive Approach for Education	Social Skills Questionnaire parent version (SSQ-P) Social Skills Questionnaire teacher version (SSQ-T) Measures taken pre and post intervention and at 12-month follow-up	Parent reported social skill gains post-intervention

Author	Study Design	Location	Participants	Intervention	Outcome Measures	Key Findings
Tan et al. (2015)	Single case experimental design	Therapist delivery to family (parent, child and sibling) Australia	3 children (all male) Aged 8-11 Autism Spectrum Disorder diagnosis with a full-scale IQ score of 85 or above on Wechsler Abbreviated Scale of Intelligence	Secret Agent Society programme over 9 weeks Delivered by programme creator and parent 75-minute sessions (first 60 minutes delivered by therapist)	Social Skills Questionnaire parent version (SSQ-P) Social Skills Questionnaire teacher version (SSQ-T) Staggered start (baseline), then measures post-intervention and 6-week follow-up	Parent reported social skill gains for all children. Gains were maintained at follow-up

Author	Study Design	Location	Participants	Intervention	Outcome Measures	Key Findings
Beaumont et al. (2021)	Randomised controlled trial	Parent delivery with therapist support Australia	70 children (60 male; 10 female) Aged 7 to 12 Autism Spectrum Disorder diagnosis with at least low average cognitive functioning, defined by their full-scale IQ or verbal and perceptual indices on standardised intelligence tests Randomly allocated into two conditions: Intervention 35 Control 35	Secret Agent Society 10-week programme with adjustments made for parent accessibility Delivered by parents with support from trained facilitators 10 x 30-minute sessions Similarly structured 10-week programme without the social or emotional skills component	Social Skills Questionnaire parent version (SSQ-P) Social Skills Questionnaire teacher version (SSQ-T) Measures pre and post intervention and at 6-week follow-up	Parent reported social skill gains post-intervention Parent reported social skill gains greater for SAS programme post-intervention and at follow-up

Author	Study Design	Location	Participants	Intervention	Outcome Measures	Key Findings
Beaumont & Sofronoff (2008)	Randomised controlled trial	Therapist led Australia	49 children (44 male; 5 female) Aged 7 to 11 Autism Spectrum Disorder diagnosis with a full-scoreda			

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3.1 Critical Evaluation

3.2 Weight of Evidence

Table 6

Study	WoE A	WoE B	WoE C	WoE D

Einfeld et al., 2018; Tan et al., 2015). Only one study (Einfeld et al., 2018)

generalisability to the UK is low. Therefore, all studies received a lower WoE C rating for country.

To ensure study findings can be generalised to school settings, studies delivered in a school setting by teaching staff were awarded a high WoE C application to school setting score. This was the case for two studies (Beaumont et al., 2015; Einfeld et al., 2018). The four other studies included in this review (Beaumont et al., 2021; Beaumont & Sofronoff, 2008; Sofronoff et al., 2017; Tan et al., 2015) were delivered outside of the school setting by trained facilitators, resulting in low WoE C application to school setting scores.

3.6 Measures

The Emotion Regulation and Social Skills Questionnaire (ERSSQ) was used in all studies. Within an evaluative study of the measure (Butterworth et al., 2014), they found that both the parent and teacher versions of the ERSSQ have been found to have high internal consistency (Cronbach's alpha >.90) alongside good concurrent validity with the Social Skills Questionnaire (SSQ; Spence, 1995). However, they failed to establish the criterion validity of the ERSSQ teacher version. At the time of Beaumont et al.'s (2021) publication, a normative sample had yet to be determined meaning there is no information on the suitability of its use for specific populations. Furthermiitnfw T*[(ns)4 (nnt

All six studies included in this review used the Social Skills Questionnaire to measure participants' social skills. The questionnaire consists of 30 statements that describe different social behaviours. The teacher and parent are asked to rate each statement on a scale of zero to two (zero = not true, two = mostly true) for how true it is for their child. A total score is then

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3.7 Conflict of interest

All studies included within this review had Dr Renae Beaumont as one of the study authors. This highlights a natural conflict of interest as they receive a financial contribution when the SAS programme is sold. Therefore, studies conducted by independent researchers would have received the highest WoE B rating. Five studies (Beaumont et al., 2021; Beaumont & Sofronoff, 2008; Einfeld et al., 2018; Sofronoff et al., 2017; Tan et al., 2015) disclosed a conflict of interest and therefore received a medium WoE B score. The remaining study (Beaumont et al., 2015) provided enough information to suggest there is a potential conflict of interest, however this isn't explicitly stated. This resulted in a low WoE B score.

3.8 Study findings and effect sizes

All included studies except one (Tan et al., 2015) reported effect sizes which is reflected in the WoE A score. Two studies (Beaumont et al., 2015; Beaumont & Sofronoff, 2008) reported an eta-squared effect size, two studies used a partial eta-squared effect size and Einfeld et al. (2018) reported significant coefficients. Although these coefficients were unable to be converted to Cohen's d, reported means and standard deviations for the intervention and wait-list groups post-intervention meant an effect size could be calculated using the online Campbell Collaboration Calculator. Outcomes in studies reporting an eta-squared or partial eta-squared effect size were converted to the common effect size of Cohen's using the Psychometrica website (Lenhard & Lenhard, 2016).

using an intention to treat principle. Therefore, pre-intervention scores were assigned to post-intervention and follow-up scores or assigned the same score as the previous time point. These methods assume that the child made no improvement over time. Despite these attempts to mitigate the impact of missing data upon statistical analyses, findings from all studies within this review should be interpreted with caution. It should be noted that one study (Sofronoff et al., 2017) analysed attrition data and found an interaction with level of education, parental traits of autism and age.

Due to the issues with data collection, only one study (Beaumont et al., 2015) was able to analyse teacher reported data on social skills. The other five studies (Beaumont et al., 2021; Beaumont & Sofronoff, 2008;

cautious interpreting the effect sizes as they may not be truly representative of the social skill gains made.

Table 7

Study	Outcome Measure	Outcomes relevant to the review question	Effect Size	Descriptor	WoE D
Beaumont et al. (2015)	SSQ-P (= 32)	Social skill gains in b8 441.BT/TT2 -0 0 12			

Study	Outcome Measure	Outcomes relevant to the review question	Effect Size	Descriptor	WoE D
Beaumont et al. (2021)	SSQ-P	Post-intervention social skill gains for treatment group (= 31) vs. control (= 33)	= 1.06	Large	2.1 (medium)
	SSQ-P	Follow-up social skill gains for treatment group (= 25) vs. control (= 32)	0.84	Large	
	SSQ-P	Pre (= 35) to post (= 31) intervention social skill gains	= 2.73	Very large	
Sofronoff et4[h (a9)2.9(l4)7.1 (.)-8up	S5-2 (o)-6 (c)-2 (ia)-6 (l s)-2 (k)-2 (ill =g)4 (a)-6 (in)-6 (=)-2Ve(o)-6a(g)8e(P)-6				

4.1 Conclusions

The aim of this review was to evaluate the effectiveness of the Secret Agent

which suggests that the programme may be intensive to implement within a school setting. It would be beneficial for a piece of qualitative work to be carried out to hear the experiences of facilitators in delivering the programme and to highlight any issues with programme implementation.

In summary, the current evidence base is insufficient to conclude that the SAS programme is an effective intervention for improving social skills in children with ASD.

References 0 12 511.0 38.4 739.92 Anderson,S.& Morris J.20M10 (06))7 (.)2 CogM10 (ni)6 (t)2 i

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Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C., & Innocenti, M. S. (2005). Quality Indicators for Group Experimental and Quasi-Experimental Research in Special Education.

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Pennington, B.F. and Ozonoff, S. (1996). Executive functions and developmental psychopathology. 37, 51-87. doi:10.1111/j.1469-7610.1996.tb01380.x

Petticrew, M., & Roberts, H. (2003). Evidence, hierarchies, and typologies: Horses for courses. , , 527–529. doi:10.1136/jech.57.7.527

Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? , (4), 515-526. doi:10.1017/S0140525X00076512

Wood, H. (2021).

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https://www.ucl.ac.uk/educational-psychology/resources/CS1Wood_20-23.pdf

6.1 Appendices

6.2

Full study reference	Exclusion reason
community clinic. , (4), 219-235. doi:10.1080/23794925.2018.1483214	
Tan, Y. L., Mazzucchelli, T. G., & Beaumont, R. (2015). An evaluation of individually delivered secret agent society social skills program for children with high-functioning autism spectrum disorders: A pilot study. , (3), 159–174. doi:10.1017/bec.2015.7	4 (Study design)
Thomson, K., Burnham Riosa, P., & Weiss, J. A. (2015). Brief report of preliminary outcomes of an emotion regulation intervention for children with autism spectrum disorder. , (11), 3487-3495. doi:10.1007/s10803-015-2446-1	1 (Intervention) 3 (Measures)
Weiss, J. A., Thomson, K., Burnham Riosa, P., Albaum, C., Chan, V., Maughan, A., ... & Black, K. (2018). A randomized waitlist-controlled trial of cognitive behavior therapy to improve emotion regulation in children with autism. , (11), 1180-1191. doi:10.1111/jcpp.12915	1 (Intervention)

6.3 Appendix B – Weight of Evidence (WoE)

6.3.1 Weight of Evidence (WoE) A – Methodological Quality

Two coding protocols, namely Gersten et al. (2005) and Horner et al. (2005) coding protocols were used to weigh the evidence of the studies included in this systematic literature review. The coding protocols were used to assess the methodological quality of two randomised controlled trials, two quasi-experimental between subject studies, a quasi-experimental within subject design and a single case experimental study.

Each randomised controlled study and quasi-experimental study was given a WoE A rating based upon the Gersten et al. (2005) coding protocol for group experimental and quasi-experimental research. Criteria to base WoE A rankings upon were adapted, as per Wood (2021), to appraise studies where they have met fewer essential criteria but more desirable criteria. Specified criteria can be found outlined in Table 10 below.

Table 8

WoE A Rating	Criteria
3 (high)	Study meets at least 9 essential criteria and at least 4 desirable criteria
2 (medium)	Study meets at least 9 essential criteria and less than 4 desirable criteria OR Study meets 7 to 8 essential criteria and at least 4 desirable criteria

criteria for Horner et al. (2005) are outlined in Table 10 as defined in Mills (2019).

Table 11

WoE A Rating	Criteria

Criteria	Weighting		Rationale
	0	Qualitative research, surveys, case studies or non-experimental evaluations	
B. Research author(s)	3	Entirely Independent Researchers	3 suggests that certain characteristics of researchers will bring bias into their study. This can have profound consequences for the conclusions that can be drawn from the piece of research It is therefore ethical for researchers to disclose a conflict of interest. If a conflict of interest is disclosed by the researchers, the study will receive a higher rating than if a disclosure is not made
	2	Researchers have disclosed or addressed a conflict of interest in the programme, e.g. author is creator and may receive financial contribution	
	1	Researchers have provided information that suggests a possible conflict of interest but have not directly disclosed or addressed this	
	0	Conflict of interest is not disclosed or addressed at all	

Table 14

Table 15

Criteria		Scoring		Rationale
A.	Intervention fidelity: • Sessions follow the Secret Agent Society programme according to the original manual • Skill practise between sessions • Delivered over 9 90-minute sessions or 18 45-minute sessions • Facilitators trained to deliver the intervention	3 2 1 0	Study meets all 4 criteria Study meets 3 criteria Study meets 2 to 1 criterion Study meets no criteria	To assess the effectiveness of the Secret Agent Society Programme Studies are more relevant if they are implemented as per the original intervention manual
B.	Participants	3	Confirmed clinical diagnosis of ASD with a required cognitive ability score from a standardised assessment for recruitment. Standardised assessment used and score cut-offs should be stated	To ensure all participants were able to access the SAS programme content

Criteria	Scoring

Criteria	Scoring	Rationale
	child's social skills with established reliability	
	1 Outcome measures include either a parent OR teacher measure of their child's social skills with established reliability	
	0 Outcome measures include a measure of social skills without established reliability	
D. Application to school setting	3 Programme delivered in school setting by teaching staff	Studies where the Secret Agent Society Programme has been delivered in school settings are more relevant to this review
	2 Programme delivered in school setting by non-teaching trained facilitator	
	1 Programme delivered outside of school setting by trained facilitator	
	0 Programme delivered outside of school setting by untrained facilitator	

Criteria		Scoring	Rationale
E. Country	3	Study conducted in the UK	
	2		
	1		
	0		

6.4. Appendix C – Coding Matrix

Table 17

	Studies				
	Beaumont et al. (2015)	Einfeld et al. (2018)	Beaumont et al. (2021)	Sofronoff et al. (2017)	Beaumont & Sofronoff (2008)
Essential Quality Indicators					
Describing participants					
Was sufficient information provided to determine/confirm whether the participants demonstrated the disability(ies) or difficulties presented?	Yes	Yes	No	Yes	Yes
Were appropriate procedures used to increase the likelihood that relevant characteristics of participants in the sample were comparable across conditions?	Yes	No	Yes	N/A	Yes
Was sufficient information given characterizing the interventionists or teachers					

Implementation of the intervention and description of comparison conditions					
Was the intervention clearly described and specified?	No	No	Yes	Yes	Yes
Was the fidelity of implementation described and assessed?	No	Yes	Yes	No	Yes
Was the nature of services provided in comparison conditions described?	Yes	Yes	Yes	N/A	No
Outcome Measures					
Were multiple measures used to provide an appropriate balance between measures closely aligned with the intervention and measures of generalised performance?	No	No	No	No	No
Were outcomes for capturing the					

Did the research report include not only inferential statistics but also effect size calculations?	Yes	Yes	Yes	Yes	Yes

Desirable Quality Indicators

Was data available on attrition rates among intervention sampl>BD-rlt0.0 111 so0.0Tj,0.0q1w6 41.4 reW nB16.51W nd4 (e)-TjsETEMm[(c)4 (al)6 (c)4 -16.51.0cp96 41.4 reW

following procedures specified), but also examine quality of implementation?					
Was the nature of instruction or series documented in the comparison conditions?	No	No	Yes	N/A	No
Did the research report include actual audio or videotape excerpts that capture the nature of the intervention?	No	Yes	Unknown	Unknown	Yes
Were results presented in a clear, coherent fashion?	Yes	Yes	Yes	Yes	Yes

6.5. Appendix D – Completed Coding Protocols

Coding protocol: Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C. & Innocenti, M. S. (2005). Quality indicators for group experimental and quasi-experimental research in special education. *Exceptional Children, 71*(2), 149-164.

N/A
Unknown/Unable to Code

Did the research report include not only inferential statistics but also effect size calculations?
Yes
No
N/A
Unknown/Unable to Code

Desirable Quality Indicators

Was data available on attrition rates among intervention samples? Was severe overall attrition documented?
Yes
No
N/A
Unknown/Unable to Code

Did the study provide not only internal consistency reliability but also test-retest reliability and interrater reliability (when appropriate) for outcome measures?
Yes
No
N/A
Unknown/Unable to Code

Were data collectors and/or scorers blind to study conditions and equally (un)familiar to examinees across study conditions?
Yes
No
N/A
Unknown/Unable to Code

Were outcomes for capturing the intervention's effect measured beyond an immediate post-test?
Yes
No
N/A
Unknown/Unable to Code

Was evidence of the criterion-related validity and construct validity of the measures provided?
Yes

No
N/A
Unknown/Unable to Code

Did the research team assess not only surface features of fidelity implementation (e.g. number of minutes allocated to the intervention or teacher/interventionist following procedures specified), but also examine quality of implementation?

Yes
No
N/A
Unknown/Unable to Code

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- No
- N/A
  Unknown/Unable to Code

Coding protocol:

Implementation of the independent variable is practical and cost effective	No