



## Long-term changes in parenting and child behavior after the Home-Start family support program

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### ABSTRACT

**Background:** The intervention Home-Start is a wide spread program in a number of countries, among which the Netherlands. In Home-Start, trained volunteers visit families with young children in need of support once or twice a week to help them to deal with problems in family life and parenting. Little is known, however, about the effects of Home-Start. This study describes short-term and long term changes in families that participated in Home-Start.

**Methods:** Three groups of families with young children (at the start mean age 1 1/2 years) were followed over a period of four years. One of the groups of families participated in the Home-Start family support program in the first 6.6 months of this period. The two other groups were (1) a randomly selected community sample and (2) a group of families with elevated parenting stress and a need for support. Data were collected at the beginning of the study, (after median 1.4 months), directly after the intervention (median 6.6 months) and at two follow-up occasions (respectively, median 12.5 and 49.2 months after the first measurement). At the last measurement, data were available for 33, 45 and 34 families respectively.

**Results:** Multilevel analysis showed more positive changes in parental wellbeing, competence and behavior (more consistent behavior and less rejection) during the intervention period in the Home-Start group than in the two other groups. At the three year follow up, the Home-Start group showed, compared to the other groups, more improvements in parenting (more responsiveness), but also diminished child externalizing and internalizing behavior problems (less oppositional defiant behavior, affective problems and anxiety problems).

**Conclusions:** Home-Start seems a promising family support intervention that deserves to be studied more extensively.

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### 1. Introduction

Home visiting is a widely applied mode of support for families with young children and attractive to professionals and policymakers because of its low-costs and easy accessibility. Various needs and problems are addressed by home visiting. Promoting positive and healthy parenting is however the primary goal of most programs (van Doesum, Riksen-Walraven, Hosman, & Hoefnagels, 2008; Gray, Spurway, & McClatchey, 2001; Niccols, 2008; Olds et al., 1999). Home visiting is usually provided to individually selected vulnerable families with specific needs or risks such as teenage motherhood, parental psychopathology or developmental or behavioral problems of children (indicated prevention e.g., Barlow et al., 2007; Eckenrode et al., 2000).

Effects of home visiting programs are generally small in magnitude and only few studies have found substantial effects on outcomes

(Olds, Sadler, & Kitzman, 2007). A meta-analytic review of 60 programs (Sweet & Appelbaum, 2004) yielded weighted mean standardized effect sizes between  $-.043$  and  $+.318$ . No specific characteristic of the programs discriminated between successful or less successful programs.

The present study contributes to the knowledge on home visiting programs by reporting short and long terms changes in families that were served by Home-Start, compared to changes in a comparison group of families at risk and a norm group: a community sample of families without known risks.

Home-Start serves families with young children (0–6 years) at risk. Individual families are referred by health care professionals or social workers. In Home-Start social support is the main component of the program. The home-visitors are volunteers that have no professional training in the field of parenting support, but are trained to offer need-oriented support to the families on an array of domains of family functioning such as: parenting, household management, building a social network, and referral to services. Volunteers are trained in a three-day program and booster sessions twice a year. Once a month they receive supervision of their local coordinator. Home visits are

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weekly for a minimum of 2 h. The length of the program is flexible and has an average of 10.5 months (Galama, 2012). The focus is on the reduction of stress levels within families, the enhancement of parental self-esteem, and the improvement of parents' social relations. The intervention theory is that by offering social support, a. The wellbeing of the mother improves b. Feelings of parental competence increase, c. Actual parenting behavior becomes more adaptive, and eventually d. Child behavior improves. No specific theoretical underpinning framework is available in the documents of Home-Start, but the departing points of the program seem to fit into the conceptual frameworks of risk accumulation, behavioral dysregulation and social support as protective factor (Hermanns, 1998; Sameroff & Fiese, 2000). In short: risk accumulation causes dysregulation of transactional family processes and an intervention that offers social support will mitigate the effect of risk accumulation and improve regulatory processes in the family. Home Start in the Netherlands is manualized and training is offered by a national organization (Stichting Home-Start Nederland) that is also responsible for the certification of local initiatives. In the Netherlands (population 16 million), Home-Start is implemented on a national scale. In 2010 a total number of 116 local sites were counted, serving a total of 2350 families by 2400 home visitors (Home Start Nederland, 2010).

English studies on the short-term effects of Home-Start in families showed mixed and modest results. Frost, Johnson, Stein, and Wallis (2000), conducting a pre-posttest design without control group, reported that Home-Start in England contributed to enhanced mother's emotional well-being, improvements of (both formal and informal) supportive relationships and increased confidence in parental capabilities. McAuley, Knapp, Beecham, McCurry, and Slead (2004), using a quasi-experimental design, found positive changes in family functioning, parenting stress, maternal wellbeing, and child behavior in the Home-Start group. They however found the same changes in the comparison group. Barnes, Senior, and MacPherson (2009) found no effects of postnatally offered Home-Start on maternal depression at two and 12 months of age of the baby's in a study with three groups: a Home-Start supported group, case-matched controls and mothers offered, but not receiving support. In an additional report on this study Barnes, MacPherson, and Senior (2006) found a greater reduction in parent-child relationship difficulties for supported families compared to the case-matched controls, but mothers of the Home-Start group offered their children fewer healthy foods.

Earlier studies in the Netherlands showed positive changes in families that were served by Home-Start. Hermanns, Venne-van-de, and Leseman (1997) followed 43 families through the Home-Start intervention. Pre- and posttest comparisons revealed that mothers experienced a decrease in parenting stress, an increase in feelings of parental competence and well-being. In addition mothers reported progress in specific family matters (e.g., improved child contact, more self-confidence or strengthened family relationships). In a recent quasi experimental study by Asscher, Hermanns, and Deković (2008) positive effects were reported by mothers: improvements in maternal competence, less depressive feelings, more consistent parenting behavior and decreased negative controlling behavior. Moreover, Asscher, Deković, Prinzie, and Hermanns (2008) showed that results were of clinical significance, since at post-test a substantial number (39% to 84%) of the Home-Start mothers functioned in the domains of maternal well-being, parenting behavior and child behavior at a level equivalent to that of a community sample. Deković et al. (2010) tested the mechanisms of change of the Home-Start and found that intervention results were consistent with the hypothesized intervention model: Home-Start induced changes in feelings of parental competence which in turn predicted changes in parenting.

In short, Home-Start seems to be able to provide help to families with young children that experience difficulties in daily life. An important question is, however, if the reported changes will endure over a longer period of time. A second question has to do with child behavior. The intervention theory of Home-Start hypothesizes that effective

family support changes transactional processes in child rearing and creates new, positive cycles of interactions (as a mirror-image of Patterson's coercive cycles) that will, in time, further promote a positive parent-child relationship. In the course of this process child behavior problems should diminish.

Hence, we elaborated on the study of Asscher, Deković, Prinzie, and Hermanns (2008), and Asscher, Hermanns, and Deković (2008). In their study two measurement occasions (prior and after intervention) were described. For the present study, additional measurements were included: one at one month after the start of the program and at two follow-up occasions, more specifically, 12 and 49 months after the first measurement. The outcome measures include indicators of maternal well-being, maternal behavior and child problem behavior. The focus of child outcome is on externalizing as well as on internalizing child behavior. So, next to hyperactive and oppositional child behavior, we also examined the development of anxious and affective child problems. Parent and child data of the five measurement occasions will be modeled simultaneously by using longitudinal multilevel models.

## 2. Method

### 2.1. Participants

Three groups were distinguished: a Home-Start group, a comparison group with elevated levels of parenting stress and a reported need for support and a community sample that reported no stresses or need for support. The three-group design allows us to describe changes in the intervention group and compare them to the developmental course of family functioning and childhood problem behaviors within a group of families with elevated stress and a need for support.

The Home-Start families were recruited through the coordinators of various Home-Start programs. Every family that was serviced was asked to participate. The comparison group was acquired from the files of well-baby-offices that are situated in regions where the Home-Start program was not available. The well-baby-office is a service offered by the Dutch preventive child health care (CHC) in which children and parents are seen at regular intervals to check physical growth and to provide vaccinations. The service reaches more than 95% of children between 0 and 4 years old. From this large pool of families, a comparison group in the relevant age group was selected. In an earlier study (Hermanns et al., 1997) it was found that parents that receive Home-Start services have above average level of parenting stress as measured with the Daily Hassles Scale of Crnic and Greenberg (1990), (more than 1 SD above the average of non-clinical groups as well for frequency of daily hassles as their impact). One of the criteria for the comparison group was therefore an elevated level of parenting stress. A second criterion was the need for support, the perception of children as more difficult than other children, and the willingness to accept support by a volunteer, as by definition this was expressed by the Home-Start group also. One thousand questionnaires were sent by mail regarding parental stress (Dutch version of the Parenting Stress Index—short form, De Brock, Vermulst, Gerris, & Abidin, 1992) together with three additional questions: 1. Do you need support regarding parenting every now and then? (Yes/No), 2. If this support were from a volunteer, coming three hours each week to support you, would you want to use this service? (Yes/No), and 3. How often do you find your child to be more difficult than other children (1 'hardly ever' to 4 'almost always'). A total of 373 questionnaires were returned. Inclusion criteria for the comparison group were: (1) self-reported parental stress levels are above the standardized mean for non-clinical groups ( $M \geq 2.48$ ), or, (2) at least two out of the three additional questions were answered positive. A community sample with average levels of stress and no extra need for support was randomly selected from the rest of the families.

Consent to participate in the study of the comparison group and the community sample was asked in a letter sent out by the well-baby-

offices. Home-Start families gave a verbal consent to their local coordinator. After contact with the researcher a written consent for the follow-up studies was acquired.

The study procedures were in accord with the ethical guidelines of the Department of Childhood Education and Development of the University of Amsterdam at the time of the study.

## 2.2. Procedure

When the research staff of Home-Start schemes had contact information of the families, one of the researchers got in touch with the family and explained the goal and the procedure of the study. Subsequently, parents were asked if they would agree to participate. If parents indicated that they did not want to participate, their personal information was erased. When families agreed to participate, maternal self-report questionnaires were sent out prior to the intervention, during the intervention (after median 1.4 months), directly after the intervention (median 6.6 months) and at two follow-up occasions (respectively, median 12.5 and 49.2 months after the first measurement). Families without any post-intervention measurements and families, for which the first measurement was missing, have been excluded from the analyses. At the first follow-up, the attrition rates were 6.8% for the Home-Start group, 1.8% for the comparison group and 2.8% for the community sample. Families who withdrew from the study at this time mostly mentioned that participation took too much of their time. At the second follow-up the attrition rates were larger, 44% for the Home-Start group, 20% for the comparison group and 6% for the community sample. A flow diagram is presented in Fig. 1.

The main reason for the loss to the last follow-up was that most families had moved several times since their previous involvement and could not be traced. The Home-Start group appeared to include the most difficult to trace families. Many of them had moved several times in the years of the intervention and could not be found. Without doubt, this instability in housing is related to a variety of social and personal problems families in this group experience to a larger degree than families in the other two groups. However, only few and not significant differences were however found in demographic characteristics between families that did and did not drop out of the study.

Background characteristics of the families are reported in Table 1. It is clear that there are marked differences between the groups. Significant differences between the groups were found (at  $\alpha = .01$  level) for age of the mother, family income, mother's educational level, marital status, number of life events, and involvement in social services. Pairwise post hoc group comparisons showed that there were significant differences (again at  $\alpha = .01$  level) between all groups for family income and number of life events, and significant differences between the Home-start group and as well the comparison group as the community sample for the other above mentioned variables. The differences between the community sample and the two others groups were expected. The Home-Start and the comparison group were after all selected because of elevated stress and a need for support. However, the Home-Start group had experienced more stressful life events and had a lower income than the comparison group, indicating that this group had more risks and stressors than the comparison group.

Thus, marked differences between the groups were found. The three groups therefore could not be seen as equivalent. A direct comparison of

Home-Start	Comparison group	Community sample
T1 59	56	36
T2 59	56	35
T3 58	56	36
T4 55	55	35
T5 33	45	34

Fig. 1. Flow chart study groups.

**Table 1**  
Background variables of the families.

	Home-Start group	Comparison group	Community sample
Nationality of the mother			
Dutch (%)	96.6	100	100
Age of the mother (years)			
Mean	31	35	35
SD	5.6	5.3	3.8
Family income			
Low (%)	61.5	14.6	0
Moderate (%)	28.8	47.9	46.4
High (%)	9.6	37.5	53.6
Mother's educational level			
Low (%)	18.6	5.4	2.9
Moderate (%)	62.7	60.7	42.9
High (%)	18.6	33.9	54.3
Marital status: single (%)	44.8	16.1	0
Number of life events			
Mean	2.5	1.8	0.8
SD	1.4	1.5	1.0
Health problems (%)	24.6	18.2	14.3
Involved in social services (%)	41.7	12.7	11.1
Gender child: male (%)	50.8	60.7	47.2
Age child (months)			
Mean	30.2	30.5	29.0
SD	7.4	6.6	6.3

the groups thus would be unwise. Therefore the focus will be primarily on the development of maternal wellbeing, maternal functioning and child behavior over time *within* the three groups.

## 2.3. Measures

Outcomes to evaluate Home-Start included three types of indicators: maternal characteristics, parenting behavior and child problem behavior.

### 2.3.1. Maternal well-being

Maternal well-being was translated in the constructs life-satisfaction, depressive mood, and maternal feelings of competence. Life-satisfaction was measured with the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). The scale consisted of 5 items rated on a 6-point scale ((1) = 'I totally disagree' to (6) 'I totally agree'). Parents were asked to indicate how much they agreed with statements as: 'In most ways my life is close to my ideal'. Cronbach's coefficient alpha ranged from .85 to .89. Depressive mood was assessed by the Parenting Stress Index-revised (Gerris et al., 1993). The scale consisted of 9 items rated on a 6-point scale ((1) = 'I totally disagree' to (6) 'I totally agree'). An example of one of the items is: 'There are quite a few things that bother me about my life'. Cronbach's alpha ranged from .87 to .90. Maternal self-esteem with regard to parenting (self-reported maternal competence) was measured with the Dutch version of the Parenting Stress Index (De Brock et al., 1992). The 13-item scale can be rated on a 6-point scale ((1) = 'I totally disagree' to (6) 'I totally agree'). Parents were asked to score items such as: 'My child seems to be much harder to care for than most'. Cronbach's coefficient alpha ranged from .87 to .91.

### 2.3.2. Maternal behavior

Maternal parenting behavior was operationalized by measuring three aspects of parenting behavior: consistent maternal behavior, responsiveness, and maternal rejection. First, consistent behavior was assessed with the Parenting Dimensions Inventory (Slater & Power, 1987). The consistency scale consisted of 8 items and can be rated on a 6-point scale ((1) = 'I totally disagree' to (6) 'I totally agree'). An example of an item is: 'There are times I just don't have the energy to make my child behave as he (or she) should'. Cronbach's alpha coefficients ranged from .72 to .78. Second, maternal responsiveness was

measured with a subscale of the Nijmegen Parenting Questionnaire (Gerris et al., 1993; Gerris, Dekovic, Groenendaal, Noom, 1996). The subscale consisted of 8 items rated on a 6-point scale ((1) = 'I totally disagree' to (6) 'I totally agree'). Parents were asked how much they identified themselves with statements as: 'I know very well what my child feels or needs'. Internal consistency ranged from .78 to .88. Third, maternal rejection of the child was assessed with a subscale of the Parenting Stress Index (Abidin, 1983; De Brock et al., 1992). This subscale consisted of 12 items, which again can be rated on a 6-point scale ((1) = 'I totally disagree' to (6) 'I totally agree'). Example of an item: 'My child is not able to do as much as I expected'. Cronbach's alpha ranged from .74 to .80.

### 2.3.3. Child problem behavior

Mothers reported on their child's problem behavior with the use of the Child Behaviour Check List (CBCL/2–3; Achenbach, 1992; Koot, 1993 and CBCL/6–18; Achenbach & Rescorla, 2001). On the first four measurement occasions negative child behavior was operationalized with the CBCL 2–3, while on the last follow-up occasion the CBCL/6–18 was used. The CBCL 2–3 consists of 99 items and can be rated on a 3-point scale (0 = not applicable and 2 = often applicable). The CBCL/6–18 consists of 113 items and can be rated on the same 3-point scale. Four subscales could be defined on the basis of concurrence between the CBCL/2–3 and the CBCL/6–18 (reference). First of all, oppositional child is assessed by 6 CBCL/2–3 items and 5 CBCL/6–18 items. Internal consistency ranged from .78 to .84. Second, hyperactive behavior was operationalized by 6 CBCL/2–3 items and 8 CBCL/6–18 items. Internal consistency ranged from .80 to .85. Third, affective child behavior was composed of ten CBCL/2–3 items and thirteen items CBCL/6–18 items. Cronbach's alpha coefficients ranged from .56 to .61. Finally, ten CBCL/2–3 items and 6 CBCL/6–18 items defined anxious child behavior. Cronbach's alpha ranged from .63 to .72.

### 2.4. Data analysis

The longitudinal data in this study are hierarchically structured with measurement occasions nested within families. To account for this nested structure, separate levels for the families and the measurement occasions were specified (Snijders & Bosker, 1999). Two advantages of this multilevel approach are noteworthy. First, multilevel modeling allows us to account for the existing variation in the timing of the measurement occasions, because the model describes change as a function of the actual time elapsed since the first home visit. Second, under the assumption that the data are "missing at random" (MAR), missing data do not have to be imputed. The multilevel model can simply be estimated on the basis of the available data using the full maximum likelihood approach.

Multilevel models consist of a fixed and a random part. In the fixed part of the multilevel model change over time is modeled with three parameters for each group, an intercept, a parameter for the rate of change from the pretest to the posttest, and a parameter for the rate of change following the posttest until the second follow-up. The time scale was set as years since the start date. Thus, the intercept reflects the estimated mean level of the outcome variable at pretest. The two parameters for the rate of change allow differentiating between (initial) differences directly following the Home-Start intervention and the long-term change that may occur after the intervention. For both intervals we considered linear change (a straight-line growth model) as well as acceleration or deceleration of change (quadratic change or a curvilinear pattern of change). The results of this modeling procedure revealed that quadratic change did not result in a better model fit than linear change. This was found for all examined outcome variables. Consequently, the parameters for change in the fixed part of the model represent the slope from pretest to posttest and from posttest to the second follow-up.

The random part of the multilevel model indicates the extent to which the mean level at pretest and the rate of change vary between families. The intercept and both slopes were random for families in the models. These parameters were also allowed to co-vary, estimating a so-called unstructured covariance matrix for the random effects. Whenever this model specification could not be properly estimated, the second random slope was dropped. Usually, the random parameters are included primarily to meet the assumptions (i.e. to account for the dependence between the repeated observations) and the main focus is on the fixed parameters of the model.

### 3. Results

Table 2 presents the means and standard deviations for the various outcome measures at each measurement occasion.

Table 3 presents the model estimates for the intercept and slopes of the multilevel model for each group. Obviously all intercepts are different from zero. These values represent the estimated levels of the dependent variables at the start of the study.

In Table 3, small p-values ( $\leq 0.01$ ) for slopes are presented in boldface. A smaller p-value represents stronger evidence for a slope deviating from zero. Here, slopes with p-values equal to or smaller than 0.01 are interpreted as significantly different from zero. P-values between 0.01 and 0.05 are mentioned as well, since these also indicate that there is some evidence against the slopes being zero. In Table 3, a significant change can be observed from pretest to posttest for the Home-Start group on the variables indicating maternal wellbeing. A significant increase is observed for life satisfaction and feelings of competence. For depressive mood, a significant decrease is observed. For the Home-Start group, a further decrease is observed for depressive mood in the period from the posttest until the second follow-up. For life satisfaction, there is evidence of a further increase of life satisfaction ( $p = .02$ ) in the Home-Start group over this period. For the variables indicating maternal wellbeing, no further changes are observed. Therefore, the only group significantly changing on these variables is the Home-Start group.

For the variables indicating maternal parenting functioning, consistency shows a significant increase from pretest to posttest in the Home-Start group. In the same period there is also evidence of a decrease in maternal rejection ( $p = .02$ ) for this group. Interestingly, in the period from posttest to the second follow-up there is also evidence for an increase in responsiveness ( $p = .03$ ) in the Home-Start group. No other significant changes within the groups were found for the variables indicating parenting behavior.

The child behavior variables show a more diverse pattern of change. That is, all three groups show change for these variables. For OD problems, both the Home-Start group and the comparison group show a significant decrease from pretest to posttest. From posttest to the second follow-up, there is a further significant decrease in the Home-Start group and evidence of such ( $p = .02$ ) in the comparison group. For ADH problems, the comparison group shows a significant decrease from pretest to posttest, while all groups show a significant decrease from posttest to the second follow-up. For affective problems, only in the Home-Start group a significant decrease is observed (both from pretest to posttest as well as from posttest to the second follow-up). Anxiety problems, finally, only display a significant decrease from pretest to posttest in the Home-Start group.

In Table 3, the intercept variances are large relatively, compared to the residual variances, showing that there are large pretest differences between families compared to the estimation errors within families. The slope variances show that there are also differences between family in the amount of change over time, unaccounted for by the fixed part (fixed parameters) of the model. The random slope variances from pretest to posttest tend to be larger than the variances from posttest to follow-up, roughly proportional to the differences in the fixed estimates of change over time for these periods. Finally, the negative covariances between the random intercept and slopes indicate that in general



**Table 2**  
Means and standard deviations of the outcome variables at the five measurement occasions.

	Pretest	1 month	Posttest	13-month follow-up	3-year follow-up
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
<i>Maternal wellbeing</i>					
<i>Life satisfaction</i>					
Home-Start	3.56 (1.26)	3.72 (1.17)	3.83 (1.25)	4.13 (1.25)	4.23 (1.25)
Comparison group	4.39 (1.03)	4.59 (1.07)	4.58 (1.01)	1.01 (0.98)	4.60 (1.11)
Community sample	5.25 (0.74)	5.35 (0.68)	5.29 (0.62)	5.39 (0.65)	5.40 (0.63)
<i>Depressive mood</i>					
Home-Start	3.22 (1.16)	3.11 (1.10)	2.71 (1.13)	2.57 (1.17)	2.17 (0.93)
Comparison group	2.39 (0.96)	2.23 (0.98)	2.20 (1.01)	2.20 (0.86)	2.23 (1.10)
Community sample	1.56 (0.46)	1.39 (0.42)	1.53 (0.56)	1.53 (0.69)	1.42 (0.37)
<i>Feelings of competence</i>					
Home-Start	4.63 (1.84)	4.78 (1.62)	5.28 (1.28)	5.04 (1.62)	5.30 (1.31)
Comparison group	4.98 (1.39)	4.96 (1.41)	5.07 (1.31)	5.33 (1.26)	5.07 (1.36)
Community sample	5.25 (1.30)	5.53 (0.79)	5.53 (1.06)	5.60 (0.81)	5.65 (0.77)
<i>Maternal functioning</i>					
<i>Consistent maternal behavior</i>					
Home-Start	4.16 (0.91)	4.17 (0.89)	4.43 (0.90)	4.49 (1.02)	4.63 (0.74)
Comparison group	4.42 (0.81)	4.41 (0.80)	4.46 (0.80)	4.47 (0.78)	4.49 (0.84)
Community sample	4.70 (0.77)	4.74 (0.78)	4.96 (0.57)	4.70 (0.79)	4.87 (0.61)
<i>Responsiveness</i>					
Home-Start	4.91 (0.75)	5.01 (0.76)	5.09 (0.60)	5.21 (0.49)	5.31 (0.59)
Comparison group	5.03 (0.62)	4.98 (0.65)	5.08 (0.50)	5.10 (0.45)	5.23 (0.54)
Community sample	5.31 (0.58)	5.41 (0.50)	5.32 (0.88)	5.35 (0.44)	5.43 (0.39)
<i>Maternal rejection</i>					
Home-Start	2.13 (0.89)	2.00 (0.79)	1.88 (0.75)	1.92 (0.76)	1.75 (0.71)
Comparison group	1.59 (0.46)	1.61 (0.52)	1.55 (0.41)	1.66 (0.51)	1.67 (0.57)
Community sample	1.15 (0.21)	1.18 (0.28)	1.21 (0.23)	1.15 (0.19)	1.33 (0.45)
<i>Child problem behavior</i>					
<i>OD problems</i>					
Home-Start	7.38 (3.04)	6.47 (3.37)	6.48 (2.95)	5.84 (3.16)	4.27 (2.89)
Comparison group	5.79 (2.53)	4.82 (2.51)	4.60 (2.32)	4.85 (2.26)	3.84 (2.68)
Community sample	2.81 (1.85)	2.69 (2.27)	2.61 (2.07)	2.57 (1.87)	1.91 (1.85)
<i>ADH problems</i>					
Home-Start	7.38 (3.12)	6.90 (3.44)	7.05 (3.15)	6.44 (3.02)	3.97 (2.82)
Comparison group	6.07 (2.78)	5.25 (3.01)	4.91 (2.68)	4.79 (2.45)	3.24 (2.39)
Community sample	3.31 (2.62)	3.09 (2.54)	3.08 (2.44)	2.70 (2.49)	1.63 (1.79)
<i>AFF problems</i>					
Home-Start	4.27 (2.93)	3.54 (2.49)	3.44 (2.73)	3.10 (2.30)	1.85 (1.70)
Comparison group	2.32 (1.93)	2.32 (1.77)	2.02 (1.76)	1.98 (1.68)	1.59 (1.90)
Community sample	1.39 (1.44)	1.34 (1.85)	1.26 (1.34)	1.00 (1.28)	0.77 (0.85)
<i>ANX problems</i>					
Home-Start	4.77 (3.47)	3.89 (3.08)	3.47 (2.83)	3.28 (2.85)	3.38 (3.45)
Comparison group	2.58 (2.17)	2.63 (2.25)	2.31 (1.88)	2.11 (2.14)	2.87 (3.55)
Community sample	1.64 (1.27)	1.74 (2.13)	1.61 (1.52)	1.43 (1.72)	0.88 (1.38)

families that score relatively high at pretest, tend to relatively change less over time and vice versa.

#### 4. Discussion

Using five measurements in a period of four and a half year the present study shows that positive changes in maternal and child functioning take place in the time window of the intervention Home-Start, i.e. are measured directly after the intervention that lasted an average of 6 months. Additional changes were observed in the three and a half years thereafter. Though this can not be seen as a direct demonstration of effectiveness of Home-Start, change over time is observed to be more pronounced in the Home-Start group than in a group of families with an elevated level of stress and need for support and also more frequent than in a community sample with average levels of stress and no expressed need for support. Positive changes in the Home-Start group are observed on a number of measures of well-being of mothers, parenting behavior and child behavior.

Taking into account that the design of the study only allows for tentative conclusions, these findings suggest long lasting changes of home visiting by volunteers, offering support on domains that families themselves bring forward. This pattern supports the intervention theory that increasing parental wellbeing by offering support increases parental competence and functioning and thus ultimately positively influences the development of children. Changes were observed on a broad domain of parental and child functioning. This is in line with the intervention theory that effective family support strengthens self regulation processes in families at a fundamental level and thus has a broad array of positive consequences. Of special interest is that improvements in parental wellbeing, parenting and child behavior seem to progress after the intervention, again suggesting that families regained self regulative capacities and that the intervention enabled them to deal with new challenges in new developmental stages. This supports a number of previous finding in the early intervention research, showing that some early interventions can have long lasting effects (Eckenrode et al., 2000; McIntosh, Barlow, Davis, & Stewart-Brown, 2009).

The findings of this study seem to contradict current views that interventions in the early years of life should by necessity be focused, highly structured and delivered by professionals (Olds et al., 2007). Less structured and more need-oriented approaches seem to be able to facilitate changes in families too.

As often in studies of need-oriented family support, this study does not give insight in the structure and content of the activities performed at home and the characteristics and competences of volunteers. To a large extent, the content and structure of the program are left to the volunteers and the families and can vary from family to family. This can be seen as a strength of these programs, but it is also a weakness when it comes to evaluation. Also the moderators of program success (e.g., duration of the sessions, presence or not of the father, age of the child, type of support provided, fidelity to the program principles) are not investigated, due to small sample size. Future research must address these potential moderators to gain insight in what are effective ingredients of home visiting programs. This study has an additional number of weaknesses. The allocation of families to research conditions was not at random. There were several reasons for this choice. Service providers strongly opposed to randomization, because assignment to a control group would deprive families in need from Home-Start support. It was also expected that these vulnerable, low income families with a relatively low education would not agree with or would not be able to participate in complex, formal procedures of random allocation. It was expected that the degree of nonparticipation would be relatively high in the most problematic families.

One of the weaknesses of the study that follows from this choice is that the groups selected as comparison group is not completely comparable to the Home-Start group, given that there are differences in

**Table 3**

Estimates for the change from pretest to posttest, and from posttest to delayed posttest.

<i>Maternal wellbeing</i>	<i>Life satisfaction</i>		<i>Depressive mood</i>		<i>Feelings of competence</i>			
	Estimate (s.e.)	p-Value	Estimate (s.e.)	p-Value	Estimate (s.e.)	p-Value		
Intercept								
Home-start	3.62 (.13)	.00	3.20 (.12)	.00	4.69 (.18)	.00		
Community sample	5.27 (.17)	.00	1.49 (.15)	.00	5.35 (.23)	.00		
Comparison group	4.45 (.13)	.00	2.34 (.12)	.00	5.00 (.19)	.00		
Pretest–posttest change								
Home-start	.50 (.18)	<b>.01</b>	–.85 (.17)	<b>.00</b>	.73 (.27)	<b>.01</b>		
Community sample	.06 (.23)	.80	.06 (.22)	.77	.39 (.34)	.26		
Comparison group	.39 (.21)	.07	–.28 (.20)	.15	.47 (.31)	.12		
Posttest–follow-up change								
Home-start	.09 (.04)	.02	–.12 (.03)	<b>.00</b>	.05 (.04)	.26		
Community sample	.02 (.05)	.61	–.03 (.04)	.37	.02 (.05)	.66		
Random parameters	Estimate (s.e.)		Estimate (s.e.)		Estimate (s.e.)			
Residual variance	.32 (.03)		.28 (.02)		.65 (.05)			
Intercept variance	.80 (.12)		.66 (.10)		1.55 (.23)			
Slope variance								
Pretest–posttest	.67 (.28)		.57 (.19)		1.61 (.48)			
Posttest–follow-up	.02 (.01)		–		–			
Covariance								
Intercept–slope 1	–.21 (.13)		–.19 (.10)		–.95 (.27)			
Intercept–slope 2	–.02 (.02)		–		–			
Slope 1–slope 2	–.05 (.04)		–		–			
Deviance	1630.80		1479.83		2023.88			
<i>Maternal functioning</i>	<i>Consistent maternal behavior</i>		<i>Responsiveness</i>		<i>Maternal rejection</i>			
Fixed parameters	Estimate (s.e.)	p-Value	Estimate (s.e.)	p-Value	Estimate (s.e.)	p-Value		
Intercept								
Home-start	4.12 (.11)	.00	4.95 (.08)	.00	2.08 (.08)	.00		
Community sample	4.72 (.14)	.00	5.35 (.10)	.00	1.15 (.10)	.00		
Comparison group	4.42 (.11)	.00	4.99 (.08)	.00	1.59 (.08)	.00		
Pretest–posttest change								
Home-start	.62 (.16)	<b>.00</b>	.29 (.13)	.28	–.29 (.12)	.02		
Community sample	.22 (.20)	.27	–.03 (.16)	.87	.05 (.15)	.76		
Comparison group	.03 (.17)	.88	.19 (.15)	.20	.02 (.13)	.89		
Posttest–follow-up change								
Home-start	.03 (.03)	.27	.05 (.02)	.03	–.04 (.03)	.19		
Community sample	.00 (.04)	.97	.03 (.03)	.90	.04 (.03)	.18		
Comparison group	.04 (.03)	.20	.05 (.03)	.08	.02 (.03)	.48		
Random parameters	Estimate (s.e.)		Estimate (s.e.)		Estimate (s.e.)			
Residual variance	.11 (.01)		.12 (.01)		.18 (.01)			
Intercept variance	.28 (.04)		.64 (.08)		.27 (.04)			
Slope variance								
Pretest–posttest	.39 (.11)		.88 (.17)		.29 (.13)			
Posttest–follow-up	.017 (.004)		.03 (.01)		.003 (.004)			
Covariance								
Intercept–slope 1	–.17 (.05)		–.31 (.09)		–.19 (.06)			
Intercept–slope 2	–.02 (.01)		–.04 (.02)		–.02 (.01)			
Slope 1–slope 2	–.01 (.02)		–.05 (.03)		.01 (.02)			
Deviance	933.30		1174.14		1059.25			
<i>Child behavior</i>	<i>OD problems</i>		<i>ADH problems</i>		<i>AFF problems</i>		<i>ANX problems</i>	
Fixed parameters	Estimate (s.e.)	p-Value	Estimate (s.e.)	p-Value	Estimate (s.e.)	p-Value	Estimate (s.e.)	p-Value
Intercept								
Home-start	7.03 (.34)	.00	7.23 (.36)	.00	4.00 (.26)	.00	4.44 (.32)	.00
Community sample	2.72 (.43)	.00	3.25 (.47)	.00	1.39 (.34)	.00	1.69 (.41)	.00
Comparison group	5.41 (.34)	.00	5.81 (.37)	.00	2.28 (.27)	.00	2.62 (.32)	.00
Pretest–posttest change								
Home-start	–1.18 (.47)	<b>.01</b>	–.60 (.48)	.21	–1.13 (.42)	<b>.01</b>	–1.87 (.46)	<b>.00</b>
Community sample	.00 (.59)	1.00	–.34 (.60)	.58	–.34 (.53)	.52	–.13 (.58)	.82
Comparison group	–1.35 (.54)	<b>.01</b>	–1.54 (.56)	<b>.01</b>	–.52 (.48)	.29	–.92 (.53)	.08
Posttest–follow-up change								
Home-start	–.52 (.11)	<b>.00</b>	–.71 (.11)	<b>.00</b>	–.36 (.09)	<b>.00</b>	.01 (.15)	.94
Community sample	–.23 (.13)	.08	–.42 (.13)	<b>.00</b>	–.14 (.12)	.23	–.21 (.17)	.23
Comparison group	–.27 (.12)	.02	–.52 (.12)	<b>.00</b>	–.16 (.10)	.13	.21 (.15)	.18
Random parameters	Estimate (s.e.)		Estimate (s.e.)		Estimate (s.e.)		Estimate (s.e.)	
Residual variance	2.30 (.19)		2.47 (.21)		1.87 (.15)		2.32 (.19)	
Intercept variance	5.23 (.77)		6.31 (.91)		3.01 (.49)		4.51 (.69)	
Slope variance								
Pretest–posttest	3.63 (1.63)		3.48 (1.92)		2.91 (1.25)		3.06 (1.58)	
Posttest–follow-up	.21 (.07)		.20 (.08)		.17 (.06)		.62 (.13)	

Table 3 (continued)

Random parameters	Estimate (s.e.)	Estimate (s.e.)	Estimate (s.e.)	Estimate (s.e.)
Covariance				
Intercept–slope 1	–1.74 (.89)	–1.65 (.99)	–1.44 (.65)	–2.04 (.83)
Intercept–slope 2	–.35 (.17)	–.78 (.19)	–.44 (.13)	–.49 (.23)
Slope 1–slope 2	–.07 (.27)	.12 (.27)	–.16 (.21)	–.11 (.35)
Deviance	2955.98	2997.14	2712.77	2984.38

life-events and family income. Consequently, we cannot imply that being in the program has added a significant gain that is not present in the other two groups, as groups differ on many other dimensions.

An additional weakness of the study is the loss of families in the years after the intervention, leading to small sample sizes. The dropout ratio was rather small in the first four waves of data collection. However, a number of addresses of families could not be traced in the last wave of the study. Though, this is not uncommon in studies like this, it forms a threat to the validity of the findings, because selective attrition cannot be ruled out. The differences in demographic characteristics between dropouts and included families were small, but some form of self-selection, related to family functioning is not unlikely.

Another limitation is that the child outcomes are also mother-reported. The study would have been more convincing if more information on family functioning and child behavior were included.

Nevertheless, the findings suggest positive long term changes in several domains of family functioning of families in need after a community based inexpensive intervention delivered by volunteers. This adds to previous findings suggesting that the Home-Start intervention is a promising family support program that deserves more study.

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