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**Using sociometric techniques to assess the social impacts of inclusion: some methodological considerations**

**Highlights**

- Sociometric studies have examined the social inclusion of integrated pupils with SEN
- The peer nomination and the peer rating techniques have produced negative results
- The Social Cognitive Mapping technique has produced mixed to positive results
- Multi-method research designs combining sociometric evidence with qualitative data are needed

**Abstract**
In recent years, sociometric techniques have been increasingly used to assess friendship development in children with special educational needs integrated in regular educational settings. In this paper, the findings produced by different techniques are contrasted with a view to examining whether the variable findings reported can be attributed to the technique employed. The analysis revealed that peer nominations have been used to determine pupils' social status and have overwhelmingly produced negative results. Peer ratings have been used to ascertain the level of acceptance pupils enjoy within their class network and have also produced negative results. Social Cognitive Mapping has been used to obtain information about the nature of social networks and the relations among peers and has produced mixed to positive results. As such, Social Cognitive Mapping could be viewed as a more robust approach that addresses more thoroughly the complexities of young children's social relations than the other two classic sociometric techniques. The paper concludes with highlighting methodological challenges surrounding the application of sociometric techniques and advocates their embedding within innovative multi-method research designs.

# 1. Introduction

One of the main arguments for promoting inclusive education is the social benefits pupils accredited with Special Educational Needs (SEN) gain from their increased interaction with typically achieving peers. Proponents of inclusion argue that inclusive schools are the most effective means for reducing prejudice, combating discriminatory attitudes, and ultimately leading to the creation of a more accepting society (Booth & Ainscow, 2013). By contrast, segregated provisions are assumed to reproduce stigmatisation and prejudice and on this basis should be avoided. While these assumptions have been traditionally taken for granted, the results from many empirical studies have found integrated pupils with SEN to be experiencing marginalisation and loneliness (Valås, 1999; Lackaye & Margalit, 2006; Bakkaloğlu, 2010; Bossaert et al., 2012; Mamas, 2012). Indeed, recent reviews of the relevant literature (Ruijs & Peetsma, 2009; Koster et al., 2009; Bossaert et al., 2013) have concluded that the picture emerging from studies examining the social outcomes of inclusion is a rather negative one; while some studies reporting positive results can be found, the overwhelming majority of research in the field highlights the challenge surrounding the development of meaningful relationships with peers.

The gloomy picture portrayed in the literature could be attributed to the way "social inclusion" is operationally defined and measured in different studies. Most research studies to date have employed sociometric techniques to examine a single social indicator, thus offering a partial evaluation of the social outcomes of inclusion (see Koster et al. [2010] for an exception where a more holistic model of 'social participation' was adopted). Strikingly, most studies in the field have solely investigated the social position pupils with SEN occupy within the social network of the mainstream class as determined through the classic peer nomination technique. What has been consistently reported in early such studies is that integrated pupils with SEN are less accepted and more rejected by their mainstream classmates (Larrivee & Horne, 1991; Vaughn, Elbaum, & Schumm, 1996). For example, an American study by Pavri and Luftig (2000), found that 11-year-old pupils with learning disabilities in inclusive provision were less popular than their typically achieving peers and they experienced more loneliness. Additionally, even where children with SEN seem to be accepted by their peers, their social status remains significantly poorer. For example, in a meta-analysis of 17 sociometric studies conducted in the US between 1978 and 1991, pupils identified with SEN had significantly reduced social status compared to their mainstream peers (Ochoa & Olivarez, 1995). In another meta-analysis, Nowicki (2003) also concluded that these children occupy a less favourable social position in their classroom and experience more social difficulties than their average to high-achieving peers. What is worrying is that similar negative findings have been reported across different national school systems including the UK (Nabuzoka & Smith, 1993; Frederickson & Furnham, 2004; Avramidis, 2013), Canada (Kuhne & Wiener, 2000), Spain (Cambra & Silvestre, 2003), the US (Estell et al., 2008), Norway (Pijl, Frostad, & Flem, 2008), Holland (Bakker et al., 2007; Koster et al, 2010), Cyprus (Mamas, 2012), Italy (Nepi et al., 2013), and Germany (Mand, 2007; Krull, Wilbert, & Hennemann, 2014). The results from these studies suggest that SEN pupils tend to hold a lower social position and to have fewer stable friendships than their peers. Of even greater concern is the evidence indicating that the social status held by SEN pupils remains fairly stable both when it is examined at two different points in the same school year (Kuhne & Wiener, 2000; Reed et al., 2011) and annually at the same time of the year (Frederickson & Furnham, 2001; Frostad, Mjaavatn, & Pijl, 2011).

One explanation for the difficulties pupils with SEN have in building relationships with typically developing classmates points to insufficient sets of age-group appropriate social skills, which prevents them from successfully interacting and ultimately bonding with peers (Frostad & Pijl, 2007). This is especially evident in children experiencing behavioural difficulties (De Monchy, Pijl, & Zandberg, 2004; Mand, 2007; Krull, Wilbert, & Henemman, 2014), including those diagnosed with Attention Deficit Hyperactivity Disorder (Grygiel et al., 2014), or pupils with autistic spectrum disorders (Chamberlain, Kasari, & Rotheram-Fuller, 2007; Symes & Humphrey, 2010), and to a lesser extent in pupils with mild intellectual disabilities. By contrast, pupils with motor disabilities do not usually experience social participation problems as their type of disability has the least impact on social functioning in the classroom (Koster et al., 2010).

Nevertheless, other studies have shown that, despite their generally low social status, children accredited with SEN had managed to form and maintain some positive social relationships in inclusive settings and felt part of a social network (Meyer, 2001; Pavri & Monda-Amaya, 2001). This is usually

reported in studies which, in addition to determining social position, focus on the social clusters formed within a class network. For example, in Estell et al's (2008) 2-year study, pupils with SEN were found to be less often nominated as being someone's best friend and less often nominated as popular; however, at the same time, they were equally often found to be members of a group within their class and were equally central in these groups. Similar findings were reported in a study by Avramidis (2010) where most pupils with SEN were equally often found to be members of a peer group while the percentage of isolated pupils with SEN was similar to the equivalent percentage of typically achieving ones. One useful observation emerging from this evidence is that we ought to distinguish between the "social status" or "position" pupils with SEN hold within their mainstream classes and that of their social participation or membership in peer groups. With this in mind, the literature review presented in this paper sought to test the hypothesis that the findings reported in various sociometric studies are largely dependent on the sociometric techniques utilized. Accordingly, it is towards presenting the most common sociometric techniques that we turn next.

## 2. Techniques for ascertaining social status, social acceptance, and group membership

The increased opportunities for social interaction afforded to children within a school setting normally lead to the formation of peer groups and the development of friendship networks. In sociometry, the term 'dyad' is used to denote a friendship between 2 persons while the term 'clique' is used to refer to groups of three or more peers (Wasserman & Faust, 1997). Moreover, as Chan and Mpofu (2001) observe, the term "social acceptance" has been defined as the child's actual liking by their peers while the term "social status" or "social position" refers to the child's comparative social standing or friendship with other children. Although the social status a pupil might enjoy in their class network is dependent on many (e.g. physical appearance, athletic competence, social "conduct" to name but a few), it is generally accepted that gaining their classmates' acceptance is a prerequisite for a child's social participation and for any meaningful relationships to develop. To this end, peer ratings and peer nominations are the two main techniques employed to evaluate pupils' social relationships. Generally, peer ratings are used to ascertain the level of acceptance pupils enjoy within their class network and peer nominations are used to determine pupils' social status. These techniques are further explicated next.

### 2.1 The peer nomination method

The "peer nomination" approach originated by Moreno (1934) has been the most commonly used sociometric technique. It requires children to name classmates who fit a particular sociometric criterion (e.g. 'Name three classmates with whom you like to play'). Nominations may be based on positive criteria as well as negative criteria; for example, pupils may be asked to nominate their best liked classmates and their least liked classmates or to nominate the classmates they would like to work with and the classmates they would not like to work with. These type of nominations have been generally found to be stable over time among primary school children (Nowicki, 2003). It is common in peer research to work with a fixed number of nominations i.e. allowing pupils to give a maximum of three or five nominations. These nominations are subsequently totaled and form the basis for determining sociometric status. Specifically, children are positioned as 'popular' or 'rejected' with 'average', 'controversial' and 'neglected' falling between these two poles (for a review, see Newcomb, Bukowski, & Pattee, 1993). Although there is some overlap between these categories, each is presumed to present a distinct behavioural type. Moreover, research has shown that there is a high level of consistency in the classification of pupils into sociometric categories amongst different nomination-based methods (McMullen, Veermans, & Laine, 2014).

### 2.2 The peer rating method

An alternative sociometric technique is the 'peer-rating' method, which asks pupils to rate all their classmates likeability on a Likert-type scale, rather than nominate a limited number of 'liked' or 'disliked' peers. Typically, a questionnaire is administered containing a register of all members of a class followed by a question requiring all pupils to indicate the degree of preference for spending time or working with each one of their fellow-pupils. While pictorial scales can be used for pre-school children, pupils are usually asked to rate how much they like to "spend time with" or "work with" each person in the class on a 1-5 scale where a score of "1" corresponds to "like to least" and a score of "5" implies "like

to most". Since peer-rating studies place equal attention on each class member, the probability that some pupils will be overlooked is eliminated. This is very important when pupils designated with SEN are the focus of the study since these pupils are often overlooked in classic peer nomination studies where a limited number of nominations is allowed. By contrast, peer rating techniques have the capacity to provide a fuller picture of how pupils with SEN are viewed and treated by their classmates and have been found to be reliable and valid measures of pupils' social acceptance within the social network of their classroom (Chan & Mpofu, 2001). However, it has been argued that the peer rating method is not as effective as the nomination method in identifying children who are neglected by their peers (Asher & Dodge, 1986). In addition, the peer rating method, like its peer nomination counterpart, carries a significant weakness since it might reinforce existing prejudices and potentially demarcate some children as different.

## 2.3 The social cognitive mapping method

A third technique is the so-called social cognitive mapping (SCM) developed by Cairns and his collaborators (Cairns et al., 1997). The technique obtains information about the nature of social networks and the relations among peers within a class by asking pupils the question '*Are there any pupils in your class who hang around together a lot? Who are they?*' Responses are aggregated to generate a composite social map of the class. Therefore, in the SCM approach individuals provide information about social clusters beyond their own immediate set of friends, resulting in the identification of all peer groups in a particular network. This makes it possible to determine if a pupil is a member of a group and with whom they affiliate, the number of peer clusters and the centrality of each cluster within the class network, and the centrality of each individual in their peer cluster. SCM procedures result in the classification of pupils in four types of network centrality: nuclear, secondary, peripheral, and isolate (see Avramidis [2010] for definitions of these types). The SCM approach is based on the premise that children are expert observers of the peer clusters in their classrooms and can provide reasonably convergent information about these. Moreover, the approach assumes that the produced social-cognitive map provides a valid estimate of actual peer interaction patterns. Indeed, the validity of these claims has been supported by empirical research in which the peer affiliations obtained through the SCM procedure were substantially and consistently associated with observed patterns of peer interactions in the classroom (Gest et al, 2003).

The above mentioned sociometric techniques are often combined with other self-report instruments such as self-concept inventories (Bakker et al 2007; Koster et al 2010; Schwab et al 2013) and, to a lesser extent, with observations and interviews (Kemp & Carter, 2002; Koster et al 2007; Chamberlain, Kasari & Rotheram-Fuller, 2007; Avramidis, 2013), to achieve a fuller understanding of the pupils' social relationships. In so doing, these researchers have succeeded, albeit by no means fully, to interpret the social tendencies they had detected through the application of sociometric techniques. One reason for their incapacity to elicit a fuller picture of pupils' social relationships concerns the limited application of the sociometric method within the social network of the class and, therefore, it does not take into account the fact that children might maintain friendships with peers from other classes or other year-groups. More importantly, these studies are all located in schools and, therefore, the context of the home and neighbourhood is excluded. In this way, possible friendships that exist outside the school are ignored.

## 3. The present study

The purpose of the study reported here was twofold. First, it was to contrast the results produced in studies examining the social impacts of inclusive education arrangements through the employment of different sociometric techniques. Second, to highlight methodological challenges surrounding the application of the various techniques and suggest possible ways these could be dealt with. In so doing, we draw on two recent studies that utilized innovative multi-method research designs while also offering some directions for future research.

The literature review reported here is limited to studies conducted in primary school settings. This phase typically includes grades 1 to 6 which cater for pupils aged 6 to 12. Our methodological choice to focus on this particular phase was primarily informed by the extensive literature documenting the importance of establishing social relationships in middle childhood (Bukowski, Newcomb, & Hartup,

1998). Furthermore, most relevant sociometric research to date has been conducted in primary schools and focused on social networks confined within particular classrooms. By contrast, sociometric studies in secondary schools are very rare since the boundaries of social networks can be looser in these settings.

## 3.1 Searching strategy

A review study was set up in order to present a complete and recent overview of empirical studies published in the last 15 years. First, three electronic databases i.e. 'American Psychological Association' (PsychINFO), 'Education Resource Information Clearinghouse' (ERIC), and 'Education Research Complete' were searched for recent articles using sociometric techniques to study the subject of special educational needs (SEN) and social inclusion. Reference lists from all identified relevant articles found, meta-analyses and literature reviews (e.g. Nowicki, 2003; Bossaert et al., 2013) were searched for additional references. Moreover, the following six prominent journals in the field of special needs education were hand-searched for relevant reports: *European Journal of Special Needs Education*; *Exceptional Children*; *International Journal of Disability, Development and Education*; *International Journal of Inclusive Education*; *British Journal of Special Education*; *The Journal of Special Education.* For this review, studies were only included if at least part of their method included the use of sociometric techniques to examine the social inclusion of children with SEN. Not included were articles which employed no sociometric techniques, studies with children older than primary school age (e.g. adolescents), neither were studies conducted prior to 2000. To search for potential references the terms 'pupils', 'students', 'classmates', 'children', 'peers', 'special needs', 'SEN' were combined each time with the following terms: 'social position', 'social status', 'social preference', 'peer acceptance', 'friendship', 'friendship quality', 'contact', 'relationship'. To select relevant studies for this review, a study had to conform to the following criteria:

1. Published in an international scientific journal between 2000 and 2015.
2. Contained empirical data so editorials and commentaries were excluded.
3. Focused on primary school pupils.
4. Presented investigations that had been conducted in regular settings.
5. (Or/and) Investigated the established friendships of integrated pupils with SEN within the social network of their class and the quality of those friendships.

## 3.2 Selecting the literature

The search within the six journals and the electronic search within the databases resulted in 115 references. From only reading the titles and the abstracts of the identified articles, we rejected 30 articles as irrelevant. Following careful reading of the whole content of the remaining 85 articles, another 53 were rejected based on the evaluation of their content which led to a database of 32 articles. The rejected articles did not satisfy the following criteria:
1. They focused on pupils in preschool education or secondary settings (or focused on both primary and secondary without presenting separate analyses for the two age groups).
2. They did not include pupils with identified SEN.
3. They had not utilized sociometric techniques.
4. They did not present empirical data.

Interestingly, the majority of the identified studies had solely utilized the peer nomination technique (17 studies) or a combination of the peer nomination with the peer-rating or the social cognitive mapping methods (6 and 3 respectively). Only 3 studies had solely utilized the peer-rating method and only 3 studies had solely utilized the social cognitive mapping method.

## 4. Results: Contrasting sociometric techniques

The results identified in the literature were grouped into different categories based on the sociometric technique utilised. Two members of the research team read independently the identified studies and classified their results as 'positive', 'negative' or 'ambivalent'. The label 'positive' indicates that the social outcomes of pupils with SEN are positively influenced by inclusive education while the term 'negative' indicates the opposite. Specifically, the label 'positive' was assigned to studies in which

pupils with SEN were found to be well-accepted and/or to hold similar social status as their typically achieving peers. The label 'negative' was assigned to studies in which pupils with SEN were found to be less accepted and occupied a less favourable social position in their classroom; that is, pupils with SEN were less popular and more rejected than their typically achieving peers. In these studies, statistically significant differences had been reported. Finally, the term 'ambivalent' was assigned to studies which reported mixed or contradictory effects. For example, in the Avramidis (2013) study, pupils with SEN had received fewer nominations and had fewer friends than their typically developing peers; at the same time, they were found to hold a positive social self-concept, they had formed some positive relationships, and they were equally likely to be members of a social cluster and no more likely to be isolated than their non-SEN peers. Similarly, in the Kasari et al (2011) study, high-functioning pupils with autism were found to be more often on the periphery of their social networks, reported poorer quality friendships and had fewer reciprocal friendships compared to their typically developing peers. However, twenty percent of the participating children with autism had a reciprocated friendship and held high social network status. This latter finding is remarkable given the well-documented poor social relations of autistic children and resulted in the study being classified as obtaining 'ambivalent' results.

It is worth noting here that a high level of agreement was recorded between the two researchers who reviewed the identified research outputs. The reviewers' classification was similar in 29 out of a total of 32 outputs, which corresponds to a remarkable 90.6% agreement; the remaining three outputs were independently classified by a third member of the research team. Tables 1 to 3 present methodological details of the reviewed studies alongside with our evaluation of their outcomes. Where results are classified as ambivalent, a more detailed presentation has been made to facilitate the reader's understanding.

## 4.1 Studies utilising the peer nomination method

In considering the results of the studies utilising the peer-nomination technique some interesting observations can be made. First, the overwhelming majority of these studies have produced negative results; specifically, of the 26 different studies identified and presented in Table 1, 20 produced negative results, 4 reported no differences leading us to classify them as ambivalent, and only 2 yielded positive results. Interestingly, the 2 studies with positive results (Boutot & Bryan, 2005; Koster et al., 2007) involved very small samples, which is likely to have prevented the detection of statistically significant differences. Indeed, when Koster et al. repeated their investigation in Holland with a larger sample, negative results were obtained (Koster et al., 2010). Likewise, in three large-scale Norwegian studies by Frostad and Pijl (2007), Pijl, Frostad and Flem (2008), and Pijl and Frostad (2010) the participating pupils with SEN were found to be less popular, to have fewer friends and to be less frequently members of cohesive peer groups. These findings were, at least in the case of pupils with behavioural difficulties, attributed to the inadequate social skills these pupils possessed, which prevented them from successfully interacting and bonding with peers. Similar negative results were reported in all the studies focusing exclusively on pupils with behavioural difficulties (De Monchy, Pijl, & Zandberg, 2004) and in studies where this group was examined amongst other groups (Mand, 2007). Interestingly, negative results were reported in studies focusing on other types of SEN including deafness (Wauters & Knoors, 2008), cerebral palsy (Nadeau & Tessier, 2006), learning disabilities (Bakker et al., 2007; Baydik & Bakkaloglu, 2009) and autism (Chamberlain, Kasari, & Rotherham-Fuller, 2007). It could be suggested that the peer nomination technique measures 'popularity' and therefore children with SEN, irrespectively of type of need experienced, are more likely to be overlooked than their peers in such studies.

(Please insert Table 1, here)

## 4.2 Studies utilising the peer rating method

A negative picture also emerged from the examination of the studies that utilised the peer rating technique. Specifically, out of the 9 studies identified and presented in Table 2, 6 produced negative results, 2 reported ambivalent, and only 1 study reported positive results. The chi-squared analysis performed to compare these results with the ones obtained by the peer nomination technique did not reveal a statistically significant difference ($\chi^2$=.37, p=.08) indicating that both techniques yielded in this review equally negative results. Moreover, it is worth noting that in five out of six studies that had utilised

both techniques (peer nomination and peer rating), consistent results were reported. Specifically, in the Bakker and Bosman (2003) and in the Wauters and Knoors (2008) studies, ambivalent results were reached through both techniques. Similarly, in the Baydik and Bakkaloglu (2009), in the Koster et al. (2010) and in the Nepi et al. (2015) studies, negative results emerged from the utilisation of both techniques. By contrast, in the Kemp and Carter (2002) five-year longitudinal study, negative results were reached through the application of the peer nomination technique and positive through the peer rating method. It could be suggested that in this study, pupils with SEN enjoyed their classmates' acceptance but, at the same time, were less popular than their typically achieving peers.

Moreover, in the majority of the studies presented in Table 2, the SEN group consisted solely of pupils with moderate leaning difficulties and, therefore, no firm conclusions can be drawn about the levels of acceptance enjoyed by pupils with other types of SEN. Finally, it is worth noting that the three longitudinal studies contained in Table 2 reported negative (Frederickson & Furnham, 2001), ambivalent (Bakker & Bosman, 2003) and positive (Kemp & Carter, 2002) results respectively. In this respect, although longitudinal studies are certainly more valuable, no clear pattern in their results could be detected.

(Please insert Table 2, here)

### 4.3 Studies utilising the social cognitive mapping method

Finally, the application of the SCM technique yielded mixed to positive results (see Table 3). Specifically, of the 6 SCM studies identified, 3 reported positive results, 1 study reported ambivalent results, and only 2 studies reported negative results. Where the SCM technique was utilized alongside the peer nomination method, consistent results were reported. Specifically, Boutot and Bryant (2005) reported positive results, whereas Chamberlain, Kasari and Rotherham-Fuller (2007) and Estell et al. (2008) reported negative results from the utilisation of both techniques. Nevertheless, with such a small number of studies it is difficult to reach any safe conclusions about the two techniques. What is worth noting, however, is that 3 out of 6 SCM studies involved pupils with autistic spectrum disorders (Chamberlain, Kasari, & Rotherham-Fuller, 2007; Kasari et al., 2011; Calder, Hill, & Pellicano, 2012); contrary to what was expected, these three studies produced negative, ambivalent, and positive results respectively. This is very promising given that pupils with autistic spectrum disorders possess very poor social skills and have been consistently found to be socially isolated.

(Please insert Table 3, here)

To sum up, the review presented here indicates that the above three sociometric techniques assess different kinds of social outcomes and, by extension the variable findings reported can be largely (but by no means exclusively) attributed to the technique employed. Specifically, the classic sociometric techniques (peer nomination and peer rating) are used to determine a pupil's social status and the level of acceptance they enjoy within their class network thus producing predominantly negative results when pupils with SEN are the focus of the study. On the other hand, Social Cognitive Mapping is a more sophisticated technique emanating from the burgeoning field of social network analysis and has the potential to obtain information about the nature of social groups in a class network and the relations among peers within these social groups. As such, the technique's application has produced mixed to positive results indicating that pupils with SEN often manage, despite their social difficulties, to become members of peer groups in their classrooms. It could, therefore, be suggested that Social Cognitive Mapping has the potential to address more thoroughly the complexities of young children's social relations than the other two classic sociometric techniques.

### 5. Discussion: Methodological issues surrounding the application of sociometric methods

In considering the results of the review reported here, readers should be aware of some limitations. Specifically, the review is based on studies conducted in primary school settings thus excluding some rare studies focusing on adolescents in secondary settings. As Bossaert et al. (2013) point out, during

adolescence the peer environment undergoes substantial transformation in a number of respects: "Peer affiliations become more important in children's lives, social interactions become more complex and take place with less adult guidance…. Additionally, relations become more intimate and the first romantic relationships occur…. Gradually, same-sex cliques formed in middle childhood and early adolescence transform to mixed-sex cliques, to eventually dissolve again" (p.61-62). Consequently, incorporating the few studies conducted in secondary education would have certainly strengthened the present review's outcomes. Moreover, the focus on a limited number of sources, the use of specific search terms and the application of strict criteria for selecting the identified studies might have resulted in an incomplete account of the literature. Certainly, the inclusion of other sources (e.g. journals not included in the electronic databases searched), the employment of additional search terms and the broader use of the inclusion criteria might have shed another light on our findings. Finally, the evaluation of the research outcomes of the selected studies was based on the reviewers' judgements rather than on strict statistical criteria. Nevertheless, remarkable consistency was achieved in the classification of the outcomes of the selected studies, thus minimising the risk of misinterpreting the outcomes of a particular study. Although remarkable consistency was achieved between researchers, the use of a meta-analytic technique would have resulted in a more rigorous consideration of the selected studies. Specifically, in studies where more than one sociometric measure has been utilised, a meta-analytic technique would allow the researchers to pick apart the results produced by different measures thus determining more accurately the direction of the study's outcomes. This is very useful since a study that has reported contradictory results emanating from different sociometric techniques does not have to be classified as "ambiguous". Moreover, a meta-analytic technique would generate confidence intervals adjusted by sample size for the sociometric techniques compared, and therefore, more firm conclusions would be drawn when results are aggregated across all selected studies.

Recognising these limitations, this review has raised a number of important methodological issues surrounding the application of sociometric techniques. First, the majority of sociometric research in the field concerns the application of the peer nomination technique. Several explanations can be put forward to account for this trend; for example, the peer-nomination is the original sociometric technique invented by Moreno (1934) and the sociogram produced through its application enjoys wide reputation among researchers and practitioners alike; peer-nominations can be transformed into different types of social status; peer nominations have been generally found to remain stable over time among primary school children; and no ethical issues emerge when administered in a positive manner (i.e. only positive nominations are asked). Nevertheless, the peer-nomination technique cannot be used to identify actual peer groups or clusters and it is possible for a child to be identified as rejected even though he or she has one or two very close friendships in the class. Moreover, when a limited nomination approach is used, there is always a danger that many children with SEN in a given sample will be ignored; by contrast, when nominations are unrestricted, children with SEN will most likely receive some nominations. As Frederickson and Furnham (2001) point out, when limited nominations are afforded "….*it is likely that three or four of the children in the class may receive over 50% of the nominations, leaving too few votes being distributed among other children to permit reliable differentiation of social acceptance*" (p.582-583). A further methodological issue concerns the procedure used to collect the nominations. Many researchers simply ask children to list the names of their nominations for each sociometric question addressed to them. This strategy is based on the pupils' free recall of their sociometric preferences and requires the writing of the relevant names. As Poulin and Dishion (2008) note, this strategy "….*is time consuming for participants* (and) *it can artifactually reduce the number of choices given because of fatigue and frustration with the task*. (p.908). The alternative to this strategy involves administering an alphabetized roster and asking pupils to tick their nominations on that list. Although this procedure has the advantage of saving time it can produce a response bias since pupils tend to nominate their classmates who are on the top of the list. Indeed, this "sequence effect" was found by Poulin and Dishion (2008) in a study examining the nominations of middle school pupils. Specifically, in this study, pupils whose names were listed higher on the rosters received more nominations than their classmates whose names were listed lower on the list.

The "sequence effect" does not apply in sociometric studies utilising the peer rating method since in these studies pupils are asked to rate all their classmates. In this way, the risk of some pupils being overlooked is eliminated thus rendering these studies especially promising to researchers focusing on

pupils with SEN. Paradoxically, the literature review presented here identified only 8 studies that had utilized the peer-rating technique (see Table 2). One possible explanation for this could be the ethical issues surrounding the technique's application rendering parents, teachers, and researchers skeptical about its use. As Child and Nind (2012) point out, the application of the peer rating technique might have a detrimental impact upon individual children who already have difficulty with peer relationships thus reinforcing their preexisting isolated or rejected position. Additionally, the peer rating method is very limited in its capacity to classify children into different sociometric categories. Indeed, in a recent large-scale study (McMullen, Veermans, & Laine, 2014) rating-based methods showed surprisingly low agreement with each other when applied into the same dataset. By contrast, in the same study, nomination-based methods showed fairly high levels of correspondence with each other and showed very strong correlations with student behavioural traits. This finding, coupled with the ethical concerns raised might well explain the less frequent utilization of the peer rating by researchers in the field. Similarly uncommon in the field proved the SCM technique, since it was only utilized in 6 studies. Although SCM stems from the flourishing field of social network analysis, it seems that education researchers are reluctant to adopt it because of the technique's complicated calculation of friendship networks.

Another observation concerns two limitations inherent in sociometric research: the duration of such studies and the limited samples involved. As it can be seen in Tables 1-3, the vast majority of the reviewed studies are cross-sectional (synchronic) studies where sociometric data have been collected only once from each pupil. Our understanding, therefore, of the pupils' socialisation is limited to a particular point in time. The shortage of longitudinal sociometric research could be attributed to the lack of adequate research funding in the field which deters researchers from designing and implementing such time-consuming and expensive studies. Additionally, sociometric studies typically involve large samples since all members of a social network (in our case a given regular class) are required to take part in the study; yet, the number of pupils with SEN participating in the identified studies is fairly small, a limitation characterising most sociometric studies in the field.

A further observation concerns the use of additional methods to compliment the sociometric evidence collected in order to achieve a fuller understanding of the pupils' social relationships. Strikingly, most of the reviewed studies combined a sociometric technique with other self-report instruments such as self-concept inventories and, to a lesser extent, with observations and interviews. For example, Koster et al. (2010) combined in their study sociometric techniques with an assessment of children's social self-concept and observations of children's interaction during break times. Other authors have utilised alongside sociometric techniques instruments assessing social behaviour, loneliness or quality of friendship. Examples include the Social Skills Rating System (Frostad & Pijl, 2007), the Asher/Loneliness Scale (Bakker et al., 2007; Chamberlain, Kasari, & Rotheram-Fuller, 2007), the Social Belonging Scale (Nepi et al., 2013) and the Friendship Quality Scale (Calder, Hill, & Pelicano, 2012). Given that these instruments are all child reports, there is a need for the deployment of other psychometric tools by teachers and parents. For example, the Strengths and Difficulties Questionnaire (SDQ) developed by Goodman (1997) is a well-known behavioural screening instrument which includes 4 subscales (namely emotional problems, conduct problems, hyperactivity/inattention, and peer relationship problems) that can be summed to produce a total difficulties score; as well as a separate prosocial behaviour scale. The SDQ has been shown to have high concurrent and predictive validity, and therefore, would certainly provide valuable information when administered as a part of a sociometric study.

Notwithstanding the value of psychometric instruments, it is regrettable that most sociometric research in the field has been purely quantitative. Indeed, as this review indicates very few researchers have combined sociometric techniques with qualitative methods such as interviews with teachers and parents (Koster et al., 2007; Kemp & Carter, 2002; Avramidis, 2013). The absence of qualitative evidence in the vast majority of the identified studies reflects probably the researchers' adherence to quantitative research traditions and, to a lesser extent, the time-consuming and demanding nature of qualitative fieldwork. Without such fieldwork, however, important contextual factors (i.e. local support structures and wider education system, teachers' attitudes to name but a few) that might affect the outcomes of sociometric studies are ignored, leaving researchers with a rather limited understanding. In this respect, it could be concluded here that mixed research designs that combine sociometric techniques with more ecological (qualitative) methods are more promising in producing a fuller picture of the pupil's social

relationships. For example, interviewing teachers might elicit information about a pupil's friendships with peers from other classes or other year-groups. Similarly, interviewing parents might reveal friendships that exist outside the school. Further, conducting direct observations of the children's affiliation patterns might help overcome the limitations of traditional sociometric techniques. Certainly, practical problems such as securing the time required and limited access to important settings where children interact (e.g., hallways, restrooms, buses, locker rooms) have precluded their use in studies (see Gest et al., 2003 for an exception). Recognising these limitations, we contend that the field would benefit from the increased utilization of coherent multi-method research designs encompassing a range of methods and spanning over a considerable period of time. It is towards presenting two such recent studies along these lines, a large research project and a small-scale doctoral study. Our choice of such dissimilar studies reflects our intention to demonstrate that the judicious blending of diverse methodologies can be achieved irrespectively of the scale of the study.

A recent large-scale project (Avramidis & Wilde, 2009), sought to systematically evaluate the social impacts of inclusion on a sample of 566 pupils (of which 101 with SEN) drawn from seven English mainstream primary schools in the North of England. The study not only focused on the usual social indicators of inclusion (e.g. the social status pupils accredited with SEN enjoyed within their classroom network) but also to elicit evidence about the nature of their social interaction and participation in peer groups (see the Avramidis [2010] and [2013] papers reviewed earlier which presented different aspects of this project). To pursue these objectives, a multi-method research design was adopted consisting of sociometric techniques (peer nomination, social cognitive mapping, and a peer assessment of pupils' social behaviour) ascertaining the social position of pupils accredited with SEN and detecting the predominant patterns of friendship and social interaction in their classrooms; a psychometric assessment of various dimensions of pupils' self-concept; and qualitative interviewing of 27 teachers in the seven participating schools aiming to elicit their views about their pupils' social interactions and their preferred teaching strategies and practices in relation to inclusion. It is worth noting here that the sociometric part of the study did not involve administering a paper and pencil instrument; instead, the sociometric techniques applied were disguised in wider interviews with all participating pupils. In so doing, the risk of upsetting existing relationships in the class or reinforcing existing stereotypes was minimized while, at the same time, rich data were collected from the pupils themselves about their social life in the school.

In another multi-method study, Mamas (2009) sought in his doctoral research to determine the social status of children with special educational needs in Cypriot mainstream primary schools (see the Mammas [2012] paper reviewed earlier for the study's sociometric results); and at a subsequent stage implement transformative steps to alter pupils' status at both the micro (school) and the macro (policy) level. As such, the study was informed by transformative assumptions whereby the purpose of the research is not only to understand and explain social phenomena but to transform them. To achieve this, Mamas adopted a mixed-method sequential research design with two distinct phases. The first one involved the application of a classic sociometric approach using the peer nomination technique, while the second phase involved conducting semi-structured interviews with pupils and teachers as well as qualitative observations in the participating schools. In this respect, the outcomes of the quantitative phase were contextualised and interpreted through extensive qualitative fieldwork resulting in the formulation of a fuller understanding of the schools involved. The final stage of the study was dedicated to producing transformation through empowering the research participants at the school level and disseminating more widely the research outcome to influence policy making and stimulate further research.

## 6. Conclusion

Over the last fifteen years, there has been a resurgence of sociometric studies seeking to ascertain the social position pupils with SEN occupy and the level of acceptance they enjoy within their class network and, to a lesser extent their participation in peer groups. Notwithstanding the value of existing research in the field, we argue in this paper that simply continuing this line of sociometric research will not provide any new empirical evidence that can be utilized to promote social inclusion. The small-scale, short-term and reductionist nature of most research designs reviewed in this paper precludes any aspiration for progress. By contrast, we argue that the field would benefit from large-scale, longitudinal and multi-method research designs which carry the potential to produce more valid and original insights.

This is not an easy or comfortable task since multiple sources of data require more time for collection and analysis, broader data analysis skills and an understanding about the integration of the different elements. Further, gaining access into schools and collecting data from children can be very challenging given the current antipathy towards research in many school settings. The latter barrier is perhaps sharper nowadays as there is anecdotal evidence that practitioners in schools, in many countries, are becoming increasingly more hesitant to participate in demanding research studies. Nevertheless, the struggle for realising inclusive education requires that we all reappraise our research practices and strive toward producing research grounded in high quality methodologies and underpinned by sound theoretical concerns. We contend that coherent multi-method designs of the type discussed earlier is a promising route to tentative research progress.

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**Table 1**. Studies utilising the peer nomination technique

| | | Peer Nomination | | |
|---|---|---|---|---|
| **Authors, date of publication and follow-up** | **Sample & age of participants\*** | **Positive and/or negative nominations (max. number allowed)** | **Combination with other methods** | **Results** |
| Kuhne & Wiener (2000) (5 months) | 9-12 years old 38 TA & 38 SEN (Learning Disabilities) | Positive and Negative (up to 3) | - Social Behavior Nomination Scale | Negative |
| Pavri & Luftig (2000) | 10-13 years old 68 TA & 15 SEN (Learning Disabilities) | Positive (up to 3) | - Children's Loneliness - Social Dissatisfaction Rating Scale | Negative |
| Manetti, Schneider & Siperstein (2001) | 9-11 years old 181 TA & 9 SEN (Mental Retardation) | Positive and Negative without limiting choices | - Vigniettes: Measure of teachers' and children's attitudes | Negative |
| Kemp and Carter (2002) (5 years) | 7-11 years old 491 TA & 22 SEN (moderate intellectual disabilities) | Positive (up to 3) | - Observations - Interviews (teachers, parents, children) - Peer Rating | Negative |
| Bakker & Bosman (2003) | Regular Education: 7-13 years old 377 TA, 42 SEN Special Education: 8-15 years old 149 SEN (Learning Disabilities) | Positive (up to 3) | - Self Image Scale - Peer Rating | Ambivalent in regular / Positive in Special - Pupils with learning disabilities who received remedial support had a similar self-image and were equally accepted by their peers as their low-achieving classmates. At the same time, they had a worse self-image and were less accepted than their middle/high achieving classmates. - Pupils in special education had a better self-image and were more accepted by their peers than their counterparts in regular education. |
| De Monchy, Pijl & Zandberg (2004) | 9-12 years old 411 TA & 21 SEN (Behavioral Difficulties) | Positive and Negative (up to 3) | - Questionnaires (to teachers about the children's social status, and to children about bullying | Negative |
| Boutot & Bryant (2005) | 8-11 years old 141 TA & 26 SEN (various learning disabilities & 10 autistic) | Positive and Negative (up to 3) | - Behavior Rating Profile - SCM | Positive |
| Chamberlain, Kasari & Rotheram-Fuller (2007) | 7-11 years old 381 TA & 17 SEN (Autism) | Positive (up to 3) | - Asher Loneliness Scale - Friendship Quality Scale - Observations - Questionnaires (teacher & parent) - SCM | Negative |
| Nadeau & Tessier (2006) | 9-12 years old 57 TA & 60 SEN (Cerebral Palsy) | Positive and Negative (up to 2) | - Questionnaire (children): Victimization-Aggression - Questionnaire (children): Assessment of social behaviour | Negative |

| | | | | |
|---|---|---|---|---|
| Bakker et al. (2007) | 9-12 years old 861 TA & 439 SEN (Learning Disabilities) | Positive and Negative (up to 3) | - Self Image Scale - Questionnaires to teachers (2): performance level and nature of students' LD | Negative |
| Frostad & Pijl (2007) | 9-13 years old 910 TA & 79 SEN (various types) | Positive (up to 5) | - Social Skills Rating System | Negative |
| Koster et al. (2007) | 4-11 years old 386 TA & 20 SEN (various types) | Positive and Negative (up to 3) | - Interviews with teachers & parents | Positive |
| Mand (2007) | mean age 10 144 TA & 95 SEN (Learning & Behavioral difficulties) | Positive and Negative (up to 3) | - Questionnaires to teachers (3): Teacher's Report Form, School Resources, Pupils' information | Negative |
| Estell et al (2008) 2,5 years (every 2 months following 1st semester) | 8-12 years old 1306 TA & 55 SEN (Learning Disabilities) | - Positive (up to 6) (best friend) - Positive (up to 3) (popularity) - Positive & Negative (up to 3) (preference) | - SCM | Negative |
| Pijl, Frostad & Flem (2008) | 9-13 years old 910 TA & 79 SEN (various types) | Positive (up to 5) | - Interviews (teachers & pupils) | Negative |
| Wauters & Knoors (2008) | 6-12 years old 344 TA & 18 SEN (Deafness) | Positive and Negative (up to 3) | - Peer rating - Assessment of social behaviour | Ambivalent Deaf and hearing children were found to be similar in their peer-acceptance and friendship relations, while the distribution over the social status groups did not differ. At the same time, deaf children scored lower than hearing children on prosocial behavior and higher on socially withdrawn behavior. |
| Baydik & Bakkaloglu (2009) | 7-10 years old 1090 TA & 96 SEN (mild mental disability & learning disability | Positive and Negative (up to 3) | -Students Information Form - Physical Appearance Rating Form -Social Skill Rating System (Teacher Form) - Peer rating | Negative |
| Koster et al. (2010) | 6-8 years old 353 TA & 234 SEN (various types) | Positive (up to 5) | - Self-Perception Profile for Children - Observations - Peer rating | Negative |
| Pijl & Frostad (2010) | 12-13 years old 461 TA & 37 SEN (various types) | Positive (up to 5) | - Self Description Questionnaire | Negative |
| Reed et al (2011) (3 months) | 9 & 12 years old (3rd & 5th grade respectively) 18 TA & 12 SEN (various types) | Positive (up to 3) | - Systematic screening for behavior disorders -Teacher Expectancies - Social Skill Rating System (Teacher Form) - Self-Perception Profile for Children | Negative |

| | | | | |
|---|---|---|---|---|
| Mamas (2012) | 9-10 years old 63 TA & 7 SEN (various types) | Positive and Negative (up to 3) | - Observations - Semi-structured interviews with teachers and pupils | Negative |
| Avramidis (2013) | 11-12 years old 465 TA & 101 SEN (various types) | Positive (up to 5) | - Self-Perception Profile for Children - Interviews with teachers | Ambivalent SEN pupils received fewer nominations and had fewer friends than their non-SEN peers; at the same time, they held a positive social self-concept, they had formed some positive relationships, and they were equally likely to be members of a social cluster and no more likely to be isolated than their non-SEN peers. |
| De Boer et al. (2013) | 8-11 years old 985 TA & 65 SEN (ADHD & Autistic Spectrum Disorder) | Positive (up to 5) | - Teacher's Report Form - Attitudes Survey towards Inclusive Education (measure of children attitudes) | Ambivalent The type of disability experienced and the social issues presented by boys with disabilities did not affect their acceptance by same-sex peers. At the same time, girls with disabilities were less accepted by their same-sex peers when they showed social issues in class. Teacher assistance affected negatively the peer acceptance of pupils with disabilities. |
| Grygiel et al. (2014) | 9-12 years old 680 TA & 38 SEN (ADHD) | Positive and Negative without limiting choices | - Social Integration subscale of a Questionnaire on pupils' dimensions of integration | Negative |
| Krull, Wilbert and Hennemann (2014) | 6 years old 2839 TA & 582 SEN (Learning & Behavioral difficulties) | Positive and Negative without limiting choices | - Interviews (with teachers) - Questionnaire on academic self-concept, feeling of being accepted by teacher, and class climate | Negative |
| Nepi et al (2015) | 486 in total (272 primary aged) 219 TA & 53 SEN (Cognitive and/or sensory motor, learning & behavioural, difficulties arising from disadvantaged background) | Positive (up to 3) | Peer rating | Negative |

*Note*: TA=typically achieving and SEN= special educational needs

[*]terminology used in the reviewed articles has been retained

[**]not specified how many children are from the first years of high school

**Table 2. Studies utilising the rating scale technique**

| | Peer Rating | | |
|---|---|---|---|
| **Authors, date of publication and follow-up** | **Sample & age of participants** | **Combination with other methods** | **Results** |
| Frederickson & Furnham (2001) (2 years) | 8-10 years old 375 TA & 41 SEN (moderate learning difficulties) | - | Negative |
| Kemp & Carter (2002) (5 years) | 7-11 years old 491 TA & 22 SEN (moderate intellectual disabilities) | - Observations - Interviews (teachers, parents, children) - Peer nomination | Positive |
| Bakker & Bosman (2003) | Regular education: 7-13 years old 377 TA & 42 SEN Special education: 8-15 years old 149 SEN (Learning Difficulties) | - Self Image Scale - Peer nomination | - Ambivalent in regular - Positive in special (see Table 1 for details) |
| Wauters & Knoors (2008) (2 years) | 6-12 years old 344 TA & 18 SEN (Deafness) | - Peer nomination - Assessment of social behaviour | Ambivalent (see Table 1 for details) |
| Baydik & Bakkaloglu (2009) | 7-10 years old 1090 TA & 96 SEN ( mild mental disability & learning disability) | -Students Information Form - Physical Appearance Rating Form -Social Skill Rating System (Teacher Form) - Peer nomination | Negative |
| Koster et al. (2010) | 6-8 years old 353 TA & 234 SEN (various types) | - Self-Perception Profile for Children - Observations - Peer nomination | Negative |
| Nepi et al. (2013) | 8-11 years old 296 TA & 122 SEN (various types) | - Social belonging scale | Negative |
| Schwab et al. (2013) | Mean age 11 144 & 35 SEN (various types of intellectual disabilities) | - Self-Concept Assessment (Children) - Questionnaire to Teachers | Negative |
| Nepi et al (2015) | 272 primary aged 219 TA & 53 SEN (Cognitive and/or sensory motor, learning & behavioural, difficulties arising from disadvantaged background) | - Peer nomination | Negative |

*Note*: TA=typically achieving and SEN= special educational needs
[*]terminology used in the reviewed articles has been retained

**Table 3**. **Studies utilising the Social Cognitive Mapping technique**

| | Social Cognitive Mapping | | |
|---|---|---|---|
| **Authors, date of publication and follow-up** | **Sample & age of participants** | **Combination with other methods** | **Results** |
| Boutot & Bryant (2005) | 8-11 years old 141 TA & 26 SEN (various learning disabilities and 10 autistic) | - Behavior Rating Profile<br>- Peer nomination | Positive |
| Chamberlain, Kasari & Rotheram-Fuller (2007) | 7-11 years old 381 TA & 17 SEN (Autism) | - Asher Loneliness Scale<br>- Bukowski's Friendship Quality Scale<br>- Observations<br>- Questionnaires (teachers & parents)<br>- Peer nomination | Negative |
| Estell et al. (2008) 2,5 years (every 2 months following 1st semester) | 8-12 years old 1306 TA & 55 SEN (Learning Disabilities) | - Peer nomination | Negative |
| Avramidis (2010) | 11-12 years old 465 TA &101 SEN (various types) | - Assessment of social behaviour | Positive |
| Kasari et al. (2010) | 6-11 years old 815 TA & 60 SEN (Autism) | - Bukowski's Friendship Quality Scale<br>- Questionnaire (teachers)<br>- Observations | Ambivalent<br>High-functioning pupils with autism were more often on the periphery of their social networks, reported poorer quality friendships and had fewer friendships than their typically developing peers. However, 20% of the participating children with autism had a reciprocated friendship and held high social network status. |
| Calder, Hill & Pelicano (2012) | 9-11 years old 237 TA & 12 SEN (Autism) | - Bukowski's Friendship Quality Scale<br>- Vigniettes (children)<br>- Observations<br>- Questionnaires (teachers, parents, children with SEN) | Positive |

*Note*: TA=typically achieving and SEN= special educational needs
[*]terminology used in the reviewed articles has been retained