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Chapter II

Effects of Regular Versus Special School Placement on Students with Down Syndrome: A Systematic Review of Studies

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Abstract

Background Since the 1980s, more and more children with Down syndrome are in regular education. Parents and schools expect social and cognitive advantages.

Method This systematic review of studies on the effects of school placement of students with Down syndrome, with special reference to self-help skills, language, academics and social functioning, is based on the following criteria. Firstly, studies were published in the period 1970-2010. Secondly, any study with a direct comparison between placements in developmental or social outcomes was included. However, studies with a very small sample size ($n < 3$) were excluded. Thirdly, non-comparative studies were included if in the study the acceptance of regularly placed children with Down syndrome by their own classmates was evaluated. Single case studies were excluded. Finally, studies were published in English, Dutch, German, French, Italian, Portuguese, Spanish, Norwegian, Swedish, Danish or Greek. To detect studies, comprehensive sources such as Picarta, Google, Medline, ERIC and Science Direct were used. In addition, a request for relevant research reports was sent out to all member organisations of the European Down Syndrome Organisation (EDSA).

Results The literature search yielded 133 potentially relevant studies, of which 53 met the inclusion criteria. In 26 studies, regularly and specially placed children with

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Down syndrome were compared and in another 27 studies, the acceptance of regularly placed children with Down syndrome by their classmates was evaluated. In nine of the 26 comparative studies, no attempt was made to disentangle the effect of selective placement from the effect of differences in stimulation between settings. However, in fifteen studies researchers did statistically correct for the effect of important other child and/or family variables that could have an impact on development. Furthermore, four studies can be considered to be natural experiments in which school placement was not determined by child characteristics but by geographical area and/or generation. Results show that regular classroom placement yields a better development of language and academic skills, even after the effect of selective placement has been taken into account. As regards self-help skills, under the same condition, there seem to be no differences between both types of school. Social functioning shows a mixed image. For social network, behaviour, and self-competence, no differences at all or small positive differences for regularly placed children were found. However, most studies also highlight that mere placement in a regular setting without any support is not enough. Interactions between children with and without Down syndrome need to be modelled and fostered. Furthermore, although regularly placed children are generally fairly well accepted by their peers, they are less often seen as 'best' friend. Apparently, in special education, there exist more opportunities for being 'best' friends.

Conclusion Children with Down syndrome learn more academic and language skills in regular education, not only because of selective placement. They are well accepted by their peers. However, peer interactions need to be modelled and fostered. Furthermore, opportunities for the development of intimate 'best' friendships have to be organized explicitly.

Keywords: Down syndrome, education, disability, inclusion, inclusive education

Introduction

In many developed countries the right to public school education for children with Down syndrome was not established until the 1970s. With the exception of Italy, a country adopting a full inclusive educational system as early as 1977, in practical terms this newly acquired right to education almost inevitably meant special school placement. In the 1970s, and in most countries even in the early 1980s, very few students with Down syndrome entered regular education.

However, since the mid 1980s in many countries, including the UK (Cuckle, 1997), Australia (Bochner and Pieterse, 1996) and the Netherlands (de Graaf, 2007a; Scheepstra, 1998), more and more children with Down syndrome are entering regular schools. For children with Down syndrome, the parent's choice for more inclusion has been and still is the driving force for changes in educational placements. Dutch studies show that parents with children with Down syndrome choose regular schools for social, educational and ethical reasons (de Graaf, 1998; Pijl and Scheepstra, 1998; Poulisse, 2002).

The consequences of the social principle of inclusive education, the expectation that in the long term regular school placement of children with disabilities will lead to a more open and tolerant society, are rather difficult to research in any direct way. However, one could argue that a more tolerant society derives from positive experiences in childhood, such as children with disabilities being accepted by peers. The extent to which this is really

happening in the schools can be researched. Consequently, an important research topic is the question whether regular school placement really leads to the social and cognitive advantages these parents (and those regular schools which agree to take the child) are expecting and hoping for. Does regular placement of students with Down syndrome really lead to better self-help skills, language development, academics and social functioning?

Earlier Reviews on the Effect of Placement for Children with Disabilities

Studies into the effects of special versus regular placement for children with disabilities date back into the 1930s (Carlberg and Kavale, 1980). Three meta-analyses (Baker, Wang, and Walberg, 1994/95; Carlberg and Kavale, 1980; Wang and Baker, 1985/86) conclude that placement in a regular class leads to small to moderate positive effects on cognitive and social development of students with intellectual disabilities (ID). However, in a recent review, Lindsay (2007) states that there is not enough methodologically sound research to prove the superiority of inclusive education for students with disabilities. However, Lindsay's review is rather limited in scope, only reviewing articles in eight relevant journals published in the period 2001-2005. In contrast, Ruijs and Peetsma (2009) reviewed a larger body of research and conclude that inclusive education leads to neutral to positive effects on cognitive and socio-emotional development.

The academic achievement of students with special educational needs in inclusive classes is comparable or even better to that of their counterparts in non-inclusive classes. However, most studies in these reviews focus on students with mild disabilities, including many studies on students with specific learning difficulties.

Only one review by Freeman and Alkin (2000) specifically aims at research on students with ID, ranging from mild to severe ID. These reviewers state that many of these studies suffer from methodological shortcomings. Nevertheless, they conclude that the research seems to support the notion that students with ID develop more academic and social competence in regular schools than in special education, also if comparing students of similar intelligence. However, we cannot assume that the results of these reviews will automatically apply to students with Down syndrome as well. We will have to focus on Down syndrome specific research.

Earlier Down Syndrome Specific Reviews

In contrast to our review of international research, earlier reviews on the effect of regular versus school placement on students with Down syndrome were narrower in scope, and in particular covered only studies published in English.

Cunningham, Glenn, Lorenz, Cuckle, and Shepperdson (1998) identified only four outcome studies at that time, three in the UK (Casey, Jones, Kugler, and Watkins, 1988; Philips, 1992; Sloper, Cunningham, Turner, and Knussen, 1990) and one in the USA (Fewell and Oelwein, 1990). These four studies are included in our review. Buckley and Bird (2000)

identified another five comparative studies from the UK (Beadman, 1997; Dew-Hughes and Blandford, 1998; Gould, 1998; Laws, Byrne, and Buckley, 2000; and the study later published as Buckley, Bird, Sacks, and Archer, 2006). In addition they reviewed two non-comparative studies on social acceptance and interactions of students with Down syndrome in mainstream schools (Laws, Taylor, Bennie, and Buckley, 1996; Quail, 2000).

All of these studies are included in our review as well, with the exception of Dew-Hughes and Blandford (1998), as in presenting their results no distinction was made between students with and without Down syndrome and, moreover, out of 12 participants only two had Down syndrome.

Both Cunningham *et al.* (1998) and Buckley and Bird (2000) conclude that regular classroom placement appears to support academic skill development in children with Down syndrome.

Method

Criteria for Inclusion and Exclusion of Studies

Our review covers the period 1970-2010. Studies were published in English, Dutch, German, French, Italian, Portuguese, Spanish, Norwegian, Swedish, Danish or Greek. We included in our review any study in which a comparison was made between regularly and specially placed children with Down syndrome in their development or functioning. Subsequently, the material could be divided in results regarding self-help skills, language, academics and/or social functioning. However, we excluded studies in which only one regularly placed child was compared with only one specially placed other child, as this approach will yield rather idiosyncratic results. Furthermore, most comparative studies contain a regularly placed group and a specially placed control group. However, sometimes a comparison is made with a reference group outside the specific study. In that case, this study was only included if adequate and precise information on this reference group was presented.

We not only included studies on the effect of *school* placement, but also studies on the effect of regular versus special *preschool* placement, as in different countries the moment children enter the school system can vary. For instance in the Netherlands children enter the school system at age 4, while in many other countries children between 4 and 6 are still in preschool.

To avoid publication bias we included not only studies published in scientific journals, but also studies published as book, conference paper, PhD or master's thesis. We searched for articles published since 1970, because worldwide only since the 1970s, and in many countries even later, children with Down syndrome were granted the right to public school education. As a result, before the 1970s only few entered the educational system at all, and regular school placement must have been extremely rare.

Finally, we included not only studies targeted solely on pupils with Down syndrome, but also studies in which children with Down syndrome formed a substantial subgroup of a mixed research population. However, the latter were only included if the researchers presented their results separately for pupils with and without Down syndrome, or if they had checked that

their results were not different for pupils with and without Down syndrome, or if a vast majority of the children in the study had Down syndrome.

In addition, studies without a direct comparison between placements were included if in the study the acceptance of regularly placed children with Down syndrome by their classmates was evaluated.

Any study measuring this acceptance (through interviews or questionnaires with children, parents or teachers, sociometric methods or direct observation) was included, with the exception of: 1) single case studies; 2) studies targeted at investigating ways of social support in the regular school, but not actually evaluating the extent of acceptance by peers in any systematic way; 3) studies measuring attitudes of children in mainstream schools towards children with Down syndrome in general, however without them having any actual classroom contact with children with Down syndrome.

Literature Search

To reach a complete overview of studies on this issue over the period 1970-2010, a literature search was conducted in Picarta, Google, Medline, ERIC and Science Direct, using different combinations of relevant entries (Down syndrome, trisomy-21, integration, inclusion, inclusive, education, disability, school; and also equivalents in Dutch, German and French). If in a publication authors referred to other studies on this topic, we tried to obtain these as well.

To get an even broader view, beyond these language boundaries, a request for relevant research reports was sent out on the mailing list of the member organisations of the European Down Syndrome Organisation (EDSA).

In this way, it was possible to reach Board members of more than 40 syndrome specific European organisations in more than 25 countries. However, this yielded response only from Germany, France, Poland, Belgium and Malta. The organisations from these first three countries reported that to their knowledge no relevant Down syndrome specific studies on regular school placement had been conducted in their country. The organisation from Belgium referred to one study; however, this article already had been found through the literature search and, moreover, didn't meet the inclusion criteria. From Malta one study was derived, also not meeting the inclusion criteria.

Through the Down syndrome Organisation, we were brought into contact with researchers with experience in educational research on children with Down syndrome from Norway (Anne-Stine Dolva) and Italy (Renzo Vianello). Dolva (email to the first author 9-8-2011) reported that, apart from her own dissertation, to her knowledge no relevant Down syndrome specific educational studies had been conducted in Norway, Sweden and Denmark. Vianello (email to the first author 14-7-2011) sent two articles from Italy, one on attitudes of teachers, parents and peers towards students with Down syndrome and another one on the development of students with Down syndrome.

Vianello stated that in the Italian system all children with Down syndrome go to regular schools, making it impossible to conduct studies on the effects of regular placement with a specially placed control group.

Subsequently, in addition to the request to the European Down syndrome Organisation, another literature search was conducted in Google with combinations of the afore mentioned

entries, but now in Italian, Portuguese, Spanish, Norwegian, Swedish, Danish and Greek. This yielded educational studies on children with Down syndrome from Latin America, Italy and Greece. However, most did not meet our inclusion criteria.

Results

The literature search yielded 133 potentially relevant educational studies on students with Down syndrome from 23 different countries. 70 of these studies had been conducted in the period 2000-2010, 39 in the 1990s, 22 in the 1980s and only 2 in the 1970s, confirming the fact that in the 1970s, integration in regular education of children with Down syndrome must have been extremely rare.

This total of 133 potentially relevant studies contained 31 comparative studies from 8 different countries and 102 non-comparative studies from 23 different countries. Applying the exclusion criteria, the total number of included studies was reduced to 53 from 12 different countries, with 26 comparative studies from 6 different countries (Argentina, Australia, Ireland, the Netherlands, UK, USA) and 27 non-comparative studies from 11 different countries (Australia, Colombia, Guatemala, Ireland, Italy, the Netherlands, New Zealand, Norway, South Africa, UK, USA). Consequently, bearing in mind that four decades of international research in 11 different languages were reviewed, the picture that emerges is the relative scarcity of studies on the topic.

In table 1, in order of year of publication, all comparative studies included are presented. In table 2 the non-comparative studies included are presented. If the same study was reported in different publications, for instance as a thesis and as articles, the publication with most details is referred to in the first column in the tables 1 and 2.

Table 3 presents studies excluded, explaining the reasons why. Out of the pool of potentially relevant comparative studies, one study (Diniz, 2008) (Table 3, No. 63) was excluded because only two children were compared; one study (Dew-Hughes and Blandford, 1998) (Table 3, No. 103) because no clear distinction was made between students with and without Down syndrome; and three studies (Gheradini, 2000; Schramm, 1974; Vianello and Lanfranchi, 2009) (Table 2, No. 39 and 53; Table 3, No. 61) because a comparison was made with a reference group outside the study without precise information on this reference group. However, two of these studies (Gheradini, 2000; Schramm, 1974) (Table 2, No. 39 and 53) could be included as a non-comparative study containing information on acceptance by classmates.

Out of the pool of potentially relevant non-comparative studies a majority of 53 were excluded because the study contained no information on social acceptance. Also excluded were 20 single case studies, 6 studies on attitudes of school children to children with Down syndrome in general (instead of own classmates with Down syndrome) and 5 mixed population studies in which no clear distinction was made between students with and without Down syndrome.

As can be seen in table 3, a few studies were excluded for more than one reason.

Table 1. Included comparative studies on the effect of (pre)school placement on students with Down syndrome

| Study | Country | N | Longitudinal/ Cross-sectional | Age in yrs | Data sources | Effect* of regular placement | | | | Also reported in: |
|------------------------------------|---------|-----|----------------------------------|--------------------------------------|--------------------------------------|------------------------------|----------|-----------|---|-------------------|
| | | | | | | Self-help | Language | Academics | Social | |
| 1. Matthews (2009) | Ireland | 65 | C | 12-19 | Parent questionnaires | - | - | - | 0 Having a close friend; AR Having a group of friends; AR (s) Having a friend without a disability; AR (s) Speaking to many people during social activities; AR (s) Number of social activities in clubs | |
| 2. Turner <i>et al.</i> (2008) | UK | 71 | L | 6-14 at t1; 11-19 at t2; 18-26 at t3 | Teacher and parent questionnaire | - | - | AR (s) | - | |
| 3. Vervat (2008) | NL | 43 | C | 8-13 | Parent scale and PSPCSA by the child | AR (s) | AR (s) | - | 0 Self-esteem | |
| 4. Dijkxhoorn <i>et al.</i> (2007) | NL | 504 | C | 4-18 | Vineland screener (parents) | AR (s) | - | - | - | |

Table 1. (Continued)

| Study | Country | N | Longitudinal/ Cross-sectional | Age in yrs | Data sources | Effect* of regular placement | | | | Also reported in: |
|---|---------|------------------------------|----------------------------------|------------|--|------------------------------|----------|-----------|---|---------------------------------|
| | | | | | | Self-help | Language | Academics | Social | |
| 5. de Graaf (2007a;b) | NL | 121 | C | 5-13 | Parent questionnaire | AR (s) | AR (s) | AR (s) | AR (s) Friendships at home; AR (s) Having a friend without a disability; AS (s) Having a friend with a disability; AS (s) Equal friendships at school | |
| 6. Buckley, Bird, Sacks, <i>et al.</i> (2006) | UK | 46 (now) + 90 (older cohort) | C | 11-20 | Parent questionnaire; Vineland; Conners rating scale | 0 | AR (s) | AR (s) | 0 Socialisation Vineland; AR (s) Behavioural problems + social mature behaviour; AS (s) Interpersonal relationships | Buckley <i>et al.</i> (2002a;b) |
| 7. McMahon (2003) | Ireland | 38 | C | 6-16 | Parent questionnaire (adaptation of Vineland) | - | 0 | - | 0 Socialisation and behavioural problems | |

| Study | Country | N | Longitudinal/ Cross-sectional | Age in yrs | Data sources | Effect* of regular placement | | | | Also reported in: |
|----------------------------------|-----------|----------------|----------------------------------|------------|--|------------------------------|----------|-----------------------------------|--|-------------------|
| | | | | | | Self-help | Language | Academics | Social | |
| 8. Cuckle and Wilson (2002) | UK | 14 | C | 12-18 | Interviews with students, classmates, parents and teachers | - | - | - | AS Friends at school | |
| 9. Freeman and Kasari (2002) | USA | 27 | C | 5-11 | Direct observation | - | - | - | AS (s) Quality of interaction during play date with chosen friend | |
| 10. Bochner <i>et al.</i> (2001) | Australia | 30 | C | 18-36 | Normative tests on reading and language | - | AR (s) | AR (s) Reading | - | |
| 11. Laws <i>et al.</i> (2000) | UK | 44 | C | 7-14 | Normative tests on reading, language and memory. | - | AR (s) | AR (s) Reading | - | |
| 12. Begley (1999) | UK | 64 | C | 8-16 | PSPCSA (child) | - | - | - | 0 Self-esteem | |
| 13. Gould (1998) | UK | 24 | C | 11-18 | PSPCSA (child) | - | - | - | 0 Self-esteem | |
| 14. Beadman (1997) | UK | 22 | C | 4-12 | IQ-test; ratings of behaviour by teachers | - | AR | - | 0 Behavioural problems | |
| 15. Bronson <i>et al.</i> (1997) | USA | 115 (38 DS) | C | 5 | IQ; systematic observation | - | - | AR (s) Task-oriented behaviour | AR(s) Using adequate social strategies | |
| 16. Bochner and Pieterse (1996) | Australia | 87 | C | 13-20 | Parent questionnaire | 0 | - | AR | AR Independent behaviour | |

Table 1. (Continued)

| Study | Country | N | Longitudinal/ Cross-sectional | Age in yrs | Data sources | Effect* of regular placement | | | | Also reported in: |
|--|-----------|---------------------|----------------------------------|--------------------------------------|---|------------------------------|----------|--------------------------------|--|-------------------|
| | | | | | | Self-help | Language | Academics | Social | |
| 17. Yadarola (1996) | Argentina | 54 (C) ; and 10 (L) | C (54); and L (10) | 5-10 (C); 5-10 (L) at t1, 9-14 at t4 | Teacher and parent questionnaires and interviews; classroom and recess observations | - | AR | AR | AR Number of interactions; Positive interactions; Child's satisfaction with school and with school tasks | Yadarola (1998) |
| 18. Laws <i>et al.</i> (1995) | UK | 14 | L | 4-10 at t1; 8-14 at t2 | Normative tests on reading, language and non-verbal IQ | - | AR (s) | AR (s) | - | |
| 19. Hauser-Cran and Bronson (1993) | USA | 148 (49 DS) | C | 3 | IQ; systematic observation | - | - | AR (s) Task-oriented behaviour | AR (s) Using adequate social strategies | |
| 20. Philps (1992) | UK | 30 | C | 5-11 | Normative tests on language and IQ, teacher questionnaire | - | 0 | AR (s) | AR (s) Number of interactions at playtime; AS (s) Number of language initiations to peers | |
| 21. Fewell and Oelwein (1990) | USA | 135 (58 DS) | L | 3-10 (6 mths between t1 and t2) | Criterion-referenced test | 0 | AS (s) | - | 0 Social development | |
| 22. Sloper, Cunningham, <i>et al.</i> (1990) | UK | 181 | C | 6-14 | Teacher and parent questionnaire | AR (s) | - | AR (s) | - | |

| Study | Country | N | Longitudinal/ Cross-sectional | Age in yrs | Data sources | Effect* of regular placement | | | | Also reported in: |
|--|---------|-----|----------------------------------|------------|---|------------------------------|----------|-----------|--|-------------------|
| | | | | | | Self-help | Language | Academics | Social | |
| 23. Sloper, Turner, <i>et al.</i> (1990) | UK | 181 | C | 6-14 | Teacher and parent questionnaire | - | - | - | 0 Social contacts after school | |
| 24. Casey <i>et al.</i> (1988) | UK | 36 | L | 4-10 | Normative tests on language, math, MA | - | AR (s) | AR (s) | - | |
| 25. Lorenz <i>et al.</i> (1985) | UK | 115 | C | 5-7 | IQ; MA; teacher questionnaire on reading; | | | AR (s) | | |
| 26. Sinson and Wetherick (1981) | UK | 7 | L | 2-5 | Direct observation of interactions with peers | | | | AS Eye contact and social interactions | |

*: 0= no difference; AR= Advantage for Regular students; AS= Advantage for Special students; (s)= statistically significant difference ($p < 0.05$).

Table 2. Included descriptive studies on the social acceptance of regularly placed students with Down syndrome

| Study | Country | N | Longitudinal/ Cross-sectional | Age in yrs | Data sources | Also reported in: |
|------------------------------------|--------------|------------|----------------------------------|------------|--|----------------------------|
| 27. Dolva (2009) | Norway | 6 | L | 10 | Participant observation and interviews with staff and child with Down syndrome | Dolva <i>et al.</i> (2010) |
| 28. Guralnick <i>et al.</i> (2009) | USA | 81 (27 DS) | C | 4-7 | Parent questionnaires on social network; normative tests on language and IQ; parent rating scales for behaviour; Vineland | |
| 29. Klompas (2008) | South Africa | 3 | C | 8-12 | Interviews with parents and teachers | |
| 30. Castro (2007) | Colombia | 60 | C | 3-16 | Questionnaires for school staff, parents, counsellors and persons with Down syndrome | |
| 31. Wilson (2007) | UK | 35 (18 DS) | C | 5-16 | interviews with staff; rating of self-esteem (competence and social acceptance) with the PSPCSA (child) | |
| 32. de Graaf (2006) | NL | 15 | L | 4-13 | Interviews with parents, regular teachers and counsellors from special education; narrative observations; parent and staff questionnaires. | |
| 33. Hamilton (2005) | Australia | 30 (10 DS) | L | 4-5 | Observations of interactions | |

Table 2. (Continued)

| Study | Country | N | Longitudinal/ Cross-sectional | Age in yrs | Data sources | Also reported in: |
|---|-------------|------------|----------------------------------|--------------------------|---|--|
| 34. Solorzano Arriaga (2005) | Guatemala | 5 | C | 5-12 | Observations of interactions, interviews with teachers and parents | |
| 35. Commodari and Pirrone (2004) | Italy | 119 | C | 11-15 | Sociometric ratings by classmates | |
| 36. Shevlin <i>et al.</i> (2003) | Ireland | 3 | C | 13-15 | Interviews with parents (looking in retrospective at integration in primary school) | |
| 37. Rietveld (2002) | New Zealand | 4 (2 DS) | L | 4-5 | Observations of interactions; interviews with staff and parents. | Rietveld (2008) |
| 38. de Graaf (2001) | NL | 12 | C | 5-13 | Interviews with parents and teachers; narrative observations. | de Graaf (2002) |
| 39. Gheradini (2000) | Italy | 385 | C | 6-15 | Questionnaires for teachers and head teachers | |
| 40. Quail (2000) | UK | 7 | C | 11-18 | Observations of interactions | |
| 41. de Graaf (1998) | NL | 18 (16 DS) | C | 5-16 | Interviews with parents | |
| 42. Kliewer (1998a;b) | USA | 10 | L | 2-10 | Participant observation and interviews with staff | |
| 43. Scheepstra (1998) | NL | 23 | C | 6-8 | Observations of interactions; ratings of social acceptance by teachers; sociometric rating by classmates. | Scheepstra <i>et al.</i> (1999); Pijl and Scheepstra (1996;1998) |
| 44. Laws <i>et al.</i> (1996) | UK | 16 | C | 8-11 | Sociometric ratings by classmates | |
| 45. Wolpert (1996) | USA | 250 | C | 4-20 | Parent and teacher questionnaire | |
| 46. Petley (1993) | UK | 10 | C | 6-8 | Interviews with parents and headmasters | |
| 47. Rietveld (1989) | New Zealand | 6 | L | 6-7 at t1; 9-11 at t2 | Observations of interactions | |
| 48. Rietveld (1986) | New Zealand | 8 | C | 6-7 | Observations of interactions; teacher questionnaire. | |
| 49. Hudson and Clunies-Ross (1984) | Australia | 15 (11 DS) | C | 5-8 | Sociometric ratings by classmates; ratings by parents and teachers; observations of interactions | |
| 50. Pieterse and Center (1984) | Australia | 8 | C | 7-9 | Sociometric ratings by classmates; teacher ratings. | |
| 51. Knox (1983) | Australia | 6 | L | 3-7 | Observations of interactions | |
| 52. Rogers-Warren <i>et al.</i> (1980). | USA | 4 | C | 5-6 | Observations of interactions | |
| 53. Schramm (1974) | USA | 2 | C | 8-10 | Interviews with parents and teachers | |

Table 3. Studies excluded from the review

| Study | Country | Reason* for exclusion |
|--|----------------------------------|-----------------------|
| 54. Odluyurt and Batu (2010) | Turkey | C |
| 55. Tanti Burlò (2010) | Malta | C |
| 56. Wendelborg and Tøssebro (2010) | Norway | F |
| 57. Beltrame <i>et al.</i> (2009) | Brazil | E |
| 58. Doherty and Egan (2009) | Ireland | C |
| 59. Gannon and McGilloway (2009) | Ireland | D |
| 60. Hooton and Westaway (2009) | UK | C |
| 61. Vianello and Lanfranchi (2009) | Italy | B |
| 62. Silva (2009) | Brazil | C;E |
| 63. Diniz (2008) | Brazil | A |
| 64. Keenan (2008) | Ireland | C |
| 65. Koulousia (2008) | Greek | C |
| 66. Morrison (2008) | South Africa | E |
| 67. Muniz (2008) | Brazil | C |
| 68. Neto and Silva (2008) | Brazil | C |
| 69. Sirlopu <i>et al.</i> (2008) | Chile | D |
| 70. Gannon and McGilloway (2007) | Ireland | D |
| 71. Sioutis (2007) | Greek | C |
| 72. Alvarez and Ramirez (2006) | Colombia | C |
| 73. Casale-Giannola and Wilson Kamens (2006) | USA | E |
| 74. Johnson (2006) | UK | C |
| 75. Engelbrecht <i>et al.</i> (2005) | South Africa | C |
| 76. van Hove <i>et al.</i> (2005) | Belgium | F |
| 77. Kenny <i>et al.</i> (2005) | Ireland | C |
| 78. Rynders (2005) | USA | C |
| 79. Solórzano Arriaga (2005) | Guatemala | C |
| 80. Butler and Hodge (2004) | USA | E |
| 81. Down's Syndrome Association (2004) | UK | C |
| 82. Felice (2004) | Argentina | C |
| 83. Fox <i>et al.</i> (2004) | UK | C |
| 84. Campbell <i>et al.</i> (2003) | Australia | C |
| 85. Eloff and Kriel (2003) | South Africa | C |
| 86. McCormick <i>et al.</i> (2003) | USA | C;E |
| 87. Clarke (2002) | Ireland | D |
| 88. Kostelnik <i>et al.</i> (2002) | USA | E |
| 89. Mori (2002) | Argentina | C |
| 90. Newmark (2002) | South Africa | C |
| 91. Engelbrecht <i>et al.</i> (2001) | South Africa | C |
| 92. Gaad (2001) | United Arab Emirates | C |
| 93. Vianello and Moalli (2001) | Italy | D |
| 94. Wang <i>et al.</i> (2001) | USA | C |
| 95. Wolpert (2001a;b) | USA | C |
| 96. Egan-McGann (2000) | Ireland | C |
| 97. Gash <i>et al.</i> (2000) | France, Ireland, Portugal, Spain | D |
| 98. Muthukrishna <i>et al.</i> (2000) | South Africa | C |
| 99. Freeman <i>et al.</i> (1999) | USA | C |

Table 3. (Continued)

| Study | Country | Reason* for exclusion |
|--|--------------|-----------------------|
| 100. Kasari <i>et al.</i> (1999) | USA | C |
| 101. Martins (1999) | Brazil | C |
| 102. Velez <i>et al.</i> (1999) | Colombia | C |
| 103. Dew-Hughes and Blandford (1998) | UK | F |
| 104. Giangreco <i>et al.</i> (1998) | USA | E |
| 105. Cuckle (1997) | UK | C |
| 106. Engelbrecht <i>et al.</i> (1997) | South Africa | C |
| 107. Rao (1997) | Hong Kong | C |
| 108. Sader (1997) | South Africa | C |
| 109. Wybranski (1997) | USA | C |
| 110. Cheney and Demchak (1996) | USA | E |
| 111. Lorenz (1996) | UK | C |
| 112. Muthukrishna (1996) | South Africa | C |
| 113. Scheepstra <i>et al.</i> (1996) | NL | C |
| 114. Cormany (1994) | USA | C;F |
| 115. Passaro (1994) | USA | C;E |
| 116. Fox and Hanline (1993) | USA | C |
| 117. Barringer (1992) | USA | E |
| 118. Elias (1991) | USA | E |
| 119. West and Cummins (1990) | USA | C |
| 120. Center (1989) | Australia | F |
| 121. Allen (1987) | UK | E |
| 122. Fredericks <i>et al.</i> (1987) | USA | C |
| 123. Bookbinder (1986) | UK | E |
| 124. Budgell (1986) | UK | C |
| 125. Elias <i>et al.</i> (1986) | USA | E |
| 126. Fredericks (1986) | USA | E |
| 127. Humphreys (1984) | USA | C |
| 128. Centre for Studies on Integration in Education (1983) | UK | C;E |
| 129. Elias <i>et al.</i> (1983) | USA | E |
| 130. Bruni (1982) | USA | E |
| 131. Cooke (1982) | USA | C;E |
| 132. Hayes <i>et al.</i> (1981) | Australia | C;F |
| 133. Gorelick and Brown (1974) | USA | C |

*: A= Comparative study with only two children; B= Study in which a comparison is made with a reference group outside the study, without presenting adequate and precise information on this reference group; C= Non-comparative study, however without information on the extent of social acceptance of the students with Down syndrome by their peers; D= Study exploring peer attitudes to children with Down syndrome in general, not to real classmates with Down syndrome; E= Non-comparative single case study; F= Study in which only a minority has Down syndrome and in presenting the results no distinction is made between students with and without Down syndrome.

Selective Placement or Differential Stimulation?

To understand differences in development between specially and regularly placed students with Down syndrome, two processes should be disentangled: selective placement versus differential stimulation. Do children with Down syndrome acquire more academics in regular education because the children with more potential have a higher chance to be in regular education? Or, do they learn more academics because regular education is more stimulating?

For practical and ethical reasons, it is impossible to conduct at random trials of placements. So, researchers usually use one of two different approaches, or a combination of both, to differentiate between the effects of selective placement versus differential stimulation. The first approach is looking at the effect of placement on a dependent variable (for instance academics) while statistically correcting for the possible effects of other relevant child and/or family variables (for instance mental age of the child or parental educational level). The second approach is looking at natural experiments in which school placement was not determined by child characteristics but by geographical area and/or generation.

Self-Help Skills

Seven studies (Table 1, No. 3-6, 16, 21, 22) could be found in which a comparison between placements was made with regard to self-help skills of children with Down syndrome. In four of these studies, notably an English study from Sloper, Cunningham, *et al.* (1990) (No. 22) and three Dutch studies of respectively Vervat (2008), Dijkxhoorn, Oudheusden, and Berckelaer-Onnes (2007) and de Graaf (2007b) (No. 3, 4, and 5), a difference was found, i.e. the regularly placed students were more advanced. However, this could very well be the result of selective placement.

In research conducted by Sloper, Cunningham, *et al.* (No. 22), the difference between regularly and specially placed students in self-help skills disappeared after controlling for differences in mental age. Furthermore, in both a study of Buckley, Bird, Sacks, *et al.* (2006) (also reported in Buckley, Bird, Sacks and Archer, 2002a;b) (No. 6) and Fewell and Oelwein (No. 21), no significant differences in self-help skills were found.

It is important to note that the study of Buckley, Bird, Sacks, *et al.* (2006) can be considered to be a natural experiment, in which according to Buckley and colleagues school placement was not determined by child characteristics but by differences in educational policy in different geographical areas. Finally, in a research of Bochner and Pieterse (1996) (No. 16) no differences were found in daily living skills between a relatively recent cohort of Australian teenagers with Down syndrome, of which more than half had been in regular education for most of their school career, and older more segregated cohorts.

There is no evidence that regular placement of children with Down syndrome leads to a better development of self-help skills, but neither there is any evidence for an advantage of special school placement in this regard. It might very well be the case that parents of children with Down syndrome have more influence on the development of their child's self-help skills than school placement.

Language

In twelve studies (Table 1, No. 3, 5-7, 10, 11, 14, 17, 18, 20, 21, 24), researchers evaluated language development. In only one of these, notably Fewell and Oelwein (1990) (No. 21), a difference was found in favour of special placement. However, Fewell and Oelwein themselves don't attribute the higher gains in expressive language of children with Down syndrome in special preschool and school settings to the placement itself, but to the fact that in the special preschool settings an effective program for early intervention was carried out in a more intensive way. In this program strong emphasis was put on stimulating speech and language skills, among others by using whole sight word reading for language enrichment. Apparently, it is not where the children are educated, but more what is educated in a particular setting and with what intensity. However, an even more important issue in the context of this review is a methodological characteristic of this study. The more segregated children were younger than the more integrated and the researchers did not statistically control for age. Whereas development in Down syndrome is not necessarily linear, this might flaw the comparison between settings.

In a study by Philips (1992) (No. 20), no differences in formal language measures (Reynells Developmental Language scales) were found between regularly and specially placed children with Down syndrome. In another study, by McMahan (2003) (No. 7), results indicated that school placement had no statistically significant effect on the development of communicative adaptive skills in children with Down syndrome. However, the advantage in communication skills of the regularly placed children nearly reached statistical significance ($p=0.052$), despite the fact that the specially placed children on average were two years older. Yet, according to McMahan, this result of no difference remained the same when age and gender differences were taken into consideration. However, for the huge differences in calendar age of the specially and regularly placed children, correction was made in a rather rough way, only by dividing the group in children under and above twelve years of age. Moreover, in this specific comparison between specially and regularly placed children, McMahan only looked at actual school placement, without taking the child's school history into account. Consequently, students who might have been in mainstream education for almost their entire school career, and only lately had been transferred to a special school, were considered to be specially placed students. Interestingly, McMahan made two other comparisons. Both children who had previously attended mainstream preschool and children who had previously attended mainstream school displayed significantly higher communication results ($p<0.01$) than did children who had never attended another school (ten out of eleven of the students in this latter group had started their school career in special education).

In all the other nine studies (Table 1, No. 3, 5, 6, 10, 11, 14, 17, 18, 24), differences were found in favour of regular classroom placement. In five of these (No. 3, 5, 10, 14, 17) no attempt was made to disentangle the effect (on language skills) of selective placement from the effect of differences in stimulation. However, three other studies, of Buckley, Bird, Sacks, *et al.* (2006) (No. 6), Laws *et al.* (2000) (No. 11) and Casey *et al.* (1988) (No. 24), can be considered to be natural experiments. School placement was not determined by child characteristics but by differences in educational policy in different geographical areas. This implies that we may attribute the differences in language development in these three studies to differential stimulation between settings. Moreover, in the Casey *et al.* study (No. 24),

regularly placed children showed higher gains in receptive language, also after controlling for age, mental age and initial scores on language and academics. In the research of Laws *et al.* (2000) (No. 11), regularly placed students had higher scores on diverse measures for language skills, also after controlling for differences in receptive vocabulary (which normally correlates with mental age). And, in the study of Buckley, Bird, Sacks, *et al.* (2006) (No. 6), regularly placed students had much higher scores on speech and language skills than specially placed students, but no differences were found in daily living skills nor in the overall socialisation score on the Vineland Adaptive Behaviour Scales. Finally, in a small longitudinal study of Laws, Buckley, Bird, MacDonald, and Broadley (1995) (No. 18) on 14 students with Down syndrome, at age 4-10 years no differences between settings in language, memory and non-verbal cognitive development were found. At age 8-14 however, 6 out of 7 regularly placed children and 1 out of 7 specially placed children had some reading abilities (on the BAS). 'Readers' were more advanced on measures for language development at age 8-14. There were no differences in non-verbal abilities.

On basis of the available recent studies we may conclude that regular classroom placement has considerable advantages for the language development of children with Down syndrome. Especially in the study of Buckley, Bird, Sacks, *et al.* (2006) (No. 6), a large effect was found. The regularly placed teenagers in this particular study had on average scores of 2 years and 6 months higher on speech and language skills on the Vineland (and moreover, in a parent questionnaire on average their speech was rated as more articulate).

Academics

Fourteen studies (Table 1, No. 2, 5, 6, 10, 11, 15-20, 22, 24, 25) related to academic skills. In each of these, regularly placed students with Down syndrome had better academic skills than their specially placed counterparts. This also applies after correcting for differences in non-academic cognitive functioning, as demonstrated in the studies of Turner, Alborz, and Gayle (2008) (No. 2), de Graaf (2007b) (No. 5), Buckley, Bird, Sacks, *et al.* (2006) (No. 6), Bronson, Hauser-Cran, and Warfield (1997) (No. 15), Hauser-Cran and Bronson (1993) (No. 19), Philips (1992) (no. 20), Sloper, Cunningham, *et al.* (1990) (no. 22), Casey *et al.* (1988) (No.24) and Lorenz, Sloper, and Cunningham (1985) (No. 25). In addition, three studies of Buckley, Bird, Sacks, *et al.* (2006) (No. 6), Laws *et al.* (2000) (No. 11) and Casey *et al.* (1988) (No. 24) can be considered to be natural experiments in which school placement was not determined by child characteristics but by geographical area. In one more study, of Laws *et al.* (1995) (No. 18), no differences between settings in language, memory and non-verbal cognitive development were found early in the school career of the children with Down syndrome at age 4-10 years. At age 8-14 however, 6 out of 7 regularly placed children and 1 out of 7 specially placed children had some reading abilities (on the BAS). Finally, making a comparison with older almost totally segregated generations of students with Down syndrome, both the study of Buckley, Bird, Sacks, *et al.* (2006) (No. 6) and Bochner and Pieterse (1996) (No. 16) show a considerable advantage in academic skills in the more recent cohorts of teenagers with Down syndrome, of which many had been in regular education for most of their school career. The Buckley, Bird, Sacks, *et al.* (2006) study demonstrates that this generational difference is totally explained by the higher level of

academic skills of the students with Down syndrome in regular educational settings in the more recent cohort.

We may conclude that the differences in academic skills in favour of regularly placed children with Down syndrome cannot be the result merely of selective placement in regular schools of the more able children. It also is a direct result of more stimulation of academic development in regular settings. Turner *et al.* (2008) (No. 2) and Sloper, Cunningham, *et al.* (1990) (No. 22) found a modest beneficial effect on academic skills of mainstream attendance. In the studies of de Graaf (2007b) (No. 5), Buckley, Bird, Sacks, *et al.* (2006) (No. 6), Laws *et al.* (2000) (No. 11), Yadarola (1996) (No. 17) and Laws *et al.* (1995) (No. 18), even considerable advantages of regular placement on the development of academic skills were demonstrated. Moreover, the beneficial effects of regular classroom placement have been proven for diverse aspects of school learning, notably task-oriented behaviour (Bronson *et al.*, 1997 (Table 1, No. 15); Hauser-Cran and Bronson, 1993 (No. 19); Yadarola, 1996 (No. 17)), reading (Bochner, Outhred, and Pieterse, 2001 (No. 10); Buckley, Bird, Sacks, *et al.*, 2006 (No. 6); de Graaf, 2007b (No. 5); Laws *et al.*, 2000 (No. 11); Laws *et al.*, 1995 (No.18); Lorenz *et al.*, 1985 (No. 25); Philips, 1992 (No. 20); Sloper, Cunningham, *et al.*, 1990 (No. 22); Turner *et al.*, 2008 (No. 2); Yadarola, 1996 (No. 17)), writing (Buckley, Bird, Sacks, *et al.*, 2006 (No. 6); de Graaf, 2007b (No. 5); Philips, 1992 (No. 20); Sloper, Cunningham, *et al.*, 1990 (No. 22); Turner *et al.*, 2008 (No.2); Yadarola, 1996 (No.17)) and math (Buckley, Bird, Sacks, *et al.*, 2006 (No. 6); Casey *et al.*, 1988 (No. 24); de Graaf, 2007b (No. 5); Sloper, Cunningham, *et al.*, 1990 (No. 22); Turner *et al.*, 2008 (No. 2); Yadarola, 1996 (No. 17)).

Social Aspects

As regards social aspects, in eighteen studies (Table 1, No. 1, 3, 5-9, 12-17, 19-21, 23, 26), a comparison was made between regular and special placement. The results show a mixed image.

In ten studies (Table 1, No. 1, 3, 6, 7, 12, 13, 14, 17, 21, 23), no significant differences between settings were found in social aspects, notably regarding social skills (McMahon, 2003) (No. 7), gains in social skills (Fewell and Oelwein, 1990) (No. 21), social network (Sloper, Turner, Knussen, and Cunningham, 1990) (No. 23), self-esteem (Begley, 1999 (No. 12); Gould, 1998 (No. 13); Vervat, 2008 (No. 3)), behavioural problems (Beadman, 1997 (No. 14); Buckley, Bird, Sacks, *et al.*, 2006 (No. 6); McMahon, 2003 (No. 7)) and having a close friend (Matthews, 2009) (No. 1). Additionally, in a study by Yadarola (1996) (No. 17), teachers in special and regular primary education rated their students with Down syndrome more or less similarly on social behaviour, peer interactions and acceptance, with the exception that, in comparison with peers in special schools, peers in regular schools were more highly rated on being protective towards their classmate with Down syndrome and on helping the child with school work, a finding by Yadarola interpreted as a sign of a supportive peer group in regular schools. In the study of Buckley, Bird, Sacks, *et al.* (2006) (No. 6), specially placed students had significantly more behavioural problems on the Vineland Adaptive Behaviour Scales, but not on the Conners Rating Scales. Furthermore, it is important to note that most mainstreamed students with Down syndrome in the research of Sloper, Turner, *et al.* (1990) (No. 23) were not in their neighbourhood school. This might

explain why in this particular study regular placement didn't lead to more opportunities for playing with other children at home. As regards self-esteem, Glenn and Cunningham (2001) state that for persons with Down syndrome the validity of the measure used, the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children, is doubtful. Too many of them rate themselves positively by choosing the most positive answer instead of really considering their own situation.

Eight studies (Table 1, No. 1, 5, 6, 15, 16, 17, 19, 20) demonstrated advantages of regular classroom placement. As regards social mature behaviour, Bochner and Pieterse (1996) (No. 16), using parent questionnaires, reported more social mature behaviour in their recent cohort of Australian teenagers with Down syndrome, of which more than half had been in regular education for most of their school career, than in older more segregated cohorts. Buckley, Bird, Sacks, *et al.* (2006) (No. 6) reported a similar difference between generations. In addition, according to the parent questionnaire conducted on the more recent cohort in the study of Buckley and colleagues, the regularly placed teenagers with Down syndrome had more social mature behaviour than their specially placed counterparts (and less behavioural problems according to the Vineland). As has been stated, in this particular study placement was not determined by child characteristics but by differences in educational policy in different geographical areas. Furthermore, Bronson *et al.* (1997) (No. 15) and Hauser-Cran and Bronson (1993) (No. 19) demonstrated in a study of respectively 115 and 148 preschoolers with developmental disabilities (one third Down syndrome) that social mature behaviour (using more adequate social strategies), and task-oriented behaviour as well, was higher in more integrated settings, also after controlling for cognitive ability of the child and demographic and socio-economic characteristics of the family. Philips (1992) (No. 20) reported that the children with Down syndrome in mainstream took part in more interactions at playtime than those in schools for children with Moderate Learning Difficulties (MLD). Based on observations, Yadarola (1996) (No. 17) reported that during recess in the special schools the social climate tended to be either one of poor control of aggression, with not enough surveillance by staff, resulting in aggressive behaviour in some children and fear in others, or one of overprotection, resulting in children mostly interacting with staff instead of peers. In the regular schools, social climate was more balanced, promoting positive interaction with peers. Although some of the children with Down syndrome in regular schools encountered overprotection by teachers and peers (actually more often than in special schools), this didn't result in an overall overprotective climate during recess. As regards social network, on the basis of parent questionnaires, de Graaf (2007a) (No. 5) reported that regularly placed students with Down syndrome had more opportunities for playing with other children (not siblings) at home than their specially placed counterparts, also after correcting for differences in non-academic skills. Furthermore, students in regular education more often had a friend without a disability, a result not only found by de Graaf (2007a) but by Matthews (2009) (No. 1) as well. In addition, in Matthew's study regularly placed children more often participated in social activities in clubs and they were more frequently rated as speaking to many people during social activities.

In six studies (Table 1, No. 5, 6, 8, 9, 20, 26) a disadvantage of regular placement was reported. Four of these studies (No. 5, 6, 8, 17) made use of questionnaires and/or interviews with students, parents and/or teachers. We firstly discuss the findings from these studies. In comparison with specially placed teenagers, regularly placed teenagers with Down syndrome had less opportunities for friendships with other peers with a developmental disability and as

a result for the development of equal close friendships at school (Buckley, Bird, Sacks, *et al.*, 2006 (No. 6); Cuckle and Wilson, 2002 (No. 8)). De Graaf (2007a) (No. 5) confirmed this finding for children with Down syndrome in primary education. However, it is important to note that, although specially placed students with Down syndrome had more opportunities for developing equal close friendships at school, these friendships seldom continued into the home situation (Cuckle and Wilson, 2002; de Graaf, 2007a), partly as a consequence of limited transport skills of the children and teenagers involved. Barriers to participation in leisure activities, according to a study of Matthews (2009) (No. 1) were not having a friend to go with, followed by not knowing how to do activities, not having a place nearby and not having a way to get there. Indeed, many parents of teenagers with Down syndrome (Bochner and Pieterse, 1996 (No. 16); Buckley, Bird, Sacks, *et al.*, 2006 (No. 6); Cuckle and Wilson, 2002 (No. 8)) worry about the relative social isolation of their child. Consequently, Cuckle and Wilson conclude that parents of children with Down syndrome should continue helping organize the social life of their child, long after the child has reached an age at which for children without Down syndrome there no longer is a need to do such.

Three other studies (Table 1, No. 9, 20, 26) made use of direct observation of interactions. Sinson and Wetherick (1981) (No. 26) videotaped the interactions of seven children with Down syndrome in a special preschool setting and of three of these children in a regular playgroup. In the regular playgroup situation, the children without a disability, on first encounter, attempted to make eye-contact with the children with Down syndrome. During this encounter, the children without a disability became increasingly uneasy, having no success in sustaining mutual gaze. Observations of the three children with Down syndrome in their regular playgroups over a period of two years indicated that the other children eventually gave up and the children with Down syndrome became isolates. In the special setting, however, the children with Down syndrome interacted with each other in much the same way as the children without a disability in the regular playgroup. There was ample evidence of mutual gaze as a precursor of verbal and play interactions. Sinson and Wetherick, clearly conceptualising from the deficit model of disability, suggest that children with Down syndrome have a deficit, demonstrated by untypical mutual gaze behaviour, directly leading to their isolation from typical peers. However, in another related article, Sinson and Wetherick (1986) state that interactions of the children with Down syndrome with their mothers, and with their siblings as well, were not affected. They conclude that the prevailing method of simply introducing a child with Down syndrome into an unknown preschool peer group unlikely will lead to successful social integration. On the other hand, according to Sinson and Wetherick (1986), prolonged contacts with peers in a family play situation with mothers present, from an early age, probably support social integration. The value of the study by Sinson and Wetherick is in demonstrating that social inclusion is not reached by mere placement without any support. However, Sinson and Wetherick fail to consider the possibility that not only mothers in a family play situation, but educators in preschool settings as well, have an opportunity to model and foster social interactions between children with and without disabilities.

Freeman and Kasari (2002) (No. 9) studied the interactions of dyads of children in play-date situations. Participants were 54 children, 27 with Down syndrome and 27 who were their chosen friend (the parents were asked to bring a friend of the child with Down syndrome to the play-date). In comparison with children with Down syndrome from regular education classes, children with Down syndrome from special education classes were rated as more

cohesive and coordinated in their quality of play and they spent more time in simple social play and less time in solitary, parallel or parallel aware play. The children from general and special education were not different on demographic and developmental characteristics. This suggests that during these organised play-dates the interactions of the children with Down syndrome with their chosen friend more often displayed the characteristics of a close friendship (instead of just being playmates) if the child with Down syndrome was from a special school.

As regards another qualitative aspect of interaction, Philips (1992) (No. 20) conclude that, although children with Down syndrome in mainstream took part in more interactions at playtime than those in MLD, when initiations of language were examined it was clear that all the children initiated more language when they were in the company of younger or less able peers. This kind of setting occurred more often in MLD schools than in mainstream, except where children played with younger children at playtime in mainstream settings. In order to stimulate more language initiations, Philips suggest that children with Down syndrome in regular education should deliberately be put in the role of leader on occasions, instead of being in a situation with more able peers all the time.

Non-Comparative Studies on Social Aspects

In addition to these comparative studies, in 27 other non-comparative studies (Table 2), the acceptance of regularly placed children with Down syndrome by their classmates was evaluated.

Sixteen of these studies (Table 2, No. 29, 30-32, 35, 36, 38, 39, 41, 43-45, 46, 49, 50, 53) evaluated acceptance by exploring the perceptions of classmates, parents, teachers and/or head teachers. Regularly placed children with Down syndrome are generally fairly well accepted by their peers, according to sociometric evaluations (Commodari and Pirrone, 2004 (Table 2, No. 35); Hudson and Clunies-Ross, 1984 (No. 49); Laws *et al.*, 1996 (No. 44); Pieterse and Center, 1984 (No. 50); Scheepstra, 1998 (No. 43)) and questionnaires and/or interviews with parents, teachers and/or head teachers (Castro, 2007 (Table 2, No. 30); Gheradini, 2000 (No. 39); de Graaf, 1998 (No. 41), 2001 (No. 38), 2006 (No. 32); Hudson and Clunies-Ross, 1984 (No. 49); Klompas, 2008 (No. 29); Petley, 1993 (No. 46); Pieterse and Center, 1984 (No. 50); Scheepstra, 1998 (No. 43); Schramm, 1974 (No. 53); Shevlin, Walsh, Kenny, McNeela, and Molloy, 2003 (No. 36); Wilson, 2007 (No. 31); Wolpert, 1996 (No. 45)). In addition, the study of Wilson (2007) (No. 31) shows that children with Down syndrome in regular education positively evaluate their acceptance by peers, rating themselves higher than children with general developmental delay (not Down syndrome), and even higher than children without a disability.

However, whereas the children in four of the sociometric studies had a generally high level of peer acceptance, in the research of Scheepstra (No. 35), though only one child had a 'rejected' sociometric status, 12 out of 23 children (6-8 years of age) had a 'neglected' status. Children with a 'neglected' status are not actively disliked or avoided, but they are less often chosen as preferred playmate. Furthermore, while in the study of Laws *et al.* (1996) (No. 44), considering all six sociometric questions, most children with Down syndrome (8-11 years of age) had an average social status, they were definitively less often seen as 'best' friend by classmates. It is important to realize that sociometric results are dependent upon the exact

content of the questions posed to children. From the sociometric study of Commodari and Pirrone (No. 35) in Italian middle school, it appears that children with Down syndrome frequently would be invited to birthday parties by classmates, however were more likely to be excluded from activities involving a certain degree of ability, like doing schoolwork together or joining a sport team. Commodari and Pirrone conclude that in middle school students without disabilities accept classmates with Down syndrome, but in practice during many school and leisure related activities prefer to socialise with peers without disabilities.

In addition, parents interviewed by de Graaf (1998) (No. 41) reported that in regular school their child's contacts with classmates gradually changed from interactions based on equality in preschool to interactions that resemble a relationship with an older sibling towards the end of primary school. Both headmasters and parents in the study of Petley (1993) (No. 46) recognized the risk of relationships in which the child is 'mollycoddled' by classmates and not treated with equal respect. According to Wilson (2007) (No. 31), school staff interviewed sometimes overestimated the degree of acceptance of children with Down syndrome by their peers, not recognizing the difference between supportive relationships and equal status relationships. Parents and teacher in the study of Klompas (2008) (No. 29) reported that the three children with Down syndrome (8-12 years of age) in this study, although well accepted, lacked reciprocal friendships. Therefore, parents of, particularly older, regularly placed students with Down syndrome should be advised to organize contacts also with peers with a disability, supplementary to the relations their child has with children without a disability. However, one could make a strong case to do just as well in the case of specially placed students, because the parents report that their special friendships with classmates are often confined to only the school hours (de Graaf, 2007a; Cuckle and Wilson, 2002) (Table 1 No. 5 and 8). Moreover, from the study of de Graaf (2007a) it is clear that specially placed children also have a larger chance of not having any friendship at all with children without a disability.

In another study (Guralnick, Connor, and Johnson, 2009) (Table 2, No. 28), acceptance by preschool peers was approached in a more indirect way, not through directly informing about peer acceptance in preschool, but asking mothers about the home-based social network of their child. In comparison with two control groups, a calendar age matched group and a mental age matched group, children with Down syndrome had a significantly smaller network size (mother-identified regular playmates, maximum of 5 children) and a less high frequency with which playmates played in mother's home in the previous 3 months. In addition, a smaller percentage of identified playmates were currently in the school program of the child with Down syndrome. Only around one third of the children with Down syndrome knew any of their playmates as a result of being classmates, whereas this was the case for nearly two thirds and over three quarters of the MA-match and CA-match groups, respectively. Guralnick *et al.* suggest that a major contributor to these peer social network limitations may well be underlying peer-related social competence difficulties in children with Down syndrome.

In twelve studies (Table 2, No. 27, 33, 34, 37, 38, 42, 43, 47, 48, 49, 51, 52), researchers explored acceptance by peers making (also) use of direct observation of interactions. An early study is by Rogers-Warren, Ruggles, Peterson, and Cooper (1980) (No. 52). In a mainstreamed preschool setting with 60 percent children with a disability, four 5-6 years old children with Down syndrome and four typically developing contrast children were observed. The children with Down syndrome and the contrast children preferred the same play areas in

the classroom and in the playground. The children with Down syndrome had a higher frequency of solitary play, the contrast children a higher frequency of parallel play. The children with Down syndrome tended to play more often with other children with a disability. The contrast children more often chose to play with peers without a disability. However, interaction between children with Down syndrome and children without a disability occurred in all activities.

Eleven studies (Table 2, No. 27, 33, 34, 37, 38, 42, 43, 47, 48, 49, 51) focussed on individual inclusion with only one child with Down syndrome being included in a regular preschool or school. As we have seen in the previous section, Sinson and Wetherick (1981) (Table 1, No. 26) suggest that children with Down syndrome over time almost inevitably will become more and more isolated in regular preschool and school settings. In a recent study by Hamilton (2005) (Table 2, No. 33) a more or less similar result was found. Compared with typically developing preschool children, children with Down syndrome in inclusive preschool displayed infrequent interactions with peers. While typically developing children increased their peer interactions during activities expected to promote peer interaction (for instance during playtime), the interactive engagement of the children with Down syndrome was unrelated to the characteristics of class activities. Longitudinally, over a period of two years, in contrast to the typically developing children, children with Down syndrome did not increase their rates of peer interaction. Informal observations revealed that teachers in this study didn't use effective strategies to enhance peer interaction in children with Down syndrome. Hamilton concludes that their implicit strategy of only prompting children to be in physical proximity to other children, without actually encouraging interactive engagement, should be supplemented by explicit teaching strategies, like designing activities that require group interaction among children and adults, prompting and reinforcing peer interaction, modelling interactive behaviour, and interpreting for the typically developing children the meaning of the social behaviour of the children with disabilities.

Some other studies contradict the suggestion of Sinson and Wetherick that children with Down syndrome over time almost inevitably will become more and more isolated in regular preschool and school settings. Knox (1983) (Table 2, No. 51) observed six children with Down syndrome (3-7 years of age, two in preschool and four in school). During the 9 week observation period, the children with Down syndrome increased both their use of language to initiate interactions with peers as well as their responding to verbal directions by peers. Hudson and Clunies-Ross (1984) (No. 49) found no differences in the rates of positive and negative peer interactions of 11 regularly placed school children with Down syndrome (6-8 years of age) in comparison with 11 randomly selected contrast children from their classrooms. However, the children with Down syndrome initiated fewer interactions with peers than the typically developing contrast children.

This last result, less initiations to peers, was found in three other studies as well (Quail, 2000 (Table 2, No. 40); Rietveld, 1986 (No. 48); Scheepstra, 1998 (No. 43)). Quail (2000) (No. 40) carried out a study of the social interactions of 7 teenagers with Down syndrome in mainstream secondary schools in comparison to peers from the same classrooms. There were no differences in overall time spent in interaction. However, the other person more often initiated the interactions of the teenagers with Down syndrome and they had more interactions with adults than with peers. Topics in the conversations of the teenagers with Down syndrome were likely to be work related rather than socially related. In this specific study, these patterns of interactions might partly be the result of the fact that the teenagers

were being supported by a Learning Support Assistant for most of the day. However, comparing 23 children with Down syndrome (6-8 years of age), in the Dutch situation with only a limited amount of support a week (8 hours), with 23 low achieving contrast children from the same classrooms, Scheepstra (1998) (No. 43) (also reported in Scheepstra, Nakken, and Pijl, 1999; and in Pijl and Scheepstra, 1996) observed fewer interactions with peers, more interactions with the teacher, fewer initiations to peers, and more work related and less socially related interactions by the children with Down syndrome. Finally, Rietveld (1986) (No. 48) compared eight children with Down syndrome (6-7 years of age) with eight low achieving contrast children from their classrooms. There were no differences in the rates of social play. However, the children with Down syndrome initiated fewer interactions to peers. Interestingly, Rietveld (1989) (No. 47) carried out a follow-up study of six of these children with Down syndrome, now 9-11 years of age. In comparison with the first study, she observed in the children with Down syndrome more initiations to peers and from peers and less interactions with the teacher. Also, a higher percentage of time was spent in social play and the interactions were more complex and varied with more advanced language. Remarkably, the difference between the children with Down syndrome and the contrast children in the rate of initiating to peers had disappeared.

Four studies (Dolva, 2009 (Table 2, No. 27); Kliever, 1998a;b (No. 42); Rietveld, 2002 (No. 37); Solorzano Arriaga, 2005 (No. 34)) made use of a more qualitative interpretative methodology. By in depth exploration of small samples, this kind of research can cast light upon the complexities of the inclusion process and the role of the cultural and educational context. Dolva (2009) (No. 27) studied six students with Down syndrome in inclusive schools, in the classroom and in the playground, collecting data through field observations and interviewing the child and the staff. The children with Down syndrome were well accepted by peers. Dolva observed examples of equal interactions in which all children participating understood the activity and could interact on a rather equal basis. However more often she observed unequal interactions, with limited understanding of the activity by the child with Down syndrome and/or involving tasks that at first were too difficult. In these situations peers spontaneously divided tasks in a complementary way, or they adjusted tasks or own behaviour or created other tasks in order to include the pupil with Down syndrome without losing the original meaning of the activity. Class staff members were found to experience interaction between students with Down syndrome and peers challenging, but still possible because of peers' acceptance. Staff applied different strategies to facilitate peer interaction, for example: organising academic activities and group work; purposefully selecting tasks and pairing children to work together; educating peers to behave supportively; providing individual support to help the child to understand activities and scaffolding participation. Solorzano Arriga (2005) (No. 34) studied the social development of five girls with Down syndrome in two Guatemalan (non-special) private schools. She concludes that social integration in the schools should be supported by making curricular adaptations and that families can play an important role in preparing their child with Down syndrome for school integration by systematically stimulating the child's development from an early age onwards. Kliever (1998a;b) (No. 42) explored the (pre)school literacy experience of 10 students with Down syndrome. Two broad definitions of literacy were uncovered. The first regarded reading as confirming to a hierarchy of sub-skills. In these classrooms students with Down syndrome were separated from citizenship in the classrooms' literate communities. The second regarded reading as the construction of shared meaning in specific contexts. In these

classrooms, students with Down syndrome were valued as symbolic beings and engaged literacy as a communication tool. As a result, during the school day, there were more opportunities for participation and for demonstrating friendship. According to Kliewer, the first definition of literacy seems to be more in line with a deficit model of disability, interpreting difference as deficit, the second with the social model. Both Kliewer (No. 42) and Rietveld (2002) (No. 37) (also reported in Rietveld, 2008) highlight the consequences of the way staff conceptualises disability. Rietveld carried out an in depth study of the experiences of four boys, two with Down syndrome and two typically developing, during their transition from preschool to school. The children were observed using continuous narrative recordings during all aspects of the curriculum in preschool and in school. Teachers, parents and peers were interviewed. Inclusion or exclusion turned out not to be within-child characteristics, but largely dependent on the context, both for the children with and without Down syndrome, demonstrated by the huge changes in the extent of inclusion between the preschool and school setting for two of the boys. In one of the schools, staff modelled that it was acceptable to exclude when 'deviant' children did not fit the existing implicit or explicit classroom rules. Also, teacher and teacher-aide positively reinforced children when they assigned the child with Down syndrome an inferior status role, for instance the role of 'the object of a caregiver'. By contrast, in another school the teacher openly interpreted the likely intent of any unconventional behaviour in a positive and valuing manner. Furthermore, she included activities that highlighted the competencies and interests of her student with Down syndrome in a way that made the overall class culture more inclusive for many more children. The teacher and teacher-aide recognised and interrupted demeaning inclusion, e.g. excessive hugging, picking up. The staff scaffolded children to re-frame any problems they interpreted within a deficit framework to one that focussed on context. Successful outcomes of inclusion were associated with schools embracing at all levels a social model of disability, that focuses on the context and sees disability as a part of, not distinct from that context.

Conclusion

In the period 1970-2010, the context of regular placement of pupils with Down syndrome has changed from integration, to mainstreaming, to inclusive education. As a result, the way children with Down syndrome are supported in regular schools may have shifted over time. Furthermore, the organisation and curriculum of special schools for children with Down syndrome may have changed. In addition, also differences between countries in these regards may and probably will exist. The evidence found in this 40-year period of research is limited to twelve different countries, or regarding only comparative studies to only six countries. As regard the beneficial effect of regular schooling on, particularly, academic and language development of children with Down syndrome, despite these cultural, organisational and educational differences between these countries, the findings of the studies in this review converge to a considerable extent. This suggests that, even with these differences, there are sufficient similarities in the organisation and curriculum of special schools for children with Down syndrome and in the support of regularly placed pupils with Down syndrome over time and between different countries - at least between the countries from which the studies are derived - to make a review of research a sensible enterprise. For instance, starting in the mid

1980s and in many different countries, regular schooling for pupils with Down syndrome means education in a regular classroom with individual support to some extent. Furthermore, one could argue that special schools for children with Down syndrome, worldwide, will tend to focus more on practical and social skill acquisition, and as a result probably be liable to de-emphasise academic skill acquisition.

From our review it can be concluded that regular placement of students with Down syndrome, i.e. education in a regular classroom with individual support to some extent, yields a better development of language and academic skills, even after the effect of selective placement has been taken into account. In some of the studies a modest beneficial effect could be proven, in other studies even considerable advantages of regular placement on the development of language and academic skills were demonstrated. As regards self-help skills, under the same condition, there seem to be no differences.

As regards social functioning, the results show a mixed image. For some social aspects (social network, behaviour, self-competence) no differences at all or small positive differences for regularly placed children were found. However, studies also highlight that for many children with Down syndrome, mere placement in a regular setting without any support might not be enough. Social interactions between children with and without Down syndrome oftentimes need to be modelled and fostered. In addition, to get around the tendency of many children with Down syndrome in regular settings to respond to initiations of others rather than initiate to peers themselves, it is also advised to put children with Down syndrome sometimes in a leading position. Two qualitative studies suggest that in schools embracing a social model of disability, rather than a deficit model, the necessary social support to facilitate both more interactions, as well as more reciprocity and equal status in these interactions, seems to be more likely available. Furthermore, although regularly placed children are generally fairly well accepted by their peers, they are less often seen as 'best' friend. In addition, regularly placed teenagers with Down syndrome have fewer opportunities for friendships with other peers with a developmental disability and, as a result, for the development of equal close friendships at school. Therefore, parents of, particularly older, regularly placed students with Down syndrome should be advised to organize contacts also with peers with a disability, supplementary to the relations their child has with children without a disability. However, one could make a strong case to do just as well in the case of specially placed students, because the parents report that their special friendships with classmates are often confined to only the school hours.

It is important to mention the fact that in research on the effect of school placement, IQ and/or mental age usually are conceptualised as independent variables, i.e. control variables in determining the effect of placement on development, and not as dependent variables. However, it is conceivable that intelligence, aside of being a factor in determining placement, itself also might be directly influenced by school experience. In that case, cross-sectional studies in which IQ and/or mental age are used as control variables might underestimate the positive effect of regular placement on academic and language development. In a study by Rao (1997) on 6 preschoolers with Down syndrome, all attending a centre-based educational intervention program for three mornings a week, 3 of these children also attended regular preschools, two days a week. The researchers compared the children in the Program Only group with those in the Program Plus Preschool group. At the start of the study, both the mother's educational level and the child's IQ, chronological age and mental age were similar in both groups. A year later, the IQ of all 3 children in the Program Only group had decreased

(on average minus 6 points, range from minus 3 to minus 10). The change in IQ scores for children in the Program Plus Preschool group was less dramatic (on average plus 1 point, range from minus 1 to plus 2). This study does not demonstrate the superiority of regular preschool placement in comparison to special preschool placement, because the 3 children not in regular preschool actually stayed at home on the days they didn't visit the special educational centre. However, acknowledging that the sample size was very small, the study does suggest that the development of IQ might be influenced by preschool experience. In earlier decades, debate was fierce on the question whether children with Down syndrome institutionalised at an early age had lower IQ's than home-reared children as a result of institutionalisation or as a result of being 'constitutionally inferior in intelligence' (Carr, 1988). Carr (1988), in her review of four decades of studies on IQ of children with Down syndrome, concludes that the evidence offers very little support for the 'constitutional inferiority' hypothesis. The alternative hypothesis, that the difference between home- and institution-reared children is due to environmental influence, according to Carr, not only accounts more simply for the facts, but is also in accord with the effects on these children of environmental enrichment. This debate might be relevant to the present discourse on the effects of school placement. Firstly, we encounter the same issue of disentangling the effect of selective placement from the effect of differences in stimulation between settings. Secondly, the former debate shows that IQ should be considered as a dependent variable, a variable that is influenced by experience and thus possibly by school experience as well. In this regard, Vianello and Moalli (2001) (Table 3, No. 93) and Gheradini (2000) (Table 2, No. 39) make the interesting suggestion that school aged children with Down syndrome in the Italian educational system, as a result of inclusion, might have a higher mean IQ than usually found in international research (according to Vianello and Moalli with an average IQ of 45 for Italian subjects and less than 40 for others); however, in both articles this hypothesis is not supported by a thorough analysis of different international studies. Nevertheless, although methodologically very complex, the suggestion of comparing the cognitive development of children with Down syndrome in different countries, contrasting inclusive educational systems with more segregated systems, could be an avenue for future research. Alternatively, in countries where some children with Down syndrome go to regular schools and others to special schools, another avenue could be following-up representative groups of children with Down syndrome throughout their school career, not only repeatedly measuring their skills, but also their mental age at different chronological ages.

Apart from studying the potential effect of an inclusive school system on mean total IQ in children with Down syndrome, Vianello and Lanfranchi (2001) (Table 3, No. 61) suggest that it might be interesting to look at their profile of development. Vianello and Lanfranchi present two Italian studies, one on mental age and academic development in school-aged children with Down syndrome, and one on intellectual level and scores on daily activities and socialization in adolescents with Down syndrome. Both studies show that in many cases the age-equivalent of specific skills (academics, especially reading; daily living skills; social skills) is higher than the age-equivalent of mental development. According to Vianello and Lanfranchi, this 'surplus' is not usually found in international research and might be the result of inclusive education. However, this hypothesis is not supported by a thorough analysis of different international studies. Vianello and Lanfranchi only refer to research of Zigler and colleagues over a period of 40 years, stating that persons with an intellectual disability oftentimes demonstrate a 'deficit' in skills in respect to their mental age, as a result of having

less motivation to work and having less self-esteem. However, firstly, this research was not Down syndrome specific, secondly the personality and motivational characteristics of the persons in Zigler's research might have been influenced by institutionalisation. Vianello and Lanfranchi conclude that, in their article they have formulated more questions than generated answers. The affirmation that 'surplus' in academic and social performance seems to be greater where academic inclusion of persons with a disability is more widespread, is still a hypothesis to confirm. However, the study of Buckley, Bird, Sacks, *et al.* (2006) (Table 1, No. 6) is in agreement with the hypothesis that education can influence the developmental profile. In a paper accompanying their study, titled 'Evidence that we can change the profile from a study of inclusive education', Buckley, Bird, and Sacks (2006) conclude that the Down syndrome specific profile – a profile of communication weaknesses relative to social and daily living skills – can be changed. It is not an inevitable outcome of having Down syndrome, as this profile is seen in teenagers in special education settings, but not in teenagers in inclusive education.

As regards the beneficial effect of regular classroom placement on language development, different mechanisms might play a role. Firstly, the regular classroom seems to be a richer language environment, with more challenging language being used by teaching staff, as a small explorative UK study of Dew-Hughes and Blandford (1998) (Table 3, No. 103) suggests. Based on observations, these researchers reported that classroom language was less sophisticated in the special schools. Language was simple and direct, allowing for comprehension by the less fluent members of the class. In mainstream schools, language was more challenging. Secondly, peers in a regular classroom will most certainly be behavioural examples using more complex language than those in a special classroom. Yadarola (1996) (Table 1, No. 17) reported that the children with Down syndrome in Argentinean special education were surrounded by peers who mostly used signs and/or very short-spoken utterances for communication, whereas peers in regular school used more complex language. As a result, children with Down syndrome in regular schools were invited and encouraged to understand and use more complex language themselves, whereas in special schools the children with Down syndrome adapted to the special-school-specific communication culture of signing and using simple phrases. Finally, more emphasis on academic skills in regular classrooms, especially on reading activities, might foster understanding and use of more complex language.

Only a very limited amount of research has been done on the reasons why regular school placement, i.e. education in a regular classroom with individual support to some extent, leads to better academic skills in children with Down syndrome. Lorenz *et al.* (1985) (Table 1, No. 25) start with denying the contention that most children with Down syndrome in special schools are not taught to read, as in their birth cohort of children with Down syndrome, 38 percent of teachers from the schools for children with Severe Learning Difficulties reported to teach reading to the children with Down syndrome and another 33 percent reported to teach prereading skills. However, Lorenz *et al.* state that their data suggest that when children with Down syndrome at a three- to five-year-level are matched for mental age, those in regular schools score highest on a checklist of reading skills and those in schools for children with Severe Learning Difficulties score lowest. Lorenz *et al.* suggest that an explanation might be that in the special school curriculum there is a greater emphasis on the development of prerequisites, including fine motor and language skills, before reading is taught, resulting in an unnecessary postponement from prereading to reading activities. The point at which

teachers move pupils from prereading to reading activities may be important in the acquisition of reading skills. Furthermore, according to Lorenz *et al.*, studies on teachers' aims suggest that teachers in special schools generally place much less emphasis on reading skills compared to teachers in regular primary schools. These findings are corroborated by both the cross-sectional and longitudinal research of Yadarola (1996) (Table 1, No. 17). In this study, teachers from special schools placed less emphasis on academic skill development. The transfer from teaching prerequisites to teaching reading, writing and math, was postponed. Most children with Down syndrome at age 9 and 10 in the Argentinean special schools had not yet been exposed to any instruction at all in reading, writing or math. Teachers in special schools strongly believed that before starting instruction in academics, certain prerequisite skills should have been developed. In sharp contrast, in regular schools, the onset of teaching these skills to children with Down syndrome usually was around the age of 5 or 6. In addition, two small explorative UK studies, of Beadman (1997) (Table 1, No. 14) and Dew-Hughes and Blandford (1998) (Table 3, No. 103), report that in special schools most teacher time was devoted to the least able children in the classroom. Effective teaching time was greatly reduced as a result of time spent on transport, physical care regimes, therapies and slower-moving members of the group. The teaching staff in special schools had lower expectations for academic achievement of their students with Down syndrome than teaching staff in mainstream schools. In special schools, classrooms were generally poorly equipped with reading materials and schemes. Furthermore, in regular school students with Down syndrome received more individual instruction time (in the UK half to fulltime personal assistance is quite common for mainstreamed children with Down syndrome). Also in the study of Philips (1992) it turned out that there was a significantly greater time spent in one to one work in mainstream than in the MLD schools studied. The Dutch research of de Graaf (2007b) confirms that in the Netherlands as well, although regular schools receive less money for extra assistance time for a student with Down syndrome than in the UK (in the Netherlands on average 4 to 8 hours extra teacher's time a week), students with Down syndrome still receive more individual instruction time in regular schools than in special schools. In addition, it was demonstrated that in regular schools children with Down syndrome on average spent one and a half to twice as much time on academic learning than in special schools.

Regular placement of students with Down syndrome has a beneficial effect on language and academic skills. However, it is important to note that merely regular placement is not enough. In the different studies regular placement means placement in a regular classroom with individual support to some extent, though varying between countries and regions and between individual students. Cunningham *et al.* (1998) and Cuckle (1997) demonstrate that in the nineties in the UK huge local differences existed in the extent to which students with Down syndrome started their school career in regular schools and in the extent to which they stayed in regular education to at least the end of primary education. These differences must be the result of varying local educational policies, probably with as a result differences in support of mainstreamed children with Down syndrome. So, an important question is what amount and kind of support is needed in order to make regular placement feasible for individual children with Down syndrome. In the Netherlands, according to de Graaf (2007a), approximately 56 percent of all children with Down syndrome from the years of birth 1993-2000 started their school career in regular education. Of children with Down syndrome who started their school career at a regular school slightly more than 40 percent continued in

regular education for the entire elementary school period. This implies that transferring mainstreamed children with Down syndrome to special school during the elementary years is quite common. Again, this points at the question what amount and kind of support is needed to make regular placement feasible for individual children with Down syndrome. Only a very limited amount of research has been done on the question why the regular school career of some children with Down syndrome comes to an early end while others continue in regular education for the entire elementary school period. From the few (Dutch) systematic studies (de Graaf, 2006, 2007a; Poulisse, 2002; Scheepstra, 1998) it can be concluded that not only child characteristics but also school characteristics determine whether a child with Down syndrome will succeed or not in regular education. Some schools succeed in providing inclusive education for very challenging children. De Graaf (2006) investigated twenty cases of 'problematic integration situations'. These included 13 children with Down syndrome whose regular school placement was in danger at that moment, 4 children who were only recently placed in a special school after one or more years of regular education and 3 children who had just started anew at another regular school after being sent away from their first regular school. In each case, parents, teaching staff from the regular school, and counsellors from special education (who advise the regular schools) were interviewed about their perceptions of why a 'problematic integration situation' had emerged. In relation to school characteristics, according to parents and counsellors from special education, differences in staff attitude and school vision on inclusion, and according to parents, counsellors and regular teachers alike, the way teachers, assistants, counsellors and parents manage to work together determine whether a child will succeed or not at a certain regular school. However, this important issue deserves a more elaborate analysis which is beyond the scope of this review.

It is important to note that research on the effects of inclusive education on children without disabilities shows that regular classroom placement of students with disabilities has no negative impact on the development of classmates (Cole, Waldron, and Majd, 2004; Hunt and Goetz, 1997; Hollowood, Salisbury, Rainforth, and Palombaro, 1994; Manset and Semmel, 1997; McDonnell, Thorson, McQuivey, and Kiefer-O'Donnell, 1997; McIntosh, Vaughn, Schumm, Haager, and Lee, 1993; Saint-Laurent *et al.*, 1998; Salend and Garrick Duhaney, 1999; Sharpe, York, and Knight, 1994; Staub, 2005; Staub and Peck, 1994/95; Waldron and Cole, 2000). According to some studies, it even brings them positive social advantages like more pro-social behaviour (Allodi, 2002; Hunt and Goetz, 1997; York, Vandercook, Macdonald, Heise-Neff, and Caughey, 1992), better moral development (Dumke and Mergenschröer, 1990; Staub, 2005; Staub and Peck, 1994/95; York *et al.*, 1992) and a more accepting and less stereotyping attitude toward persons with disabilities (Fisher, 1999; Lehrer, 1983; Salend and Garrick Duhaney, 1999; Scheepstra, 1998; Staub, 2005; Staub and Peck, 1994/95; York *et al.*, 1992) and towards persons from other minorities (Fisher, 1999; Kishi and Meyer, 1994; Staub, 2005; Staub and Peck, 1994/95).

In the light of the proven advantages of regular placement for the development of language and academics, more opportunities for inclusion of children with Down syndrome in regular classrooms should be created. Besides this, inside the special schools children with Down syndrome should receive more attention in regard to the teaching of academic skills. We acknowledge that children with Down syndrome are not a homogenous group. Turner and Alborz (2003) rightly argue that a small percentage of children with Down syndrome are unable to achieve any significant level of literacy or numeracy and that the needs of these children should not be overlooked by placing too much emphasis on academics. However,

presently, for the vast majority of children with Down syndrome in special schools often too much of their learning potential in this area remains unused. Furthermore, social interactions with other children, at school and outside school hours, for many children with Down syndrome need to be organized and supported deliberately. This is independent of the school type the child is going to. Finally, embracing a social model of disability, rather than a deficit model, seems to be facilitative for social inclusion.

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