Sociometric characteristics of classes integrating children with mild intellectual disabilities

Author I (Endre HORVÁTH)[a] , Author II (Beáta SZENCZI)[b], Author III (Ágota SZEKERES)[c]

[a] Eötvös Loránd University Barczi Gusztav Faculty of Special Education, Special Education Institute of Atypical Behaviour and Cognition (1097 Budapest, Ecseri út 3., Hungary), horvath.endre@barczi.elte.hu

[b] Eötvös Loránd University Barczi Gusztav Faculty of Special Education, Special Education Institute of Atypical Behaviour and Cognition (1097 Budapest, Ecseri út 3., Hungary), szenczi.beata@barczi.elte.hu

[c] Eötvös Loránd University Barczi Gusztav Faculty of Special Education, Special Education Institute of Atypical Behaviour and Cognition (1097 Budapest, Ecseri út 3., Hungary), szekeres.agota@barczi.elte.hu

Abstract

The aim of our study was to explore the sociometric characteristics of primary school classroom communities integrating children with mild intellectual disabilities (MID). Data was collected with a self-developed paper and pencil peer nomination instrument that consisted of 28 items including questions concerning sympathy, community functions, individual abilities, popularity and integrational difficulties. Sociometric indices of 86 classes in grades 4, 5, and 6 were analysed. Results show that in general the communities seemed to be cohesive, with an average of 1 tie per person. 59% of MID students had a reciprocated tie, still they were regarded as having problems with social integration and needing support. Our results confirm that class size is of crucial importance for the success of integration, though it is not evident if smaller class size is always more favourable. The study also highlights those sociometric indices that require attention from teachers in bigger or smaller classroom communities.

. Keywords: social relations, sociometry, integration, special educational needs, mild intellectual disabilities

1 INTRODUCTION

In the past 30 years the education of special needs children has largely been transferred from special institutes to regular kindergartens and classrooms in Hungary (Papp, Perlusz, Schiffer, Szekeres and Takács, 2012) While in 1997 general education institutes provided for the education of only 7.5% of children with special educational needs (SEN), this ratio has increased to 68% by 2015 (Hungarian Central Statistical Office, 2016). This change has not affected kindergarten education in essence, but schools even more. The ratio of integrated children in elementary classes increased until 2006, but seems to stagnate in the past few years. Upper primary and secondary classes, on the other hand, tend to be more and more open for special needs students. By 2009 upper primary education has reached the integrational level of elementary schools (61%), and secondary education was not far behind (48%) (Papp, Perlusz, Schiffer, Szekeres és Takács, 2012).

Presumably, this tendency will not change in the long run, so it is important to know how effective the integration of SEN students is, and how they feel in general education classrooms. It is a primary need of a child to have friends and be accepted by his classmates, as these largely contribute to positive development and emotional stability. Building positive interactions with peers can contribute to a higher social status (Estell, Jones, Pearl, Van Acker, Farmer and Rodkin, 2008,

Kucukera and Tekinarslanb, 2015). For this reason teachers should encourage students to build and maintain relationships with others in and outside of classrooms. We know that this relationship building is a greater challenge for SEN students than for their typically developing peers (Schneider, 2016).

1.1 Previous research on the social integration of children with MID

In the USA research on the social integration of students with SEN and especially MID have been carried out since the 1960's (Horne, 1985). By reviewing studies conducted between 1959 and 1972, Végh found controversial results: according to some studies social and/or emotional adaptation of children with mild intellectual disabilities is better when educated in special schools, while others found the opposite.

More current research results are still confusing. Several studies conclude that children with mild intellectual disabilities (Bless, 1995; Szekeres, 2011a; Szekeres 2011b) and special educational needs (Cambra & Silvestre, 2003; Frostad & Pijl, 2007) have significantly lower sociometric status than their non-disabled peers. Other studies emphasize the lower social status (Lányiné Engelmayer, 1995; Vuran, 2005). Other indices of sociometric investigations have also shown differences: SEN students could name fewer friends and had only a few mutual relations (Klicpera & Klicpera, 2003; Estell, Jones, Pearl, Van Acker, Farmer és Rodkin, 2008; Estell, Jones, Pearl and Van Acker, 2009; Pijl & Frostad, 2010; Szekeres, 2012; Szekeres 2013). Sale & Carey (1995) found that the fewest positive choices were given for students with emotional and behavioural problems, followed by children with mild intellectual disabilities, and finally, youngsters with physical disability. Marginalization is also more common among students with SEN (Frederickson & Furnham, 2001; Frostad & Pijl, 2007; Koster, Pijl, Houten and Nakken, 2007), and children with MID do not like school as much as their peers with visual or hearing impairment or physical disability (McCoy & Banks, 2012). In one of our previous studies, however, we found that boys with MID are more fond of school than non-disabled boys (and disabled girls) (Szekeres, 2011a; Szekeres 2011b).

Several factors, other than disability, can affect social integration. As for personality factors, Bless (1995) as well as Torda (2004) pointed out that there are students who have no learning problems, but are still rejected. The intensity of integration can also have an effect on the social integration of disabled students. In one study the fact that disabled children spent 100% of the day in integration did not result in a change of peers' attitudes towards them (Sale & Carey, 1995). Finally, peer relations and relationships with teachers were also found to be important (Estell et al, 2008; McCoy & Banks, 2012).

Research suggests that the social integration of atypically and typically developing children are affected by similar factors. For instance, acceptance of formerly segregated students (after a minimum of 18 months spent in integration) did not differ significantly from that of their typically developing classmates (Frederickson, Simmonds, Evans és Soulsby, 2007), their ratio in a peer group was about the same and they also had similar statuses (Estell et al, 2008; Estell et al, 2009). In a two-year longitudinal study the social acceptance of students with MID increased (Frederickson & Furnham, 2001), and typically developing students in both primary and secondary schools reported to have disabled friends (Bunch & Valeo, 2004).

Results on gender differences are controversial. According to Bakker (2007), classmates' judgements about boys and girls are different: while acceptance of boys is independent of performance and diagnostic category, that of girls is not, and therefore they are rarely included in popular groups and are more often rejected in their classes. Our former studies confirm this: disabled students usually have more mutual relations than disabled girls (Szekeres, 2011a; Szekeres 2011b). Girls with MID are reported to play alone more frequently than boys with MID and this does not seem to change with age. Girls are also more silent during lessons (Szekeres, 2012; Szekeres 2013). Baydik (2009) found that SEN students' academic competence and physical appearance predict social acceptance, while non-acceptance is rather predicted by behavioural problems.

Other studies, however, draw attention to boys' exclusion. Mand (20007) found that boys are more often excluded in both integrated and segregated settings. This is supported by Grüning's (2012) data which shows that girls are more active socially during breaks and, even though they have difficulties, are more satisfied with their academic performance.

2 GOALS

The aim of our study is to explore the sociometric characteristics of primary school classroom communities integrating children with MID. Analysing the sociometric characteristics of these communities may highlight some factors that either aid or hinder successful integration. The present study is, therefore, descriptive.

3 PARTICIPANTS

Participants of our study were children with MID integrated in general education classrooms and their classmates. The present study did not aim at the re-examination of disability status, participant selection was solely based on existing diagnosis (ICD F70) by an Expert Panel. The sample comprised of a total of 143 classes. After data cleaning 86 classes remained in the sample. Classes with absentees at the time of data collection or a completion index[1] below 51% were excluded from data analysis. This paper explores characteristics of classes of grade 4 (n=32, ages 10-11), grade 5 (n=28, ages 11-12) and grade 6 (n=26, ages 12-13) students.

Table 1. Participants of the study

	Year 4			Year 5			Year 6			Total		
	Boys	**Girls**	□	**Boys**	**Girls**	□	**Boys**	**Girls**	□	**Boys**	**Girls**	⯑
non-MID students	262	269	531	264	229	493	252	233	485	778	731	1509
MID students	22	20	42	24	21	45	19	18	37	65	59	124
Total	*284*	*289*	*573*	*288*	*250*	*538*	*271*	*251*	*522*	*843*	*790*	*1633*
Average class size (no. of students)	*18*			*19*			*20*					

4 METHODS

Methods of our study are based on the multi-aspect sociometry developed by Mérei (1971/1996). Our self-developed peer-nomination instrument consisted of 28 items including questions concerning sympathy, community functions, individual abilities, popularity and integrational difficulties. The paper-pencil questionnaires were administered to groups of students on a lesson. Data processing was carried out with a self-developed software (Horváth, 2015). Correlation analysis was used to explore relationships between different sociometric indices and class size.

Sociometric indices describe communities from many aspects, such as cohesion, group atmosphere, hierarchical and role-oriented group structure. Our results are summarised according to individual indices, in line with the following categorization.

1. **Cohesion indices**

- **Reciprocity index** shows the percentage of individuals present in the social field having a reciprocated tie. Pairs have a reciprocated tie between them if they nominate each other in the same sympathy questions[2].
- **Density index** refers to the average number of reciprocated ties by individuals (Mérei, 1971/1996). In a stable community its value is 1 or above 1. A lower value refers to a loose social structure with an unsteady network.
- **Cohesion index** tells us "what percent of sociometrically possible reciprocated ties are realized in the social field" (Mérei, 1971/1996, p. 164.). A high cohesion index may refer to strong interconnectedness within the group which suggests that the group can be easily mobilized.
- **Mutual choice index** shows what percent of ties directed to individual people are reciprocated in sympathy questions (Mérei, 1971/1996).

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[1] Completion index refers to responsiveness, that is the completion ratio of questionnaires allowing for egocentric choices.

[2] Individuals are asked to answer questions about which member of the community they would choose as a fellow in concrete and important life situations. These nominations reflect emotionally driven spontaneous ties (Mérei, 1971/1996).

2. Group atmosphere index

- The **group atmosphere index** tells us to what extent personal choices are subjective and functional choices are objective. Accordingly, the index is comprised of two values - personal and functional - calculated as the means of the distribution indices of the given questions.

3. Indices of stratification dimensions

Sociometric significance refers to the hierarchical structure of the group, while role is related to differentiation, i.e. the discrepancy between status in the social field and individual characteristics. Individuals are significant in the social field if often chosen by others along the different sociometric aspects. These members of the group are significant because they are often in their peers' mind. Group members are classified into five positions in an order defined by significance values, then the number of individuals assigned to the different positions are calculated. The five positions are: positive first-order, positive second-order, not significant, negative second-order, negative first-order (Mérei, 1971/1996).

- **Significance index** is the percentage of students reaching the threshold of at least second-level significance on the basis of positive, negative or total nominations.
- **Dominance index** shows the ratio of positive and negative first-order as well as positive and negative second-order students. **Exclusion index** tells us the ratio of students of positive and negative significance. Dominance index indicate outstanding from the social field. The mean is 1, and the higher the value , the greater the separation between central and marginalized areas. If its value is well below 1, outstandings are not significant. Exclusion index tells us if positive or negative significance is more frequent in the community.
- **Role index** indicate the ratio of individuals having a role in the community, i.e. what percent of students reached the threshold in a role criterion (Mérei, 1996, p. 252.). Role is related to multi-aspect sociometry that differentiates relations qualitatively and can highlight attributions that are motivated by social expectations rather than sympathy or antipathy.
- **Choice repertoire index** refers to the number of group members taken into account during nominations (Mérei, 1971/1996).

5 RESULTS

Mean zones are calculated on the basis of means and standard deviations of the indices of individual classes and are defined as one standard deviation from the mean.

5.1. Cohesion indices

Table 2. Cohesion indices

	mean zone	mean
reciprocity index	77-96%	87%
density index	0.9-1.2	1
cohesion index	7-18%	13%
mutual choice index	42-58%	50%

According to the density index the average number of ties by one person is 1 in our sample. 60% of the class have an index of or above 1. Significant negative correlation was found between the number of students in a class and cohesion index) r=-0.81, p<0.001), meaning that the fewer the students in a class, the higher the cohesion index. In case of 55% of the examined classes, more than half of the sympathy nominations were realized. Significant negative correlation was found between the total number of students in a class and the index of reciprocated ties (r=-0,46, p<0,001)

5.2 Group atmosphere index

Table 3. Group atmosphere index

	mean zone	mean
personal	2.5-3.2	2.9
functional	2.9-4.3	3.6

Significant correlation was found between the total number of students in the class and the group atmosphere index – functional (r=0,32, p<0,001), meaning that the more students in a class, the higher the functional values.

5.3 Indices of the stratification dimensions

Table 4. Indices of stratification dimensions

	mean zone	mean
significance index	33-51%	42%
role index	52-73%	62%
choice repertoire index	67-83%	75%

Significant negative correlation was found between the total number of students in a class and the significance index (r=-0.28, p<0,001) as well as the total number of students in a class and the choice repertoire index (r=-0.60, p<0,001). As for grade differences, significant discrepancies were only found for the choice repertoire index (F(2.83) = 3,38, p = 0.039; M_4 = 76.97, M_5 = 76.23, M_6 = 71.97).

Table 5. Dominance and exclusion indices

	mean zone	mean
dominance index	0.17-4.27	2.22
exclusion index	0.61-1.73	1.17

High standard deviation of the dominance index indicates that the distribution of first- and second-order individuals varies widely across the communities under investigation. In 28% of the classes in our study first-order individuals dominate, the distribution of social significance is uneven. Significant correlation was found between the total number of students in a class and the marginalization index (r=0,38, p<0,001). Positively and negatively significant individuals dominate 43% and 34% of the sample, respectively.

6 DISCUSSION

Our study investigated the sociometric characteristics of 86 primary school classroom communities integrating children with MID. As for cohesion indexes we can conclude that:

1. Reciprocity indices of the classes vary around 87%, which is high, but it does not necessarily mean that the communities are mature, as there might be cliques. Interpretation of this index is only reasonable together with other indices. On the other hand, it is important for disabled students to develop and maintain reciprocated ties as early as primary school, that might aid their future integration into society. It is also important to develop a sense of belonging (Hall, 2009). In this sample 59% of MID students have a reciprocated tie.
2. Density indices range around 1, meaning an average of 1 tie per person. This is a necessary but not sufficient prerequisite of a mature community.
3. In our sample cohesion indices are high, although this does not necessarily mean that the communities are characterized by strong cohesion. In spite of the high cohesion values, there might by numerous isolated pairs. The domination of single rather than multiple reciprocated ties is also indicative of the immaturity of the communities. The exceptionally high cohesion value in our sample contradicts other indices. The extremely high values might be explained in terms of the interpretation of the index, by the average number of students in a class in our sample and by the questionnaire used for data collection. Our questionnaire included four items on sympathy, which increased the possibility for students to mutually nominate each other. If there was a strong cohesion in these communities, the increased possibility would not necessarily yield a higher value of the index, as nominations would be well-proportioned among students, and there would be more twofold, threefold and fourfold reciprocated ties. In our sample, however, single ties dominate over multiple ies in the ratio of 2:1. This indicates that most of the ties

are weak. As the cohesion index is independent of the strength of the ties, numerous weak, by-pass ties – which in fact do not support cohesion - can still result in a high cohesion index. Despite the high cohesion index, there might be numerous pairs, and the community might be immature. For a more throughout exploration of the possible causes, further analyses of the structural indices of sociograms would be necessary, which would exceed the framework of this study.

4. In our sample negative correlation was found between the reciprocated ties index and the total number of students in a class. This means that the more students in a class, the more difficult to develop reciprocated ties. In larger classes, it often happens that students nominate each other, but not in the same sympathy question, so a reciprocated tie is not built. Other studies also identified smaller class size as a protective factor (Kiuru, Poikkeus, Lerkkanen, Pakarinen, Siekkinen, Ahonen & Nurmi, 2012).

As for the indices of structural dimensions, we found the followings:

1. Significance index was generally high. A possible explanation might be that integrated students were more often nominated in negative questions, they are negatively significant. In our sample 69% of integrated pupils were negatively significant, the same ratio for other students being 39%. As for nominations, we found 51 negative nominations per integrated students, and 20 per non-MID students. According to our previous results with the same sample, in all questions about social integration difficulties, MID students were significantly more often nominated than non-MID students (Szekeres, 2012; Szekeres, 2014). However, it is also important to note that negative nominations are not restricted to disabled students.

2. In questions regarding social integration, we could detect the role of "the rejected student" for which disabled students were more commonly nominated. We have seen that 59% of integrated students have a reciprocated tie, meaning that they belong to someone in the community, still they are regarded as having problems with social integration, needing support and not feeling well. Integrated students' egocentric nominations were also frequent in these questions, implying that their difficulties are self-perceived and not only seen by others. The "role of the integrated student" must be dealt with not only in these classes, but also everywhere in public education, as it is clearly shown what negative consequences it can have to have this role (Nesdale, 2007). Further analysis of stratification indices and the investigation of differentiation is necessary to gain a deeper insight into this role.

3. The high choice repertoire index and the lower density index suggest that most of the students are taken into account when making nomination decisions, but choices are not motivated by mutual interest, as ties are weak. The high mean choice repertoire index (75%) is related to average class size (19 persons), and can also imply that group members know each other very well. The significantly lower value in grade 6 might be attributed to the higher number of students in a class (with an average of two persons more) at this grade level, which also suggests that bigger communities are more difficult to muster.

4. In our sample positively significant students are more common than or of the same number as negatively significant students. Negatively significant persons are dominant in only 34% of the classes. In 25% of the sample hierarchic distribution of the communities are uneven and students of first-order significance stand out. Integrated students generally belong to these latter group and are salient with their first-order negative significance.

Our results confirm that the total number of students in a class is of crucial importance for the success of integration, though on the basis of sociometric indices it is not clear if smaller class size is always more favourable. However, our results highlight those sociometric indices that require extra attention from teachers in bigger or smaller classroom communities.

In the community formation of integrating classes teachers fulfil a prominent role. They need to share values that help integration reach its goals. They need to have the competencies to optimally aid students in academic or social-emotional development (European Agency for Development in Special Needs Education, 2012; Engelbrecht, 2013). It is also the responsibility of the classroom teacher to recognize marginalized students and facilitate their inclusion. SMETRY can aid them to fulfil these missions.

 Social experiences in an integrated educational context are beneficial not only for disabled but also for typically developing children (Carter, 2013). For this reason, social skill training would be important for children with MID as well (Cuckle&Wilson, 2002), as it may aid the development and maintaining of relationships. The ratio of isolated students may decrease with the development of group dynamics (Doveston, 2006), but togetherness itself and part taking in an inclusive community without any intervention may be sufficient for building interactions and friendships (Dietrich, 2005).

7 SUMMARY

The aim of our study was to give a comprehensive view of the sociometric characteristics of regular primary school classes integrating children with MID. The multi-aspect sociometry developed by Mérei proved to be an appropriate and sensitive method for the description of the communities. Evidence was provided that the exploration of certain sociometric characteristics as a function of class size might aid the mapping of aspects important for integration.

7.1 Limitations of the study

Our study was explorative, which limited the number of statistical analysis carried out. Personal data of participants were restricted to school-related variables, we did not have any data on socioeconomic status, social skills and relations outside of school. The same holds for classes, for instance, it is not known if there were any students with other types of disabilities in the classes. These factors, however, might have affected our results.

Acknowledgements

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