

**Development and change in disabled children's social participation assessed by parents
in Norwegian daycare centres: 1999–2009**

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Abstract

The aim of this paper is to explore if there is any alteration in social participation with peers assessed by parents amongst children with disabilities from 1999 to 2009 and discuss the results in light of the developments in disability policies during the last decades, and internal developments in education/welfare policies regarding children under compulsory school age. We address changes in levels of social participation of children with disabilities in daycare centres and examine changes in mechanisms leading to social participation with peers from 1999 to 2009. The analysis is based on cross-sectional data of two representative samples of disabled children 10 years apart. The main finding of this study is that disabled children have increased their social participation with peers in the period from 1999 to 2009. Gender, age and being in a segregated daycare setting all had a significant impact on social participation with peers in 1999, but had lost their significance in 2009. The current study found that Norwegian daycare centres still have to be considered as social integrating institutions, even though in the period from 1999 to 2009 they have changed from being a care- and family-supportive service to become a pedagogical service preparing children for school.

Keywords:

day-car centres, disabled children, social participation, social inclusion

Introduction

Daycare centres have become the backbone of the welfare policy and services for children in Norway (Korsvold 2011). Disabled children have had a legal right to be prioritised for places in daycare centres since the first legal act for daycare centres in 1975. At that time, and up to 2005, daycare centres were defined as care- and family-supporting services. By the new daycare centres act (Lov om barnehager 2005) these institutions changed from being care- and family-supportive services to become pedagogical services preparing children for school. These institutions turned from being anchored in social and family policy to become anchored in the educational system. Additionally, all children in Norway gained a legal right to get access to daycare centres in 2009.

At the end of 2010, 96.5 % of children aged 3–5 years attended day-care centres in Norway (Statistics Norway 2012). Such big changes in the ambitions and quantity of daycare centres make it very interesting to look at the changes before and after these reforms as regards content. When both the size of child-groups and the plurality of children in daycare services increase, disabled children's role in social participation may be threatened – or are the institutions so solid that they are ready to achieve the goal of becoming social integrating institutions? The daycare centres are still organised at a local community level. Special institutions and boarding schools for special needs children have been replaced by competence centres owned by the state, except for deaf children who still have special schools. Furthermore, 82.1% of Norwegian women with children aged 0–6 years have increasingly become employed part-time or full-time (Statistics Norway 2012), and family structures have diversified.

Peer relationships are expected to develop and flourish when children participate in preschool or kindergarten programmes (Guralnick, Connor and Johnson 2011; Rubin et al. 2005) and social participation of children with disabilities is generally considered as a key issue in inclusive education (Pijl 2007).

Mainstream or regular settings are often found to be more supportive of peer interaction for preschool children with developmental delays, than are segregated, specialised, settings (Guralnick et al. 1996). Supportive settings are important in daycare centres and schools because the importance of social relations outside the nuclear family is increasing in western societies where family structures are changing and have become less stable than before (Asher 1990). Peer relations have increased in importance, especially among children and young people (Kvvello 2006). In Norway the amount of children in daycare centres is increasing in accordance with political goals (<http://www.ssb.no/emner/04/02/10/barnehager/>), which makes these challenges relevant for a larger part of the children's population.

At the end of 2011 89.7 % of children aged 1–5 were in daycare centres, and 93% of these children spent 33 hours or more in these institutions. Preschool-age children have to choose friends within a physical placement chosen by parents; they mostly get ascribed relations (Ytterhus 2002). Even though ascribed relations last shorter than free chosen reciprocal relations later in life, ascribed relations become very important for the children at the moment because they make you able to play, to be recognised, and to experience interaction with a diversity of children (Bø & Schiefloe 2007; Ytterhus 2000; Kvvello 2006). Disabled children are found to be participating in peer-relations and peer-activities in Nordic regular public daycare centres, but very often in marginal social positions in peer groups (Ytterhus 2000;

Ottosen and Bengtsson 2002; Undheim 2009). We will define them as active agents, but vulnerable agents in the social landscape of peers.

In this paper we will address changes in levels of social participation with peers of children with disabilities in daycare centres from 1999 to 2009. Furthermore, we will examine any change in mechanisms leading to social participation with peers in 1999 and 2009. The purpose is to explore quantitatively if there is any alteration in social participation with peers amongst children with disabilities from 1999 to 2009 and discuss the results in light of the developments of disability policies in the last decades and internal developments in education/welfare policies regarding children under compulsory school age.

Policy for children with disabilities

In Norway there has been a development in the division of labour between the private and public childcare sphere in the last few decades. Before the 1960s/70s, upbringing and childcare was a family matter, except for children with behavioural difficulties, disabilities or children of parents with poor parenting skills. These children were often put in state care, in terms of placement in special institutions or boarding schools (Tøssebro and Lundeby 2002). From the 1960s there was a gradual change in the ‘master pattern’ on how the community dealt with people who were different (Cohen 1985). These changes represent a shift from political guidelines that went in the direction of centralised institutions and specialised services for different diagnostic groups to political guidelines that represent an ideology that fronts integration, normalisation and deinstitutionalisation (Tøssebro and Lundeby 2002). Institutions and boarding schools for special needs children have been replaced by outreach community care and support within the framework of family care (Tøssebro and Lundeby 2002; White Paper no. 23 1977–78). Furthermore, women have entered the labour market,

family structures have diversified, and daycare centres are available for all children (Statistics Norway 2010a,b).

These structural developments have changed the public–private mix in all types of families. The role of the public sector has expanded with regards to childhood, through provision of daycare centres and after school facilities (Ellingsæter and Leira 2004; Ytterhus, Wendelborg and Lundeby 2008). For disabled children, public support changed from a centralised control approach to one of providing support within a family framework. Thus a convergence has taken place, with more integration of public sector systems and everyday life. Therefore all children were meant to grow up with their family, and the authorities should provide the support needed for a childhood and family life ‘as close to normal as possible’ (White Paper no. 88, 1966–67; MLSA Ministry of Labour and Social Affairs 2005).

Disabled children growing up after the 1990s were the first generation to grow up ‘after normalisation’ in line with the family–public partnership model described earlier (Tøssebro and Lundeby 2002). Today the most important welfare services for young children – daycare centres – have been moved from the family and care system into the educational system. The question today is: to what extent have these changes influenced inclusion policies and daycare centres as integrating social institutions?

Social participation with peers

Koster and colleagues (2007) recommend using the term ‘social participation’ when studying the social dimension of inclusion, underlining the importance of positive social interaction, acceptance, the perception of acceptance, and social relationships/friendships in bringing about the social participation of disabled children. Thus social participation has both a quantitative and a qualitative dimension and can be difficult to measure.

In this study, where the parents are the informants, we have to measure social participation with peers indirectly. Levels of social participation were measured by the parents regarding their child's social situation and peer reactions toward the child. This by proxy measurement has its obvious limitations, which is addressed later in this paper.

Methods

Participants and procedures

This study combined data from two different samples, collected 10 years apart.

Sample 1: 1999

The first sample is part of the longitudinal project, 'Growing up with disabilities', which is a life-course study. The participants are Norwegian families of children with disabilities. The families were recruited from the registers held by the Regional Rehabilitation Services for Children (RRSC). Such services are established in all counties in Norway and the RRSC in 17 of the 19 counties agreed to participate. The RRSCs were asked to select all children with physical, intellectual or multiple disabilities who were born between 1993 and 1995. Most children with these disabilities are in contact with the RRSC from early childhood for diagnostic purposes, assessment, or rehabilitation services. The exception is children with minor or initially undetected disabilities, or children with late-onset disabilities. In all, 984 children were identified. This is 0.55 per cent of all children in the same age group in the seventeen participating counties. In the year of sampling (1998) the proportion of children in Norway aged six and under who received Basic Benefit (BB) and/or Supplementary Benefit (SB) (received by the majority of children with disabilities) on the basis of physical, intellectual, or multiple diagnoses - or with no diagnosis - was 0.82 per cent (Rikstrygdeverket, 1998). This percentage may appear somewhat high in comparison with our

sample, which excludes children with no diagnosis. When adjusted to take account of this difference, the percentage correlates fairly well with our sample results.

An invitation to participate was sent to all parents of the 984 children, and 668 parents agreed to take part in the life- course study. Data were gathered through mail questionnaires to parents. The data gathering took place in autumn 1999, with 603 returned questionnaires. It is not possible to give an accurate estimate of potential bias in the sample. However, the gender distribution (57% boys) corresponds closely with the distribution of recipients of basic benefit and supplementary benefit (Rikstrygdeverket 1998). On the other hand, fewer parents from Oslo County – the capital of Norway – agreed to participate in comparison with other counties, and there is an underrepresentation of immigrant families (as good as none).

Sample 2: 2009

The second sample consists of parents of children with physical, intellectual or multiple disabilities in Norway. The Norwegian Labour and Welfare Administration (NAV) identified 1,076 children from all over the country born between 2003 and 2005 who received SB on the grounds of physical, intellectual or multiple impairments according to the International Classification of Diseases (ICD-10). The diagnostic groups in the ICD-10 which were appropriate for our sample was verified by a physician at NAV. The questionnaires were sent by NAV to both parents and staff in daycare centres, and a total of 406 children were included in the study. The total questionnaires included in this study is 336 (31.2 %). In this sample we had 61% boys, which is not very different for the gender distribution in 1999 nor the gender distribution of children receiving SB in 2009 the amount of immigrant families in the sample (12,3 per cent in 2009 cohort vs 10 per cent in the Norwegian population)

Comparability of the two cohorts

The two cohorts have different recruitment sources, mainly due to practical and economic reasons. Recruitment through the RRSC is highly demanding and analysis of the 1999 sample shows that 86 per cent received SB. The parents to about 80 per cent of those who did not receive SB in the 1999 cohort informed us that their child had impairment in a mild degree. As good as all children with impairment in a moderate or severe degree did receive SB. We were not allowed to have the ICD-10 diagnosis registered and the variable “Type of disability” in this study is therefore parent’s assessments. Table 1 show that though “degree of impairment” is the same between cohorts, types of disability differs. There is an increase in the relative percentage of children with physical disability which is offset by a decline in those with multiple disabilities – from 17.3% of the cohort in 1999 to 9.7% in 2009. We do not believe this reflects an actual change in prevalence. It is more likely that classification in the two recruitment sources differs or bias in the sample. Still we believe the two cohorts are comparable and results are controlled for bias in the sample (for example type of disability).

Measures

Social participation with peers assessed by parents

Social participation with peers is the main dependent variable and relates to participation with peers in general. Parents were asked to assess on a three-point scale (‘always/often true’, ‘sometimes true’, ‘hardly ever true’) the accuracy of seven statements regarding their child’s social situation and peer reactions toward the child. The statements were: (1) ‘the child participates in social activities on an equal footing with the other children’ (reversed); (2) ‘the child withdraws from the other children’; (3) ‘the child imitates and learns from other children’ (reversed); (4) ‘the child plays alongside other children’; (5) ‘the child has great pleasure with the other children’ (reversed); (6) ‘other children reject/lose interest in the child’; and (7) ‘other children relate to the child in the same way as other children’ (reversed).

A principal component analysis (PCA; varimax rotation) on the pooled sample (both years) based on Kaiser's criterion revealed that the seven questions could be treated as one homogeneous variable (Cronbach's alpha: 0.81; $n = 813$). High value indicates high/positive assessment of social participation with peers.

One limitation with this study is that *social participation with peers* is measured indirectly, through parent's assessment. In 2009, for each parent who received a questionnaire, a questionnaire was also sent to the day-care centre that the child attended. The staff at the daycare centre answered the same questions about social participation regarding the child in question. A principal component analysis on the day-care staff data revealed one factor with a Cronbach's alpha of 0.84 ($n = 298$). To further investigate the validity of the measure, a correlation analysis was conducted for *social participation with peers* measured by parents in 2009 and the daycare staff. The correlation coefficient showed a strong correlation with a Pearson's r of .66 ($p < .001$, $n = 189$ [listwise]). These results strengthen our belief that the measure is a valid measure of *social participation with peers*.

Type of disability

The parents classified the child's type of disability. The type of disability variable consists of four categories: 'physical disability'; 'intellectual disability'; 'multiple disabilities'; and 'other'. In the regression analysis, type of disability is recoded into a series of dummy variables with 'physical disability' as the reference category.

Degree of impairment

Degree of impairment is constructed as a simple additive scale with listwise deletion using six different questions on the degree of impairment/activity restrictions (as defined by parents). Assessments in the following six areas were used: (1) severity of impairment (three response categories); (2) visibility of impairment (three response categories); (3) expressive

communication (five response categories); (4) language comprehension (four response categories); (5) restrictions in mobility (five response categories); and (6) need for assistance during meals (three response categories). High values indicate more severe impairment. The degree of impairment scale ranges from six to 23, with a Cronbach's alpha of 0.81. The degree of impairment variable could theoretically represent two uncorrelated dimensions, mobility impairment and learning/communicative difficulties, but this was not supported by our empirical data. As a principal component analysis suggested one factor, and because the Cronbach's alpha was rather high, we decided to treat them as one variable.

Hours of special education

The parents were asked to assess how many hours of special education their child received on a weekly basis. Their answers were recoded into 'no special education'; '1–10 hours'; and 'over 10 hours'. In the regression analysis, *hours of special education* is recoded into a series of dummy variables with 'no special education' as the reference category. Since special education is an integrated part of the educational offerings in segregated settings, *Hours of special education* is only relevant for analysis in mainstream settings. This also goes for

Hours with assistant.

Hours with assistant

The parents assessed how many hours their child had assistant support at school on a weekly basis. Their answers were recoded into 'no assistant'; '1–10 hours'; and 'over 10 hours'. In the regression analysis, *hours with assistant* is recoded into a series of dummy variables with 'no assistant' as the reference category.

Segregated setting

Segregated setting is about whether disabled children attend mainstream daycare. Parents chose between the following response categories: (1 'attends mainstream daycare'; (2)

‘attends special group in mainstream daycare’; (3) ‘attends special daycare’; and (4) ‘other’.

The ‘segregated setting’ variable is recoded to 0 ‘mainstream’ for the first option and 1 ‘segregated’ for options two and three. Children who attend ‘other’ are excluded from the analysis.

Municipality population size

The respondents’ addresses were coupled with population statistics of their municipality available from Statistics Norway. The variable is recoded into three shares based on data from 2011: ‘under 30,000 inhabitants’; ‘30,000– 99,999 inhabitants’; ‘over 100,000 inhabitants’.

Analysis

The Statistical Package for the Social Sciences (SPSS) software package version 19.0 was employed for statistical analysis. The statistical significance was set at $\alpha = 0.05$. Independent sample *t*-test and chi-square were used to determine any significant differences between years. One-way analysis of variance (ANOVA) was used to analyse differences in ‘Degree of impairment’ between municipalities with different population size. Principal component analysis (PCA) and reliability testing (Cronbach’s alpha) were done to examine whether the variables *social participation with peers* and *degree of impairment* could be treated as homogeneous variables. Hierarchical regression analysis was applied on the pooled sample (both years) to explore any significant impact on the dependent variable between years; that is, any significant change in social participation with peers from 1999 to 2009 controlled for other variables. Identical hierarchical regression analysis was also applied within years. That is, for each subsample (1999 and 2009), regression analysis was applied to examine which independent variable had an impact on the dependent and to investigate if there was any difference in mechanisms which have an impact in 1999 and in 2009. Because of much redundant information, only the last step in the regression analysis will be presented in the

tables. However, possible important information in previous steps will be commented on in the text.

Results

In this paper we analyse the whole sample, which is all children in the study attending segregated or mainstream daycare, and children who attend mainstream daycare for more than 19 hours a week. Because of this, Table 1 presents a description of all children in the sample in 1999 and in 2009 and a description of those who attend mainstream daycare for more than 19 hours a week. Table 1 shows that, in both 1999 and 2009, about 12–13% attended a special segregated daycare (*segregated setting*) and respondents were living in similar types of municipalities regarding population size in 1999 and 2009. Further, Table 1 shows that children spend significantly more hours in daycare in 2009; however, there is no indication of a difference in hours spent in mainstream or segregated daycare between the two years. The overall picture presented in Table 1 is that the characteristics of the children included in the study is quite similar with regards to age, sex, type of disability and degree of impairment in 1999 and 2009, with maybe the exception of some more children with multiple disabilities and fewer with physical disability in 1999. With regards to the use of assistant and special education, Table 1 indicates less use of assistants in 2009 for those children who attend mainstream daycare for more than 19 hours. Table 1 shows significantly higher results on the dependent variable *social participation with peers* in 2009 compared to the results in 1999.

Table 1

One question that needs to be asked regarding participation of preschool children is whether they attend mainstream or segregated daycare. As we have seen, around 12–13% of our

sample attend segregated settings – both in 1999 and 2009. There are accordingly no indications of more or less use of segregated settings for children with disabilities 10 years after. However, Table 2 shows that attending mainstream daycare depends partly of where the children live, and this has been strengthened in 2009. While municipalities which are small in population size have reduced their use of segregated setting (t value: 2.05; p value = 0.03 one-tailed independent sample t -test), the largest municipalities in Norway have increased their use of segregated daycare for children with disabilities (t value: -1.67; p value = 0.04 one-tailed independent sample t -test).

This raises the question of if there are any differences in the population regarding degree of impairment, which can explain why the largest municipalities have increased their use of segregated daycare. Table 2 shows further that this may be the case, but in a rather small degree. There is a somewhat larger variation in degree of impairment between municipalities with different population size in 2009 (ANOVA, F -value = 6.6, p = .002) compared to 1999 (ANOVA, F -value = 1.2, p = .318). Further analysis shows that there has been an increased degree of impairment in the largest municipalities from 1999 to 2009 (t -value: -1.85; p value = 0.03 one-tailed independent sample t -test). No such increase or decrease has been found in the other municipalities.

One main difference between the 2009 cohort and 1999 cohort is that there is an overrepresentation of immigrant families in the 2009 cohort. If we exclude these families from the analysis in Table 2, the reduction in use of segregation is strengthened in the smallest municipalities (2.6 per cent in segregated setting; t value: 2.6; p value = 0.01 one-tailed independent sample t -test). For the largest municipalities the use of segregated setting are reduced and loses its significance (25.8 per cent in segregated setting; t value: 1.0; p value = 0.16 one-tailed independent sample t -test). When immigrant families are excluded from the

analysis there are no longer an significant increased degree of impairment in the largest municipalities from 1999 to 2009 (mean 12.8; t -value: -1.40 ; p value = 0.08 one-tailed independent sample t -test). These results indicate that children with disabilities from immigrant families are more likely to be in segregated settings compared to their Norwegian counterparts.

Another question is whether smaller municipalities have increased their use of special education in mainstream daycare centres by the very fact that they, to a much lesser degree than the largest municipalities, use segregated settings. Table 2 shows that, on the contrary, the smallest municipalities have decreased the use of special education in mainstream settings ($\chi^2 = 10, p < .01$), while the largest have increased their use ($\chi^2 = 7, p < .05$). Excluding immigrants families from the analysis have no effect on these findings.

Table 2

Table 3 presents a total regression model¹ which predicts the outcome of *social participation with peers* for all children in this study (pooled sample) while Table 4 presents two regression models within years. Table 3 shows that the year 2009 contributes significantly to *social participation with peers* controlled for the other variables in the model (Beta 0.13 ; $p < .001$). This means, all things being equal, children with disabilities participate more socially with peers in 2009 than in 1999. *Municipality population size* contributes to explain the variance in the model ($\Delta R^2 = 0.02$; $p < .01$) where children living in municipalities with over 100,000 inhabitants participate less than children living in municipalities with under 30,000

¹ For all the following analysis immigrant families are included, because analysis where they were excluded made no difference on the results.

inhabitants (Beta -0.09 ; $p < .01$). Children in segregated day care settings score lower on *social participation with peers* than children in mainstream settings (Beta -0.07 ; $p < 0.05$). The strongest contributor to *social participation with peers* in the total model is *degree of impairment* ($\Delta R^2 = 0.19$; $p < .001$). That is, the more severe impairment, the lower score on the dependent variable (Beta -0.37 ; $p < .001$). Having a disability other than physical also significantly reduces social participation, according to Table 3 ($\Delta R^2 = 0.08$; $p < .001$) Gender does not have any significant impact on *social participation* (Beta $.05$; $p = ns$), while the youngest children participate more than the oldest (Beta $.10$; $p < .01$).

Table 3

Table 4

Table 4 shows almost the same regression model, but instead of a pooled sample, two regression models within years are conducted. In contrast to the total model, Table 4 shows that being in a segregated daycare setting does not have an impact on *social participation with peers* in 2009, when other variables are controlled; however, it has in 1999 (Beta -0.09 ; $p < .05$). Nevertheless, when *segregated setting* was introduced in the model in step 2 it made a significant contribution in explaining the variance in the model also in 2009 ($\Delta R^2 = 0.03$; $p < .01$). However, when *degree of impairment* was introduced in the 2009 model in step 5, *segregated setting* lost its significance. *Degree of impairment* is the main determinant of social participation with peers in both years. However, it was much stronger in 2009 than in 1999 (ΔR^2 : 0.28 vs. 0.16; Beta: -0.49 vs. 0.32). Having a disability other than a physical one

reduces *social participation with peers* both in 1999 and 2009 (respectively $\Delta R^2 = 0.10$; $p < .001$ and $\Delta R^2 = 0.07$; $p < .001$). In 1999, the youngest children scored higher on *social participation with peers* than the oldest children (Beta: 0.13; $p < .01$), and girls almost scored significantly higher than boys (Beta: 0.07; $p = .051$ [ns]). In 2009, neither gender (Beta: 0.01; $p = .870$ [ns]) nor age (youngest vs oldest: Beta: 0.04; $p = .484$ [ns]) have an impact on *social participation with peers* whatsoever.

Table 5

If we now turn to social participation with peers within mainstream daycare settings, Table 5 shows a hierarchical regression model (pooled samples) which predicts *social participation with peers* for children with disabilities in mainstream daycare attending more than 19 hours per week. The main barriers for social participation are, according to Table 5, *degree of impairment* ($\Delta R^2 = 0.21$; $p < .001$ Beta= $-.36$; $p < .001$) and *type of disability* ($\Delta R^2 = 0.10$; $p < .001$). Especially children with intellectual disabilities participate less than children with physical disabilities (Beta= $-.35$; $p < .001$).

Table 5 also reveals that girls overall participate more than boys (Beta = $.07$; $p < .05$) and the youngest more than the oldest (Beta= $.11$; $p < .01$). Neither *municipality population size*, *hours of special education* nor *hours of assistant* has an impact on social participation with peers in the pooled sample.

Table 6

Table 6 presents regression models which predict social participation with peers in the sample attending mainstream daycare for more than 19 hours per week within the years. The main barrier for *social participation with peers* for both years are *degree of impairment* (1999: $\Delta R^2 = 0.18$; $p < .001$ Beta = $-.35$; $p < .001$; 2009: $\Delta R^2 = 0.31$; $p < .001$ Beta = $-.40$; $p < .001$) and having a disability other than physical disability (1999: $\Delta R^2 = 0.12$; $p < .001$; 2009: $\Delta R^2 = 0.10$; $p < .001$). In 1999 girls participated more than boys (Beta: 0.11 ; $p < .01$) and the youngest children more than the oldest (Beta: 0.13 ; $p < .01$). However, this is not the case in 2009, where neither gender nor age contributes significantly to explain the variance in the dependent variable. This means boys and the oldest children have the same level of social participation with peers in 2009 as girls and the youngest children. Interestingly, children with 1– 10 hours of special education per week in 2009 participate less than children without special education (Beta: -0.22 ; $p < .001$). However, having more than 10 hours of special education does not have an impact on social participation (Beta: -0.06 ; $p = ns$). *Municipality population size* and *hours with assistant* do not have an impact on *social participation with peers*, neither in 1999 nor 2009.

Discussion

The main finding in this study is that disabled children have increased their social participation with peers in the period from 1999 to 2009. Gender, age and being in a segregated daycare setting all had a significant impact on social participation with peers in 1999, but lost their significance in 2009. On the other hand, *degree of impairment* has a greater significant impact on social participation in 2009 compared to 1999. These results

suggest there has been a change in mechanism leading to social participation. Overall, disabled children participate more in Norwegian daycare centers in 2009 compared to 1999, which suggests that Norwegian daycare has become more open for diversity when it comes to gender and age. However, severity of the impairment has strengthened its negative impact on social participation with peers.

This study did not detect any evidence for any change in use of segregated daycare settings for disabled children in general. However, further investigation displayed that the largest municipalities in population size have increased their use of segregated settings, however only if we include children from immigrants families in the analysis. The largest municipalities has increased special education in mainstream settings as well. The smallest municipalities in population size have, on the contrary, reduced their use of special education in mainstream settings and their use of segregated daycare settings. Having a separate segregated daycare system for disabled children is often inconvenient in sparsely populated regions, just as it is found to be for school children (Meijer & De Jager 2001; Wendelborg and Tøssebro 2008). Besides being less cost-effective, the potential negative social effects may be more severe for children who are transported out of their neighbourhood community for care- and family-support or education/training service compared with children in areas of high population density where distances to special placement facilities are shorter.

The current study found that Norwegian daycare centres still have to be considered as social integrating institutions, even though, in the period from 1999 to 2009, they have changed from being a care- and family-supportive service to become a pedagogical service preparing children for school (Barnehageloven 2005). The results of this study indicate that children with 1–10 hours of special education per week in 2009 participated less than children without

special education. We may speculate that these findings indicates that special education is a barrier to social participation in 2009; yet degree of impairment captures the impact on social participation for children with the most special education followed by most likely most severe impairment. It is another question why special education did not have any impact on social participation in 1999. The case may well be that the alteration from care- and family-supporting service to a pedagogical service preparing children for school, cf. the new daycare centres act in 2005 (Barnehageloven 2005), have changed the special education practice in daycare.

Special education and its practitioners are often said to have an individual and medical understanding of disability and learning difficulties (Haug 1999). Consequently, preparing for school may imply work towards compensating for a perceived lack of ability rather than changing the environment or including disabled children in peer activities. However, it is a bit farfetched to conclude that policy changes from 2005 have impact on our results only four years after, especially when we find that disable children has increased their level social participation from 1999 to 2009.

An overall increased level of social participation for disable children while the severity of the impairment has strengthened its negative impact on social participation with peers, may depend on the fact that our main dependent variable is social participation assessed by parents. Parent's expectations of social participation ten years apart may differ and may have an impact on our results, and may also partly explain why gender, age and being in a segregated daycare setting lost their significance on social participation in 2009.

The present study has important limitations. First, the low response rate among parents in 2009. Any inferences based on generalisations must be made with caution. Second, social

participation with peers is assessed by parents, and results should therefore be interpreted with prudence. Research on school children suggests that parents of children with disabilities may view their child's social position more positively than their child's peers (Koster et al. 2007). Even so, parents are regarded as reliable providers of valid assessments about their children on many dimensions (Youngstrom, Findling and Calabrese, 2001; Findling et al. 2002; Kahana et al. 2003). Further, parents of children with disabilities are likely to know more about their children's participation due to close cooperation with daycare services or schools and their child's dependency on them (Ytterhus et al. 2008). Moreover, the strong correlation in the current study between parents' and daycare staff's assessments of social participation with peers strengthens our confidence in the study's validity.

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Table 1: Characteristics of respondents included in the analysis (%; 1999: $N = 533/430$; 2009: $N = 254/224$)

	1999		2009	
	All	Mainstream	All	Mainstream
Segregated	12.5	—	13.0	—
Hours in daycare***	Mean: 31.9 <i>SD</i> : 7.9	Mean: 31.8 <i>SD</i> : 7.8	Mean: 33.9 <i>SD</i> : 8.1	Mean: 34.0 <i>SD</i> : 7.6
		> 19 hours in mainstream		> 19 hours in mainstream
Municipality population size				
Under 30,000 inhab.	51.8	53.8	51.4	56.5
30,000 to 99,999 inhab.	24.0	22.9	23.0	22.9
Over 100,000 inhab.	24.2	23.3	25.7	20.7
Girl	42.8	42.1	38.3	36.8
Year of birth				
1993 /2003	37.1	37.3	39.9	39.2
1994 /2004	34.2	34.1	37.5	37.7
1995 /2005	28.6	28.6	22.6	23.1
Type of disability**				
Physical disability	33.0	34.4	39.2	40.9
Intellectual disability	41.3	43.8	37.1	38.3
Multiple disabilities	17.3	13.8	9.7	7.1
Other	8.4	8.0	14.0	13.8
Degree of impairment (Range 6–20)	Mean: 11.73 <i>SD</i> : 3.62	Mean: 11.35 <i>SD</i> : 3.43	Mean: 11.82 <i>SD</i> : 3.50	Mean: 11.35; <i>SD</i> : 3.27
Hours of special education				
No special education	—	25.9	—	29.2
1–10 hours	—	55.9	—	56.9
Over 10 hours	—	18.2	—	13.9
Hours with assistant ***				
No hours with assistant	—	20.8	—	31.4
1–10 hours	—	10.1	—	16.7
Over 10 hours	—	69.1	—	51.9
Social participation*** (Range 7–21)	Mean: 15.9 <i>SD</i> : 3.15	Mean: 16.04 <i>SD</i> : 3.08	Mean: 17.01; <i>SD</i> : 3.07	Mean: 17.16; <i>SD</i> : 3.02

*** $p < .01$ between years; **** $p < .001$ between years.

Table 2: Crosstab showing use of segregated setting by municipality population size in 1999 and 2009

Segregated setting		Under 30,000 inhabitants	30,000–99,999 inhabitants	Over 100,000 inhabitants	Total
1999		8.0	15.7	19.3	12.5
2009		3.5* ^x	15.8	29.4* ^x	13.0
Degree of impairment		Under 30,000 inhabitants	30,000–99,999 inhabitants	Over 100,000 inhabitants	Total
1999		11.7	11.3	12.0	11.7
2009** ^y		11.4	11.5	13.0* ^x	11.8
Special education in 1999 and 2009 < 19 hours in mainstream:		Under 30,000 inhabitants *^z	30,000–99,999 inhabitants	Over 100,000 inhabitants*^z	Total
1999	No special education	24.7	25.5	29.2	25.9
	1–10 hours	56.2	56.1	55.0	55.9
	Over 10 hours	19.2	18.4	16.0	18.2
2009	No special education	30.8	33.3	20.4	29.2
	1–10 hours	61.0	58.3	44.4	56.9
	Over 10 hours	8.2	8.3	35.3	14.9

* $p < .0.05$; ** $p < .0.01$.

^x independent sample t -test, one-tailed on increased/decrease use of segregated setting in 2009 by municipality population size.

^y One-way ANOVA between groups (municipality population size).

^z Chi square between years.

Table 3: Hierarchical regression analysis predicting social participation with peers (pooled sample). Reporting: Beta-values (b), standard errors (SE B), standardised betas (Beta), *p* value and explained variance (R^2 ; $N = 764$)

	b	SE B	Beta	<i>P</i> value.	ΔR^2
Constant	21.01	0.41		.000	
Year 2009 (step 1)	0.91	0.20	0.13	.000	.02***
Municipality population size (step 2)					.02**
30,000 to 99,999 inhabitants.	-0.18	0.23	-0.02	.426	
Over 100,000 inhabitants.	-0.70	0.23	-0.09	.003	
Segregated setting (step 3)	-0.73	0.33	-0.07	.025	.04***
Girl (step 4)	0.32	0.19	0.05	.084	.00
Age (step 5)					.01**
Born 1994/2004	0.03	0.22	0.00	.893	
Born 1995/2005	0.73	0.24	0.10	.002	
Degree of impairment (step 6)	-0.34	0.04	-0.37	.000	.19***
Type of Disability (step 7)					.08***
Intellectual disability	-2.10	0.22	-0.32	.000	
Multiple disabilities	-1.67	0.39	-0.17	.000	
Other	-1.66	0.34	-0.15	.000	
R^2 :			.36		

Ref cat.: Under 30,000 inhabitants; Born 1993/2003; Physical disabilities. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4: Hierarchical regression analysis predicting social participation with peers in 1999 and 2009; Reporting: Beta-values (b), standard errors (SE B), standardised betas (Beta), *p* value and explained variance (R^2 ; 1999: $N = 518$; 2009: $N = 245$)

	1999					2009				
	b	SE B	Beta	<i>P</i> value	ΔR^2	b	SE B	Beta	<i>P</i> value	ΔR^2
Constant	20.51	0.52		.000		23.17	0.67		.000	
Municipality population size (step 1)					.01*					.04*
30,000 to 99,999 inhabitants.	-0.27	0.29	-0.04	.345		0.06	0.38	0.01	.868	
Over 100,000 inhabitants.	-0.63	0.29	-0.08	.031		-0.73	0.40	-0.10	.068	
Segregated setting (step 2)	-0.81	0.38	-0.08	.034	.04***	-0.10	0.63	-0.01	.880	.03**
Girl (step 3)	0.45	0.23	0.07	.051	.00	0.05	0.32	0.01	.870	.01
Age (step 4)					.02**					.01
Born 1994/2004	0.15	0.27	0.02	.579		-0.09	0.36	-0.01	.803	
Born 1995/2005	0.89	0.29	0.13	.002		0.28	0.40	0.04	.484	
Degree of impairment (step 5)	-0.29	0.05	-0.33	.000	.16***	-0.44	0.06	-0.47	.000	.28***
Type of Disability (step 6)					.10***					.07***
Intellectual disability	-2.36	0.27	-0.37	.000		-1.46	0.36	-0.23	.000	
Multiple disabilities	-1.71	0.47	-0.20	.000		-2.80	0.79	-0.21	.000	
Other	-1.49	0.46	-0.12	.001		-1.93	0.47	-0.22	.000	
R^2:					.33					.44

Ref cat.: Under 30,000 inhabitants; Born 1993/2003; Physical disabilities. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 5: Hierarchical regression analysis predicting social participation with peers attending mainstream daycare for more than 19 hours per week (pooled sample). Reporting: Beta-values (b), standard errors (SE B), standardised betas (Beta), p-value and explained variance (R^2 ; $N = 633$)

	b	SE B	Beta	P value	ΔR^2
Constant	20.81	0.46		.000	
Year 2009 (step 1)	1.00	0.22	0.15	.000	.03***
Municipality population size (step 2)					.01
30,000 to 99,999 inhabitants.	-0.07	0.25	-0.01	.795	
Over 100,000 inhabitants.	-0.34	0.26	-0.04	.189	
Girl (step 3)	0.43	0.20	0.07	.037	.01*
Age (step 4)					.01*
Born 1994/2004	-0.04	0.24	-0.01	.863	
Born 1995/2005	0.74	0.26	0.10	.004	
Degree of impairment (step 5)	-0.33	0.04	-0.35	.000	.21***
Type of Disability (step 6)					.10***
Intellectual disability	-2.18	0.24	-0.35	.000	
Multiple disabilities	-1.75	0.45	-0.17	.000	
Other	-1.62	0.37	-0.15	.000	
Special education (step 7)					.00
1-10 hours	-0.44	0.25	-0.07	.074	
Over 10 hours	-0.43	0.33	-0.05	.195	
Assistant (step 8)					.00
1-10 hours	0.62	0.35	0.07	.077	
Over 10 hours	0.42	0.25	0.07	.097	
R^2:					.37

Ref cat.: Under 30,000 inhabitants; Born 1993/2003; Physical disabilities; No special education, No assistant . * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 6: Hierarchical regression analysis predicting social participation with peers attending mainstream daycare for more than 19 hours per week in 1999 and 2009. Reporting: Beta-values (b), standard errors (SE B), standardised betas (Beta), *p* value and explained variance (*R*²; 1999: *N* = 415; 2009: *N* = 217)

	1999					2009				
	B	SE B	Beta	<i>P</i> value	ΔR^2	b	SE B	Beta	<i>P</i> value	ΔR^2
Constant	20.10	0.57		.000		22.97	0.71		.000	.
Municipality population size (step 1)					.00					.00
30,000 to 99,999 inhabitants	-0.06	0.33	-0.01	.864		-0.05	0.39	-0.01	.906	
Over 100,000 inhabitants	-0.21	0.32	-0.03	.526		-0.56	0.43	-0.07	.197	
Girl (step 2)	0.67	0.26	0.11	.009	.01	-0.11	0.33	-0.02	.734	.01
Age (step 3)					.02*					.00
Born 1994/2004	0.10	0.31	0.02	.749		-0.05	0.37	-0.01	.893	
Born 1995/2005	0.86	0.33	0.13	.008		0.58	0.42	0.08	.171	
Degree of impairment (step 4)	-0.31	0.05	-0.35	.000	.18***	-0.39	0.07	-0.40	.000	.31***
Type of Disability (step 5)					.12***					.10***
Intellectual disability	-2.52	0.31	-0.40	.000		-1.40	0.39	-0.23	.000	
Multiple disabilities	-1.62	0.53	-0.18	.002		-3.89	0.95	-0.24	.000	
Other	-1.38	0.52	-0.12	.008		-2.04	0.50	-0.23	.000	
Special education (step 6)					.00					.03***
1–10 hours	-0.03	0.31	-0.01	.910		-1.34	0.41	-0.22	.001	
Over 10 hours	-0.25	0.41	-0.03	.535		-0.50	0.60	-0.06	.399	
Assistant (step 7)					.00					.01
1–10 hours	0.66	0.49	0.06	.185		0.84	0.48	0.10	.078	
Over 10 hours	0.48	0.33	0.07	.151		0.63	0.38	0.10	.100	
<i>R</i>²:					.34					.47

Ref cat.: Under 30,000 inhabitants; Born 1993/2003; Physical disabilities; No special education, No assistant . **p* < .05; ***p* < .01; ****p* < .001.