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Improving foster children's school performance:

A replication of the Helsingborg study

Rikard Tordön¹, Bo Vinnerljung² and Ulla Axelsson³

Rikard Tordön

Children's House Foundation, Stockholm, Sweden

Bo Vinnerljung

Department of Social Work, Stockholm University, Stockholm, Sweden

Ulla Axelsson

Department of education, Municipality of Norrköping, Sweden

Corresponding author:

Rikard Tordön, Children's House Foundation (Stiftelsen Allmänna Barnhuset),

Strandgatan 2, 582 26, Linköping, Sweden.

Email: rikard.tordon@allmannabarnhuset.se

Abstract

A replication of the Helsingborg study (Tideman et al, 2011), was staged in the municipality of Norrköping 2008 to 2011. Results confirm the conclusions from the original study, that children in foster care can benefit from a working model aimed to improve school performance. Furthermore, a possible way to address poor numeracy skills by computerized working memory training was found. Implications for further research in active interventions to address underachieving foster children are discussed.

Keywords

Foster care, foster children, school performance, psychological assessment, intervention, working memory training, education, prevention

Introduction

Children in long term foster care tend to have substantially lower school achievements and educational attainments than peers growing up in their own families, even after controlling for socioeconomic and other relevant confounders (eg. Vinnerljung, Öhman & Gunnarson, 2005; Vinnerljung, Berlin & Hjern, 2010). Results from a host of national cohort studies have also shown that this group has radically higher risks (RR 6-10) for unfavourable outcomes in early adulthood, such as suicidal behaviour and other health problems, substance abuse, severe criminality, and welfare dependency (eg. Vinnerljung, et al, 2010).

After adjustment for school failure (no or very poor grades from the end of primary school), the size of these excessive risks were in recent population studies reduced by 40-50 percent for care leavers from long term foster care (Berlin, Vinnerljung & Hjern, 2011), confirming the hypothesis of the distinguished UK scholar Sonia Jackson that poor educational performance is a determinant for young care leavers' life prospects (Jackson, 1994).

Research in this domain has previously been focused mainly on describing poor educational outcomes. Studies aimed at developing and evaluating interventions for improving school achievements are rare. A recent scoping review (Forsman & Vinnerljung, 2012) found only eleven relevant studies from the last four decades in the international literature. Nine reported positive results: three tutoring programmes (Flynn, Paguet & Marquis, 2010; Flynn et al, 2012; Olisa et al, undated); Osbourne, Alfano & Winn, 2010), one structured training program (O'Brien & Rutland, 2008), two programmes that distributed learning material (Griffiths, Comber & Dymoke, Wolfendale & Bryans, 2004), one school counselling program (Zetlin, Weinberg & Kimm, 2004) and one Swedish program based on individual assessments and individualized support (Tideman et al, 2011). The evaluation of the Swedish program, an intensive study by Tideman and colleagues (here called the Helsingborg study), was reported in *Adoption & Fostering's* spring issue 2011.

Here we report on results from a replication of the program used in the Helsingborg study. The approach is known in the Nordic countries as the Skolfam model (School-Family care). It is at present being replicated by nine Swedish local authorities. These are Gävle, Landskrona, Malmö, Tjörn-Stenungsund, Uppsala, Angered (Gothenburg), and Nacka. The work in Helsingborg and Norrköping continues. A report from the Skolfam study in Swedish is available on <http://www.allmannabarnhuset.se/index.cfm?id=108&l=2>

The first Skolfam trial was staged 2005 to 2008 in Helsingborg, involving 25 foster children age 7-11. Results showed improved cognitive performance, spelling, word comprehension, and reading speed in a two year follow-up. Strengthened relations between teacher and child, as well as improved pro-social behaviour were also noted (Tideman et al, 2011).

As stated by authors as Mitchell (2006), and shown in metaanalyses by Hattie (2009), teachers' positive expectations of academic performance have a substantial impact on children's school achievements. Another important factor promoting good school results is feedback on students' performance. Hattie clarifies that effective feedback should cover three aspects: What direction am I heading? How am I doing? What is my next step forward? A third strong factor in Hattie's syntheses is formal assessment of performance (effect size 0.90). In the Skolfam model these three factors are applied. By assessing each child's prerequisites for learning (eg. cognitive capacity) with standardized instruments, and comparing their potential to actual performance, teachers' and carers expectations of the foster children's academic performance usually become far more optimistic than before assessment (Tideman et al, 2011). A thorough individual follow-up twice every semester (of each child participating in the program), based on

renewed assessment of performance in different subjects provide forward-oriented feedback on the students' progress.

Despite far-going efforts, results from the first trial showed no statistically significant gains in numeracy skills over the two year follow up period. These results were considered in the replication of the Helsingborg study, staged in the Swedish municipality of Norrköping 2008-2011, involving 21 children age 7-12. Computerized working memory training were provided to all children (n=11) that scored more than one SD below index mean in the working memory index of WISC-IV, or whose working memory scores were not on par with other scores in the WISC-IV test. Studies on effects of working memory training, especially in relation to secondary transfer effects, have reported contradictory results (Witt, 2011; Morrison & Chein, 2011; Klingberg, 2010; Melby-Lervåg & Hulme, 2012). If the hypothesis of positive secondary effects is correct, enhanced working memory capacity could help underachieving children to catch up in mathematics.

In the Norrköping replication, we followed the same research protocol as in Helsingborg, with minor adjustments in assessment material and interventions. We used a more recent version of the cognitive test (WISC-IV instead of WISC-III), and an added assessment of adaptive behaviour, with ABAS-II. We also addressed working memory deficits, measured at the start of the intervention program, with computerized working memory training for 11 children that scored low on the working memory scale in the WISC-IV test. The overall aim was to investigate if the promising results from the earlier Skolfam trial in Helsingborg (Tideman et al, 2011) could be replicated. Our study was guided by two research questions:

- Can academic achievement for children in foster care be improved by the Skolfam model?
- Can the model be expanded to also improve performance in mathematics?

Method

The inclusion criteria for participation was a) to be in the first six years in school at the start of the study, and b) placed in a foster care family where the placement was expected to last at least three years.

Exclusion criteria were neuropsychiatric or other disabilities to such extent that the child was placed in a special teaching class with a high grade of individualized teaching. In Norrköping, 29 children fulfilled these criteria. After decisions from case workers, four were exempted from participation: two due to extensive parallel on-going psychiatric treatment, and two due an expected imminent transfer to specialized residential care. For one child, the legal caregiver did not consent to the child being included in the project. Subsequently, the intervention group consisted of 24 children (12 boys, 12 girls).

First, interviews with each child's social worker, teacher and foster parents were performed by a psychologist and a special education teacher. The aim was to broadly assess environmental factors in the past or present that could influence the child's academic school performance. Factors we assumed could have influenced the school performance were for example severe neglect or nutritional deprivation before placement. Other factors were more related to present conditions, such as the foster parent's willingness and abilities to support the child's academic activities.

Secondly, each child was assessed with standardized tests at time of inclusion and at follow up two years later. Instruments used in the psychological assessment were WISC-IV for intellectual ability (Wechsler Intelligence Scale for Children – fourth edition; Wechsler, 2003), Beck Youth scales for emotional status (Beck, Beck & Jolly 2004), ABAS-II (Adaptive Behavior Assessment System-II) for adaptive behaviour, SDQ parent and SDQ teacher for general strengths and difficulties (Goodman, 1997; Smedje et al, 1999), and a visual analogue scale (Badia et al, 1999) to assess pupil-teacher relation. We also used DLS (Järpsten, 1999, 2002, 2004) (Järpsten and Taube, 1997) for assessing reading and writing skills, DLSM

for reading comprehension, “Reading chains” for assessment of verbal and reading fluency (Jacobsson, 2001) and the Olof Magne mathematical diagnostic tests to assess numeracy performance (Engström and Magne, 2006). All instruments have been standardized for Swedish child populations, with the exception of the visual analogue scale (Badia et al, 1999) for assessment of teacher-pupil relation.

Based on a combined analysis of each child’s potential and difficulties, an individually tailored plan of action was modelled in cooperation with the child’s primary teacher, the principal of the child’s school, the case worker, and the foster parents. A summary of the interventions utilized in these action plans is presented in appendix 1. Progress in school was followed up by the Skolfam team consisting of the psychologist, the special education teacher and the case worker, at least twice per semester and more often if needed.

Three children dropped out from the project between the pre- and post-intervention assessments. One parent withdrew permission of having the child included in the program, and breakdown of placement resulted in one child leaving the project. In addition, one child refused to participate in the post intervention tests.

The evaluation consisted of comparisons between pre and post intervention scores from the age standardized assessment instruments. Data were analysed in SPSS, version 20.0. We used paired T-tests of means to analyse changes between pre and post intervention assessment scores. Analyses of correlations were done with Pearson product moment coefficient.

Results

Intellectual capacity, assessed by WISC-IV, increased in all four indexes and in the Full Scale index (Table 1). Verbal comprehension index increased by 6.5 percent ($p < 0.001$). Perceptual Reasoning index increased by 5.1 percent ($p = 0.02$). Working memory index increased by 8.5 percent ($p = 0.02$). Processing speed index increased by 6.4 percent ($p = 0.04$). The increase in Full Scale IQ was 8.4 percent ($p < 0.001$).

Table 1

WISC-IV index scores at inclusion (T1) and post-intervention (T2), 24 months after inclusion. N = 21

WISC-IV Index Scales	T1		T2		T-test (T1/T2)
	Mean	S.D.	Mean	S.D.	<i>p</i>
Mean = 100, S.D. = 15					
Verbal Comprehension Index	95.14	10.01	101.29	10.12	***
Perceptual Reasoning Index	97.76	11.88	102.71	11.16	*
Working Memory Index	88.81	14.83	96.33	14.46	*
Processing Speed Index	89.14	16.18	94.86	16.51	*
Full Scale IQ	91.71	12.39	99.43	12.01	***

* $p < 0.05$

*** $p < 0.001$

Outcome of working memory training

For those children that scored more than one SD below index mean in the working memory index of WISC-IV, and those whose scores in the same index indicated a bottle neck of their intellectual abilities, computer based working memory training were provided. Eleven children received this intervention.

Mean increase in working memory index in this subgroup was 13.0 points (+ 16.6 %, SD = 12.1) in the Wechsler scale. In comparison, the 10 children who did not receive such an intervention, increased in mean 1.5 points (+ 1.5 %, SD = 12.1) in the same scale. The increase in each subgroup respectively was not significant, but the difference between subgroups was significant ($p < 0.05$).

Correlation analysis suggested a tendency towards a spill-over effect of working memory training outside the primary cognitive domain (WISC-IV, working memory scale), to the mathematical diagnostic test. However, this tendency was not statistically significant, due to low statistical power (figure 1).

Figure 1
Magne's mathematics at pre-intervention (Test 1) and post-intervention (Test 2). Comparison between having/having not received computerized working memory training (WMT).

Self-concept, as measured in the Beck Youth Inventories, increased by 18.2 percent ($SD = 17.7$; $p = 0.02$)

No significant changes over time were found in the other subscales: anxiety, depression, anger or disruptive behaviour (table 2).

Table 2

Beck Youth Inventories percentiles at inclusion (T1) and post-intervention (T2), 24 months after inclusion. $N = 21$

	T1		T2		T-test (T1/T2)
	Mean	S.D.	Mean	S.D.	p
Beck Youth Inventories Percentiles					
Anxiety	56.68	31.34	46.98	34.02	n.s.
Depression	51.20	30.79	46.42	35.29	n.s.
Anger	50.09	30.18	53.23	35.55	n.s.
Disruptive Behavior	59.61	27.87	51.90	25.17	n.s.
Self-Concept	55.80	26.09	65.96	30.38	*

* $p < 0.05$ n.s. = non-significant

In the domain of literacy and language skills, there were consistent tendencies toward positive results in DLS word comprehension, reading speed, content comprehension, and spelling. However, the sample was too small to enable statistically significant results in most comparisons, mainly because DLS consists of several subtests, measuring different aspects of literacy development. Therefore, children in the first years in school were tested with different subtests at baseline and in follow up tests, making longitudinal comparison impossible. The subtest “sentence-chains” in “Reading chains” (Jacobsson, 2001), showed significant improvement of 33.3 percent ($N = 12$; $SD = 1.1$; $p = 0.005$), indicating a growth in the ability

to decode and comprehend text sentences (table 3). However, when we estimated crude effect sizes, all results on the literacy and language tests were on par with, or even better than the results from the Helsingborg study (Tideman et al, 2011).

Numeracy skills increased by 61.1 percent for the whole group ($N = 20$; $SD = 2.2$; $p = 0.004$). Mean score at the base line assessment was 2.65 in the stanine (1-9) scale, revealing substantial knowledge gaps. Ten children scored stanine 1 and three stanine 2. Typically, these children regarded mathematics as boring and troublesome. At follow up assessment, mean score was 4.27. Three children still scored stanine 1, none scored stanine 2. One child showed a decrease from stanine nine to six, six children remained in the same level (two or less points deviation in the stanine scale). Thirteen children showed improved numeracy skills (table 3).

Table 3

Pedagogical tests DLS, Reading-chains, and mathematics at inclusion (T1) and post-intervention (T2), 24 months after inclusion

Pedagogical tests	N	T1		T2		T-test (T1/T2)
		Mean	S.D.	Mean	S.D.	<i>p</i>
Stanine scale, Mean = 5, S.D. = 2						
DLS word recognition	18	3.00	1.75	3.67	1.61	n.s.
DLS reading speed	12	3.08	1.68	3.67	2.50	n.s.
DLS spelling skills	15	4.27	1.87	4.53	1.60	n.s.
Letter chains	12	3.42	1.78	4.17	1.75	n.s.
Word chains	18	4.17	2.04	4.06	1.73	n.s.

Sentence chains	12	3.25	1.71	4.33	2.19	**
Magne Mathematics	20	2.65	2.28	4.27	2.03	**

** p<0.01

n.s. = non-significant

Discussion

The aim of the study was to replicate the Skolfam model in a new setting. In the replication, 24 children in foster care were assessed and individually followed for two years in an indirect consulting and coaching process involving foster parents, teachers, principals, and in some cases, the birth parents. This process focused on school achievements and factors that could influence school performance, such as intellectual strengths, educational gaps, performance expectations, and reading habits.

21 children fulfilled the post-intervention assessments. Since the results from Helsingborg reported difficulties in addressing lack of numeracy skills, we added computerized working memory training and a more detailed mathematical assessment as an attempt to stimulate a positive progress in this domain. Results indicate a significant growth in intellectual capacity, self-concept, literacy and numeracy skills.

This study confirms the conclusions from the Helsingborg trial (Tideman et al, 2011). The poor results in school performance for children in foster care can be improved with an intervention based on an educational and psychological assessment, followed by an individual, coached progress plan. In addition to the Helsingborg study's positive outcome in literacy skills, we have shown that numeracy skills can also be addressed.

We would like to stress that there were probably at least two different factors contributing to the positive outcomes for enhanced numeracy skills. One was the computerized training of working memory for children. The other was an approach in numeracy assessment, where we started from a “zero skills level”, regardless of the child’s age or school grade. This enabled us to detect early knowledge gaps that could be properly addressed by the teacher.

The results from this study can now be added to the present knowledge, as described by Forsman & Vinnerljung (2012), further reinforcing the hypothesis that well-known patterns of underachievement for children in foster-care can be addressed. Researchers and policy makers have for several decades known that children in foster-care as a group perform poorly in the school and education system (Jackson & Martin, 1998). Now we also know from national cohort studies that school achievement is a strong determinant for a host of long-term psychosocial outcomes for all children. For children that grow up in foster care, this means that the very potent risk factor “school failure” is added to other risk factors that are prominently common in these populations and often appearing in clusters, for example parental psychiatric disorders and addiction problems (Vinnerljung et al, 2010; Berlin et al, 2011). Yet, examples of structured and evaluated efforts to compensate and even out odds in school for this extremely unprivileged group in society are few and far in-between (Forsman & Vinnerljung, 2012).

At present (summer 2013), only two children in the Norrköping group have failed to achieve grades good enough to grant access to a national program in the upper secondary education. This indicates that a two year “filling gaps and catching up-period” may serve as a long term normalization agent. Our experiences naturally include several backlashes, primarily in the last three years in compulsory school (age 13-16). But when a child has a good platform of basic knowledge, skills and previous experiences of success, these backlashes could be effectively managed in most cases.

As far as ethical considerations go, we found – as in the Helsingborg trial (see Tideman et al, 2011) – no signs that the children felt stigmatized by being tested (this was done outside school settings) or singled out for individual support. In no case was individual support by the Skolfam team given in group-based special education settings, where the child was separated from her/his normal teaching class.

Limitations/methodological issues

The small sample (n=21) did compromise some analyses due to low statistical power. The sensibility for a few outliers or standard deviation increases with a small sample, which in turn increase the demands of a big pre/post difference in means to reach statistical significance.

Another power related limitation concerns the pedagogical assessment of literacy. Because of age related sectioning of tests, longitudinal comparisons become difficult. A test measuring digit processing at age 8 cannot be compared to reading comprehension for the same child at age 10. This is why data from reading speed, letter-chains and sentence-chains comes from only 12 individuals. However, aggregated data from this and future replications of the Skolfam model will bring more statistical power to forthcoming analyses.

The actual interventions were not guided by a strict manual as in some evidence-based programs. This left room for local resources and references to influence what support the children got. One example is that the children in Helsingborg received more computerized literacy training than in Norrköping.

Two important factors limit generalisations from our study. Firstly, it is a small study in local settings. Secondly, comparing pre and post interventions scores without a comparison group or – as in a

randomized controlled trial (RCT) – a control group does not enable us to infer any firm causal conclusions. But considering that other studies have reported on foster children's over time deteriorating school performances (eg. Dumaret, 1985), it seems likely that the Skolfam model did make a difference. For the same reasons as reported by Tideman and her colleagues (2011), we found that the ethical problems with staging a RCT were too persuasive. A core component of the Skolfam model is to systematically access support that these children have a right to receive, but often do not due to lack of understanding from the adults sharing the responsibility for the children's educational progress.

Henceforth, we also do not know if the positive results are effects of the individualized educational interventions or of the attention given to each child, the latter a form of Hawthorne effect (Rosenthal & Jacobson, 1992). But we have seen clearly, both in the Helsingborg and the Norrköping project, that the pre-intervention assessments usually resulted in more positive expectations on the child's ability to succeed in school among foster parents, teachers and case workers. If this is a Hawthorne effect, so be it. There is strong qualitative evidence from both trials that this benefited many children.

Conclusions

The promising results from the Helsingborg study (Tideman et al, 2011) were replicated in our study. New on-going trials with the same model will provide possibilities of aggregating results from several small studies to improve statistical power, and to enable more sophisticated (multivariate) analyses. The perhaps most salient conclusion is that the results reinforce Forsman's and Vinnerljung's scoping review (2011): poor school performance in out-of-home care can be improved, if children are given reasonably adequate support. This sends a hopeful message – as the Helsingborg study, several other primary studies and the scoping review did – to policy makers and professionals. It is reasonable to expect positive results from systematic interventions targeting foster children's school achievements. The message to the

research community is also clear. We do not need more studies describing how poor these children do in the educational system - we need more intervention research. High quality experimental trials are of course to be preferred (see eg. Flynn et al, 2012) but - in our opinion - we should beware of “the best becoming the enemy of the good”. Small local studies with a pre/post intervention design with age-standardized assessment instruments – as ours - are welcome contributions to a neglected field of research. They are considerably easier (and cheaper) to stage than a RCT, and can encourage, enable and simplify local initiatives.

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References

- Badia, X., Montserrat, S., Roset, M. and Herdman, M. (1999). Feasibility, validity and test-retest reliability of scaling methods for health status: the visual analogue scale and the time trade-off. *Quality Life Research*, 8: 303–310
- Beck, J.S., Beck, A.T. och Jolly, J.B. (2004). *Beck ungdomsskalor, Manual*, Svensk version. Harcourt Assessment. Här måste du ha förlagsort.
- Berlin M., Vinnerljung, B. & Hjern, A. (2011). School performance in primary school and psychosocial problems in young adulthood among care leavers from long term foster care. *Children and Youth Services Review*, 33 (12): 2489-2494.
- Dumaret A. (1985). IQ, scholastic performance and behavior in sibs raised in contrasting environments. *Journal of Child Psychology and Psychiatry*, 26: 553–580
- Engström, A., & Magne, O. (2006). *Medelsta-matematik III: Eleverna räknar*. Örebro: Örebro university.
- Flynn, R.J., Marquis, R.A., Paquet, M.P, Peeke, L. M. & Aubry, T. D. (2012). Effects of individual direct-instruction tutoring on foster children's academic skills: A randomized trial. *Children and Youth Services Review*, 34: 1183-1189
- Flynn, R. J., Marquis, R. A., Paquet, M. P. & Peeke, L. M. (2011). *Effects of tutoring by foster parents on foster children's academic skills in reading and math: A randomized effectiveness trial: Final report of the RESPs Kids In Care Project*. Ottawa: Canada's University.
- Flynn, R. J., Paquet, M. P. & Marquis, R. A. (2010). Can tutoring by foster parents improve foster children's basic academic skills? A Canadian randomized field trial. In E. Fernandez & R.P. Barth (Eds.), *How does foster care work? International evidence on outcomes* (pp.259-272). London, UK: Jessica Kingsley Publishers.

Forsman, H., & Vinnerljung, B. (2012). Interventions aiming to improve school achievements of children in out-of-home care: A scoping review. *Children and Youth Services Review*, 34(6): 1084-1091

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of Child Psychology and Psychiatry*, 38: 581-586

Griffiths, R., Comber, C. & Dymoke, S. (2010). *The Letterbox Club 2007 to 2009: Final evaluation report*. Leicester: University of Leicester School of Education.

Hattie, J. (2009). *Visible learning: a synthesis of over 800 meta-analyses relating to achievement*. New York: Routledge.

Jacobsson, C. (2001). *Läskedjor, Manual*. Stockholm: Psykologiförlaget

Jackson, S. (1994). Educating children in residential and foster care: An overview. *Oxford Review of Education*, 20: 47-56.

Jackson, S. & Martin, P. (1998). Surviving the care system: Education and resilience. *Journal of Adolescence*, 21: 569-583.

Järpsten, B. (1999). *DLS för klasserna 2 och 3,Handledning*. Stockholm: Psykologiförlaget

Järpsten, B. (2002). *DLS för skolår 7-9 och år 1 i gymnasiet,Handledning*. Stockholm: Psykologiförlaget

Järpsten, B. (2004). *DLS bas för skolår 1 och 2,Handledning*. Stockholm: Psykologiförlaget

Järpsten, B. och Taube, K. (1997). *DLS för klasserna 4-6,Handledning*. Stockholm: Psykologiförlaget

Klingberg, T. (2010). Training and plasticity of working memory. *Trends in Cognitive Science*, 14(7): 317-324

Melby-Lervåg, M., & Hulme, C. (2012). Is Working Memory Training Effective? A Meta-Analytic Review. *Developmental Psychology*, 49(2): 270-291

Mitchell, D. (2006). *What really works in special and inclusive education. Using evidence-based teaching strategies*. London: Routledge.

Morrison, A.B. och Chein, J.M. (2011). Does working memory training work? The promise and challenges of enhancing cognition by training working memory. *Psychon Bull Rev* 18: 46-60

O'Brien, M. & Rutland, J. (2008). Outcomes of a supplemental learning program for children in care at family and children's services of Renfrew County. *Oacas Journal*, 52(4): 11-14.

Olisa, J., Stuart, M., Hill, V., Male, D. & Radford, J. (n.d.). *Intervention to promote good literacy in looked after children*. (Project 2001-02S30). London: London University Institute of Education.

Osbourne, C., Alfano, J. & Winn, T. (2010). Paired reading as a literacy intervention for foster children. *Adoption & Fostering*, 34: 17-26.

Rosenthal, R. & Jacobson, L. (1992). *Pygmalion in the classroom: Teacher expectation and pupils' intellectual development*. New York: Irvington Publ.

Smedje, H., Broman, J.E., Hetta, J. och von Knorring, A.L. (1999). Psychometric properties of a Swedish version of the Strengths and Difficulties Questionnaire. *Journal of European Children and Adolescent Psychiatry*, 8: 63-70

Social Report 2010 – The national report on social conditions in Sweden – Summary

<http://www.socialstyrelsen.se/publikationer2010/socialreport-summary>

Tideman, E., Vinnerljung, B., Hintze, K. & Aldenius Isaksson, A. (2011). Improving foster children's school achievements: Promising results from a Swedish intensive study. *Adoption & Fostering*, 35(1): 44-56.

Wechsler, D. (2003). *Wechsler intelligence scale for children – fourth edition*. San Antonio, TX: Harcourt Assessment.

Vinnerljung, B., Berlin, M. & Hjern, A. (2010). School performance, educational attainments, and risks for unfavourable development among children. In Socialstyrelsen (Ed.), *Social rapport 2010* (pp. 227-266). Stockholm: Socialstyrelsen.

Vinnerljung, B., Öman, M. & Gunnarson, T. (2005). Educational attainments of former child welfare clients: A Swedish national cohort study. *International Journal of Social Welfare*, 14, 265-276.

Witt, M. (2011). School based working memory training: Preliminary finding of improvement in children's mathematical performance. *Advances in Cognitive Psychology* 7: 7-15

Wolfendale, S. & Bryans, T. (2004). *Evaluation of the looking after project in Kent for children in public care*. London: University of East London.

Zeitlin, A., Weinberg, L. & Kimm, C. (2004). Improving education outcomes for children in foster care: Intervention by an education liaison. *Journal of Education for Students Placed at Risk*, 9, (4), 421-429.

Appendix 1

Example of interventions used in Skolfam replication

- One-to-one teaching
- Counselling of teachers, principals and other school personnel
- Computer-based working memory training ("Cogmed RoboMemo" or "MinnesLek")
- Physical exercise
- Non-structured reading tutoring by foster parents
- Referral to specialized child psychiatric or medical assessment and care
- Fine motor skills practice by foster parents
- Fluency training in writing letters and short words (using individual stopwatch)
- Training of concept of time
- Social support person
- Encouraging writing a personal diary
- Structured word comprehension training (in some cases computer assisted)
- Structured reading comprehension training
- Independency training (bus travels, library visits, paying in stores etcetera)
- Following and discussing news reports in papers and television with foster parents
- Structure and predictability in daily routines (school and home)
- Parlor games in foster family
- Fluency training of mathematical algorithms and multiplication tables
- Literature genre and literacy level coaching
- Use of mind mapping techniques
- Access to special teacher
- Training of adaptive behaviour (guided by result from ABAS-II assessment)
- Supported school transitions
- Re-orientation and motivation meeting with whole network of adults
- Daily or weekly evaluation of results with teacher
- Rhymes and chants
- Re-start from basic level in mathematics or reading (to fill early educational gaps)
- Aggression Replacement Training