

Case Study 1: An Evidence-Based Practice Review Report

Theme: School (setting) based interventions for children and young people with special educational needs (SEN).

How effective is the “Circle of Friends” intervention for children and young people with Autism Spectrum Disorders?

Summary

“Circle of Friends” (CoF) is an active educational approach to develop a support network around a vulnerable focus child. Taylor (1997) states that the approach consists of a whole-class session which culminates in peers volunteering to partake. This is followed by weekly circle meetings (attended by the focus child, volunteer members and an adult facilitator) to set and review targets and strategies and to problem solve around social difficulties experienced by the focus child. The purpose of this systematic literature review is to evaluate the effectiveness of the CoF approach for children with Autism Spectrum Disorders (ASD).

A systematic literature search revealed five studies which adhered to the inclusion criteria. Gough’s (2007) weight of evidence framework was used to evaluate the studies. The studies differed in research design and in the quality and methods of reporting findings. All studies reported a positive effect of CoF for the focus child, for example, increase in peer acceptance, decrease in rejection levels, improvements in peer perceptions, improvements in social responses and initiations. Some problems arising from CoF implementation were also highlighted. Implications of this review and recommendations for future research are discussed.

Introduction

Autism Spectrum Disorder (ASD)

The core diagnostic criteria defining ASD, according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) (American Psychiatric Association, 2013), are “persistent difficulties with social communication and social interaction” and “restrictive and repetitive patterns of behaviours, activities or interests”. This is known as the dyad of impairment. The dyad replaces the ‘triad of impairment’ described by Wing and Gould (1979). The triad incorporated difficulties in social communication, social relating and social imagination. With the nature of a spectrum disorder, impairments can present differently in different individuals.

It must be acknowledged that DSM-V categorises Autism and Asperger’s syndrome as two separate types of pervasive developmental disorders. They can both be referred to as autism spectrum disorders (ASD). Thus, in this review the term ‘autism’ or ‘ASD’ will be used to refer to all Autism Spectrum Disorders, including Asperger’s syndrome.

Children with ASD can struggle to comprehend emotions as well as verbal and non-verbal communication and this relates to difficulties around inclusion and forming friendships (National Research Council, 2001). Difficulties in managing social interactions impede development and lead to a decrease in positive learning experiences (Koegel & Koegel, 1995). Recent statistics show that there are over 70,000 children and young people with ASD attending mainstream schools across the UK (DfE, 2017). ASD is also the most prevalent primary type of need across the ages of 4 to 18 for those with a statement of special educational need or education, health and care plan (DfE, 2017). Despite the high volume of pupils with special educational needs attending mainstream schools, the process of ‘inclusion’ may not

be prevalent for all these pupils. Research suggests that pupils with ASD are often bullied (Humphrey & Lewis, 2008; Batten, Corbett, Rosenblatt, Withers & Yuille, 2006) and children with Asperger's are more likely to be shunned by peers (Little, 2002).

It must be recognised that due to the nature of ASD, alternative views of inclusion must be considered when working with this population. For example, pupils with ASD may not have the desire or motivation to socialise with peers (Fleisher, 2001), thus additional support to promote inclusion and peer support must be recommended and implemented on an individual basis when appropriate.

Circle of Friends (CoF)

The CoF methodology originated in Canada and the United States in the late 1980's (Perske, 1988) to promote and develop the inclusion of children with special educational needs in mainstream classes and schools (Pearpoint, Forest & Snow, 1992). It has been used to support pupils of various ages and with a variety of additional needs across the UK and other countries. The DfEE (1999) promoted the approach as an example of good practice for social inclusion and more recently it has been endorsed by the Department for Children, Education and Schools (2008).

CoF is an inclusive approach to develop a support network around the focus child who is experiencing social difficulties. It enlists support from the peer group by conducting a whole-class session and then creating a volunteer group or 'circle' to set, monitor, problem-solve and review targets in weekly meetings facilitated by an adult (Frederickson, Warren & Turner, 2005). The key elements of CoF described by Taylor (1997) are summarised in Table 1.

Table 1

Descriptions of key Components of CoF, summarised from Taylor (1997).

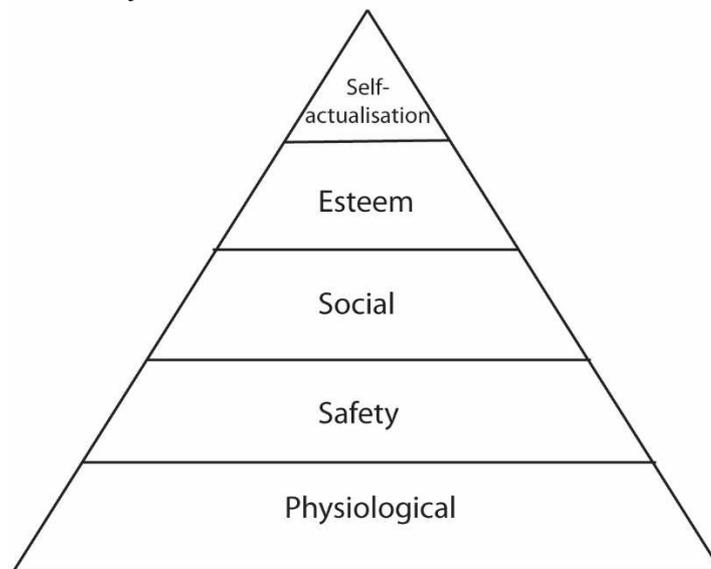
Component	Description
Establishment of fundamentals	Establish the commitment of school management, obtain permission from the focus child and parental consent for the focus child and other children in the class.
Whole-class meeting to form the CoF	It is recommended that this meeting is facilitated by an external agency, for example an Educational Psychologist. The focus child is absent from this meeting but is aware of it, this enables their peers to speak more freely. Firstly, ground rules are set, then the class discuss the focus child's areas of strength and difficulty. The facilitator then discusses friendships and the emotions and behaviours that may be associated with a lack of friendship, with links being made to the focus child to elicit empathy. Peers then consider ways to support the focus child. Peers then volunteer to partake in the CoF.
CoF Initial meeting	It is suggested that the focus child, volunteers and an adult facilitator meet directly after the whole-class session. The class discussion is summarised, ground rules are set, a name for the group is created and future targets and strategies are decided upon through group problem solving.
CoF Weekly meetings	The group (focus child, volunteers and adult facilitator) meet weekly for 6 to 10 weeks to review the previous targets and strategies, discussing what went well and problem solving about things that didn't go well to identify future targets and strategies.

There are a number of variations to the CoF format described above. One that is of particular interest for this review is Gus' (2000) adapted version for children with autism. This approach replaces the whole-class exercise that promotes thinking about relationships with a discussion about ASD. This involved talking about the triad of impairments (Wing & Gould, 1979), its cause and a discussion of how individuals with autism are similar to individuals without autism. Gus (2000) reported an improvement in the attitude of peers towards the focus child following this discussion.

Psychological Basis for Circle of Friends

This approach is underpinned by a number of psychological theories, for example, Maslow's (1943) hierarchy of needs. Individuals are motivated to achieve certain needs in sequence and we must satisfy the lower level deficit needs before progressing on to meet higher level needs. Maslow's (1943) hierarchy as seen in Figure 1, emphasises the importance of belonging to promote self-esteem and self-actualisation. Thus, in the classroom a pupil must feel that they belong to a group and have strong relationships with their peers before they can reach their full potential. The CoF approach helps pupils to identify with peers and feel valued as an individual.

Figure 1
Maslow's (1943) Hierarchy of Needs

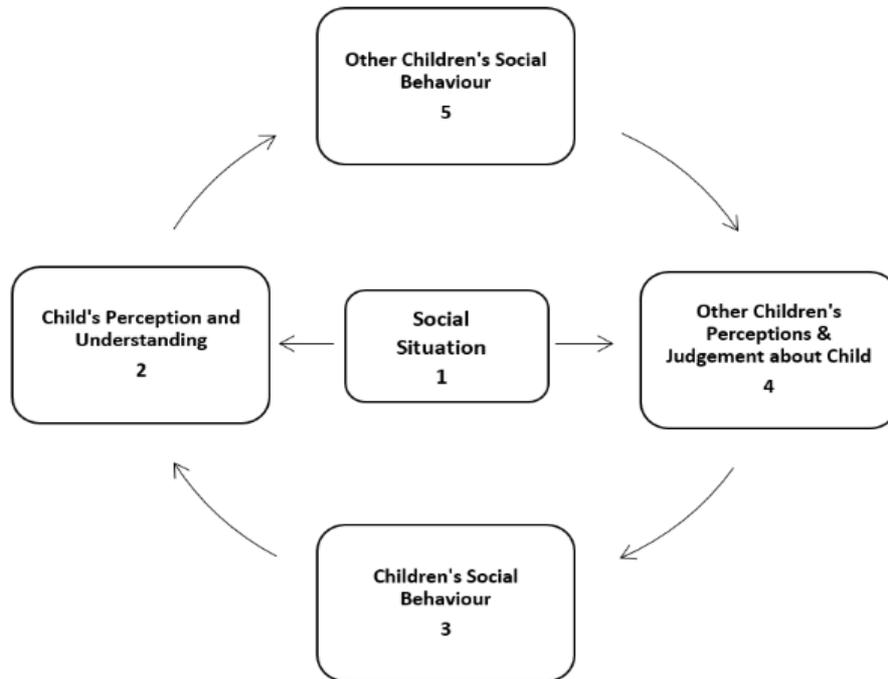


It also corresponds with interactive models of social competence, such as Bandura's (1977) Social Learning Theory. This model suggests that children observe and imitate behaviours, however, the likelihood of this imitation depends upon whether they see themselves as similar, if they identify with the person they are

observing and whether the behaviour was reinforced or punished. This emphasises the importance of environmental influences on learning and behaviour in which altering environmental factors would likely have an impact on both learning and behaviour. CoF harnesses the positive influence of the focus child's peers which may contribute to improvements in the classroom and playground. It helps to develop the focus child's self-efficacy through confidence building, constructive feedback, social persuasion and social modelling.

Circle of Friends draws upon models of social interaction. The model in Figure 2 (adapted from Dodge, Pettit, McClasky, & Brown, 1986) emphasises the variety of influences on behaviour and the way these interact, from within child factors to situational factors and other children's responses. For example, a child with ASD may perceive social situations differently and attribute hostile intent to others. They may lack the problem-solving skills to produce an effective response and consider the possible consequences, this may negatively impact peer perceptions and behaviour towards the focus child. CoF permits discussion of how others perceive and judge behaviour, provides role models and offers opportunities to practise alternative ways of behaving - this helps promote understanding of volunteers and inclusion of the focus child.

Figure 2
Dodge et al. (1986) Adapted Model of Social Interaction in Children



Rationale for Review

Social acceptance in school is linked to school achievement (Wentzel, 1991) and low acceptance levels in primary school is related to problems in adolescence and adulthood, for example, increase academic problems and truancy (Coie, Terry, Lenox & Lochman, 1995). Harrower and Dunlap (2001) suggest that pupils with ASD in fully inclusive mainstream classes have better social interaction and engagement skills than those who are marginalised. Thus, promoting social inclusion is important. It is noted that as the intervention utilises classroom social networks to create a supportive environment for the 'vulnerable' child, it is suitable for children with ASD whose successful inclusion in mainstream school is impacted by their social difficulties (Kayla & Avramidis, 2005). There is a large body of evidence that evaluates the use of CoF for pupils with a variety of needs, although, there is much

less research evaluating its use for pupils with ASD. In 2002, McConnell (2002) cautioned that the CoF approach for pupils with ASD was lacking in its empirical support. Since then, further research has been conducted therefore a review would be beneficial.

It is essential for Educational Psychologists (EPs) to consider the efficacy of this intervention. With the increased emphasis of inclusion and social and emotional development in schools, schools increasingly seek support, advice and interventions from EPs (Children and Families Act, 2014; DfES, 2005). In the field of Educational Psychology there has been a shift towards evidence based practice (Frederickson, 2002) and thus interventions that EPs recommend are being progressively analysed for their evidence-base. This review will support EPs to make informed judgements about the implementation of the approach for this population. Consequently, it is necessary to methodically explore the evidence-base regarding the effectiveness of the CoF approach for children with ASD.

Review Question

How effective is the Circle of Friends intervention for children and young people with Autism Spectrum Disorders?

Critical Review of the Evidence Base

Systematic Literature Search

An in-depth literature search was conducted in January 2018. This search involved a variety of databases and search terms in order to identify all studies that would be appropriate to review (see Table 2). The search identified a total of 105 studies, following the removal of duplicates 88 remained. These studies were then screened by title and abstract using the inclusion and exclusion criteria (Table 3) leaving 9 studies. An additional study was identified during an ancestral search. Full text screening excluded a further 5 studies, thus 5 studies remained as the focus for this review (Table 4). Figure 3 represents the literature search and selection process. Appendix A lists examples of studies excluded at title and abstract screening and the 5 studies excluded at full text screening with criteria reasons.

Table 2

Databases and search terms

Database	Search terms
British Education Index, ERIC, PsycINFO, UCL online library search	“Circle of friends” and ASD OR Autism OR Autistic OR “Autism Spectrum Disorder” OR Asperger’s OR “Asperger’s Syndrome”

Table 3

Inclusion and exclusion criteria

		Inclusion Criteria	Exclusion Criteria	Rationale
1	Participants	At least one focus child must have a diagnosis of Autistic Spectrum Disorder (ASD) or Asperger's Syndrome in each study	The focus child does not have a diagnosis of ASD or Asperger's Syndrome	To ensure that the focus child receiving CoF has a clinical diagnosis of ASD or Asperger's Syndrome
2	Type of Publication	Published journal article or thesis	Literature is not a published journal or thesis.	Unpublished journals will not have undergone rigorous ethical approval and supervision like published articles or theses
		Study contains primary data	Study is a systematic review or meta-analysis, containing secondary data.	Systematic reviews or meta-analyses studies will already be evaluated and may not contain all information required in the summary
3	Language	Studies are written in English	Studies are not written in English	To ensure research is understood
4	Intervention	Intervention must follow "Circle of Friends" (CoF) approach using the key components described in Table 1 (establishment of prerequisites, whole class meeting to form CoF, initial meeting of CoF and weekly CoF meetings)	Peer based interventions that are not "Circle of Friends" and do not follow the CoF format	To ensure that the intervention reviewed is the Circle of Friends intervention

5	Type of Design	Must be group based or single case study design	Not group based or single case study design.	To ascertain a comparison of between or within participants.
---	----------------	---	--	--

Figure 3
Flow diagram of the search and exclusion process

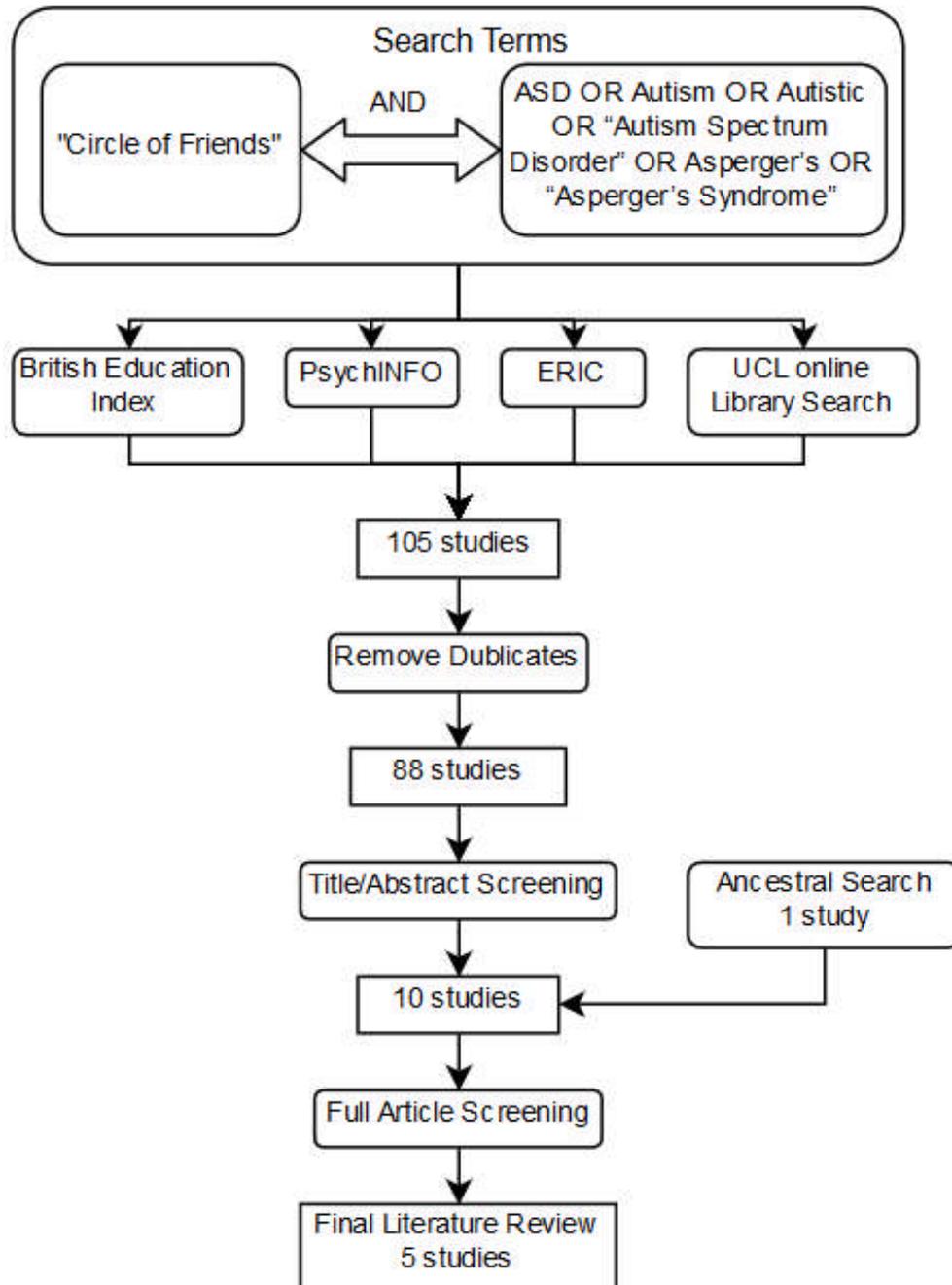


Table 4

The five studies included in this review

	Full reference of study
A	Frederickson, N., Warren, L., & Turner, J. (2005). "Circle of Friends" – An exploration of impact over time. <i>Educational Psychology in Practice</i> , 21(3), 197 – 217.
B	James, R. (2011). <i>An Evaluation of the 'Circle of Friends' Intervention Used to Support Pupils with Autism in Their Mainstream Classrooms</i> , ProQuest Dissertations & Theses database - UK & Ireland.
C	Kalyva, E., & Avramidis, E. (2005). Improving Communication between Children with Autism and Their Peers through the "Circle of Friends": A Small-Scale Intervention Study. <i>Journal of Applied Research in Intellectual Disabilities</i> , 18(3), 253-261.
D	O'Connor, E. (2016). The Use of "Circle of Friends" Strategy to Improve Social Interactions and Social Acceptance: A Case Study of a Child with Asperger's Syndrome and Other Associated Needs. <i>Support for Learning</i> , 31(2), 138-147.
E	Whitaker, P., Barratt, P., Joy, H., Potter, M., & Thomas, G. (1998). Children with Autism and Peer Group Support: "Using Circles of Friends". <i>British Journal of Special Education</i> , 25(2), 60-64.

Mapping the Field

The five studies identified through the systematic literature search described a CoF approach that had been implemented with pupils with ASD as the focus child. Table 5 shows the key features of each study.

Table 5
Mapping the Field – Key Features of Each Study

Author	Study Design and measures used	Participants (focus children)	Setting	Intervention implementation	Outcomes reported
A Frederickson, Warren & Turner (2005)	<p><u>Design:</u> Pre-post and follow up single group design. Data collected at 4 time points – 2-3 weeks before whole-class session, 3-5days after, within a week of last weekly session and 1 term after last session.</p> <p><u>Measures:</u> ‘Acceptance’ and ‘Rejection’ scores – sociometric rating scale LITOP questionnaire from Social Inclusion Survey. Perceptions of the focus child – Guess Who questionnaire.</p>	<p>14 pupils in primary school but only 1 diagnosed with ASD. Male, 7 years 11 months, ASD diagnosis.</p>	<p>Mainstream School UK</p>	<p>Taylor’s (1997) key components followed. Recruited by EP. Intervention delivered by Assistant EPs. Peers given information about ASD. 6 weeks of sessions.</p>	<p>Acceptance and rejection scores improved. Found a positive change in peers perceptions of focus child, reported to be less disruptive.</p> <p><u>Follow up</u> Rejection scores had risen only slightly along with peers who rated focus child as disruptive.</p>

Author	Study Design and measures used	Participants (focus children)	Setting	Intervention implementation	Outcomes reported
B James (2011)	<p><u>Design:</u> Pre-post, single case experimental design</p> <p><u>Measures:</u> The school Children's Happiness inventory completed by target child one week before and one week after CoF finished to look at subjective wellbeing. Strengths and Difficulties Questionnaire to measure focus child's behaviour – completed by class teacher and CoF facilitator one week before and one week after CoF finished. Social inclusion survey – completed by peers after initial class session and weekly during intervention.</p>	<p>5 participants, male, aged 7 – 10.</p> <p>4 with ASD diagnosis, 1 with Asperger's syndrome.</p> <p>Identified by EP or Autism Outreach teacher.</p>	<p>Mainstream School</p> <p>UK</p>	<p>'Circle of Friends' intervention implemented, following Newton and Wilson (2003) guidance. Including a discussion about the child's difficulties in whole class session.</p> <p>Whole class and first circle meeting delivered by Trainee Educational Psychologist.</p> <p>Weekly meetings delivered by member of school staff following clear guidelines.</p>	<p>Positive impact on social inclusion - Increase in focus child's acceptance levels and fall in rejection levels following initial whole class session. For most they showed an increase in happiness rating at school (4 out of 5). Generally a positive change in class teacher ratings on behaviour – not as much for CoF facilitator.</p> <p>No follow up</p>

Author	Study Design and measures used	Participants (focus children)	Setting	Intervention implementation	Outcomes reported
C Kalyva & Avramidis (2005)	<p><u>Design:</u> Pre-post small scale RCT and follow up</p> <p>Data collected at three time points – 1 week before, post intervention and two months later.</p> <p><u>Measures:</u> Observation schedule focusing on the number of successful and unsuccessful responses and successful and unsuccessful initiations for each participant. Interrater reliability assessed.</p>	<p>5 pre-school children All boys. Diagnosed with ASD by Local Educational Authority. Age 3:10 to 4:7 in intervention group, and 3:11 – 4:4 in control group. All were receiving ABA support at home.</p>	<p>Preschool setting</p> <p>UK</p>	<p>'Circle of Friends' intervention delivered.</p> <p>3 randomly allocated to intervention group, 2 to control group.</p> <p>Class teacher chose 5 peers to join the group.</p> <p>CoF implemented weekly over 3 months (12 sessions), each session was 30 minutes and took place on the same day every week, delivered by class teacher.</p>	<p><u>Post-intervention</u> – significant increase in successful responses, significant decrease in unsuccessful responses, and significant increase in successful initiations and significant decrease in unsuccessful initiations compared to control group.</p> <p><u>Follow-up</u> – significant increase in successful responses, significant decrease in unsuccessful responses, significant increase in successful initiations and significant decrease in unsuccessful initiations compared to control group</p>

Author	Study Design and measures used	Participants (focus children)	Setting	Intervention implementation	Outcomes reported
D O'Connor (2016)	<p><u>Design:</u> Case study.</p> <p><u>Measures:</u> Observations using STAR (settings, triggers, actions and results) approach. Belonging Scale to measure focus child's self-worth and acceptance level Social Inclusion Survey to measure peer 'acceptance' and 'rejection' levels. Focus on two target behaviours - appropriately responding to peer contact and initiating appropriate social contact both prompted and unprompted.</p>	1 participant. Male, 10 years old, Asperger's diagnosis.	Mainstream school UK	'Circle of Friends' implemented over 3 months on a weekly basis, sessions were between 30 and 40mins and took place on the same day every week.	<p>"70% increase in children willing to make social initiations and relationships" with focus child. "80% more likely to accept different types of behaviour displayed" by focus child. Focus "child felt more accepted and liked and this affected his behaviour" radically.</p> <p>No follow up</p>

Author	Study Design and measures used	Participants (focus children)	Setting	Intervention implementation	Outcomes reported
E Whitaker, Barratt, Joy, Potter & Thomas (1998)	<p><u>Design:</u> Post-only single group design.</p> <p><u>Measures:</u> Qualitative approach – structured interviews questionnaires and discussions with school staff, focus child, parents and circle members. Information was collected by school staff or Trainee Educational Psychologists to gather their perspectives of CoF.</p>	<p>6 participants from years 3 to 10.</p> <p>All with ASD Diagnosis with statements of special educational needs.</p>	<p>Mainstream schools and 1 in school for pupils with MLD</p> <p>UK</p>	<p>Taylor's (1997) key components followed.</p> <p>Whole class session led by member of the Autism Outreach team.</p> <p>6 - 8 peers were selected by Class teacher chose to join the group.</p> <p>Circle meetings took place during lunchtime with the first six being jointly led by a member of the Autism Outreach team and a member of school staff. Between 3-17 sessions.</p>	<p>Positive report from circle leader (e.g. improved social integration, reduced anxiety, improved behaviour).</p> <p>Positive impact of circle members (e.g. increased empathy and understanding, enhanced self-esteem).</p> <p>Positive report from circle members (e.g. achieving targets and helping others).</p> <p>Positive impact on inclusion (e.g. higher levels of peer contact).</p> <p>Problems and concerns highlighted (e.g. 'missing lunchtimes').</p> <p>No follow up.</p>

Critical Evaluation

Weight of Evidence (WoE)

Gough's (2007) weight of evidence (WoE) framework was used to evaluate the five studies. Each study was rated according to 3 main areas: methodological quality (WoE A), methodological relevance (WoE B) and relevance to the review question (WoE C). Using this framework, WoE B and WoE C are review-specific ratings that assess how appropriate each study is in addressing the review question.

WoE A was judged using published coding protocols for research. Four studies were evaluated using the Horner et al. (2005) coding protocol as they had small-N designs. One study was judged using an adapted version of Brantlinger, Jimenez, Klingner, Pugach and Richardson's (2005) credibility measures and quality indicators as it had a qualitative design. The observation studies and document analysis sections were removed from this protocol as the research took the form of interviews.

WoE B examined how appropriate the forms of evidence from the studies were for answering the specific research question. A typology of evidence criteria was applied to evaluate this (Petticrew & Roberts, 2003).

WoE C evaluated how relevant the focus of the studies were for answering the specific review question. Appendix B specifies criteria descriptions.

Once all 3 areas have been evaluated, an overall judgement value (WoE D) was assigned to each study. Table 6 summarises the WoE scores for each study.

Appendix B contains additional information regarding each WoE with example coding protocols.

Table 6
Summary of Weight of Evidence Judgements

Study	Methodological quality (WoE A)	Methodological relevance (WoE B)	Relevance to review question (WoE C)	Overall weighting (WoE D)
A Frederickson, Warren & Turner (2005)	2 (Medium)	1 (Low)	2 (Medium)	1.67 (Medium)
B James (2011)	3 (High)	2 (Medium)	3 (High)	2.67 (High)
C Kalyva & Avramidis (2005)	2 (Medium)	3 (High)	1 (Low)	2 (Medium)
D O'Connor (2016)	1 (Low)	1 (Low)	2 (Medium)	1.33 (Low)
E Whitaker, Barratt, Joy, Potter & Thomas (1998)	1 (Low)	1 (Low)	1 (Low)	1 (Low)

Participants

The number of participants in each study ranged from 1 to 6. A total of 18 students were included within the studies evaluated in this review, 12 of these were male, however, gender was not specified for the remaining 6 participants (Whitaker et al., 1998) which contributed to its low WoE A scoring. This indicated a clear gender bias in the literature. This overall small sample size alongside the over representation of male participants has implications on the generalisability of any findings.

Frederickson (2008) highlights that ASD diagnosis is three times more prevalent in males than females thus this could be the reason for the gender imbalance.

Four studies were conducted in schools, 1 in preschool (Kalyva & Avramidis, 2005) in the United Kingdom. It must be noted that all attended mainstream settings apart from 1 participant (Whitaker et al., 1998) who attended a school for pupils with

moderate learning difficulties. This has positive implications on generalising findings to students placed in mainstream educational settings in the UK.

Sixteen participants had a diagnosis of ASD and two had a diagnosis of Asperger's syndrome (James, 2011; O'Connor, 2016). Some studies (James, 2011; O'Connor, 2016; Whitaker et al., 1998) gave brief descriptions of the nature of the ASD difficulties, for example, "difficulties in engaging in appropriate social interactions with immediate peers" (O'Connor, 2016). Participants were aged between 3 years 10 months (Kalyva & Avramidis, 2005) to year 10 (Whitaker et al., 1998), typically in UK schools a year 10 child would be aged 14 – 15, although this was not explicitly stated in the study. One study focused on preschool aged sample (Kalyva & Avramidis, 2005), three on primary school aged pupils (Frederickson et al., 2005; James, 2011; O'Connor, 2016) and one stretched over primary and secondary school (Whitaker et al., 1998). The lack of specificity regarding ages in Whitaker et al. (1998) has contributed to its low WoE A score. James (2011) included a comprehensive description of each focus child which was taken in to account for its high WoE A score. Kalyva and Avramidis (2005) included a robust description of participants contributing to its WoE A score, however, all pupils were also undergoing Applied Behaviour Analysis treatment at home. This negatively impacted on its WoE C score as it's hard to establish the cause of the findings.

Some studies acquired their sample through referrals from the Educational Psychology service or the Local Authority's ASD Outreach team (Frederickson et al., 2005; James, 2011) or through a multi-disciplinary team meeting (O'Connor, 2016). Sampling method was not always explicitly stated (Kalyva & Avramidis, 2005; Whitaker et al., 1998), this negatively contributed to their WoE A scores.

Research Design

The designs of the studies (as seen in Table 5) varied dramatically. Due to the few studies identified in the search, it was not possible to ensure all studies were deemed as having high methodological rigour according to Petticrew and Roberts' (2003) hierarchy of evidence. A qualitative post-only design was used by Whitaker et al., (1998), due to its lack of methodological rigour this study scored low on WoE B. A small-scale randomised control trial was used by Kalyva & Avramidis (2005). They compared the CoF intervention to a wait list control group, comparing the number of successful and unsuccessful responses and successful and unsuccessful initiations. Due to the relevance of this methodology, this study scored the highest in WoE B (Appendix B).

Intervention

The CoF approach was explicitly stated in all the papers but specific details of implementation differed across studies. Two studies (Frederickson et al., 2005; Whitaker et al., 1998) followed Taylor's (1997) guidelines and one study (James, 2011) followed similar guidelines (Newton & Wilson, 2003) which contributed to their WoE C score. The remaining two studies (Kalyva & Avramidis, 2005; O'Connor, 2016) simply stated the CoF approach was used which contributed to their lower WoE C scores. Two studies (Frederickson et al., 2005; James, 2011) adapted the approach to this population to include a description of ASD and information about the focus child's difficulties in the initial whole-class session, following Gus' (2000) guidelines. As the intervention was implemented slightly differently it is difficult to compare efficacy.

Measures

The measures used also varied across the studies as described in Table 5. Three studies (Frederickson et al., 2005; James, 2011; O'Connor, 2016) used parts or all of the Social Inclusion Survey (Frederickson & Graham, 1999) to assess peer acceptance and rejection levels. This sociometric scale was used to evaluate the level of social inclusion of the focus child.

Frederickson et al. (2005) also gathered peers' perceptions of the focus child using the adapted Guess Who assessment tool (Frederickson & Graham, 1999). James (2011) looked at the subjective wellbeing of the focus child using The School Children's Happiness Inventory (Ivens, 2007) and behaviour of the focus child using the Strengths and Difficulties Questionnaire (Goodman, 1997). O'Connor (2016) also used Belonging Scales (Frederickson, Simmonds, Evans & Soulsby, 2007) to measure the focus child's feelings of self-worth and acceptance.

One study (Kalyva & Avramidis, 2005) used observations as their only method of measurement, focusing on successful and unsuccessful responses and successful and unsuccessful initiations. To reduce the observation bias, interrater reliability was assessed and reported, this positively impacted on its WoE A score. O'Connor (2016) used observations applying the STAR (settings, triggers, actions and results) approach as an additional measure.

Whitaker et al. (1998) used structured interviews and discussions with school staff, focus children, parent and circle members. Little information was provided about the contents of these interviews and discussions thus a lower WoE A score was awarded due to its low methodological quality. Whereas, James' (2011) use of

multiple measures to triangulate evidence alongside specific descriptions of how each measure was used contributed to its high WoE A score.

Outcomes and Effect Sizes

All studies reported positive effects following the CoF intervention. It must be acknowledged that there were substantial differences in the approaches and quality of reporting these findings. Two studies (James, 2011; Kalyva & Avramidis, 2005) reported means and standard deviations allowing effect sizes to be calculated using Pre-Post Standardised Mean Difference. Thus these two studies can be compared to Cohen's *d* effect size indicators where 0.2 is regarded as small, 0.5, medium and 0.8 large (Cohen, 1988). Only one participant in Frederickson et al. (2005) study had ASD, thus not all the data could be analysed for this review. The data relevant to this review was insufficient to calculate effect size. O'Connor (2016) did not provide an effect size or sufficient data for one to be calculated. This insufficient data reporting contributed to lower WoE A scores. One study (Whitaker et al., 1998) took the form of interview analysis therefore effect sizes could not be calculated for this qualitative design. Table 7 shows the main findings, effect size (if applicable) and WoE D for each study reviewed.

According to Cohen's (1992) guidelines for sample sizes, all studies were underpowered to detect effects due to insufficient sample sizes. When comparing two means with a power of 0.8 at a 0.5 significance level, Cohen (1992) recommends minimum group sizes of 26 to find a large effect, 64 for a medium effect and 393 for a small effect. Thus although Kalyva & Avramidis (2005) and James (2011) found a large effect size it must be acknowledged that due to the small sample sizes this effect size may be biased and not truly representative.

Underpowered studies may lead to inconsistent findings across research (Maxwell,

2004). Equally, it must be recognised that the nature of this intervention does not lend itself to large sample sizes with rigorous methodological designs.

The studies reported that there was a decrease in rejection scores by peers (Frederickson, et al., 2005; James, 2011) alongside an increase in acceptance scores (Frederickson, et al., 2005; James, 2011) with peers more prepared to make social initiations and relationships with the focus child (O'Connor, 2016). There was a positive change in peer perceptions (Frederickson, et al., 2005) with peers more likely to accept different behaviours (O'Connor, 2016). The focus child reported increased happiness rating (James, 2011), global self-esteem and rating of social acceptance (O'Connor, 2016). There was an increase in successful responses and decrease in unsuccessful responses (Kalyva & Avramidis, 2005) together with increase in successful initiations (Kalyva & Avramidis, 2005; O'Connor, 2016) and decrease in unsuccessful social initiations (Kalyva & Avramidis, 2005). But these changes were not consistently seen through the weekly sessions (James, 2011) or at follow up (Frederickson et al., 2005). Some "problems and concerns" were also raised by Whitaker et al. (1998), for example, there were reports of increased 'egocentricity' of the focus child and timing difficulties.

Table 7

Study findings and effect size of the intervention and overall evidence weighting

Study	Study Findings	Measure and Effect Size ¹ (Cohen's d) with descriptor	WoE D ²
Frederickson, Warren & Turner (2005)	Proportion of peers who rejected the focus child decreased from 0.71 pre intervention to 0.18 post intervention, this increased slightly at follow up. Acceptance scores increased during and immediately post intervention but dropped lower than baseline at follow up. A positive change in peers' perceptions of focus child was found, the proportion of peers rating the focus child as disruptive decreased from 0.59 pre intervention to 0.30 post intervention, but this increased to 0.38 at follow up.	Insufficient information to calculate effect size	1.67 (Medium)
James (2011)	Positive impact on social inclusion - Increase in focus child's acceptance levels and fall in rejection levels following whole class session, however, this did not continue across the course of the weekly sessions. Four out of five focus children showed an increase in happiness rating at school. Generally a positive change in class teacher ratings on behaviour – not as much for CoF facilitator.	Acceptance; d = 0.81 (large) Rejection; d = 0.48 (small)	2.67 (High)
Kalyva & Avramidis (2005)	After 3 months and after 5 months, the number of successful responses of the intervention group was significantly higher than those of the control group. The number of unsuccessful responses of the intervention group was significantly lower than that of the control group. The number of successful initiations of the intervention group was significantly higher than those in the control group. The number of unsuccessful initiations of the intervention group was significantly lower for the control group.	Successful responses; d = 5.05 (large) Unsuccessful responses; d = 2.27 (large) Successful initiations; d = 4.03 (large) Unsuccessful initiations; d = 2.85 (large)	2 (Medium)

Study	Study Findings	Measure and Effect Size ¹ (Cohen's d) with descriptor	WoE D ²
O'Connor (2016)	A 70% increase in peers prepared to make social initiations and relationships with focus child was reported. With 80% of the peer group more likely to accept different types of behaviour displayed by focus child. Belonging Scale indicated an increased in global self-esteem and rating of social acceptance of focus child. STAR recording chart showed an increase in successful social initiations. Contact and quality of contact with peers had improved.	Insufficient information to calculate effect size	1.67 (Medium)

Study	Study Findings	Measure and Effect Size ¹ (Cohen's d) with descriptor	WoE D ²
Whitaker, Barratt, Joy, Potter & Thomas (1998)	<p>Circle facilitators perceived improved social integration and an increase in peer contact with the focus child. Four out of seven reported reduced anxiety of focus child. Most circles focused on improving behaviour. However, two leaders reported an 'increased egocentricity'. All circle facilitators rated CoF as 'worthwhile' or 'very worthwhile' and found the experience rewarding.</p> <p>The CoF had a positive impact on circle members, with an increase in levels of empathy and improved understanding, enhanced self-esteem. Five out of seven reported no disadvantages to circle members, however, two reported "circle members becoming distressed when faced with unexpected reactions". A total of 32 of 52 circle members reported it was 'good to help' and 'develop ourselves' with an increase in self-esteem. A total of 40 of 52 circle members reported working with, playing or spending time with the focus child but only 3 expressed that the focus child was a friend. There was recognition of positive attributes, greater understanding of difficulties and a reduction in blaming the focus child, however, the focus child continued to be the receiver of support rather than a mutual partner.</p> <p>Problems and concerns were highlighted – one in three circle members raised 'missing lunchtime' as an issue, some raised 'challenges to personal skills' and 'the "autistic" difference' (difficulties engaging with someone who doesn't respond like a typically developing child).</p> <p>All parents expressed enthusiasm for CoF, five parents reported a shift in friendship patterns with their children playing more with same-age peers.</p>	Qualitative design	1 (Low)

¹Effect sizes were interpreted according to Cohen's (1988) criteria, whereby '0.2' is considered a 'small' effect, '0.5' is regarded as a 'medium' effect and '0.8' is deemed be a 'large' effect

²For WoE D, 1 - 1.4 = "low", 1.5 - 2.4 = "medium", 2.5 - 3 = "high"

Conclusions and Recommendations

The aim of this review was to evaluate the effectiveness of the CoF approach for children with ASD, allowing professionals to make informed choices about the appropriateness of CoF for this population. A systematic literature search identified 5 studies that met the inclusion criteria. Evaluation using the weight of evidence framework (Gough, 2007), critiquing findings and calculating effect sizes has highlighted that these studies provided a limited evidence-base for the use of CoF with this population. Some studies received overall weight of evidence scores (WoE D) of high (James, 2011) or medium (Frederickson et al., 2005; Kalyva & Avramidis, 2005) and effect sizes that could be calculated were mostly large (James, 2011; Kalyva & Avramidis, 2005). However, synthesis of the results was difficult due to the heterogeneity of the studies. The small sample sizes, the absence of control groups and/or pre-post designs, the variance in the way CoF was implemented and the differences in quality of reporting makes drawing conclusions about reliability and causality of the findings difficult.

All studies reported positive outcomes for the focus child with ASD following the CoF intervention. Positive outcomes were also reported for circle members. However, these improvements were not consistent through the weekly meetings (James, 2011) or at follow up (Frederickson et al., 2005). Whitaker et al. (1998) also noted “problems and concerns” that arose following the intervention, these should be addressed and considered by professionals when recommending or implementing this intervention.

This review has highlighted gaps in the research for the use of this intervention for this population. Given the gender disparity in participants, with no participants

specified as being female, these findings cannot be generalised across genders. More research is required to evaluate its use for females with ASD before it should be recommended by professionals, for example EPs. Currently, any recommendation for using CoF approach for children with ASD would have to be conveyed with caution considering the restricted evidence base. It is recommended that future researchers should use more rigorous research designs, for example, randomised controlled trials and larger sample sizes with both genders. Enhancing the methodological quality would allow findings to be assumed with greater confidence with any findings being attributed to CoF and not the differences between participants.

The review has identified some benefits of using this approach for pupils with ASD, it has also identified the need for further research in order to establish a causal link between the CoF intervention and possible outcomes. Thus it is suggested that the current evidence-base is insufficient to conclude that CoF is effective for children with ASD.

References and Appendices

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.
- Batten, A., Corbett, C., Rosenblatt, M., Withers, L., & Yuille, R. (2006). *Make School Make Sense. Autism and Education: The Reality for Families Today*, NAS, London.
- Brantlinger, E., Jimenez, R., Klingner, J., Pugach, M., & Richardson, V. (2005). Qualitative Studies in Special Education. *Exceptional Children*, 71(2), 195-207.
- Children and Families Act. (2014). Retrieved from http://www.legislation.gov.uk/ukpga/2014/6/pdfs/ukpga_20140006_en.pdf
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cohen, J. (1992). A Power Primer. *Psychological Bulletin*, 112(1), 155–159.
- Coie, J., Terry, R., Lenox, K., & Lochman, J. (1995). Childhood peer rejection and aggression as predictors of stable patterns of adolescent disorder. *Development and Psychopathology*, 7, 697 – 713.
- Department for Children, Education and Schools. (2008). *Bullying Involving Children with Special Educational Needs and Disabilities*, London: DCSF Publications.
- Department for Education. (2017). *Special educational needs in England: January 2017*.
- Department for Education and Employment. (DfEE) (1999). *Social inclusion: pupil support*. (Circular 10/99). London: DfEE Publications.
- Department for Education and Skills. (DfES, 2005). *Excellence and Enjoyment: Social and Emotional Aspects of Learning (guidance)*. Nottingham: DfES.
- Dodge, K. A., Pettit, C. S., McClasky, C. J., & Brown, M. M. (1986). Social competence in children. *Monographs of the Society for Research in Child Development*, 51.
- Fleisher, M. (2001). *Autism: An Insider View*. In Richer, J & Coates, S. (Eds). *Autism: The Search for Coherence*. Jessica Kingsley Publishers: London.
- Frederickson, N. (2002). Evidence-based practice and educational psychology. *Educational and Child Psychology*, 19(3), 96-111.
- Frederickson, N. (2008) Educating children with autism. In N. Frederickson, A. Miller, and T. Cline (Eds.), *Educational Psychology*. London: Hodder Education.

- Frederickson, N., & Graham, B. (1999). *Social skills and emotional intelligence: Psychology in education portfolio*. Windsor: NFER-Nelson.
- Frederickson, N., Simmonds, E., Evans L., & Soulsby, C. (2007). Assessing social and affective outcomes of inclusion. *British Journal of Special Education*, 34(2), 105 – 115.
- Frederickson, N., Warren, L., & Turner, J. (2005). “Circle of Friends” – An exploration of impact over time. *Educational Psychology in Practice*, 21(3), 197 – 217.
- Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, 28(5), 581 – 586.
- Gough, D. (2007). Weight of Evidence: a framework for the appraisal of the quality and relevance of evidence. *Research Papers in Education*, 22(2), 213 – 228.
- Gus, L. (2000). Autism: Promoting peer understanding. *Educational Psychology in Practice*, 16, 461 – 466.
- Harrower, J. K., & Dunlap, G. (2001). Including children with autism in general education classrooms. *Behavior Modification*, 25(5), 762 – 784.
- Horner, R., Carr, E., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The Use of Single-Subject Research to Identify Evidence-Based Practice in Special Education. *Exceptional Children*, 71(2), 165-179.
- Humphrey, N., & Lewis, S. (2008). ‘Make me normal’ the views and experiences of pupils on the autistic spectrum in mainstream secondary schools. *Autism*, 12(1), 23 – 46.
- Ivens, J. (2007). The development of a happiness measure for school children. *Educational Psychology in Practice*, 23(3), 221 – 239.
- James, R. (2011). *An Evaluation of the 'circle of Friends' Intervention Used to Support Pupils with Autism in Their Mainstream Classrooms*, ProQuest Dissertations & Theses database - UK & Ireland.
- Kalyva, E., & Avramidis, E. (2005). Improving Communication between Children with Autism and Their Peers through the "Circle of Friends": A Small-Scale Intervention Study. *Journal of Applied Research in Intellectual Disabilities*, 18(3), 253-261.
- Koegel, R. L., & Koegel, L. K. E. (1995). *Teaching children with autism: Strategies for initiating positive interactions and improving learning opportunities*. Paul H Brookes Publishing.
- Little, L. (2002). Middle-class mothers’ perceptions of peer and sibling victimization among children with Asperger’s syndrome and non-verbal learning disorders. *Issues in Comprehensive Paediatric Nursing*, 25, 43 - 57.
- Maslow, A. H. (1943). A Theory of Human Motivation. *Psychological Review*, 50(4), 370-96.

- Maxwell, S. E. (2004). The persistence of underpowered studies in psychological research: Causes, consequences, and remedies. *Psychological Methods*, 9(2), 147–163.
- McConnell, S, R. (2002). Interventions to facilitate social interaction for children with autism: review of available research and recommendations for educational intervention and future research. *Journal of Autism and Developmental disorders*, 32(5), 351 – 371.
- National Research Council. (2001). *Educating children with autism*. Washington, DC: National Academy Press.
- Newton, C., & Wilson, D. (2003). *Creating Circle of Friends. A peer support and inclusion workbook*. Inclusive Solutions UK Limited: UK.
- O'Connor, E. (2016). The Use of "Circle of Friends" Strategy to Improve Social Interactions and Social Acceptance: A Case Study of a Child with Asperger's Syndrome and Other Associated Needs. *Support for Learning*, 31(2), 138-147.
- Pearpoint, J., Forest, M., & Snow, J. (1992). *The inclusion papers*. Toronto: Inclusion Press.
- Perske, R. (1988). *Circle of Friends*. Nashville, Tennessee: Abington Press.
- Petticrew, M., & Roberts, H. (2003). Evidence, hierarchies, and typologies: Horses for courses. *Journal of Epidemiology and Community Health*, 57(7), 527–529.
- Taylor, G. (1997). Community building in schools: Developing a circle of friends. *Educational and Child Psychology*, 14, 45 – 50.
- Wentzel, H. R. (1991). Relations between social competence and academic achievement in early adolescence. *Child Development*, 62, 1066 – 1078.
- Whitaker, P., Barratt, P., Joy, H., Potter, M., & Thomas, G. (1998). Children with Autism and Peer Group Support: "Using Circles of Friends". *British Journal of Special Education*, 25(2), 60-64.
- Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated abnormalities in children: epidemiology and classification. *Journal of Autism and Developmental Disorders*, 9, 11 -29.

Appendices

Appendix A – Excluded Articles

Table A1:

Examples of articles excluded at title and abstract screening with criteria reasons

Article	Exclusion Criteria Number
Garrote, A., & Dessefontet, R. (2015). Social Participation in Inclusive Classrooms: Empirical and Theoretical Foundations of an Intervention Program. <i>Journal of Cognitive Education and Psychology, 14</i> (3), 375-38	1, 4
Gozes, I., & Ivashko-Pachima, Y. (2015). ADNP: In search for molecular mechanisms and innovative therapeutic strategies for frontotemporal degeneration. <i>Frontiers In Aging Neuroscience, 7</i> , 205.	1, 4
Malishkevich, A., Marshall, G., Schultz, A., Sperling, R., Aharon-Peretz, J., & Gozes, I. (2016). Blood-Borne Activity-Dependent Neuroprotective Protein (ADNP) is Correlated with Premorbid Intelligence, Clinical Stage, and Alzheimer's Disease Biomarkers. <i>Journal Of Alzheimers Disease, 50</i> (1), 249-260.	1, 4
Thompson, S. A., & Timmons, V. (2017). Authentic Inclusion in Two Secondary Schools: "It's the Full Meal Deal. It's Not Just in the Class. It's Everywhere.". <i>Exceptionality Education International, 27</i> (1), 62-84.	1, 4
Jones, M., Hocking, C., & Mcpherson, K. (2017). Communities with participation-enabling skills: A study of children with traumatic brain injury and their shared occupations. <i>Journal of Occupational Science, 24</i> (1), 88-104.	1, 4
Wistow, G., Perkins, M., Knapp, M., Bauer, A., & Bonin, E-M. (2016). Circles of Support and Personalization: Exploring the Economic Case. <i>Journal of Intellectual Disabilities, 20</i> (2), 194-207.	1, 4
Amram, N., Hacoheh-Kleiman, G., Sragovich, S., Malishkevich, A., Katz, J., Touloumi, O., & Gozes, I. (2016). Sexual divergence in microtubule function: The novel intranasal microtubule targeting SKIP normalizes axonal transport and enhances memory. <i>Molecular Psychiatry, 21</i> (10), 1467-1476.	1, 4
Schultz, T. R., Able, H., Sreckovic, M. A., & White, T. (2016). Parent-Teacher Collaboration: Teacher Perceptions of What Is Needed to Support Students with ASD in the Inclusive Classroom. <i>Education and Training in Autism and Developmental Disabilities, 51</i> (4), 344-354.	1, 4

Article	Exclusion Criteria Number
Reid, S. (2017). The curious case of loners: Social isolation and juvenile incarceration. <i>Legal and Criminological Psychology</i> , 22(1), 180-195.	1, 4
Sutcliffe, A. (2016). Grounded theory: A method for practitioner research by educational psychologists. <i>Educational and Child Psychology</i> , 33(3), 44 – 54.	1, 4
Locke, J., Shih, W., Kretzmann, M., & Kasari, C. (2016). Examining Playground Engagement between Elementary School Children with and without Autism Spectrum Disorder. <i>Autism: The International Journal of Research and Practice</i> , 20(6), 653-662.	4
Chang, Y. C., & Locke, J. (2016). A systematic review of peer-mediated interventions for children with autism spectrum disorder. <i>Research in Autism Spectrum Disorders</i> , 27, 1-10.	2
Del Barrio, C., & van der Meulen, K. (2016). Peer victimization among pupils with disability. <i>Pensamiento Psicologico</i> , 14(1), 103 – 118.	1, 3, 4
Katz, E., & Girolametto, L. (2015). Peer-mediated intervention for pre-schoolers with ASD: Effects on responses and initiations. <i>International Journal of Speech-Language Pathology</i> , 17(6), 565-576.	5
Del Barrio, C., & van der Meulen, K. (2015). Mistreatment due to abuse of power from peers victimization among pupils with disability. <i>Pensamiento Psicologico</i> , 13(2).	1, 3, 4
Warren, L., Jones, A., & Frederickson, N. (2014). Callous-unemotional interpersonal style in DSM-V: What does this mean for the UK SEBD population? <i>Emotional and Behavioural Difficulties</i> , 1-14.	1, 4
Theara, G., & Abbott, D. (2015). Understanding the experiences of South Asian parents who have a child with autism. <i>Educational and Child Psychology</i> , 32(2), 47 – 56.	4
Koller, D., & San Juan, V. (2015). Play-Based Interview Methods for Exploring Young Children's Perspectives on Inclusion. <i>International Journal of Qualitative Studies in Education (QSE)</i> , 28(5), 610-631.	1, 4
Gozes, I., Yeheskel, A., & Pasmanik-Chor, M. (2015). Activity-Dependent Neuroprotective Protein (ADNP): A case study for highly conserved chordata-specific genes shaping the brain and mutated in cancer. <i>Journal of Alzheimer's Disease</i> , 45(1), 57-73.	1, 4
Lindsay, S., & Edwards, A. (2013). A systematic review of disability awareness interventions for children and youth. <i>Disability and Rehabilitation</i> , 35(8), 623-646.	1, 2, 4

Article	Exclusion Criteria Number
Dillenburger, K., Jordan, J., Mckerr, L., Devine, P., & Keenan, M. (2013). Awareness and knowledge of autism and autism interventions: A general population survey. <i>Research in Autism Spectrum Disorders</i> , 7(12), 1558-1567.	4
Koegel, R., Kim, S., Koegel, L., & Schwartzman, B. (2013). Improving Socialization for High School Students with ASD by Using Their Preferred Interests. <i>Journal of Autism and Developmental Disorders</i> , 43(9), 2121-2134.	4
Alves Bosa, C. (2012). Social competence, school inclusion and autism: A comparative case study. <i>Psicologia</i> , 28(3), 315-324.	3, 4
Katz, J., Porath, M., Bendu, C., & Epp, B. (2012). Diverse Voices: Middle Years Students' Insights into Life in Inclusive Classrooms. <i>Exceptionality Education International</i> , 22(1), 2-16.	1, 4
Symes, W., & Humphrey, N. (2012). Including Pupils with Autistic Spectrum Disorders in the Classroom: The Role of Teaching Assistants. <i>European Journal of Special Needs Education</i> , 27(4), 517-532	4
Koegel, L. K., Vernon, T. W., Koegel, R. L., Koegel, B. L., & Paullin, A. W. (2012). Improving Social Engagement and Initiations between Children with Autism Spectrum Disorder and Their Peers in Inclusive Settings. <i>Journal of Positive Behavior Interventions</i> , 14(4), 220-22	4
Pisula, E., & Lukowska, E. (2012). Perception of Social Relationships with Classmates and Social Support in Adolescents with Asperger Syndrome Attending Mainstream Schools in Poland. <i>School Psychology International</i> , 33(2), 185-206.	4
Wadman, R., Durkin, K., & Conti-Ramsden, G. (2011). Social Stress in Young People with Specific Language Impairment. <i>Journal of Adolescence</i> , 34(3), 421-431.	1, 4
Schreiber, C. (2011). Social Skills Interventions for Children with High-Functioning Autism Spectrum Disorders. <i>Journal of Positive Behavior Interventions</i> , 13(1), 49-62.	4
Walker, A., Barry, Tammy D., & Bader, S. H. (2010). Therapist and Parent Ratings of Changes in Adaptive Social Skills Following a Summer Treatment Camp for Children with Autism Spectrum Disorders: A Preliminary Study. <i>Child & Youth Care Forum</i> , 39(5), 305-322.	4
James, A., & Leyden, G. (2010). Putting the circle back into circle of friends: A grounded theory study. <i>Educational and Child Psychology</i> , 27(1), 52 – 63.	1

Article	Exclusion Criteria Number
Koster, M., Pijl, S. J, Nakken, H, & Van Houten, E. (2010). Social Participation of Students with Special Needs in Regular Primary Education in the Netherlands. <i>International Journal of Disability, Development and Education</i> , 57(1), 59-75.	4
Myles, Brenda Smith, Grossman, Barry G., Aspy, Ruth, Henry, Shawn A., & Coffin, Amy Bixler. (2007). Planning a Comprehensive Program for Students with Autism Spectrum Disorders Using Evidence-Based Practices. <i>Education and Training in Developmental Disabilities</i> , 42(4), 398-409.	4
Frederickson, N., & Turner, J. (2003). Utilizing the Classroom Peer Group to Address Children's Social Needs. <i>The Journal of Special Education</i> , 36(4), 234-245.	1
Greenway, C. (2000). Autism and Asperger Syndrome: Strategies to promote prosocial behaviours. <i>Educational Psychology in Practice</i> , 16(4), 469-486.	4

Table A2

Articles excluded at full text screening with criteria reasons

Article	Exclusion Criteria Number
Ezzamel, N., & Bond, C. (2017). The use of a peer-mediated intervention for a pupil with autism spectrum disorder: Pupil, peer and staff perceptions. <i>Educational and Child Psychology</i> . 34(2), 27-39.	4
Ezzamel, N., & Bond, C. (2016). How have target pupil, peer and school level outcomes related to peer-mediated interventions for pupils with ASD been evaluated? <i>European Journal of Special Needs Education</i> , 31(4), 440-457.	4
Barrett, W., & Randall, L. (2004). Investigating the Circle of Friends Approach: Adaptations and Implications for Practice. <i>Educational Psychology in Practice</i> , 20(4), 353-368.	1
Gus, L. (2000). Autism: Promoting peer understanding. <i>Educational Psychology in Practice</i> , 16(4), 461-468.	4
Schlieder, M., Maldonado, N., & Baltés, B. (2014). A investigation of "Circle of Friends" peer-mediated intervention for students with autism. <i>The Journal of Social Change</i> , 6(1), 27 – 40.	5

Appendix B – Weight of Evidence (WoE)

Weight of Evidence A (WoE A) - Methodological quality

Table B1

Weight of evidence A criteria

Protocol	WoE A Score	Criteria	Rationale
Horner et al. (2005) Coding Protocol	3	Average score of 2 – 3 across the seven judgement areas	Possible WoE scores range from 0 – 3, this criteria converts them into scores between 1 - 3 whilst taking account of all judgement areas.
	2	Average score of 1 – 1.9 across the seven judgement areas	
	1	Average score of 0 – 0.9 across the seven judgement areas	
Adapted Brantlinger et al. (2005) Coding Protocol	3	Average score of 2 – 3 across the twenty two judgement areas	Possible WoE scores range from 0 – 3, this criteria converts them into scores between 1 – 3 whilst taking account of all judgement areas.
	2	Average score of 1 – 1.9 across the twenty two judgement areas	
	1	Average score of 0 – 0.9 across the twenty two judgement areas	

Table B2

WoE A - Horner et al. (2005) Coding Protocol and overall score

Quality indicators within single-subject research (Horner et al., 2005)	Study A
Description of participants	0
Participants are described with sufficient detail to allow others to select individuals with similar characteristics (e.g. age, gender, disability, diagnosis)	No
The process for selecting participants is described with replicable precision	No
Critical features of the physical setting are described with sufficient precision to allow replication	No
Dependent Variable	3
Dependent variables are described with operational precision	Yes
Each dependent variable is measured with a procedure that generates a quantifiable index	Yes
Measurement of the dependent variable is valid and described with replicable precision	Yes
Dependent variables are measured repeatedly over time	Yes
Data are collected on the reliability or interobserver agreement associated with each dependent variable, and IOA levels meet minimal standards (e.g., IOA = 80%; Kappa = 60%)	Yes
Independent Variable	2
Independent variable is described with replicable precision	Yes
Independent variable is systematically manipulated and under the control of the experimenter	Yes
Overt measurement of the fidelity of the implementation for the independent variable is highly desirable	No
Baseline	1
The majority of single-subject research studies will include a baseline phase that provides repeated measurement of a dependent variable and established a pattern of responding that can be used to predict the pattern of future performance, if introduction or manipulation of the independent variable did not occur	Yes
Baseline conditions are described with replicable precision	No

Quality indicators within single-subject research (Horner et al., 2005)	Study A
Experimental Control/Internal Validity	2
The design provides at least three demonstrations of experimental effect at three different points in time	Yes
The design controls for common threats to internal validity (e.g. permits elimination of rival hypotheses)	No
The results document a pattern that demonstrates experimental control	Yes
External Validity	0
Experimental effects are replicated across participants, settings, or materials to establish external validity	No
Social Validity	3
The dependent variable is socially important	Yes
The magnitude of change in the dependent variable resulting from the intervention is socially important	Yes
Implementation of the independent variable is practical and cost effective	Yes
Social validity is enhanced by the implementation of the independent variable over extended time periods, by typical intervention agents, in typical physical and social contexts.	Yes
Total	11
Average across 7 judgement areas Total/7 =	1.57
WoE A Score	2

Table B3

WoE A – Brantlinger et al. (2005) coding protocol and overall score

	Study
Credibility measures and quality indicators for qualitative research (adapted from Brantlinger, Jimenez, Klingner, Pugach & Richardson, 2005)	E
Triangulation — Data triangulation, Investigator triangulation, Theory triangulation, Methodological triangulation.	1
Disconfirming evidence	0
Researcher reflexivity	0
Member checks —having participants review and confirm the accuracy (or inaccuracy) of interview transcriptions or observational field notes.	0
Collaborative work —involving multiple researchers in designing a study or concurring about conclusions to ensure that analyses and interpretations are not idiosyncratic and/or biased	0
External auditors —using outsiders (to the research) to examine if, and confirm that, a researcher’s inferences are logical and grounded in findings.	0
Peer debriefing —having a colleague review and provide critical feedback on descriptions, analyses, and interpretations or a study’s results.	0
Audit trail —keeping track of interviews conducted; used to document and substantiate that sufficient time was spent in the field to claim dependable and confirmable results.	0
Prolonged field engagement —repeated, substantive observations; multiple, in-depth interviews; inspection of a range of relevant documents	2
Thick, detailed description —reporting sufficient quotes and field note descriptions to provide evidence for researchers’ interpretations and conclusions.	2
Particularisability —documenting cases with thick description so that readers can determine the degree of transferability to their own situations.	0
<hr/>	
Interview Studies (or interview components of Comprehensive studies)	
<hr/>	
Appropriate participants are selected (purposefully identified, effectively recruited, adequate number, representative of population of interest).	2
Interview questions are reasonable (clearly worded, not leading, appropriate and sufficient for exploring domains of interest).	0
Adequate mechanisms are used to record and transcribe interviews.	0
Participants are represented sensitively and fairly in the report.	1
Sound measures are used to ensure confidentiality.	0
<hr/>	

Data Analysis	
Results are sorted and coded in a systematic and meaningful way.	1
Sufficient rationale is provided for what was (or was not) included in the report.	0
Documentation of methods used to establish trustworthiness and credibility are clear.	0
Reflection about researchers' personal position/perspectives are provided	0
Conclusions are substantiated by sufficient quotations from participants, field notes of observations, and evidence of documentation inspection.	1
Connections are made with related research.	1
Total	11
Average across 22 judgement areas (Total/22)	0.5
WoE A Score	1

Weight of Evidence B (WoE B) - methodological relevance

Table B4

Weight of evidence B criteria, rationale and scoring

WoE B Score	Type of study design	Study					Rationale
		A	B	C	D	E	
1	Qualitative research, surveys, case-control studies, non-experimental evaluations	/			/	/	These are the study types, excluding systematic literature reviews, that are most suitable to research questions about 'effectiveness' (Petticrew & Roberts, 2003)
2	Cohort studies, quasi-experimental designs		/				
3	Randomised control studies			/			

Weight of Evidence C (WoE C) – Relevance of the Review Question

WoE C was used to review each individual study in relation to its relevance and appropriateness for answering the review question. In order to make this rating the reviewer carefully considered 1) the level of training provided for Circle of Friends group leaders; 2) the fidelity of programme implementation; 3) the description of the intervention and selection of participants provided.

All of the criteria below each weighting had to be met in order to achieve that score.

To receive a rating of 3 (high) studies must:

- Participants have a clinical diagnosis of ASD
- Have stated that staff who delivered the intervention had received training specific to CoF
- Have stated that staff followed specific CoF guidelines with a whole class session followed by weekly meeting
- CoF intervention is fully described, including examples of weekly meeting guidelines
- Intervention is delivered for 8 weeks or more with 1 session per week

To receive a rating of 2 (medium) studies must:

- Participants are selected on researchers own diagnostic criteria for ASD
- Have stated that staff followed specific CoF guidelines with a whole class session followed by weekly meeting
- Have provided sufficient description of the intervention programme that was delivered
- Intervention is delivered for 5 weeks or more with 1 session per week
- CoF is not delivered alongside other interventions

To receive a rating of 1 (low) studies must:

- Participants are believed to have ASD, for example, suspicions by school staff
- Have followed the CoF framework with a whole class session followed by weekly meeting
- CoF is delivered alongside other interventions

Table B5

Summary of WoE C Score

Study	WoE C Rating
A Frederickson, Warren & Turner (2005)	2
B James (2011)	3
C Kalyva & Avramidis (2005)	1
D O'Connor (2016)	2
E Whitaker, Barratt, Joy, Potter & Thomas (1998)	1

Weight of Evidence D (WoE D) – Overall Weighting

In order to calculate overall weighting (WoE D), the mean of WoE A, B and C score was calculated.

To receive a 'High' overall rating, a study must receive an average rating of 2.5 or above.

To receive a 'Medium' overall rating, a study must receive an average weighting between 1.5 and 2.4.

To receive a 'Low' overall rating, a study must receive an average weighting below 1.4.