Comparison of Popular and Lonely Students' Attitude and Their Relationship to the Classroom Situation as Reported by Teachers

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Author's contribution

This whole work was carried out by author MH.

ABSTRACT

Aims: To investigate the attitudinal profiles of Popular and Lonely students in school classes and their similarities and differences, relationships to gender and cultural backgrounds, and the classroom characteristics reported by teachers.
Study Design: Self-reports on attitudes were collected from 1531 students representing 77 grade 6 classes from comprehensive schools in the city of Göteborg, Sweden. The students were asked to answer 40 questions, each with five possible responses. Each student was asked to rank the three peers they would most prefer to work with in the classroom and to play with during breaks. In addition, data was gathered from the teacher of each class.
Place and Duration of Study: Sampling of all data autumn 2003. Work up of sociometric data 2013.
Methodology: Based on a previous two-level confirmatory factor analysis, three school factors and four relational factors were identified. Weighted adjacency matrices were used to quantify social relationships. The eigenvector of the largest eigenvalue of each adjacency matrix yielded individual indices drawn from the eigenvector components and a group index from the eigenvalue. Symmetrized matrices were used to reveal the most popular individuals in each network. Lonely individuals were outliers who were not nominated by other students and were identified based on bilateral choices using semi-symmetrized matrices.
Results: Popular (11.5%) and Lonely (8.5%) students have similar attitudes to school and

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teachers. Around 10% of both groups had very positive attitudes for all factors. However, lonely students were three times likelier than popular students to have negative attitudes and also expressed more anxiety, considered disruption to be more common, and sometimes reported problematic relationships with their classmates and peers. Half of the popular students had negative or neutral attitudes to school factors and 40% had negative or neutral scores for relational factors.

Conclusion: The working conditions were most positive in classrooms with only one large peer group and a minimum of Lonely students.

1. INTRODUCTION

Most essential in middle childhood is the desire to be included in peer-group activities. For individuals being outside a group the risk of humiliation and abuse can become increased [1]. The evolution of social connection and care among all individuals include feelings of loneliness and need for social connections in order to survive. Human infants have a long period of dependency also related to individual differences in sensitivity [2].

For children in school two extreme scenarios are possible; to be very popular or to be lonely. Concepts related to loneliness are the experience of alienation, sadness, malaise or boredom. In this way children are similar to adults. Being rejected or without social skills, such as making friends, seem typical when loneliness occurs. Being anxious or shy does not help when seeking friendship among peers [3]. However, lonely students represent large heterogeneity. In a previous study [4] lonely students in grade 6 represented different categories. The preliminary results suggested that some lonely individuals were enthusiastic towards school and even towards peers. In educational settings loneliness is an underdeveloped area of research [3].

Individuals considered most popular within the peer groups are nominated due to leadership, having status, dominance and influence. Popularity is obviously congruent with social status [5]. Popular individuals also represent subgroups. For example popular and aggressive boys can become influential. According to teachers popular and ideal boys are competent, but neither shy or internalising, nor aggressive [6]. Demonstrating for example social competence is not a guarantee for high status. Popularity is not always related to engagement or achievement in 6th or 7th grades.

The demands on teachers to promote positive values and behaviours in students´ interaction are relevant both for educational outcomes and peer relationships during adolescence. In the present investigation Popular and Lonely students will be on focus. Comparisons of similarities and differences with respect to their attitudes towards school, teacher and peers can bring out new knowledge around two complicated positions. To better comprehend the topic specific classrooms teacher information will be included.

1.1 Attitudes

The definition of attitudes is primarily following Eagly and Chaiken [7]. Attitudes are a psychological tendency when evaluating a particular entity with certain degrees of favor or disfavor. Generally attitudes acknowledge three mental functions: affective/evaluative,

cognitive/belief and conative/behavioral [i.e. 8,9] and always multidimensional. Wittenbrink [10] proposes an attitude as a global and enduring predisposition towards a stimulus or a cluster of stimuli. Attitudes towards school are comprehensive and therefore peer group factors are recommended to be explored together with the broader school attitudes. Due to this inner complexity of the concept school attitudes they can only partially be captured. Attitudes in this domain are thus not separated from aspects of classroom learning environment, classroom climate or social environment in school. Recent publications of variables affecting students' attitudes towards school can be found in Şeker [11]. Furthermore it has been shown that academic performance below average is more common for students with a lower attitude towards school [12].

1.2 From Emotional Regulation towards Social Stratification

The evolution of social connections and care among humans naturally involve feelings of loneliness that reflect the need to form social bonds. Social pain is experienced during loneliness while the formation of connections provides social rewards [2]. Even among toddlers, social skills and social understanding fluctuate between acceptance and rejection. Infants often exhibit variable levels of both shyness and aggression. Although causes and effects are partly hidden at this age, a child's emotional regulation seems to be related to their peer acceptance or risk of rejection [13]. Often, these initial peer interactions develop while children are being monitored by teachers. Peer interaction proceeds from the child's understanding of their relationships with their early teachers [14].

Levels of engagement within social groups are related to students' socialisation and behavior within their peer groups, but do not reflect academic engagement. Social engagement also affects social alienation and likelihood of dropping out [15]. Positive teacher expectations and the provision of conditions that support the formation of new relationships can counteract status inequalities. In this way, the teacher can reduce the students' risk of social exclusion. Such measures may weaken the dominance of certain popular students but typically have beneficial effects on low status individuals [16].

In multi-ethnic societies, an individual's class and ethnicity can confer significant advantage or disadvantage in life. These factors are also strongly interrelated with gender. The mechanisms that underpin social stratification are highly dependent on these three factors. Kiefer and Ryan [17] have emphasized the importance of gender differences among school children. Girls strive for social status and popularity in different ways depending on their cultural background and ethnicity. A low status during childhood seems to have appreciable effects during adolescence and adulthood for female students [18,19]. In this aspect, the literature contains little information on gender differences associated with status other than that non-athletic boys seems to be in a more vulnerable position than their athletic counterparts. Rodkin et al. [6] therefore conclude that more attention to the impact of gender is required. These authors also provide evidence indicating that antisocial behaviour is common among certain groups of boys and can increase social status. Rodkin et al. [6] also report more antisocial behaviour for one group of boys while the other raises their social status.

Based on data provided by parents, peer rejection during childhood is a predictor of disorder that may persist into adolescence. In contrast, children who are accepted by their peers exhibit a strong social capacity for cooperation and support, and are often considered physically attractive [20]. Family norms influence behaviour and social adjustment strongly [e.g. 21]. These behaviours learned from the family may be individual determinants of status.

Support provided by teachers to promote cognitive or athletic performance can also improve peer popularity [22]. Adult support can thus modulate the effects of other variables in determining an individual's social status. The social status of students in the sixth-grade has been argued to affect their future status and behaviour even among individuals whose social status subsequently changes [23]. Relational studies tend to emphasize contextual and cultural factors but may obscure the effects of individual's prior experiences, which may be hidden or impossible to scrutinize.

The socialisation norms of Western cultures are more individualistic than those of cultures such as Korea [24]. Characteristics such as shyness, reservation and reticence are valued differently in Asian compared to Western educational contexts. Nevertheless, some factors are common to both. In particular, in both contexts, students with multiple friends are protected from loneliness and derive emotional benefits from their friendships. Moreover, students who suffer from relational difficulties exhibit lower levels of achievement in both contexts. Low acceptance, having few friends and aggressive tendencies are generally interlinked. According to Shin [24], individual behaviour, achievement and loneliness become linked through peer culture.

1.3 Sociometry and Categories

Sociometric procedures can be used to determine students' social preference and social impact [20]. Specifically, students can be classified as being Popular, Average or Rejected based on their level of social preference, and Controversial, Average or Neglected based on their social impact. In a previous experimental study, children were identified as having one of five statuses (Popular, Rejected, Neglected, and Controversial or Average). Based on these classifications, it was possible to identify social leaders among both the Popular and Controversial groups [20].This demonstrates that individuals in categories that are traditionally considered to be separate can have overlapping characteristics. Jackson & Bracken [25] conducted a similar study using the same traditional status groups together with an additional Unclassified category. Both of these prior studies indicated that Popular individuals typically have more positive self-concepts and especially positive social self-evaluations compared to other groups. While many sociometric studies have used both positive and negative nominations, this work uses only positive choices.

Garandeau, Ahn and Rodkin [16] have demonstrated that perceived popularity and social preference are highly correlated. Popularity also seems to correlate positively with aggression, but the correlation between aggression and social preference seems to be negative. Indicators of aggression are in turn dependent on cultural norms. Groups of students with higher levels of academic performance dislike aggressiveness, but popular aggressive individuals may be appreciated in hierarchical classrooms. Disruptive students generally attract attention. Irrespective of classroom norms, some popularity can generally be earned through disruptiveness. The social status of popular and aggressive students may also depend on the ease with which network members can leave a network without risking social exclusion [6,16]. In particular, it is hard for individuals to maintain dominance over a group when their peers are readily able to move between networks [16]. If every individual in a group such as a classroom is categorised, more than two labels are usually required to describe social status positions. Lease et al. [1] reported seven status categories or labels, which sometimes occurred in different combinations. Groups that were perceived to have a popular or dominant status sometimes had average scores with respect to the likability dimension. In such cases, well-liked/dominant individuals are regarded as being pro-social (girls) or athletic (boys), and thus fun to be with. The likeable category in this case is thus

very similar to the Popular group identified in other studies [e.g. 26]. In another study of 815 children and adolescents, 93 were identified as being popular (11.4%) but up to 189 individuals remained unclassified [25].

1.4 Perceptions of Popularity and Loneliness

Popularity and repulsion within peer groups emerge during adolescence [27]. An on-going and mutual influence between individuals and among peers is typical [28]. Experiences of inclusion during adolescence in classrooms without outliers are associated with reduced risks of malaise, i.e. feelings of illness [29]. Peer interactions conserve and exaggerate initial social labels [30], which are thereby stabilized and preserved over extended periods of time within classrooms. Popular individuals are often leaders who are perceived to be academically superior by their peers. According to teachers, these popular students are more helpful than average students but do not have significantly higher levels of school motivation [31]. Popular students are generally quick, humorous, not shy, not quiet, and often academically appreciated by teachers. However, they also have the courage to express more criticism of their teachers. Their social position gives them the power to question the learning climate within the classroom. The most popular students are successful but not academically excellent, and are often quite competitive. Interestingly enough, a popular individual may not be seen as a potential friend and in some cases have lower than average potentials for forming intimate friendships [5].

Loneliness can be characterized in terms of its cognitive representation and an ensuing emotional reaction. The first aspect involves desires to form relationships while the second is caused by the failure to satisfy the first desire and involves negative responses [32]. The emotional reaction is thus a response to the discrepancy between the desired and achieved social contact [33]. Lonely individuals are without networks and group membership. According to their peers, individuals in this category are considered unsuccessful. They may fall victim to aggression and bullying from other children [e.g. 34]. The likelihood that a student will be rejected or excluded depends on the overall level of aggression both individually and at the school level [28]. Academically neglected children are rarely focused on in sociometric research, but are generally assumed to perform less well than popular or controversial students [35].However, it should be noted that there is a sub-group of lonely students with very high levels of academic motivation [4]. This is consistent with the findings reported by Cacciopo et al. [36], who showed that these students are not more traumatized or lacking in social capital but definitely had negative interpersonal experiences. A reluctance to seek instrumental or emotional support from others can increase the potential for stress among lonely individuals, and they are more sensitive to adverse conditions within their schools. Although loneliness is a reaction, it rarely has positive effects during pre-adolescence. If it occurs often, it may be linked to maladjustment or a personal tendency to regard social interaction as intolerable [37]. Everyday loneliness causes stress followed by poorer control of attention. This is partly because lonely individuals expend more energy on heightened alertness towards threats or attacks, which may induce anxiety or fear. Other socio-emotional states such as optimism will be negatively affected [36], as will future hopes regarding relational issues. Seigner and Lilach [38] investigated mild loneliness that was not linked to cognitive or behavioural orientation variables. The effects of such loneliness are domain-specific, whereas severe loneliness has long-term effects. Individuals' academic motivation could be strengthened by alleviating this mild loneliness. Even in childhood, individuals spend more time with their peer group than with their parents once time spent asleep is excluded [39]. Low acceptance by peers clearly undermines individual socialisation and academic progress [40].

Being on your own is more complicated than a threat. Solitude in elementary school is however considered aversive and rarely something that is chosen voluntarily [37], but temporary withdrawal is associated with healthiness and has a number of positive aspects. The amount of time that individuals spend by themselves outside classrooms increases from grade 5 to grade 7, and the desire to spend time alone increases by 4% year by year up to grade 9. Furthermore, students report positive feelings towards this freely chosen loneliness, e.g. when at home. Students who spend some amount of time alone are usually well-adjusted and receive higher grades. Extreme situations such as being entirely solitary in the classroom or never spending time alone are both observed among unsuccessful students. Larson and Richards [37] have highlighted the importance of differentiating between solitude since they can experience both positive and negative outcomes.

1.5 Classroom Context

The goals of institutional educational justice can be quite varied, in contrast to students' general desire to have strong relationships with their peers and fears of not fitting in [41]. An individual student's low status may be due to background factors or simply to being new to a specific classroom. Social group norms originate from the specific socio-cultural group to which an individual belongs. Specific adverse effects on performance associated with chronic peer rejection have been identified in children as young as six [40]. However, aside from these specific effects, the mental abilities of peer-rejected children are similar to those of the average population [42]. Repeated rejections often occur in a specific context, e.g. in the classroom.

There are a number of apparent contradictions associated with the classroom climate and peer relationships in elementary school. Several factors can hinder the development of positive inter-group relations. These may have social, historical, philosophical and/or psychological origins. It is also important for group members to have a degree of empathy. This is fostered by interaction and listening with respect, according to Kastel [43]. Teachers have tools that can promote these behaviours, but students themselves have a degree of interest in social justice. Students often have different beliefs concerning socialisation due to their different backgrounds. Replacing prejudice with empathy can strengthen students' ability to cooperate with others [43].

As a role model, the teacher can promote or undermines students' senses of belonging in the classroom. They directly influence students' engagement and interest in classrooms, but peer support is no less significant than that provided by teachers [44]. The classroom climate evolves via a mixture of common practices, relationships, beliefs and norms, within a context that provides specific resources. O'Connor, Fish and Yasik [45] conclude that classrooms managed by expert teachers are flexible and communicative. There are pronounced differences between novice and expert teachers in the way they introduce lessons and react towards their classes. Flexible communication is beneficial for both students and experienced teachers. Based on their findings, these researchers recommended that patterns of student-teacher interaction should be investigated further due to their apparent profound impact on school efficiency. Brackett et al. [46] investigated the emotional climate and conducted a survey in 90 fifth- and sixth-grade classrooms. Their results indicated that there is a need for a didactic shift towards appearance and performance in teacher training and education. Teachers who create warm and open classrooms are believed to inspire better behaviour, school success and feelings of connectedness.

1.5.1 Aims

To investigate the attitudinal profiles of students having one of two extreme status positions (Popular or Lonely) in their school classes.

1.5.2 Research questions

* What are the similarities and differences between Popular and Lonely students with respect to their attitudes towards school, their teachers and their peers?
* To what extent can these differences in attitude be related to the gender and/or cultural background of the Popular and Lonely individuals?
* What are the relationships between the classroom characteristics reported by teachers and the numbers of Popular and Lonely students?
* What are the typical characteristics of classes with low ratios of Popular or Lonely students?

2. MATERIALS AND METHODS

Self-reported data on attitudes from 1531 students in 77 classes in the city of Göteborg were analysed. The schools represented 18 of the city's 21 administrative school districts. The students all attended grade 6 of Swedish comprehensive school and were around 12 years old. The responses from one class were excluded from the analysis because there were no data for more than half the members of that class in the original data set. As described previously [47], the students in each class were asked to answer a questionnaire with 40 questions, each of which had five possible responses. The responses were coded using a scale that ranged from 1 to 5, with the highest value always being assigned to the most positive option. Two-level confirmatory factor analyses at the individual (within-class) and between-class levels were then performed [47]. The within-class analysis revealed seven attitude factors. The first three of these factors related to the student's Interest in School (IS), View of Teacher (VT), and Working Atmosphere (WA), and were labelled "school factors". The remaining four factors were Relations with Classmates (RC), View of Peers (VP), Lack of Anxiety (LA) and Perception of Disruption (PD) and were labelled "relational factors". Factor scores for each student were computed from their individual scores on each item, weighted by that item's factor loading. The factor scores were then normalised with their means being set at 500 and their SD values at 100.

Each student was also asked to write the name of the 3 peers he/she preferred to work with in the classroom, as well as 3 peers they would prefer to play with during breaks. In both cases, they were asked to rank their preferences from 1 to 3. Thus only positive nominations were used. A pilot study in three grade 6 classrooms had demonstrated how sensitive parents and teachers were towards sociometric nominations. In the present study the only remaining hesitation among parents concerned the sociometry. By using positive nominations only 1.5% of the parents refused their child to take part in the investigation.

The teacher of each class completed a separate questionnaire containing both relatively open and more closed questions about the class. These questions concerned the students' collective fulfilment of curriculum goals, assessments in core subjects, ambitions, degree of gender cooperation, frequency of conflicts, and so on. Teachers were also asked about organisational matters such as their available resources and time, teacher management, and their preferred methods. Finally, the teachers were asked to provide some personal data concerning their education and teaching experience.

The investigator made notes concerning the degree of wear and quality of maintenance of each school's buildings, the equipment in the school yards, the level of decoration, the provision of books and computers, and the general orderliness of their classrooms. In addition, the behaviour and human approach of the adults working in the schools was noted, in terms of the friendliness of their greetings and general politeness. These field notes were then collated to provide an overview of the investigator's impression of each studied classroom environment as a work place for the pupils and the teacher. The classroom environments were graded on a scale ranging from 1 to 3, with 3 denoting the most positive environments. This grading was done before any further analysis was performed.

2.1 Sociometric Classification

Individuals were not categorised in advance or due to teacher information. Only positive nominations were used when analysing the gathered data. Students in two specific categories – Popular and Lonely were considered. The Popular were those individual students who received the largest number of nominations from their peers as being desirable to work with or to spend time with during breaks. The group Popular thus belong to a traditional sociometric type while Lonely students were not chosen by their peers either as classroom workmates or as partners during breaks. Lonely individuals correspond to the traditional sociometric types neglected and/or rejected.

Weighted adjacency matrices were used to quantify the social relationships between individuals as described previously [48]. The eigenvector of the largest eigenvalue of an adjacency matrix is a good measure of the centrality of a network [49,50]. It can be regarded as a weighted sum of the network's direct and indirect connections and thus reflects the network's overall structure. This approach generates individual indices in terms of the eigenvector components together with a group index derived from the eigenvalue. Moreover, it is possible to compute individual indices for the eigenvector components of each network. This means that the strength of belonging to the network for each member also can be computed; in this case, the most popular student within a group is the one with the largest eigenvector component. A MATLAB™ routine was developed to calculate the eigenvector centrality of the data. The interpersonal data were assigned numerical weights of 0.6 for first choices, 0.3 for second choices and 0.1 for third choices. These weights were chosen to ensure adequate discrimination between individuals. Calculations using these values yielded non-symmetric, weighted adjacency matrices describing work and break relationships. By computing different types of matrices in this way, it is possible to reveal the properties and profiles of several kinds of networks [51,48]. In the present investigation, symmetrized matrices were used to reveal the most popular individuals in each network to work with and to play with, as well as the number of networks and the number of peers within each network. If the networks of peers within a given (school) class were irreducible, i.e. had no connections with each other, this was revealed in the analysis. Lonely individuals were identified using semi-symmetrized matrices, which required the inclusion of bilateral choices when drawing up the networks. Lonely individuals nominated peers with whom to work and play but received no votes themselves. Students who were not included in any networks for either work or play were defined as being lonely.

2.2 Classification of Pupils' Names

Mapping cultural belonging in this study was not performed in detail since this would have included ethical dilemmas. The received information made it possible to categorize all

students into two broad subgroups - non-Scandinavian or Scandinavian - which provided a crude way of identifying students with immigrant backgrounds. It has previously been demonstrated that names are the most important variables for identifying ethnic minority students [52]. The proportion of non-Scandinavian names in the classroom correlated strongly (r = 0.85) with the information provided by the teachers regarding the number of students in the classroom who had a language other than Swedish as their mother tongue. In the studied group as a whole, 20% of the students had non-Scandinavian names. The proportion of students with non-Scandinavian names within the classes ranged from 0-100%.

Statistical calculations were performed using SPSS 17.0. A significance threshold of p<.05 was imposed.

3. RESULTS

In total, 176 of the 1531 studied pupils were found to be Popular (11.5%) and 130 were found to be Lonely (8.5%).

There was considerable variation between classes with respect to all seven attitude factors both for Popular and Lonely students. The variation between classes (i.e. the intra-class correlation coefficient, ICC) was measured in terms of eta-squared (eta²). The eta² values of the seven attitude factors ranged from 0.37 to 0.51 for Popular students and from 0.37 to 0.49 for Lonely students. The levels of variation for the two groups were thus very similar. The attitudes of each Lonely and Popular pupil were therefore compared to those of their classmates after testing the class distributions for normality using the Kolmogorow-Smirnow test. The unique aspects of the attitude profiles for Popular and Lonely students were identified by performing one-sample t-tests to measure the level of significance of their deviation from their classmates attitude scores with respect to the seven factors. If the student's attitude score was below the mean for their classmates, they were assigned a negative p-score, while positive p-scores were assigned for those whose attitude scores were above the class mean. The absolute magnitude of the p-score in each case was determined by the significance of the deviation from the class mean. Moderately significant deviations (.05>p>.01) were assigned p-scores of 1, more significant deviations (.01>p>.001) were assigned p-scores of 2, and very significant deviations (p< .001) were assigned p-scores of 3. Non-significant differences (p>.05) were assigned p-scores of zero. The p-scores could thus range from +3 to -3. P-scores were determined for the three school factors and the four relational factors. The scores for these factors were then summed to yield the so-called School Sum and Relational Sum.

3.1 Comparing Attitude Profiles of Popular and Lonely Students

The p-scores were used to compare the attitude scores for the Popular and Lonely students to those of the 'average' student in their classes. There were no statistically significant differences between the Popular and Lonely students with respect to the two broad school factors Interest in School and View of Teacher. However, their levels of academic interest exhibited considerable variation. Lonely and Popular students were represented at both ends of the spectrum, with approximately equal numbers of students in both groups having both the highest (+3) and lowest (-3) possible p-scores for the IS and VT factors.

The Popular group had positive average p-scores for the remaining five factors while the average p-scores for the Lonely group with respect to these factors were uniformly negative (Table 1). The two groups thus differed substantially. Lonely students evaluated their Working Atmosphere (WA) more negatively. They also seemed more Anxious and reported higher perception of Disruption (LA, PD). In addition, they were aware of their problematic relationships with their classmates and peers (RC, VP).

Table 1. Popular and Lonely students compared to their classmates.
Mean (SD) given in p-scores. Comparison between the two groups
by Mann-Whitney U test

P-scores of attitude factors	Popular (n=175) p-scores mean (SD)	Lonely (n=130) p-scores mean (SD)	Sign. two-tailed
Interest in School (pIS)	0.07(1.81)	0.15(1.90)	0.469
View of Teacher (pVT)	0.33(1.84)	0.04(2.02)	0.259
Work Atmosphere (pWA)	0.37(1.87)	-0.23(2.02)	0.006
Relations with Classmates (pRC)	0.41(1.83)	-0.24(2.04)	0.006
View of Peers (pVP)	0.51(1.79)	-0.37(2.00)	0.000
Lack of Anxiety (pLA)	0.46(1.74)	-0.45(2.12)	0.000
Perception of Disruption (pPD)	0.17(1.86)	-0.62(1.95)	0.000

Students with negative LA scores are more anxious in school than their classmates, while negative PD scores indicate that students find the amount of disruption they experience at school hard to cope with (Fig. 1). Lonely students are overrepresented among those with negative scores with respect to these factors and are thus more vulnerable than their classmates. However, some Popular individuals are rather similar to Lonely students in terms of their experience of Disruption and Anxiety.

Examples of the variation within specific classes are provided below (Tables 2-4). It was not unusual to find Popular and Lonely individuals with identical attitude scores, indicating a degree of common experience among individuals within the same classroom.

Table 2 shows data for four lonely (L) pupils, 2 boys and 2 girls in a specific school class. The boys expressed rather negative feelings towards school and their relationships, whereas the girls were quite positive towards both their school and their teachers. The responses of one lonely girl and one lonely boy reflected a degree of distrust and a lack of harmony in their school situation. The table also provides data on one Popular (P) boy and girl. The Popular girl's profile is similar to that for one of the Lonely girls. The Popular girl and boy were not anxious, in contrast to 3 of the 4 Lonely individuals.
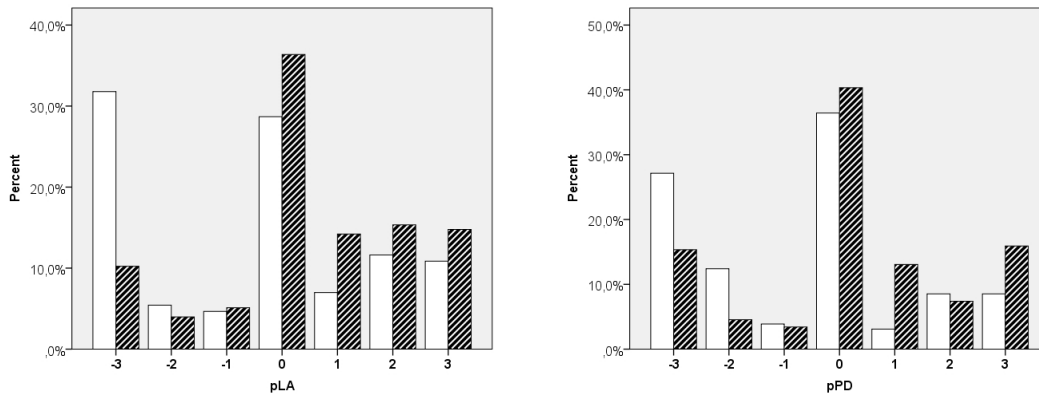
Fig. 1a and b. Distribution of p-scores for Lack of Anxiety (pLA) left and Perception of Disruption (pPD) right. The unfilled bars represent Lonely, and bars for Popular marked with lines

The 4 Lonely students in class no. 87 (Table 3) exemplify the variability of possible reasons for loneliness. The first boy had average scores for the school factors but low scores for his relationships with his classmates and experience of disruption. The girl had a general dislike of both the school and her peers, and had an extremely sad profile. The second lonely boy was below average in terms of his liking for school, but had great expectations of his relationships with his classmates. The third boy had very optimistic attitudes in general compared to his classmates. Six of the 23 students in this class had non-Scandinavian names, including the two Popular boys. The second Popular boy had attitude scores that were appreciably higher than the average for his classmates.

In class no. 99 (Table 4), 13 of the 23 students had non-Scandinavian names including the 3 Lonely students. None of the Lonely had negative p-scores for the school factors. The first Lonely boy had much higher attitude scores than the class average, whereas the Lonely girl had low attitude scores for all four relational factors. The second boy had a strong interest in school and appreciated his teacher but below-average scores for his relationships with his classmates. The three Popular students in this class were all girls. Two of them had positive attitudes overall while one with a non-Scandinavian name had negative attitudes with respect to school factors and also scored below the class mean with respect to one relational factor.

Fig. 2 shows the distributions of the total summed p-scores for the seven factors of the Popular and Lonely groups. The whole spectrum of possible scores, from -21 to +21 is covered for both groups, but negative scores are more common for the Lonely group. Even then, however, 10% of Lonely students had total scores of ≥+13, which is fairly similar to the corresponding proportion for the Popular students (13%). On the other hand, 20% of the Lonely students had scores of ≤-13 compared to only around 6% of the Popular group. It is thus much more common to find Lonely students on the negative end of the spectrum than Popular students.

Table 2. An example of the variation within a specific class (no 92) with 4 Lonely (L) and 2 Popular (P). The Popular and Lonely compared to their classmates and the differences expressed as p-scores. Abbreviations: boy (B), girl (G), Interest in School (IS), View of Teacher (VT), Working Atmosphere (WA), Relations with Classmates (RC), View of Peers (VP), Lack of Anxiety (LA), Perception of Disruption (PD)

B/G L/P	p-score IS	p-score VT	p-score WA	School Sum	p-score RC	p-score VP	p-score LA	p-score PD	Rel Sum
B L	-3	-3	-3	-9	-3	-3	-3	-3	-12
G L	3	3	3	9	0	3	-3	3	3
B L	-3	-3	-3	-9	-1	-2	2	-3	-4
G L	0	3	3	6	-2	0	-2	-3	-7
G P	0	0	-1	-1	-3	-2	0	-2	-7
B P	-3	0	-3	-6	2	0	1	0	3

Table 3. An example of the variation within a specific class (no. 87) with 4 Lonely (L) and 2 Popular (P). The Popular and Lonely compared to their classmates and the differences expressed as p-scores. Abbreviations as in Table 2

B/G L/P	p-score IS	p-score VT	p-score WA	School Sum	p-score RC	p-score VP	p-score LA	p-score PD	Rel Sum
B L	0	0	0	0	-3	0	0	-2	-5
G L	-3	-3	-1	-7	-3	-3	-3	-2	-11
B L	-1	0	0	-1	3	0	0	0	3
B L	3	3	3	9	2	3	0	3	8
B P	2	-1	3	4	0	0	0	1	1
B P	3	3	3	9	3	3	2	3	11

Table 4. An example of the variation within a specific class (no. 99) with 3 Lonely (L) and 3 Popular (P). The Popular and Lonely compared to their classmates and the differences expressed as p-scores. Abbreviations as in table 2

B/G L/P	p-score IS	p-score VT	p-score WA	School Sum	p-score RC	p-score VP	p-score LA	p-score PD	Rel Sum
B L	2	0	3	5	3	3	1	3	10
G L	0	0	0	0	-2	-3	-3	-1	-9
B L	3	1	0	4	-2	0	0	0	-2
G P	0	3	2	5	2	2	1	1	6
G P	-2	-3	0	-5	-2	1	0	0	-1
G P	0	3	3	6	3	3	0	2	8
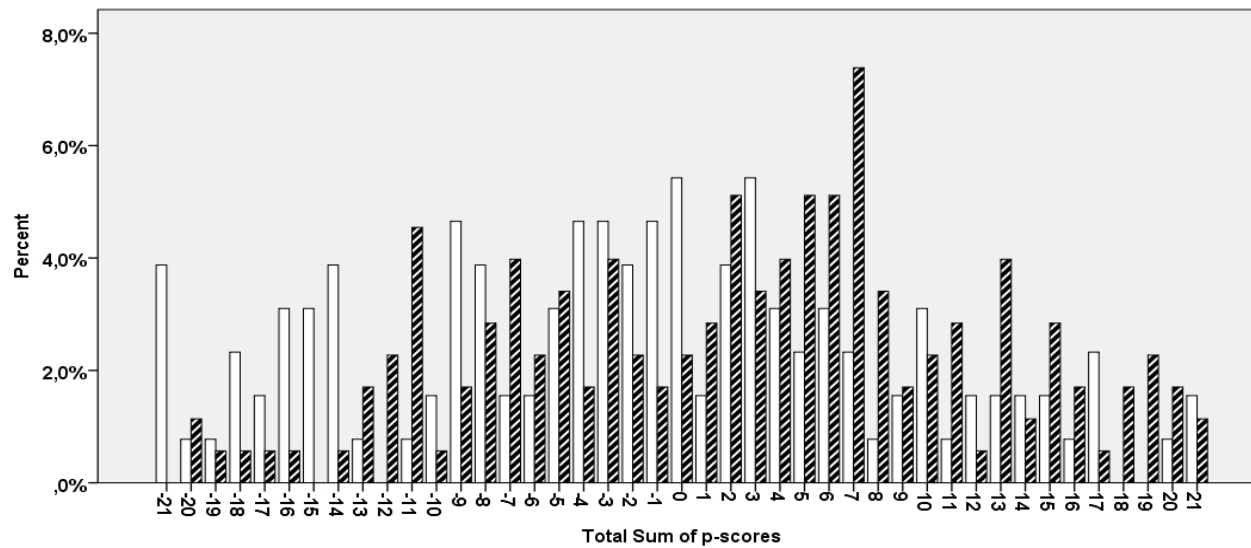
Fig. 2. Distribution of the total sum of p-scores for the seven attitude factors. Bars representing Popular marked with lines, Lonely with unfilled bars

3.2 Comparison between Genders

There were no gender-related differences in the p-scores for Popular boys and girls with respect to any of the seven attitude factors (boys n = 84, girls n = 92).

The p-scores for Lonely girls (n = 57) were significantly higher than those for Lonely boys (n = 73) with respect to the three School factors - Interest in School (p=.021), View of Teacher (p=.011) and Work Atmosphere (p=.010) (Mann-Whitney U-test; M-W). However, there were no gender-related differences in the p-scores for any of the relational factors among the Lonely group. Thus, in relational situations, Lonely boys and girls are alike.

3.3 Comparison between Students with Scandinavian and Non-scandinavian Names

The proportion of Popular students among all students with non-Scandinavian (n=35) was equal to that for students with Scandinavian names (n=141), and both groups had identical scores for all seven factors. The profiles of Popular students are thus relatively similar regardless of their cultural background.

Students with non-Scandinavian names were slightly overrepresented in the Lonely group (35 of a total of 302) compared to those with Scandinavian names (n=94 of 1219; 10 of the total 1531 could not be classified) (χ^2=4.687, p=.030). Lonely students with non-Scandinavian names scored somewhat better on Relations to Classmates (p=.045) than those with Scandinavian names, but the two groups had identical scores with respect to the other six factors.

3.4 The Popular Category

Each classroom was represented either by one large or 2-4 irreducible networks, i.e. peer groups within the classroom that were not connected to one-another. In 19 of the 77 classes (24.7%) there was only one Popular student, i.e. the same individual was chosen both for work and breaks. This also means that every member of the class was sociometrically connected (except for the Lonely individuals). In 28 classes (36.4%) there were two Popular students, i.e. two networks. In 19 classes (24.7%) there were 3 Popular students and in 11 classes (14.3%) there were four. In the classes with only one Popular student, 13 of the popular students were girls and 6 were boys. Overall, however, girls and boys were equally represented among the Popular group (with 87 and 89 individuals, respectively). Of the 176 pupils categorised as the most Popular in their networks, 50 were only chosen by their classmates as working partners and 74 were selected to spend time with during breaks. In 52 cases, the same individuals were chosen as the most Popular during both lessons and breaks. This means that there are more networks during breaks than during lessons. Breaks are thus very important for network building. There were no differences between the proportions of boys and girls or between the proportions of Scandinavian and non-Scandinavian students in the groups that were popular either as workmates or for spending time with during breaks.

3.5 Comparison of Socio-metric Indices between Individuals who were Popular as Workmates and During Break Times

There was an inverse curvilinear relationship between the magnitude of the largest eigenvector component, indicating the most Popular student of a group, and the number of individuals in the group (Fig. 3). This was expected because the eigenvector component indicating the most Popular student is more "diluted" in large and complex networks than in smaller ones.
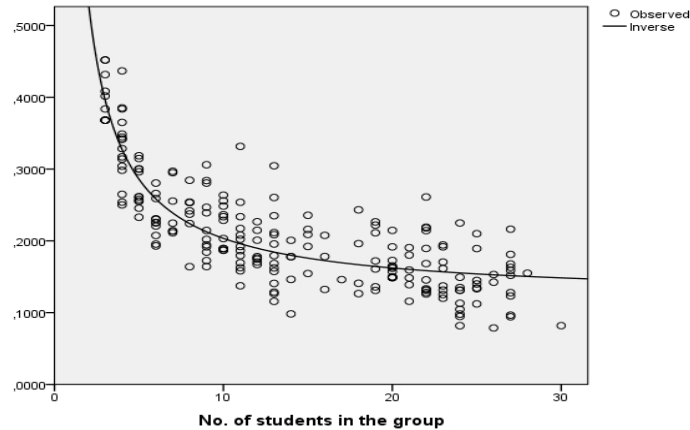

Fig. 3. The highest eigenvector component (on the vertical axis) visualising the most popular individual of a group is dependent on the number of students in the group. There is an inverse curvilinear relationship. The eigenvector components have been normalised to a group eigenvalue of 1.0

The networks associated with work were somewhat larger (M 15.6, SD 7.5) than those associated with break time preferences (M 12.6, SD 7.6), t=3.020, df 225, p=.003. Larger networks with more members indicate that there are more direct and indirect relationships between peers in the classrooms. Conversely, the smaller networks associated with breaks reflect tighter bonds between members. Lonely students are thus at a greater risk of being excluded from their peer groups during breaks.

3.6 The School and Relational Sums of Popular Students

Eighty-seven of the 176 popular students had more positive school sums than their classmates (49.4%), while 89 had school sums that were identical to or more negative than the class average. With respect to the relational sum, 107 of the 176 had more positive scores than their classmates (60.8%) while 69 had identical or more negative sums. In 17 out of 77 classes (22%), the Popular students had more positive school and relational sums than their class averages, whereas in 8 classes, the Popular students had more negative school and relational sums than the class as a whole (10.4%).

3.7 Are the Teachers' Perceptions of their Classes Correlated with Popular Students' School Sum and Relational Sum Scores?

The studied classes were categorized into 5 subgroups with respect to their school and relational sums. The same procedure was performed for School and Relational Sum. For example if all of the Popular students in a class had zero or negative school sums the class was assigned to group 1; group 2 contained classes in which there were more Popular students with negative sums than those with positive sums; group 3 contained classes in which there were equal numbers of Popular students having positive and negative sums; group 4 contained classes in which there were more Popular students with positive scores than those with negative scores; and group 5 contained classes in which all Popular students had positive sums. There was a positive correlation between the school and relational sums (Spearman rho 0.48, p< .0001).

There was an inverse correlation between the school sums of the classes (1-5) and the number of years their teachers had spent as teachers (rho -0.25, p .031). Younger teachers thus seem to be more appreciated. In classes where all of the popular students have positive feelings towards their school, the teachers identified fewer stable peer groups. Conversely, in classes where all of the popular students had negative feelings towards their school, the bonds between classmates were comparatively loose (rho -0.28, p .025).

In school classes where Popular students had positive Relational Sums, the teachers reported that they spent less time negotiating with the student group (rho 0.29, p .014). These teachers also had more planned meetings with the students' parents (rho 0.24, p .039) but fewer unplanned contacts with the students' families (rho -0.26, p .028). For Popular students, there was a negative correlation between the Relational Sum and the number of students in the class without formal competence in the Swedish language (rho -0.27, p .020). Classes containing many students who lack Swedish language competence seem to be associated with low Relational sums among Popular students.

Classes in which the Popular students had positive school and relational sums (n=17) were more likely to be receiving remedial teaching, p.033 (M-W). These classes were also more likely to require special support (p.036). This implies that the students in these 17 classes were cognitively weaker than most students and were being tutored by professional teachers. The provision of support to students with learning difficulties and/or functional impairments seems to promote positive profiles among the Popular. This suggests that the attitudes of Popular students may depend on the resources that are available in their classes, including the provision of cognitive support in the classroom.

3.8 The Lonely Category

Students who were neither chosen as working partners in the classroom nor as play mates at breaks were classified as Lonely. Nineteen of 77 classes (24.7%) had no Lonely students, while 41 (53.2%) had 1-2 Lonely individuals. Overall, the studied classes contained 0-7 Lonely individuals (Fig. 4).
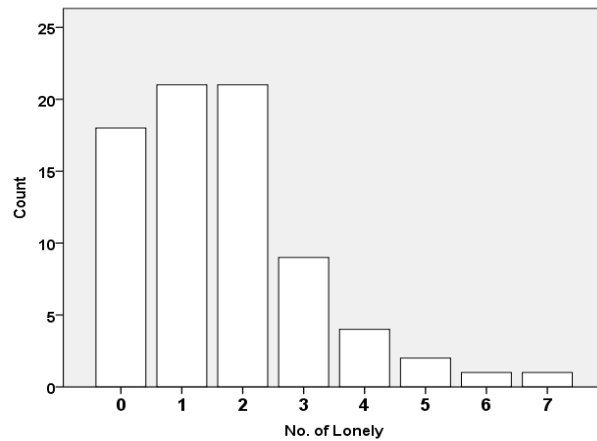
Fig. 4. The number of lonely students in the 77 school classes

The background data provided by the teachers for the 19 classes with no Lonely students were compared to those for classes with one or more Lonely individuals (M-W). Classes containing Lonely individuals had more boys than those with no Lonely students (p = .004). Classes with no Lonely students were also generally smaller (p = .009) and students in these classes worked alone more frequently than did those with Lonely students (p = .006). This finding was supported by the negative correlation between the ratio of Lonely students in the class and the scoring of the teacher item "The students work on their own in the classroom", i.e. classes with few Lonely students have more opportunities for individual work (r -0.33, p.003, n=77).

There was a negative correlation between the investigator's impression of the classroom environment and the number of Lonely pupils (rho – 0.40, p<.0001, n=77), i.e. the worse the investigator's general impression of the environment (which was ranked on a scale ranging from 1-3), the greater the number of Lonely individuals. In addition, the numbers of absent or ill students in classes with many Lonely individuals were higher than those for classes with no Lonely students (rho 0.31, p.006, n=77). A high incidence of absence suggests that students disapprove strongly of the situation in the classroom. There was also a significant correlation between the number of Lonely students in the class and the number of students requiring special support (r 0.35, p.003, n=70). This suggests that many classes with Lonely individuals have students who require professional support but are not receiving an adequate level of it.

3.9 Classrooms with a Single Popular Individual Compared to those with Several

The proportion of Lonely was not significantly different in classes with only one Popular compared to those with two or more high status students.

4. DISCUSSION

Previous studies on the classification of different student groups have primarily focused on students' self-concepts and self-evaluation by building different profiles and analysing these together with positive and negative nominations supplied by the students' peers [20,1]. However, Jackson and Bracken [25] have presented various shortcomings associated with

these sociometric classification procedures. In this work, an alternative method was used to provide clear-cut definitions of the two extreme groups and their attitudes towards school, their teachers, and their peers. Popular individuals accounted for 11.5% of the total sample in this work, which is close to the proportion identified by Jackson and Bracken [25] using a different method. However, the proportion of students that could not be classified using the method adopted by these authors was high. The method used herein unambiguously identified the most popular student in each studied class as the individual with the highest eigenvector component [51], i.e. the student who was most frequently and strongly nominated as being desirable to work with during lessons and/or be with during breaks. It is likely that popularity is gained through different characteristics in different contexts. In classrooms where academic work is considered important a student with high grades is likely to be positively evaluated. These individuals may also be regarded fun to be with during breaks. The latter is probably of equal importance in less academically oriented classes. In both contexts the Popular student may be strong enough to challenge the teacher management [5].

In contrast, Lonely students were identified using criteria based on bilateral choices, which necessitated the use of a method involving semi-symmetrized matrices. Lonely individuals in this case were those who were not chosen either as partners for work during lessons or for spending time with during breaks. The Lonely proportion of 8.5% determined in this work is below typical self-reported loneliness rates, which range from 10-15% [53,34]. Our method thus probably provides a lower boundary on the incidence of loneliness. The assumptions used to identify loneliness within certain networks should be borne in mind when considering the analysis of students' attitudes. Because two different methods were used to identify Popular and Lonely individuals, it was unlikely that significant correlations between the two categories would have occurred.

It has been reported that the Popular and Lonely groups can both include a wide range of different student types [37,17,4], which necessitates further research into their composition [3]. The work presented herein was conducted to address this issue by characterizing the attitude profiles of Popular and Lonely students as well as the differences and similarities between individuals in these two extreme categories. At an early stage in the process, it was demonstrated that both Lonely and Popular individuals from different classes exhibited a significant diversity of attitudes, i.e. their attitudes were found to depend on their specific contexts [cf. 42]. The attitudes of each Popular and Lonely student were therefore compared to those of their classmates.

In general, the attitudes of both Popular and Lonely students to their schools and teachers were similar to those of their fellow pupils. There was appreciable variation in these attitudes within both groups, with approximately equal proportions of individuals in both cases having the highest and lowest possible scores for these factors. An unexpected finding was that the proportion of individuals within the Popular and Lonely groups with very positive attitude scorings was very similar. Thus, a large proportion of the Lonely students (10%) expressed positive feelings towards both their school and their peers. However, the proportion of Lonely students with negative scores towards their school and peers was three times greater than that of Popular students. This aside, the similarities between the profiles of the two extreme groups were more striking than expected, especially with respect to the school factors. Academic ambitions and (dis)-interest in school work may reflect individual norms related to an individual's upbringing in a specific cultural context [54]. Therefore, a Lonely individual may nevertheless be ambitious in school and enthusiastic towards their peers, giving them a unique attitudinal profile relative to the rest of their class. Lonely students as a group thus

have extremely complex attitude profile, and should be analysed as individuals. In particular, it is important to determine which Lonely individuals are in need of critical help and which are coping comparatively well in school. It was possible to identify specific attitude profiles among individuals. The conclusion in the present investigation was that in specific classrooms students receiving most nominations from class members could be less different than expected compared to the category receiving no nomination from peers in their attitudes.

There are several possible explanations for the existence of Lonely individuals with very positive attitudes. In some cases, the Lonely students' attitudes indicated that they were cognitively superior to their classmates, as shown by the examples in Tables 2-4. Cacciopo et al. [36] similarly identified a subgroup of Lonely students who were very motivated in school without being more traumatized or having lower social capital than their peers, but nevertheless reported negative interpersonal experiences. In this work, such individuals were identified by having low scores for their relationships with their classmates or by considering disruption in their classes to be common. Such Lonely individuals may experience high levels of aggression from other members of their classes [28]. Alternatively, some of the Lonely students who express positive attitudes may have only recently joined the class and not yet settled in [41], or may have a different ethos to their peers due to different past experiences [21].

The most striking difference between the Popular and Lonely groups was the amount of anxiety expressed specifically among the Lonely. They were typically more observant of conditions related to Disruption and Work Atmosphere, which may indirectly reflect the occurrence of abuse or humiliation within school. Some individuals in this group may accordingly become victims of aggression and bullying from other children [1,34,2]. Some students from specific school-classes expressed attitudes that suggested they were being suppressed. However, when these individual classrooms were examined in more detail, it became apparent that the attitude profiles of individual Popular and Lonely students were in some cases almost identical. That is to say, they had common experiences but probably did not realise the similarity of their attitudes. This highlights the importance of working on relational issues [16].

Popular individuals with their high status can be assumed to have broad and competitive repertoires of talents that favour educational success [31,5]. However, half of the Popular students had neutral or negative scores for the School factors, i.e. school sums. That is to say, they did not appreciate their school any more than their classmates. Even when it came to relational factors (based on the relational sum), 40% of the Popular students had neutral or negative scores, i.e. were no more enthusiastic than their classmates. Nevertheless, they retained their high social status [5], probably in part because of the support and approval of teachers [31].

The number of Popular students in each class reflected the number of networks within it. If there was only one network in each class, all of its members were connected. This was the case in 25% of the classes. This finding seems to be rather positive, especially if this single Popular boy or girl had generally positive attitudes. The profile of such Popular students may well be in line with the teacher's expectations and preferences.

During breaks, some classes seemed to be more flexible in terms of their members' interactions since they tended to have a greater number of tighter networks based on break-time preferences. Such schoolyard situations could potentially create an elevated risk of

exclusion or even harassment. In this context, it might therefore be preferable for classes to have a single network during both lessons and break times. However, it should be noted that outliers such as Lonely individuals may still be present even in single network situations.

In school-classes where every Popular student had a generally positive attitude, the teacher's responses reflected a high level of relational stability with relatively few negotiations or informal contacts with students' family members. The teachers of such classes tended to be comparatively young, and were strongly appreciated by their pupils. In many cases, they taught remedial classes and provided additional support to pupils. Lower levels of relational stability were reported in other classrooms where many students had difficulties in mastering the Swedish language.

Around 10% of the Popular students identified in this study expressed strongly negative attitudes to their school. This could potentially reduce the teacher's ability to manage their students' school work, since students of this type may well be aggressive and academically neglected [28]. Such behaviour may reflect the student's talent for hiding their own weaknesses.

Classes with many Lonely students also had a higher incidence of student illness or absence, which is suggestive of malaise or disapproval of the situation in the classroom [cf. 29]. The teachers reported that such classes had larger numbers of students who required special support, i.e. cognitively weaker students. The greater the number of Lonely individuals in the classroom, the lower was the investigator's general impression of the environment. Overall, these classrooms did not provide attractive environments for students and teachers to share and work in.

Classes without any Lonely individuals were smaller, with fewer boys, and the students had better opportunities to work individually, perhaps due to a lack of disruption among the members. There was thus a connection between the level of socialisation within the classroom (as measured by the presence of few or no Lonely individuals) and the quality of the classroom environment. While there was no correlation between the numbers of Lonely and Popular students within a class, there appeared to be an appreciable advantage to having a single Popular student, especially if that student had positive attitude scores overall. Without making any suggestion regarding cause and effect, the teachers' responses indicated that the students in these classes were more ambitious, took more responsibility regarding their work, exhibited higher levels of cooperation between boys and girls, and generally had more positive classroom environments based on the investigator's observations. These classrooms were thus more harmonious and provided more favourable circumstances for learning compared to those with many networks. Superior working conditions were thus found in classes with minimal numbers of Lonely students and/or those with a single large student network.

Lonely girls exhibited a higher degree of interest in academic matters than Lonely boys, which is consistent with general trends [55]. However, no gender differences were observed among the Popular group with respect to any attitude factor. Like gender, concepts such as ethnicity and social class often have substantial effects on social status [17]. Previous investigations have shown that Göteborg is a segregated city in terms of housing, schools and socio-economic standards [56,57]. This is consistent with the high degree of variation in the proportion of students with non-Scandinavian names in the studied classes, which ranged from 0-100%. No other information on the students' social status or background was gathered. However, the investigation covered 18 of the city's 21 administrative school

districts and so would necessarily have covered areas with very different socioeconomic statuses. The proportion of students with non-Scandinavian names in the classrooms correlated strongly with the information provided by the teachers concerning the proportion of students with a native language other than Swedish, supporting the usefulness of the non-Scandinavian name metric. Interestingly enough, the proportion of Popular students within the two name categories was equal, and Popular students with both name types had equal scores with respect to the various attitude factors. This may have been partly due to the crudeness of the instrument, which only had two categories. Lonely students were slightly overrepresented among the group with non-Scandinavian names, even though students from this group as a whole considered their relationships with their classmates to be somewhat better than did those with Scandinavian names. It was not possible to determine whether any of these students were new to their classes and had not yet had time to fit in [41].

The students seemed to appreciate younger teachers more strongly than older ones. However, it seemed that older, more experienced teachers were more common in classes with large networks. The attitudes of the Popular students from such classes indicate that they are quite harmonious, and that the students' needs in such classes are taken care of well. Moreover, the teachers of such classes spend less time on negotiation and unplanned meetings with parents.

Why is it important to do research on Popular and Lonely students? Children who are not well accepted by their peers have fewer opportunities for social adaptation, which might undermine their academic progress [40]. Both popularity and rejection among children have been shown to be stable over several years because peer interaction conserves and exaggerates a child's initial label [30]. A student's sixth-grade position has been argued to influence their future status even if their status subsequently changes [23]. Therefore, loneliness during childhood may have long term effects that affect the individual's future life. In addition, the hidden similarities between the attitudes of Popular and Lonely students suggest that teachers' educational goals should perhaps be more focused on relational factors than they are at present.

4.1 Limitations of the Study

When data was collected, the sociometric method here used was not yet described. Due to the time consuming method development additional interviews with the teachers about specific students were not realistic. It had otherwise been interesting to comprehend if the teacher was aware of the extreme individuals and his/her opinion of both the Popular and the Lonely.

By small network analysis there are now possibilities to explore the status position of all individuals within a classroom. However, the large sample in the present study made methodological limitations necessary. Performance results were not included, otherwise detection of possible correlations such as between lower attitudes and weak academic performance or between academic success among Popular could have been scrutinized.

Another limitation concerns lack of data representing the cultural environment including students' different interests and memberships in subgroups outside school community.

5. CONCLUSION

Popular (11.5%) and Lonely (8.5%) students have similar attitudes to school and teachers. Around 10% of both groups had very positive attitudes for all factors. However, lonely students were three times likelier than popular students to have negative attitudes and also expressed more anxiety, considered disruption to be more common, and sometimes reported problematic relationships with their classmates and peers. Half of the popular students had negative or neutral attitudes to school factors and 40% had negative or neutral scores for relational factors. There was a connection between the level of socialisation within the classroom (as measured by the presence of few or no Lonely individuals) and the quality of the classroom environment. There appeared to be an appreciable advantage to having a single Popular student, especially if that student had positive attitude scores overall.

CONSENT

The investigation was carried out with the approval of the headmaster of each school. Parents also had to approve the participation of their child. The author personally instructed the students and the teacher in each class and collected the questionnaires and teacher responses.

ACKNOWLEDGEMENTS

COMPETING INTERESTS

Author has declared that no competing interests exist.

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