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HEALTHY FAMILIES NEW YORK (HFNY) RANDOMIZED TRIAL: IMPACTS ON PARENTING AFTER THE FIRST TWO YEARS

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ABSTRACT

This paper evaluates early impacts of a home visiting program modeled after Healthy Families America on parenting behaviors in the first two years of life. It also proposes a framework for reconciling discrepant findings from randomized trials evaluating home visitation programs. A sample of 1173 families at risk for child abuse and neglect who met the criteria for Healthy Families New York (HFNY) was randomly assigned to either an intervention group that was offered the program or to a control group that was given information and referrals to other services. Study participants were interviewed at baseline and at the child's first birthday (90% re-interviewed) and second birthday (85% re-interviewed). HFNY mothers reported committing fewer acts of abuse and neglect during the child's first two years of life than control mothers. Compared to counterparts in the control group, women in the intervention group who were young, first-time mothers and randomly assigned at 30 weeks of pregnancy or less were less likely to engage in minor physical aggression (51% versus 70%) and abusive parenting in the past week (41% versus 62%). Impacts on the prevalence and number of incidents of serious abuse and neglect were concentrated among the "psychologically vulnerable." These findings suggest that who is offered home visitation may be an important factor in explaining the differential effectiveness of home visitation programs. Improved impacts may be realized by prioritizing the populations served or by enhancing the model to meet program objectives for hard-to-serve families.

Keywords: child abuse and neglect; home visiting; randomized trial; evaluation research

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Introduction

Healthy Families New York (HFNY) is a comprehensive and intensive home visitation program based on the Healthy Families America (HFA) model. Consistent with the HFA model, specially trained paraprofessionals provide home visiting services to new or expectant parents who are deemed to be at risk of abusing or neglecting their children. Home visits are initially frequent, and then continue on a less intensive schedule until the child enrolls in Kindergarten or Head Start. The goals of HFNY are to: (1) promote positive parenting skills and parent-child interaction; (2) prevent child abuse and neglect; (3) support optimal prenatal care, and child health and development; and (4) improve parent's self-sufficiency. These comprehensive goals require the home visitor to provide an array of services and to draw on a number of strategies and resources. The hope for HFNY and other HFA programs is that a comprehensive, strength-based approach will prevent child maltreatment while enhancing child health and development.

Although the HFA model is one of the most broadly recommended and practiced strategies for child abuse prevention in the nation (Harding, Diaz, & Oshana, 2004; Leventhal, 2005), there is considerable debate as to whether the HFA model is an effective means of preventing child abuse and neglect (Chaffin, 2004, 2005; Hahn, Mercy, Bilukha, & Briss, 2005; Oshana, Harding, Friedman, & Holton, 2005). In an article summarizing results from 12 randomized trials that directly measured the child maltreatment outcomes of home visitation programs, Chaffin (2005) reported that only one of the twelve studies, a study of the Nurse Family Partnership (NFP) program in Elmira, New York (Olds, Henderson, Chamberlin, & Tatelbaum, 1986), found a positive impact on child maltreatment; ten revealed no significant improvements; and one showed a negative effect on child maltreatment. While much of the debate regarding the relative effectiveness of the NFP model versus the HFA model has focused

on who delivers home visitation services (i.e., nurses or paraprofessionals), this paper proposes and tests an alternative framework for reconciling the discrepant findings and shifts the focus to who is offered home visitation services.

In contrast to two recent randomized trials of the Hawaii Healthy Start program and San Diego's HFA program, which found little or no evidence that HFA reduced child abuse and neglect (Duggan, McFarlane, Fuddy, Burrell, Higman, Windham, & Sia, 2004; Landsverk, Carrilio, Connelly, Ganger, Slymen, Newton, Leslie, & Jones, 2002), results from the HFNY randomized trial showed that as of the target child's first birthday, the program had positive effects in the areas of parenting and child abuse and neglect (Mitchell-Herzfeld, Izzo, Greene, Lee, & Lowenfels, 2005), birth outcomes (Lee, Mitchell-Herzfeld, Lowenfels, Greene, Dorabawilla, & DuMont, unpublished), and health care (Mitchell-Herzfeld, et al., 2005). Although the findings from the HFNY randomized trial are encouraging, they raise questions about why the other randomized trials of the HFA model have not found positive impacts.

In their recent letter to the editor of *Child Abuse and Neglect*, Olds, Eckenrode, and Kitzman (2005) reminded readers that the original intent of the NFP home visitation program was to prevent the initiation of abuse and neglect, not to prevent the recurrence of abuse and neglect after it has already taken place. In keeping with the goals of the NFP model, Olds and colleagues (1999) recommended targeting a particular group for the prevention effort: young, first-time mothers, who are introduced to the program prior to the birth of their children. The rationale given by David Olds, the developer of NFP, for focusing on this population is threefold (Olds, Henderson, Kitzman, Eckenrode, Cole, & Tatelbaum, 1999). First, the problems the program is designed to prevent are often concentrated among adolescent, first-time mothers (Maynard, 1997; Stier, Leventhal, Berg, Johnson, & Mezger, 1999). Second, first-time mothers

may be more receptive to services, instruction and support given their "heightened sense of vulnerability," as compared to women who have already given birth (Olds et al., 1999: 46). Third, early home visitation provides the opportunity to help plan pregnancies at a pace that allows the young mothers to finish school with as few child care burdens as possible, while also positioning these young women to provide better care to subsequent children (Olds, Kitzman, Cole, Robinson, Sidora, Luckey, Henderson, Hanks, Bondy, & Holmberg, 2004a). Consistent with these ideas, in 1991, the U.S. Advisory Board on Child Abuse and Neglect recommended working with first-time parents "to teach good parenting practices before destructive patterns become entrenched."

Although HFA, like NFP, was not designed to intervene with abusive or neglectful parents in order to avert further maltreatment, a sizable number of families participating in HFA programs have engaged in abuse and neglect prior to enrolling in the program. Moreover, many women have already given birth to the target child or other offspring at the time of their entry into HFA programs. Even if these women do not have an administrative record of abuse or neglect, there is still the possibility that they have engaged in abusive or neglectful behaviors that have not been reported or behaviors that are likely precursors of maltreatment, such as harsh scoldings or punishments. We hypothesize that the participation of such women in the HFA program is likely to dilute the impact of the program on child maltreatment by introducing the possibility that maltreatment may have already occurred prior to or concurrent with program entry. Indeed, MacMillan and colleagues (2005) found limited impacts when they used a randomized controlled trial to evaluate the effectiveness of a home visitation program delivered by public-health nurses in preventing the recurrence of child abuse and neglect.

In the current study, we use data gathered from a randomized control trial that was designed to evaluate the effectiveness of HFNY. Whereas the randomized trials of HFA programs conducted in Hawaii (Duggan et al., 2004) and San Diego (Landsverk et al., 2002) were limited to women who had already given birth, HFNY's evaluation included young women who were randomly assigned to the intervention or control groups prior to the birth of their first child as well as older women who entered the study after the birth of their first child or a subsequent child. This places our evaluation in the unique position of being able to identify a subgroup of our sample that has not yet had the opportunity to abuse or neglect their children. We therefore constructed an analytic subgroup (which we refer to as a prevention subgroup) to resemble the population targeted by the NFP program (Olds, Eckenrode, Henderson, Kitzman, Powers, Cole, Sidora, et al., 1997): first-time mothers under the age of 19 who were randomly assigned at 30 weeks of pregnancy or less. As approximately 15% of our entire sample falls into this relatively homogeneous subgroup, we are able to contrast HFNY's effectiveness for this prevention subgroup with the remaining women, a more heterogeneous sample that is similar to those used in the other randomized trials of HFA.

We also isolate a second subgroup that is similar to a group for whom NFP was found to be particularly successful, women with "low psychologic resources" (Olds, Robinson, Pettitt, Luckey, Holmberg, Ng, Isacks, Sheff, & Henderson, 2004b). In work by Olds and colleagues (2002; 2004b), the low psychologic resources group is comprised of women who have "limited intellectual functioning, mental health, and sense of control over their lives." As the NFP sample consisted primarily of first-time mothers under the age of 19 years, the current study is the first to test the generalizability and robustness of the impact of home visitation among women with low psychologic resources within a more heterogeneous sample of women. It is hypothesized

that this compromised status will make program participants more susceptible and receptive to the messages and services the program offers.

Purpose

In summary, this paper will (1) document HFNY's ability to reduce child abuse and neglect; (2) explore and test one framework for understanding and reconciling the discrepant findings from various randomized trials of home visiting models—prevention versus intervention; and (3) evaluate an additional subgroup for whom home visitation has previously been found to be particularly successful—the psychologically vulnerable. The evaluation of HFNY utilizes a randomized experimental design in three of the 29 program sites. To date, it is the largest and most comprehensive randomized trial of the HFA model, and is the first randomized trial to evaluate the importance of pre- versus post-natal service delivery.

Healthy Families New York Program Description

New York State's Office of Children and Family Services (OCFS), formerly the Department of Social Services, established Healthy Families New York (HFNY) in 1995. HFNY is funded and managed by OCFS, which contracts with community-based agencies to provide home visitation services, and currently operates in 29 sites throughout New York State. In 2005, HFNY had an allocated budget of $17.6 million and the cost per family ranged from $3,000-$3,500 per year.

Screening

Population-based screening is used to target expectant parents and parents with an infant under three months of age who are deemed to be at risk for child abuse or neglect and live in communities that are considered high risk due to high rates of teen pregnancy, infant mortality, welfare receipt, and late or no prenatal care. Parents who screen positive are referred to the

HFNY program, and a Family Assessment Worker (FAW) conducts an interview using the Family Stress Checklist (Kempe, 1976) to determine their risk of abusing or neglecting their children and ultimate eligibility for the program. Parents who score above a predetermined cut-off are offered home visitation services, even if they have a prior Child Protective Services (CPS) report. Participation in the program is voluntary.

The Family Support Worker

After the assessment process is complete, a Family Support Worker (FSW) or home visitor is assigned to the family. FSWs are specially trained paraprofessionals who live in the target community and share the same language and cultural backgrounds as program participants. Home visitors are selected primarily based on personal attributes such as warmth, fondness for children, non-judgmental attitude, and belief in non-physical methods of disciplining children. As a result, home visitors often are able to reach families who might not go to an office-based setting to receive services. Although home visitors are not required to have any post-secondary education, many have taken courses at the post-secondary level (approximately 40%) and about one-third are college graduates. These figures are slightly higher than the averages for other HFA programs across the country that were reported in the HFA Implementation Study (Harding, Reid, Oshana, & Holton, 2004).

Training and quality assurance

HFNY uses a standardized approach to training and quality assurance. All new HFNY staff members attend a one-week core training that is run by a New York State team of approved HFA trainers and sponsored by Prevent Child Abuse New York. The goal of the core training is to teach the basic skills needed to perform home visits and assessments. It includes training on parent-child interaction, child development, and strength-based service delivery for FSWs;

training in administering and scoring the Kempe for FAWs; and four days of training for supervisors on their role in promoting quality services. Staff members practice skills learned in core training with a series of transfer-of-learning exercises and receive intensive local "wraparound" training on a variety of topics such as domestic violence, substance abuse, abuse and neglect, well-baby care, and communication skills. Prior to visiting families, FSWs shadow an experienced home visitor. Once in the field, home visitors meet with their supervisors for at least 1.5 hours each week and are observed on one home visit per quarter. All program managers attend state-sponsored bi-monthly meetings to share resources, discuss training and policy issues, and receive technical assistance. Quality assurance is performed through regular visits by OCFS and by PCANY trainers' observations of FAWs, FSWs, and supervisors.

Home visits

Home visits are scheduled biweekly during pregnancy and increase to once a week after the mother gives birth (Level 1), usually remaining at this level until the child is at least six months old. As families progress through the service levels, home visits occur on a diminishing schedule, from biweekly (Level 2), to monthly (Level 3), and then quarterly (Level 4). The program continues until the target child is five years old, or enrolls in Kindergarten or Head Start. Home visitors typically carry a caseload of 15 when the home visitor is seeing families weekly, and up to 25 cases when the families are visited less frequently.

The content of the visits is intended to be individualized and culturally appropriate. At all levels, activities focus on supporting parents, improving the parent/child relationship, helping parents understand child development and age-appropriate behaviors, encouraging optimal growth, providing assistance with access to health care, working with parents to address family challenges (e.g., substance abuse, mental health issues), and developing Individual Family

Support Plans to improve self-sufficiency and family functioning. FSWs utilize curricula approved by HFA such as "Partners for a Healthy Baby" and "Parents as Teachers" as well as standardized instruments to assess children for developmental delays. Referrals to local early intervention programs or other community services and resources are made as needed.

Methods

Overview of the randomized controlled trial of HFNY

In 2000, the Bureau of Evaluation and Research located within New York State's OCFS, in collaboration with the Center for Human Services Research (CHSR) at the University at Albany, launched a three-year evaluation to determine whether HFNY works for New York's families. A randomized experimental design was used in which families meeting the assessment criteria for HFNY were randomly assigned to either an intervention group that was offered HFNY services or to a control group that was given information and referral to other appropriate services.

The randomized trial was conducted at three sites with home visiting programs that had been in operation since HFNY's inception. By expanding recruitment of potential participants to cover the whole county or additional zip codes, the three selected sites were able to identify a pool of potential candidates for the program that was large enough to both maintain (or increase) the number of families they served and to form a control group of sufficient size. Site A comprised about half the sample, and Sites B and C each made up approximately a quarter of the sample. The three sites varied in terms of geographic location, urbanization, host agency affiliation, and the characteristics of eligible families.

Recruitment, screening, random assignment, and enrollment

Recruitment for the study began in March 2000 and ended in August 2001. After the initial screening, a FAW arranged to meet with the potential study participant in her home to provide information about the types of services she would be offered, the nature of the study, what would be expected of her, her right to refuse or end participation in the research, and the procedures for protecting the confidentiality of the information provided. The FAW then asked the woman to sign an informed consent form signifying her willingness to participate in the study. Once the consent form was signed, the FAW assessed the women for risk of engaging in child abuse and neglect using the Family Stress Checklist (Kempe, 1976), and if she scored at or above the pre-established cutoff of 25 she was considered eligible for the study.

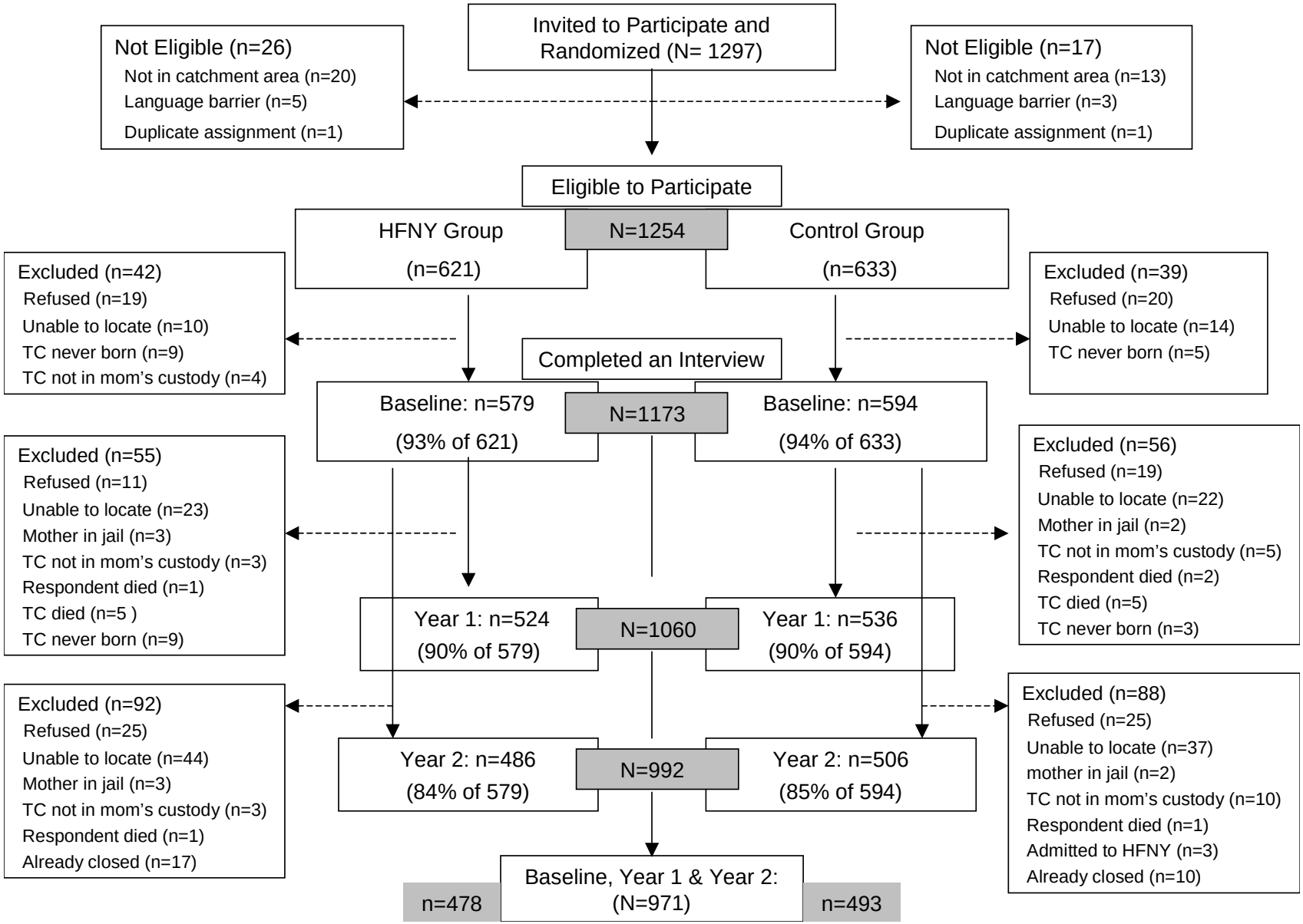
Within a week of determining initial program and study eligibility, random assignment was performed within each site using a computer program designed for this study, which incorporated security protections to preclude program or evaluation staff from bypassing the random assignment process. Each participant in the HFNY (intervention) group was assigned to a home visitor, who contacted her to set up an initial home visit to complete the enrollment process. After enrollment in HFNY, families were offered the usual array of services provided by the program. Meanwhile, FAWs provided parents assigned to the control group with information about other services in the community and made referrals based on the needs identified during the assessment interview, but did not refer parents to other home visiting programs that were similar in type, duration, and intensity to HFNY. FAWs did not contact other providers on behalf of control parents or follow up to determine whether they actually received the services to which they were referred.

Over the eighteen-month sample selection period, 1297 were randomly assigned to the HFNY program (n= 647) or the control group (n=650). Between the time of random assignment and the baseline interview, a number of women were deemed ineligible for the study due to language barriers, duplicate representation in the study, addresses outside of the catchment area (i.e., outside certain zip code areas in one site or outside the county in the other two sites), and participation in a HFNY program at another site (see Figure 1). As a result, only 1254 of the 1297 women who had been randomly assigned were actually eligible for the study. Evaluation staff then attempted to conduct an in-home baseline interview with each eligible women assigned to the HFNY and control groups within one month of random assignment. Baseline interviews were conducted with 1173 (93.5%) of the eligible women (intervention, n=579; control, n=594), as shown in Figure 1.

Study sample

The study sample includes women who were deemed eligible for the study, were randomly assigned, and received baseline interviews (n=1173). Similar to the population of HFNY participants served statewide, the study sample is ethnically and racially diverse. About a third (34%) of the mothers in the study sample were white, non-Latina; 45% were African-American, non-Latina; and 18% were Latina. Like HFNY participants statewide, women in the study sample were often young (31% under age 19), first-time mothers (54%) who had not yet completed high school or received a GED (53%) and were never married (82%). Over half (54%) of those served statewide enrolled in HFNY during the prenatal period, while nearly 65 percent of women in the study sample were randomly assigned during their pregnancies.

Figure 1. CONSORT Diagram: Study Random Assignment, Sample, and Participation



For the 1173 women interviewed at baseline, an intention-to-treat approach was adopted. That is, once a woman was randomly assigned and interviewed, she remained in her assigned group for the duration of the study, regardless of whether she ever enrolled in HFNY or dropped out prematurely.

Data Collection

In addition to the baseline interview, participants were interviewed in their homes shortly after the birth of their children (if they entered the study prior to giving birth), at the time of the target children's first and second birthdays, and, for a subsample, again at age three. This paper uses data from the baseline, Year 1, and Year 2 data collection efforts (data from the third year subsample are not yet available). Study retention was high: 90% of the parents who completed a baseline interview were re-interviewed at Year 1, and 85% were re-interviewed at Year 2; 2% of the sample completed the Year 2 but not the Year 1 interview.

All interviews were completed by interviewers who were independent of HFNY and blind to group assignment. Interviewers from the evaluation team waited two weeks after random assignment before contacting the respondents for their baseline research interviews. This delay gave the FAWs a chance to contact the families and tell them whether they were in the HFNY group or in the control group. Most interviewers initiated the tracking process for the baseline interview with a phone call. For respondents who did not have phones, interviewers used letters and home visits. The baseline interview lasted about 1 hour and 15 minutes and the follow-up interviews at Year 1 and Year 2 took between 45 minutes and one hour. Study respondents were paid a small stipend of $40 for their participation in each of the three interviews.

Most interview data were collected using laptop computers equipped with a Computer-Assisted Personal Interviewing (CAPI) system. CAPI guided staff through each interview, provided prompts as appropriate, automatically skipped questions that were not applicable to the respondent, substituted phrases based upon previous responses, and edited data upon entry to maximize integrity and consistency. At each follow-up we also administered a paper-and-pencil self-report measure of abusive and neglectful parenting, and extracted data from an automated database maintained by OCFS that tracks child abuse and neglect reports and determinations. By drawing upon data from two independent sources, we hoped to create a fairly accurate picture of abusive and neglectful parenting. Self-reports of parenting practices have the benefit of capturing abusive and neglectful behaviors that may never come to the attention of CPS, but parents may underreport undesirable behaviors like abuse. On the other hand, although the incidents of child abuse and neglect that are substantiated by CPS are likely to have actually occurred, most acts of child abuse and neglect are never reported to CPS, and only a small proportion of those that are reported are substantiated. In addition, Olds and colleagues (1995) found that CPS reports are prone to surveillance bias and cautioned against their use as a single measure of child abuse and neglect in evaluations of home visiting programs

Analytic Subgroups

Prior to analyzing the Year 2 data, we constructed two analytic subgroups. The first, which we refer to as the "prevention subgroup," includes first-time mothers under the age of 19 years who were randomly assigned at a gestational age of 30 weeks or less – a group that closely resembles the population served by NFP. In contrast to this relatively homogeneous group of women, the remaining women, whom we refer to as the "diverse subgroup," are similar to the majority of women served by HFA programs. The "prevention subgroup" was created to explore

the possibility that the program differentially impacts those who are at high risk of maltreating, but have not yet had the opportunity to abuse or neglect their own children as compared to a more diverse group of women who varied in age, prenatal status at the time of random assignment, presence of other offspring, and prior involvement with CPS.

The second subgroup, the "psychologically vulnerable," approximates the "low psychologic resources" subgroup identified by Olds and colleagues (Olds, Robinson, O'Brien, Luckey, Pettitt, Henderson, Ng, Sheff, Korfmacher, Hiatt, & Talmi, 2002). The low psychologic resources index constructed by Olds included three components: mental health status, mastery, and a measure of limited intellectual functioning (Olds et al., 2002; Olds, et al., 2004b), while our psychologically vulnerable variable was limited to two components: depressive symptoms (CES-D; Radloff, 1977) and mastery (Mastery of Psychological Coping Resources Scale; Pearlin & Schooler, 1978). In keeping with the procedure used by Olds and colleagues (2002), we first created an index of psychological vulnerability by combining mean baseline z scores for the respondent's depressive symptoms and a reverse-scored mastery scale, and then standardized the composite to a mean of 100 and a standard deviation of 10. Next, as we did not have information on the third component included in the NFP low psychologic resources variable, intellectual functioning, we compensated for the potential reduction in reliability by dichotomizing our index at the top ten percent (113.3) to capture the most psychologically vulnerable women in the sample instead of dividing the sample at the mean (Olds et al., 2002). Those above the cutoff were considered "psychologically vulnerable," and those below the cutoff served as the reference group. The index was also included as a covariate in the analyses to mark psychological vulnerability at baseline.

Measures

Maternal report of parenting behaviors. We used the revised parent-child Conflict Tactics Scale (CTS-PC) at each follow-up to measure self-reported parenting practices (Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). To reduce respondents' reluctance to disclose negative behaviors to the interviewers, mothers were instructed to fill out a paper-and-pencil version of the CTS-PC (which did not include their names), and then place the completed instrument in a sealed envelope. Mothers were asked how often they engaged in 27 different behaviors in the past year (never, 1 time, 2 times, 3-5 times, 6-10 times, 11-20 times, or more than 20 times) as well as five questions about parenting in the past week. The instrument measures both whether an event ever occurred, its "prevalence," and how often it occurred (0-20 times), which we refer to as "frequency." The reliability and validity of the CTS-PC have been demonstrated by Straus and colleagues (1998; 2004). Cronbach alphas in our sample ranged from .60 to .95.

The CTS-PC has a number of subscales: neglect, psychological aggression, nonviolent discipline, minor physical aggression, severe abuse, very severe abuse, and harsh parenting in the past week: shouting, shaking, spanking, and slapping (we omitted the item that inquired about time outs). We excluded the nonviolent discipline subscale because some of the items were over-endorsed, suggesting that punitive parenting styles may exist even within this positively labeled category. For purposes of comparison with CPS data, we also derived a proxy measure of "official" child abuse and neglect by creating a composite scale consisting of the eleven most serious items from the neglect and severe/very severe physical abuse subscales. The composite scale encompasses acts that likely would have resulted in a substantiated report had they been brought to the attention of CPS, such as hitting with a fist or object, shaking or burning the child, leaving the child alone, or being so drunk that the parent can not care for the child. Finally, due

to nonrandom missing data on the self-reports at Year 2, we examined multiple algorithms for replacing missing items. The methods ultimately used for substitution are described in the data analysis section.

Substantiated CPS reports. We reviewed CPS records of child abuse and neglect reports using data from OCFS' CONNECTIONS database. CONNECTIONS tracks abuse and neglect cases from the time they are reported to the Statewide Central Register for Child Abuse and Neglect through their investigation and determination. When a report for a study participant was located, information was collected about whether or not the report was substantiated, who the perpetrator and victim were, the type of maltreatment alleged, the extent of injury to the child, and whether substance abuse and domestic violence were involved. In this paper we measured program impact by the percent of women with a substantiated report and the mean number of substantiated reports. We also abstracted information on CPS reports dating back five years prior to study entry to establish a meaningful baseline. Evidence of a prior substantiated case of child abuse or neglect in the past five years was dummy coded 1 and used as a covariate in the analyses.

Random Assignment. Treatment group assignment was represented with a dummy-coded variable (1=HFNY intervention; 0=control).

Covariates used when estimating the treatment effect. A number of variables were included in the analyses to adjust for levels of functioning at baseline and to help isolate the treatment effect. Two dummy-coded variables were used to represent race/ethnicity: non-Latina white women and Latina women versus the reference group of non-Latina African-American women. Other dummy-coded covariates included random assignment at a gestational age of 30 weeks or less, site of participation, history of substantiated neglect or abuse, status as a first-time mother,

respondent's age at intake, born in the United States, receipt of cash assistance from welfare in the past year, and psychological vulnerability. Also dummy coded was parents' own history of childhood maltreatment, a single recall item from the Revised Conflict Tactics Scale (CTS2; Straus, Hamby, Bonney-McCoy, & Sugarman, 1996), "my mother swore at me more than twice," that captured harsh or inappropriate treatment of the respondent as a child. A continuous variable from baseline was included to measure physical health status, from the general health subscale of the RAND 36-Item Healthy Survey 1.0 (Hays, Sherbourne, & Mazel, 1993). In addition, we controlled for the total number of current depressive symptoms as measured by the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) at each of the corresponding follow-ups to adjust for variations in self-reported behaviors that could be attributed to one's current mental health status or to method bias (Dohrenwend, Dohrenwend, Dodson, & Shrout, 1984).

Data Analysis

We used student t-tests and chi-square tests to assess the comparability of the intervention and control groups on demographic variables and risk factors for child abuse and neglect at baseline as well as to test the representativeness of mothers who completed the follow-up interviews at the first and second follow-ups. In order to explore the possibility of a surveillance bias, we also conducted chi-square tests to estimate the level of agreement between self-reported abuse and neglect and CPS substantiated reports.

Logistic regressions were used to examine the effects of HFNY on the dichotomized prevalence outcomes for the two measures of parenting (self-reported parenting and CPS substantiated reports) at Years 1 and 2. Odds ratios, a way of comparing whether the probability of a certain event is the same for two groups, were calculated to compute the adjusted means and

significance levels. A program impact is suggested if the intervention group is significantly less likely to have poor parenting behaviors or substantiated reports relative to the control group. In models where the outcome of interest was a count variable with a large proportion of zero or near-zero values (i.e., the frequency scores and counts of substantiated reports), program effects were analyzed using log-linear regression, assuming a negative binomial distribution, as appropriate (Long, 1997). Statistical significance was set at 0.05 and SAS 8.2 was used for analyses.

In both sets of analyses, the treatment condition (i.e., assigned to the control group versus the HFNY group) was the primary independent variable, and the models controlled for the covariates described above. To test for specific subgroup program effects, two sets of interactions (prevention subgroup X treatment group assignment and, psychologically vulnerable subgroup X treatment group assignment) were examined separately. Due to concerns regarding sufficient power to detect interaction effects and/or to produce stable coefficients for the interaction terms, interactions were only evaluated if the prevalence of the maltreatment event was at least 6% for both the treatment and control conditions.

Missing data. As mentioned earlier, a computer-assisted program that required participants to select an answer (including don't know or refused) was used for most of the questions on the interview. For these variables, the percentage of missing responses was less than 1%. However, when completing the paper-and-pencil version of the CTS-PC, if a parent chose to skip an item, the item was left blank. At Year 1, the number of missing items for those who completed the CTS-PC was minimal (<6.7%) and equivalent across the two groups. But, at Year 2, the number of missing items increased and varied across the groups, with approximately 13% of the control group missing at least one item as compared to only 10% of the intervention group. In addition,

seven control and three intervention group Year 2 participants who completed the computer-assisted questionnaire chose not to answer any of the CTS-PC items and had to be excluded from the analyses. Seventy percent of these individuals had either a CPS report since random assignment or self-reported acts of abusive or neglectful parenting at Year 1.

To better understand why some respondents at Year 2 failed to respond to certain CTS-PC items (i.e., was this merely an oversight or did the respondent intentionally ignore certain behaviors either because she felt they did not apply or she did not want to admit undesirable behaviors), we investigated the relations between the missing items, prior CPS reports, self-reported parenting at Year 1, and current CPS reports. For both groups, skipping an item was associated with indicators of abuse and neglect from other data sources (e.g., CPS records and Year 1 self-report) and therefore appeared to be non-random. McCarroll and colleagues (2000) reported a similar finding regarding items on the CTS measure of domestic violence, in which individuals who omitted an item were more aggressive towards their partner than those who did not omit an item. Consequently, we were reluctant to drop these cases from the analyses as it might underestimate the prevalence of abusive or neglectful parenting (Straus, 2004).

To further assess how non-reporting might bias our Year 2 prevalence results, we constructed and compared five different substitution methods: dropping missing items, substituting 0s for all missing items, substituting 1s for all missing items, substituting 1s only when a subject had a concurrent indicated CPS report, and using an index substitution procedure (see below). We did not substitute values from Year 1 self-reports or CPS records as this presumes the intervention is not working and minimizes shifts in parenting behaviors or styles as a result of developmental differences (e.g., parenting an infant is different than parenting a two-year-old).

To create the index, we used data from Year 1, excluding the dummy code for treatment group assignment, to develop a regression model that explained a substantial portion of the variance of self-reported major abuse and neglect as measured by the Year 1 composite scale. The Year 1 correlates included: presence of domestic violence, being African-American, being Latina, having a male target child, using drugs, falling in the top quartile for depressive symptoms, having an indicated maltreatment report in the first year of the target child's life, having an instance of the target child not receiving needed medical care in the past year, and already having at least one other child. We then constructed a similar equation at Year 2 using the weights from Year 1 and the values of the Year 2 variables to compute risk for self-reported maltreatment as of the child's second birthday. Next, to assure that our treatment of the missing values was conservative, we dichotomized the index at one standard deviation above the mean versus all others. Thus, only those who had the highest levels of risk were assigned a score greater than zero to replace the missing value. To illustrate the biases of the missing data and to demonstrate the robustness of the study's effects, results for prevalence data were repeated with the means from all five-substitution methods (see Appendix A).

As there was no straightforward way to replace missing values for frequency scores, and given the relative consistency of results for the prevalence scores across substitution methods, we simply used a traditional listwise deletion method within subscales for analyses of frequency of abuse and neglect. While we are quite confident in our estimates of whether a behavior ever occurred - its prevalence - we are less confident in our estimates of missing value substitutions about how often a behavior occurred - its frequency.

Results

Sample description

Table 1 displays means and percentages for demographic variables, covariates, and membership in the subgroups for the entire sample, control group, and HFNY group. There were no significant differences between the HFNY group and control group on any of these measures, demonstrating that the random assignment was successful in securing the equivalence of the two groups at baseline. Despite the fact that over half of the sample was comprised of first-time mothers, approximately 20% of the sample had a prior CPS report and 9% of the sample had a substantiated child abuse or neglect report prior to baseline. Over 40% of these prior CPS reports were still open at the time of random assignment.

With respect to group differences over the course of the study, the HFNY group and the control group did not differ significantly at either the Year 1 or the Year 2 follow-up points. Follow-up rates at Year 1 were slightly higher for non-Latina white women, and lower for Latina women and non-Latina African-American women. However, by Year 2, there was no longer a difference in the rate at which non-Latina African-American women participated in the study. At both follow-up periods, participants who remained in the study were more likely than those who dropped out of the study to be first-time mothers (Year 1: 55.5% versus 41.8%, $p=.006$; Year 2: 56.1% versus 43.9%, $p=.003$), but less likely to have been randomly assigned at a gestational age of 30 weeks or less (Year 1: 47.4% versus 84%, $p<.001$; Year 2: 47.4% versus 80%, $p<.001$). No other significant differences were found between those who continued in the study and those lost to attrition.

Table 1. Baseline characteristics of HFNY and control groups

Characteristic	**Total (n=1173)**	**HFNY Group (n=579)**	**Control Group (n=594)**	***p***
Mean maternal age in years	22.5 (sd = 5.5)	22.4 (sd = 5.6)	22.5 (sd = 5.4)	.60
Mother < 19 years old	31.0%	32.3%	29.8%	.36
First-time mother	54.2%	55.3%	53.2%	.48
Randomly assigned at a gestational age of 30 weeks or less	48.5%	47.3%	49.7%	.42
Mother's race/ethnicity White, non-Latina African-American, non-Latina Latina	 34.4% 45.4% 18.0%	 34.4% 44.4% 18.3%	 34.3% 46.5% 17.7%	 .99 .48 .78
Prior substantiated child abuse or neglect reports	9.0%	9.0%	8.9%	.97
Prior child abuse or neglect reports (substantiated or unsubstantiated)	20.2%	19.7%	20.7%	.66
Family received cash assistance from welfare	29.2%	31.1%	27.4%	.39
Mean score on general health status [from RAND]	70.6 (sd = 18.3)	70.3 (sd = 18.6)	70.9 (sd = 18.0)	.52
Mother's childhood history of child maltreatment	48.7%	49.2%	48.1%	.69
Psychologically vulnerable subgroup	10.4%	10.2%	10.6%	.82
Prevention subgroup	14.5%	14.9%	14.1%	.73

Did HFNY have an impact on abusive or neglectful parenting?

Table 2 shows adjusted means and confidence intervals for program impacts on child maltreatment by year and treatment group assignment for prevalence, whether an event ever occurred (shaded columns), and frequency, how often the event occurred (unshaded columns). Statistically significant ($p<.05$) program impacts are asterisked and bolded. For the sample as a whole, no program effects were observed for prevalence of any self-reported subscales at Year 1 or Year 2, although the prevalence of neglect was marginally significant at Year 1 ($p=.07$) and the frequency of neglect was marginally significant at Year 2 ($p=.08$). Differences were noted, however, for the frequency of several self-reported subscales. At Year 1, compared to mothers in the control group, mothers in the HFNY intervention group reported having engaged in significantly fewer acts of very serious physical abuse (.01 versus .08, $p<.05$), minor physical aggression (2.40 versus 3.46, $p<.01$), psychological aggression (3.34 versus 4.74, $p<.01$), and harsh parenting behaviors in the last week (1.21 versus 1.81, $p<.05$). At Year 2, a program impact was found for the frequency of self-reported serious physical abuse such that HFNY parents reported having committed, on average, one-third fewer acts of serious physical abuse in the past year (e.g., hitting child with fist, kicking child, slapping on face) than the control group (.01 versus .04).

Consistent with findings from other randomized trials of HFA programs, no significant differences were detected between the control and HFNY groups for indicators of substantiated CPS reports of abuse and neglect at Year 1 (n=1173) or Year 2 (n=1166) (bottom of Table 2).

Table 2. Mother's abusive and neglectful parenting behaviors toward target children by treatment group assignment and year of follow up: overall sample from the Randomized Trial of Healthy Families New York[1,2].

Characteristic	**Group**	**Prevalence (%) Year 1 (confidence interval)**	**Prevalence (%) Year 2 (confidence interval)**	**Frequency Year 1 (count) (confidence interval)**	**Frequency Year 2 (count) (confidence interval)**
Serious abuse and neglect composite scale	Control	7.28 (5.28-9.96)	7.83 (5.59-10.87)	.53 (.29-.97)	.35 (.19-.63)
	HFNY	5.67 (3.94-8.10)	6.78 (4.71-9.66)	.27 (.14-.51)	.38 (.21-.70)
Very serious physical abuse	Control	1.33 (.59-2.94)	2.85 (1.63-4.94)	.08 (.03-.41)	.13 (.05-.37)
	HFNY	.93 (.38-2.26)	2.62 (1.47-4.64)	.01* (.00-.06)	.13 (.04-.38)
Serious physical abuse	Control	.81 (.31-2.07)	1.21 (.46-3.14)	.01 (.00-.05)	.04 (.01-.11)
	HFNY	.85 (.34-2.14)	.06 (.19-1.78)	.01 (.00-.05)	.01***** (.00-.03)
Minor physical aggression	Control	44.42 (39.99-48.94)	64.55 (59.94-68.91)	3.46 (2.82-4.24)	5.86 (5.00-6.86)
	HFNY	39.60 (35.25-44.12)	64.50 (59.81-68.93)	2.40****** (1.95-2.96)	5.67 (4.84-6.66)

Table 2 (continued).

Characteristic	Group	Prevalence (%) Year 1 (confid. interval)	Prevalence (%) Year 2 (confid. interval)	Frequency Year 1 (count) (confid. interval)	Frequency Year 2 (count) (confid. interval)
Psychological Aggression	Control	56.13 (51.62-60.53)	77.74 (73.62-81.38)	4.74 (3.99-5.65)	9.84 (8.56-11.31)
	HFNY	51.18 (46.63-55.70)	76.44 (72.18-80.23)	3.34** (2.80-3.99)	9.37 (8.16-10.79)
Neglect	Control	8.27 (6.13-11.06)	7.18 (5.11-10.00)	.21 (.12-.35)	.46 (.27-.76)
	HFNY	5.52+ (3.83-7.90)	8.09 (5.83-11.13)	.21 (.12-.35)	.22+ (.13-.38)
Harsh Parenting in past week (excluding time outs)	Control	36.12 (31.94-40.51)	54.58 (49.81-59.27)	1.81 (1.46-2.24)	3.13 (2.62-3.73)
	HFNY	32.67 (28.58-37.04)	53.12 (48.30-57.87)	1.21* (.97-1.51)	2.76 (2.30-3.30)
Substantiated abuse or neglect reports	Control	5.98 (4.33-8.21)	4.80 (3.33-6.87)	.07 (.05-.10)	.06 (.04-.09)
	HFNY	7.90 (5.92-10.46)	5.08 (3.54-7.22)	.09 (.70-.12)	.06 (.04-.09)

1 All means are adjusted for prior substantiated reports of child abuse or neglect, two dummy codes representing race/ethnicity, random assignment at a gestational age of 30 weeks or less, site of participation, status as a first-time mother,born in the United States, mothers' age at intake, welfare receipt, mothers' own history of abuse, physical health status, the psychologically vulnerable index, and current depressive symptoms from the appropriate follow-ups.

2 The results presented are from analysis of CTS-PC data using group means without any substitutions for missing data.

+ $p \leq .10$ * $p < .05$ ** $p < .01$

Is there evidence of a surveillance bias?

One barrier to detecting a program impact on official reports of substantiated abuse and neglect is increased surveillance of the intervention group, either as a direct result of participating in HFNY, or indirectly through referrals and connections to other services associated with participation in HFNY. To determine whether a surveillance bias was operating, we examined whether parents in the HFNY group who self-reported serious abuse and neglect, as measured by the composite scale, were more likely to have CPS reports (either substantiated or unfounded) than parents in the control group who self-reported serious abuse and neglect. Among parents who self-reported serious abuse or neglect at Year 1, the percentage with CPS reports was significantly greater in the HFNY group (43%) than in the control group (18%). At Year 2, the detection rates were comparable (23% for controls and 24% for the intervention group), but the opportunity for surveillance of the intervention group dramatically decreased, as only 33% of the respondents in the HFNY group were still participating in the HFNY program. However, increased detection in the first year is likely to influence the rate of reports on subsequent years because once a family is known to CPS, they are subject to heightened scrutiny that is likely to result in additional reports. Thus, increased surveillance as a result of association with HFNY seems likely, particularly during the initial year of the program.

Were impacts of HFNY concentrated in the prevention subgroup?

Next, we examined whether the "prevention subgroup" (i.e., first-time mothers under age 19 who were randomly assigned at a gestational age of 30 weeks or less) moderated the relationship between treatment group assignment and indicators of abuse and neglect. At Year 2, we detected two pronounced program impacts on the prevalence of maltreatment in the "prevention subgroup." The significant interactions ($p<.05$) showed that compared to their

Figure 2a. Percentage of parents at Year 2 engaging in minor physical aggression by treatment group assignment and prevention subgroup status

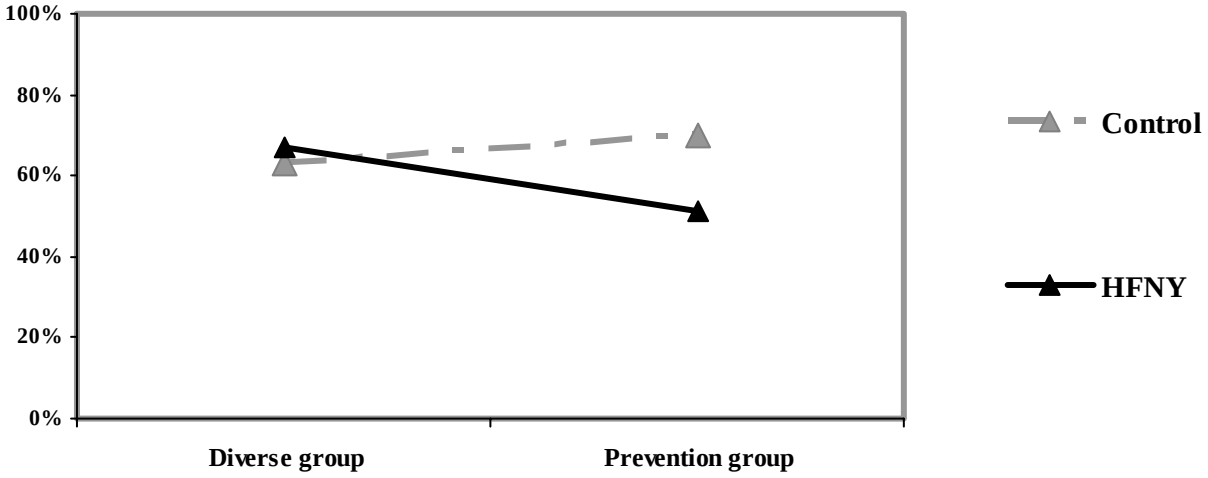
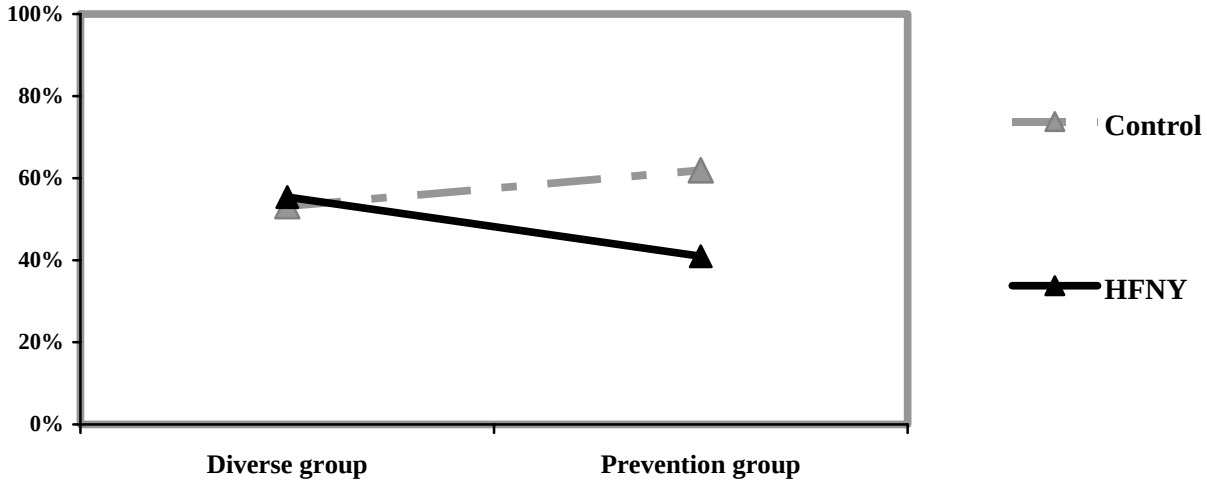


Figure 2b. Percentage of parents at Year 2 engaging in harsh parenting during the past week by treatment group assignment and prevention subgroup status



counterparts in the control group, HFNY mothers classified as part of the prevention subgroup were less likely to self-report engaging in minor physical aggression against their children in the past year (51% versus 70%, Figure 2a) and harsh parenting behaviors in the past week (41% versus 62%, Figure 2b). For both of these subscales, significant interactions were found across all five missing data substitution methods (Appendix B). In contrast, the prevalence rates for the intervention and control groups among the more "diverse group" of mothers were comparable: minor physical aggression (67% versus 63%) and harsh parenting in the past week (55% versus 53%).

Table 3 shows the adjusted means, significance levels, and confidence intervals for all of the prevention interactions that we examined. The "prevention subgroup" classification did not moderate the relationship between treatment group assignment and the frequency of any self-reported parenting subscales. However, the pattern of non-significant effects for the CPS reports, and, at Year 2, all but one maltreatment subscale was consistent with the significant effects observed for minor physical aggression and harsh parenting. Of note, and as indicated in Table 3, we were unable to conduct adequate tests of subgroup impacts on several of the more severe abuse and neglect subscales of the CTS-PC due to the low incidence of these events.

Were impacts of HFNY concentrated in the psychologically vulnerable subgroup?

Next, we examined whether being "psychologically vulnerable," those with a low sense of mastery and high levels of depressive symptoms at baseline, conditioned relationships between treatment group assignment and indicators of abuse and neglect. Several significant interactions emerged across the two years that were consistent with this suggestion. For example,

Table 3. Mother's abusive and neglectful parenting behaviors toward target children by treatment group assignment: Prevention Subgroup Interactions[1,2].

Characteristic	**Group**	**Prevalence (%) Year 1 (confidence interval)**	**Prevalence (%) Year 2 (confidence interval)**	**Frequency (count) Year 1 (confidence interval)**	**Frequency (count) Year 2 (confidence interval)**
Serious abuse and neglect composite scale	**CONTROL** Diverse Prevntn **HFNY** Diverse Prevntn	Incidence too low to reliably test interaction	P=.57 8.13 (5.72-11.42) 7.18 (3.06-15.95) 7.31 (5.02-10.54) 4.33 (1.53-11.69)	Incidence too low to reliably test interaction	P=.16 .24 (.12-.47) 1.66 (.39-7.05) .41 (.21-.78) .63 (.13-3.07)
Very serious physical abuse	**CONTROL** **HFNY**	Incidence too low to reliably test interaction	Incidence too low to reliably test interaction	Incidence too low to reliably test interaction	Incidence too low to reliably test interaction
Serious physical abuse	**CONTROL** **HFNY**	Incidence too low to reliably test interaction	Incidence too low to reliably test interaction	Incidence too low to reliably test interaction	Incidence too low to reliably test interaction
Minor physical aggression	**CONTROL** Diverse Prevntn **HFNY** Diverse Prevntn	P=.94 44.65 (39.92-49.48) 41.97 (30.80-54.03) 40.58 (35.88-45.46) 37.39 (27.05-49.02)	**p<.05** 63.26 (58.28-67.97) 70.02 (57.30-80.25) 67.01 (61.97-71.68) 51.04 (38.56-63.39)	P=.80 3.67 (2.94-4.59) 3.04 (1.73-5.35) 2.42 (1.93-3.03) 2.24 (1.29-3.89)	P=.11 5.72 (4.82-6.78) 7.13 (4.67-10.89) 5.90 (4.95-7.01) 4.35 (2.84-6.66)

Table 3 (continued).

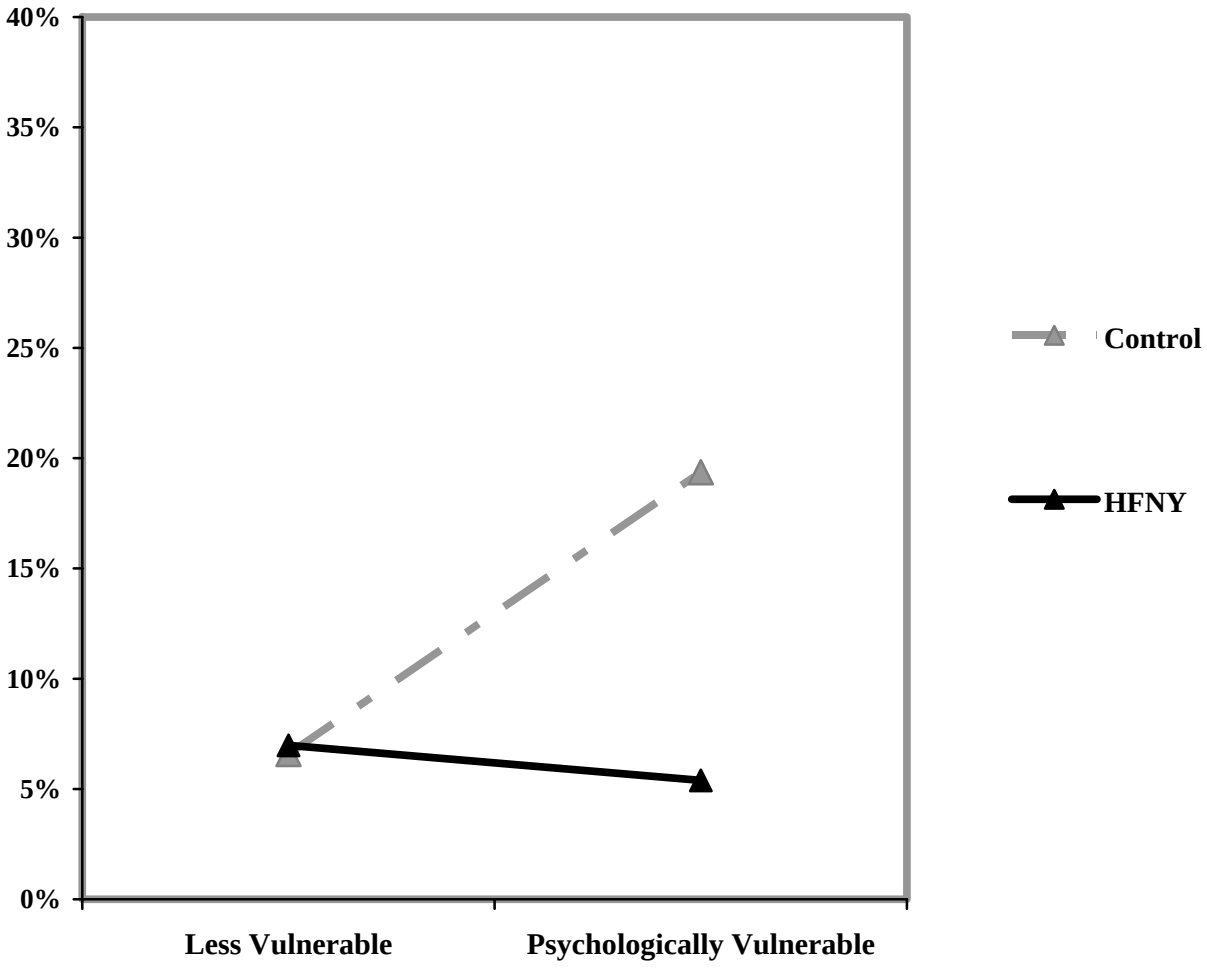
Characteristic	**Group**	**Prevalence (%) Year 1 (confid. interval)**	**Prevalence (%) Year 2 (confid. interval)**	**Frequency (count) Year 1 (confid. interval)**	**Frequency (count) Year 2 (confid. interval)**
Psychological Aggression	**CONTROL**	P=.76	P=.39	P=.51	P=.71
	Diverse	55.98 (51.17-43.36)	76.86 (72.37-80.82)	4.99 (4.13-6.02)	3.37 (2.67-4.27)
	Prevntn	54.33 (42.21-65.95	81.08 (69.30-89.06)	4.28 (2.65-6.90)	4.80 (2.19-10.56)
	HFNY				
	Diverse	52.17 (47.27-57.02)	76.81 (72.22-80.85)	3.55 (2.93-4.30)	3.19 (2.52-4.03)
	Prevntn	47.69 (36.18-59.46)	73.92 (61.08-83.66)	2.39 (1.48-3.84)	3.69 (1.74-7.84)
Neglect	**CONTROL**	Incidence too low to reliably test interaction	P=.97	Incidence too low to reliably test interaction	P=.99
	Diverse		7.14 (4.97-10.15)		.40 (.23-.71)
	Prevntn		8.57 (3.73-18.47)		.88 (.23-3.34)
	HFNY				
	Diverse		7.81 (5.46-11.05		.22 (.12-.41)
	Prevntn		9.56 (4.49-19.20)		.49 (.12-1.90)

Table 3 (continued).

Characteristic	**Group**	**Prevalence (%) Year 1 (confid. interval)**	**Prevalence (%) Year 2 (confid. interval)**	**Frequency (count) Year 1 (confid. interval)**	**Frequency (count) Year 2 (confid. interval)**
Harsh Parenting in past week (excluding time outs)	**CONTROL**	P=.15	**P<.05**	P=.23	P=.26
	Diverse	35.51 (31.06-40.23)	53.18 (48.05-58.25)	1.94 (1.54-2.43)	3.06 (2.53-3.72)
	Prevntn	39.16 (30.40-51.19)	61.93 (48.74-73.57)	1.47 (.83-2.60)	3.55 (2.18-5.77)
	HFNY				
	Diverse	34.25 (29.77-39.04)	55.39 (50.16-60.50)	1.30 (1.03-1.65)	2.88 (2.37-3.50)
	Prevntn	25.86 (17.17-36.98)	40.95 (29.21-53.82)	.57 (.31-1.05)	2.19 (1.35-3.55)
Substantiated abuse or neglect reports	**CONTROL**	P=.98	P=.93	P=.19	P=.21
	Diverse (n=510)	6.03 (4.27-8.45)	4.63 (3.11-6.85)	.07 (.05-.10)	.06 (.04-.09)
	Prevntn (n=84)	6.42 (2.66-1.47)	7.42 (3.29-15.88)	.08 (.03-.20)	.08 (.03-.19)
	HFNY				
	Diverse (n=493)	8.00 (5.88-10.79)	5.56 (3.84-8.00)	.09 (.07-.13)	.07 (.04-.10)
	Prevntn (n=86)	8.35 (3.93-16.88)	3.36 (1.06-10.17)	.11 (.05-.24)	.03 (.01-.11)

at Year 2, compared to their counterparts in the control group, HFNY parents who were psychologically vulnerable were one-third less likely to self-report engaging in acts of serious abuse or neglect (5% versus 19%, Figure 3). In contrast, there were no differences in the rates of self-reported serious abuse and neglect for the remaining women (7% versus 6.6%), suggesting that the program buffered the vulnerable women against serious abuse and neglect. This finding was sustained at the $p<.05$ level across three of the five missing value substitution methods used to estimate prevalence for the composite scale. In addition, a similar pattern of results was revealed for the frequency of two other CTS-PC subscales: psychological aggression at Year 1 ($p<.001$; no substitution methods used) and serious abuse and neglect at Year 2 ($p<.05$). The average number of self-reported incidents of psychological aggression at Year 1 for psychologically vulnerable women assigned to the HFNY group was 1.95 (c.i.: 1.08, 3.54) as compared to 8.57 (c.i.: 4.87, 15.09) for their counterparts in the control group. Similarly, the average number of self-reported incidents of serious abuse and neglect at Year 2 for psychologically vulnerable women assigned to the HFNY group was .02 (c.i.: .00, .22) as compared to .62 (c.i.: .11, 3.38) for their counterparts in the control group. Psychological vulnerability did not moderate differences between the HFNY and control groups in substantiated CPS reports.

Figure 3. Percentage of parents engaging in serious abuse or neglect by treatment group assignment and psychological vulnerability



Discussion

Self-report data from the current study suggest that HFNY may lead to significant reductions in several types of abusive and neglectful parenting practices during the first two years of life. As the target child turned one, there was a consistent and significant pattern of reductions in self-reports of the frequency with which HFNY parents committed acts of very severe physical abuse, minor physical aggression, psychological aggression, and harsh parenting against their children as compared to parents in the control group, and a trend showing that HFNY mothers were less likely to report neglecting their children. The pervasive impacts on frequency identified at Year 1 shifted from including both minor and serious offenses to only the more serious acts at Year 2, perhaps due to new or different parenting demands and the developmental age of the child.

One possible explanation for the program's consistent success in reducing the number of abusive incidents reported across the two years may be the improved access to health care noted at both follow-up periods (DuMont, Spera, Mitchell-Herzfeld, Lee, Greene, Lowenfels, & Baum, 2005; Mitchell-Herzfeld et al., 2005). Improved access to health care is a known protective factor for maltreatment (DHHS, 2003), and may help to diminish some of the stressors experienced by new, economically disadvantaged parents. Alternatively, reductions in maltreatment may be a consequence of shifts in mothers' approaches to, or attitudes about, parenting as a result of the program. For example, at Year 2, HFNY mothers reported engaging in more appropriate limit-setting than control parents (DuMont, et al., 2005) which may help to promote non-coercive parenting and healthy child behaviors, thereby reducing the likelihood that the child is maltreated (Gerard, 1994; Lahey, Conger, Atkeson, & Treiberm, 1984).

The most notable impacts, and the ones that speak to the heart of the home visitation policy debate, include the emergence and concentration of specific subgroup effects at Year 2. The difference in impacts observed between the prevention analytic subgroup and the more diverse subgroup provides an initial framework for understanding why HFNY shows meaningful effects while other randomized trials of HFA models have revealed no or minimal effects. An important difference between the evaluation of HFNY and the Hawaii and San Diego randomized trials is that the HFNY randomized trial includes women who were randomized prenatally, whereas the other studies were limited to women who had already given birth. The exclusion of pregnant women from the Hawaii and San Diego randomized trials precludes an examination of reduced child maltreatment as a result of providing services to women during pregnancy. In addition, this omission prevented researchers from analyzing the effects of HFA on the population that is most likely to benefit from a program designed to *prevent* child abuse and neglect from occurring in the first place – young women who have not yet experienced a live birth. The fact that HFNY was most effective for the prevention subgroup in the domain of minor physical aggression provides additional support for this argument, suggesting that the program prevents the initiation of minor acts of aggression, a likely starting point for abusive parenting. Furthermore, compared to their counterparts in the control group, mothers who were assigned to the intervention group at a gestational age of 30 weeks or less delivered a higher percentage of healthy weight babies (Lee, et al., unpublished manuscript). This health advantage may help to reduce risks leading to the initiation of maltreatment. Additional research is needed to better understand the mechanisms through which the home visitation model reduces child maltreatment for this specific subgroup of women.

Another important finding relates to the concentrated impacts for the group of woman who at baseline presented with psychological vulnerabilities, a group that had minimal overlap with the prevention subgroup. For these women, the HFNY program appears to *buffer* the effect of their vulnerabilities. These findings are consistent with those of NFP that showed that the families who were at greatest risk due to "low psychologic resources" benefited the most from home visitation (Olds, 2004b). Conversely, parents with higher levels of resources may have less of a need for a home visitor. Together, the current findings and the NFP findings suggest that home visitation may promote positive program impacts for the psychologically vulnerable, regardless of whether or not the woman is a young, first-time mother entering home visitation services during pregnancy.

Despite significant impacts on self-reported parenting, we found no program effects on CPS reports. Importantly, however, analyses comparing CPS reports and self-reported abuse and neglect suggest that participants in the HFNY group were under greater surveillance than members of the control group. We suspect that the surveillance bias results from reports of abuse and neglect made by home visitors or their supervisors as well as other service providers to whom home visitors referred the HFNY group families. Thus, the net for detecting parental transgressions is much wider for HFNY mothers than for control mothers, who are likely to be more isolated. In turn, this may artificially inflate the rate of CPS reports in the HFNY group making it more difficult to observe reductions in CPS reports as a result of program participation.

Another possible explanation for the discrepancy between results from self-report data and CPS data concerns differences in the samples used for analyses. Specifically, CPS data were collected for all study participants. In contrast, the sample for self-reported abuse and neglect was limited to study participants who were located, consented to be interviewed, and completed

the CTS-PC questionnaire at each follow-up. To explore the possibility that differences in results were due to variation introduced by study attrition, we conducted post-hoc analyses and re-estimated program impacts on substantiated CPS reports, restricting the sample to those who completed the CTS-PC at Year 1 and/or Year 2. The pattern of results with the restricted sample was similar to that produced by the full baseline sample: no program impacts on substantiated CPS reports. Thus, it is unlikely that sample differences account for the discrepancies in the treatment impacts for self-reported abuse and neglect and substantiated CPS reports.

Limitations

There are several limitations to the data and analyses presented. First, while HFNY intends for services to be provided to families until the target child is five years old or enters Kindergarten or Head Start, the current study only reports on impacts observed as of the target child's first and second birthdays. As information from the Year 3 follow-up becomes available, we will analyze these data using a generalized estimation technique rather than presenting static snapshots measured at each year. However, given the pronounced differences in developmental tasks and parenting challenges during the first two years of life, we felt justified in documenting how the impacts unfold during the program's initial years. As the evaluation moves forward, we anticipate that the strongest benefits of home visitation programs may not become evident for several years (Johnson & Walker, 1991; Olds et al., 1997; 2004a). Similarly, we encourage funders and researchers to extend existing trials to examine impacts across different developmental stages and milestones.

Despite high rates of study retention, the impacts reported reflect significant levels of program attrition. By one year after baseline, fifty percent of the mothers who were assigned to the intervention group and chose to enroll in HFNY had dropped out of the program, and by two

years, only one-third of HFNY participants remained in the program. These rates are nearly identical to the averages documented by the national HFA implementation study (Harding, et al., 2004) and the nurse home visitation program (Olds et al., 2002). Consequently, most HFNY participants received considerably less treatment than intended by the model, which, given our use of an intention-to-treat approach, undoubtedly diluted our assessment of the program's impacts.

A third challenge to the evaluation concerns biases introduced by the two methods used to assess maltreatment: self-reported parenting behaviors and CPS reports. As presented, the biases for both measures worked against detecting an intervention effect, and therefore generated conservative estimates of the program's impact. In addition, the results highlight the importance of using multiple indicators of child maltreatment in evaluations of home visiting programs, rather than relying solely on CPS reports or any other single measure. Despite these limitations, the study offers methodological rigor in its use of a well-executed randomized trial and standardized measures, and its high study retention rates. Together, these factors foster a high level of confidence in the accuracy of the results.

Implications

The current pattern of results suggests that the HFNY program holds promise for at-risk families in New York State. Parents who were offered HFNY services reported engaging in fewer abusive acts than control parents at both Year 1 and Year 2. Moreover, when abuse or neglect did occur among HFNY families, it was more likely to be reported to CPS officials than when it occurred among control group families. Thus, in addition to reducing the likelihood that child maltreatment will occur, HFNY services may prevent long-term patterns of maltreatment from developing by increasing opportunities for early detection and intervention. Given that

child maltreatment is a strong predictor of later psychological, social, and behavioral problems among children (Kim & Cicchetti, 2003; Macfie, Cicchetti, & Toth, 2001), and can lead to legal problems for parents and family dissolution, reducing abuse and neglect among HFNY families should significantly improve their life circumstances.

While our overall findings speak to the benefits of providing HFNY services to diverse groups of women at risk for abuse and neglect, our subgroup findings also suggest ways in which HFNY resources may be optimized. Specifically, after two years, HFNY parents in the "prevention subgroup" showed an average reduction of about 20% in the prevalence rates of self-reported minor physical aggression and abusive parenting in the past week compared to their counterparts in the control group. Although less severe than child abuse, coercive parenting is a prominent risk factor for later behavioral problems in children (Eddy, Leve, & Fagot, 2001; O'Connor, Deater, Rutter, & Plomin, 1998), and can develop into intractable patterns of negative parent-child interaction (Patterson, 1982) that may eventually lead to later abuse. Reducing these types of negative parenting behaviors may create more opportunities for parents to develop a warm, nurturing parenting style, laying the foundation for positive social and emotional development throughout the child's life (Forgatch & DeGarmo, 1999; MacDonald, 1992). Based on these findings we recommend: 1) enrolling more families into HFA programs during the prenatal period, preferably at a gestational age of 30 weeks or less, and 2) prioritizing home visitation services for young, first-time mothers. The proposed recommendations are consistent with the successes identified by NFP (Olds et al., 2004a; 2004b) and with findings from randomized trials of other home visitation programs that showed limited impacts in the area of child maltreatment for samples that included women who already had children, entered at or

after the child's birth, or had engaged in prior acts of abuse or neglect (Duggan, et al., 2004; Landsverk et al., 2002; MacMillan et al., 2005).

Although we believe the program can maximize its preventive benefits by prioritizing services for young, first-time moms enrolled earlier in pregnancy, we do not recommend limiting home visiting services to this group because we found that HFNY reduced the frequency of serious self-reported physical abuse by one third for HNFY mothers overall and played a protective role for the psychologically vulnerable women in the HFNY group. Among the psychologically vulnerable, control mothers were nearly four times as likely as HFNY mothers (19% versus 5%) to report having committed acts of abuse and neglect in Year 2 that were serious enough to have resulted in a substantiated report had they come to the attention of CPS. In contrast, among the non-psychologically vulnerable, the rates of serious abuse and neglect were essentially the same for the HFNY and control mothers, and were comparable to the rate observed for the psychologically vulnerable HFNY mothers, suggesting that HFNY helps to protect psychologically vulnerable mothers from engaging in serious abusive and neglectful behaviors.

For those who do not fall into the successful subgroups specified, we recommend additional research to investigate the most appropriate strategies for effectively serving these women. For example, programs may want to explore model enhancements such as using motivational interviewing (Miller & Rollnick, 1991) to help motivate mothers who are already engaging in abusive or neglectful parenting practices to initiate or sustain changes in this challenging area. Curriculum shifts or enrichments that focus on unlearning harsh or neglectful parenting behaviors, while also offering concrete suggestions to help replace the unacceptable

behaviors with actions to improve the situation could be used to supplement motivational interviewing strategies.

In sum, our findings suggest new ways of thinking about home visitation research. When comparing NFP and HFA-based models of home visitation, discussions have traditionally focused on who delivers the services (i.e., nurses or paraprofessionals). While weak program effects are often attributed to the use of paraprofessional staff, our findings suggest that meaningful impacts on parenting behavior can be found among programs utilizing paraprofessionals. Furthermore, we observed significant differences in program impacts depending on who was offered HFNY services. Program effects were more pronounced among those mothers who resembled the type of clients traditionally served by NFP programs (i.e., young mothers enrolled prior to the birth of their first child) and among the psychologically vulnerable. For both of these subgroups the evaluation revealed impacts of both statistical and clinical significance. Given the similarity between these results and those found by the NFP, we propose that who is offered home visitation may be a key factor in explaining the differential effectiveness of home visitation programs. We therefore recommend that future evaluations of the HFA model's effectiveness explore issues pertaining to the recipients of home visiting services as well as the providers of these services.

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Appendix A. Prevalence of self-reported abusive and neglectful parenting at Year 2 using different substitutions methods for missing values on CTS-PC.

Characteristic	Group	Group Means Before Substitutions (%)	Substituted 0s for all missing (%)	Substituted 1s for all missing (%)	Substituted 1s when concurrent CPS indication (%)	Index Substitution for missing (%)
		N=885	N=924	N=924	N=893	N=911
Serious abuse and neglect composite scale	Control	7.83 (5.59-10.87)	7.57 (5.42-10.49)	11.65 (8.92-15.06)	8.36 (6.05-11.44)	8.37 (6.07-11.43)
	HFNY	6.78 (4.71-9.66)	6.58 (4.58-9.36)	9.87 (7.35-13.12)	7.52 (5.34-10.50)	7.46 (5.31-10.39)
		N=894	N=924	N=924	N=900	N=924
Very serious physical aggression	Control	2.85 (1.63-4.94)	2.78 (1.59-4.81)	5.89 (4.05-8.48)	3.53 (2.16-5.73)	3.45 (2.10-5.62)
	HFNY	2.62 (1.47-4.64)	2.55 (1.43-4.49)	5.35 (3.59-7.90)	3.73 (2.10-5.68)	3.30 (1.98-5.46)
		N=904	N=924	N=924	N=908	N=924
Serious physical aggression	Control	1.21 (.46-3.14)	1.20 (.46-3.08)	4.03 (2.49-6.47)	1.70 (.79-2.07)	1.73 (.83-3.58)
	HFNY	.58 (.19-1.78)	.59 (.19-1.79)	1.94* (1.03-3.65)	1.01 (.41-2.14)	1.08 (.46-2.51)

Appendix A (continued).

Characteristic	Group	Group Means Before Substitutions (%)	Substituted 0s for all missing (%)	Substituted 1s for all missing (%)	Substituted 1s when concurrent CPS indication (%)	Index Substitution for missing (%)
Minor physical aggression		N=908	N=924	N=924	N=910	N=924
	Control	64.55 (59.94-68.91)	63.33 (58.74-67.70)	65.22 (60.66-69.51)	64.56 (59.94-68.92)	63.56 (58.96-67.92)
	HFNY	64.50 (59.81-68.93)	63.35 (58.74-67.70)	65.13 (60.50-69.50)	64.67 (59.98-69.08)	64.29 (59.64-68.70)
Psychological aggression		N=910	N=924	N=924	N=912	N=924
	Control	77.74 (73.62-81.38)	76.69 (72.54-80.38)	78.02 (73.94-81.62)	77.75 (73.63-81.39)	76.67 (72.51-80.37)
	HFNY	76.44 (72.18-80.23)	75.19 (70.91-79.03)	76.86 (72.67-80.59)	76.55 (72.30-80.32)	75.45 (71.18-79.27)
Neglect		N=901	N=924	N=924	N=904	N=924
	Control	7.18 (5.11-10.00)	7.04 (5.03-9.78)	9.53 (7.11-12.66)	7.44 (5.33-10.30)	7.37 (6.07-11.43)
	HFNY	8.09 (5.83-11.13)	7.99 (5.76-10.97)	9.24 (6.81-12.42)	8.14 (5.87-11.18)	8.18 (5.31-10.39)
Harsh Parenting in the Past Week		N=907	N=924	N=924	N=910	N=924
	Control	54.58 (49.81-59.27)	52.83 (48.14-57.46)	55.85 (51.14-60.45)	54.80 (50.03-59.48)	53.73 (49.03-58.36)
	HFNY	53.12 (48.30-57.87)	52.71 (47.94-57.44)	53.67 (48.87-58.39)	53.23 (48.42-57.98)	52.98 (48.20-57.70)

Appendix B. Prevalence of minor physical aggression at Year 2 using different substitutions methods for missing values.

Characteristic	Group	Group Means Before Substitutions (%)	Substituted 0s for all missing (%)	Substituted 1s for all missing (%)	Substituted 1s when concurrent CPS indication (%)	Index Substitution for missing (%)
Minor Physical Aggression		N=908*	N=924*	N=924*	N=910*	N=924*
	CONTROL					
	Diverse	63.26 (58.28-67.97)	62.49 (57.53-67.21)	63.78 (58.84-68.44)	63.25 (58.27-67.97)	62.75 (57.78-67.46)
	Prevntn	70.02 (57.30-80.25)	66.00 (53.39-76.69)	71.36 (59.04-81.16)	70.09 (57.39-80.31)	66.22 (53.62-76.87)
	HFNY					
	Diverse	67.01 (61.97-71.68)	65.67 (60.65-70.37)	67.67 (62.71-72.26)	67.17 (62.15-71.83)	66.74 (61.75-71.39)
	Prevntn	51.04 (38.56-63.39)	50.77 (38.34-63.12)	51.13 (38.64-63.48)	51.08 (38.59-63.43)	50.80 (38.34-63.17)
Harsh Parenting in the Past Week		N=907*	N=924*	N=924*	N=910*	N=924*
	CONTROL					
	Diverse	53.18 (48.05-58.25)	51.87 (46.82-56.88)	54.31 (49.23-59.30)	53.36 (48.23-58.42)	52.98 (47.91-57.99)
	Prevntn	61.93 (48.74-73.57)	57.33 (44.65-69.12)	63.77 (50.96-74.89)	62.36 (49.25-73.88)	57.26 (44.54-69.08)
	HFNY					
	Diverse	55.39 (50.16-60.50)	55.07 (49.87-60.15)	55.94 (50.73-61.02)	55.45 (50.22-60.56)	55.37 (50.16-60.46)
	Prevntn	40.95 (29.21-53.82)	40.18 (28.65-52.91)	41.55 (29.81-54.35)	41.55 (29.80-54.35)	39.93 (28.41-52.69)