Journal of Child and Family Studies
https://doi.org/10.1007/s10826-020-01838-7

ORIGINAL PAPER

The Impact of Default Options for Parent Participation in an Early Language Intervention

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Accepted: 14 September 2020

Abstract

In this study we tested, via a randomized control study design, different enrollment options for a scaled city-wide text-based early learning program among 405 mothers who were receiving newborn home visiting services. We found that when automatically enrolled with a voluntary option to opt out, 88.7% of mothers in the experimental group stayed in the program and continued to receive the text-based content over the course of 26 weeks. In contrast, only 1% of mothers in the control group who heard about the text-based program through conventional recruitment flyers voluntarily enrolled in the program. Opt-out and opt-in patterns did not differ by characteristics typically considered as interfering with program participation: low income status, first-time motherhood status, total number of children, maternal language, flagging for depressive symptoms, and household residential instability. Findings suggest that automatic enrollment might be an effective engagement strategy for text- and similar digitally-based early childhood programs.

Keywords Early childhood programming · Language development · Socioeconomic disparities · Parent engagement · Default options

Highlights

- We test automatic enrollment for participation in a scaled early learning program.
- The majority of parents in the opt-out condition remained enrolled.
- Few parents enrolled in the opt-in condition in response to informational flyers.
- Opting-out did not vary by key demographic or socio-economic characteristics.

Children from birth up through kindergarten and, by extension, their caregivers, are the target recipients of substantial federal and local public investment. Such early childhood education investments are viewed as springboards to support early learning skills among low socioeconomic status families and, thus reduce socio-economic gaps in educational and behavioral outcomes (Duncan and Magnuson 2011). Popularized estimates show high returns to quality early childhood education programs as measured by children's subsequent education completion and earnings (Heckman 2006; García et al. 2016).

The efforts to promote early learning has recently extended beyond conventional classrooms. Community-based initiatives and programs hold promise to help children fulfill their potential by increasing caregiver knowledge of strategies that promote early brain and language development (e.g. Galinsky et al. 2017). Community-based campaigns can take many forms such as transforming playgrounds to hubs of learning or delivering child development information and parenting tips via text messages. With technology-assisted interventions are increasingly viewed as an accessible platform to directly reach parents (Hall and Bierman 2015), growth in text-based initiatives is particularly high. For example, Talking is Teaching, was first piloted only in Oakland, CA and Tulsa, OK in 2014

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Published online: 24 September 2020

and is now being in implemented in 12 cities across the country (Talking is Teaching 2016). Web- and text-based platforms for the delivery of parenting support also include privately-funded initiatives such as Vroom (Galinsky et al. 2017), and government-backed programs such as New York City's Talk to Your Baby program (https://www1.nyc.gov/site/talktoyourbaby/index.page). Despite widespread enthusiasm, very little is understood or documented about parent participation in these community based early education initiatives (Hall and Bierman 2015). Whereas the content delivered to families has scientific basis, the campaigns themselves are not typically designed with a framework to measure or to optimize parent participation. Little is known as to what strategies could facilitate program participation.

Questions about parent participation is complicated by views about the extent of the role of government in the lives of families particularly in cases when a child's health or safety is not clearly in jeopardy. Parents, therefore, are typically treated with full authority to decide whether to utilize programs, even when scientific evidence might be clear that children are better off when such programs are received (Conly 2017). The result is a long history and current presence of parent- and child-targeted programs and services that are premised on voluntary enrollment. Such voluntary enrollment seemingly resolves any ethical issues regarding human agency and free will. Nevertheless, it also presumes that parents are "rational" agents who never make flawed decisions or fail to act on their intentions (Sunstein 2017). Small innovations in design of programs—popularized as nudges—informed by the interdisciplinary science of behavioral economics suggest a promising approach for supporting parent follow through with their good intentions, such as participating in a program, while still preserving their freedom of choice.

In this study, we specifically test how one particular design innovation related to default choices—whether changing the enrollment option from voluntary sign up (i.e. opt-in) to voluntary leave (i.e. opt-out)—shape parents' participation as measured through completion of a community-based texting program designed to enrich children's early language environment. Second, we assess whether the default option contributes to different participation decisions for mothers as a function of characteristics that are typically hypothesized to predict engagement in parenting programs. Sociodemographic characteristics have been extensively researched in relation to participation as they are closely related to parents' resources and ability to attend multi-session programs. Low family income has predicted lower participation perhaps due to unstable work schedules, lack of transportation and childcare (Whittaker and Cowley 2012; Winslow et al. 2009). First-time mothers with limited practical childrearing experience are more likely to attend parenting programs (Miller et al. 2019). In contrast, program attendance is lower among parents with a larger number of children (Brody et al. 2006; Eisner and Meidert 2011). Program participation has also been found to be lower among parents whose native language is different from the mainstream language (Eisner and Meidert 2011) and who has higher depressive symptoms (Baydar et al. 2003). Frequent moves seem to present barriers to participation as well with residential instability emerging as a robust predictor of program utilization and attrition (Tufts Interdisciplinary Evaluation Research 2015). We explore how enrollment options may independently moderate participation in ways that are distinct from the observable characteristics of families typically associated with program engagement. Consistent with earlier research, we examined whether low-income status (as proxied by household receipt of benefits from the Women, Infants and Children (WIC) program), first time parenting status, number of children in the household, mothers' native language, home visitor report of maternal depression concern and household residential instability are associated with differential rates of program participation.

Default enrollment options have been tested in areas of public life with health, economic and social consequences (such as organ donation, smoking cessation and participation in a retirement plan). To our knowledge, this is the first study examining the role of default enrollment options in predicting parent participation in a scaled community-based program aimed at promoting early childhood development.

The Challenges of Parents' Participation in Programs in the Context of Poverty

The quantity and the quality of the parent-child interactions during early years are the key determinants of later language proficiency and cognitive development (Bornstein et al. 1998; Golinkoff et al. 2019; Hoff-Ginsberg 1991; Hoff and Naigles 2002; Rowe 2012; Shimpi et al. 2012; Suskind 2015). Research on parent-child language interactions points to notable variations in children's language exposure—both on dimensions of quantity (amount of talk) and quality (number of different types of words and sentence complexity)—by family socio-economic status that appear to contribute to observed socio-economic gaps in cognitive development and school achievement (Golinkoff et al. 2019; Romeo et al. 2018; Weisleder and Fernald 2013). Low-income parents are found, on average, to talk less and use less varied language with their infants than their higher-income counterparts (Fernald et al. 2013; Hoff 2003; Weisleder and Fernald 2013). Moreover, children growing up in low-income households on average have more limited access to books and experience fewer book-sharing

interactions than their wealthier peers (Raikes et al. 2006; Yarosz and Barnett 2001). This line of research has fueled the emergence of a wide array of early childhood programs and interventions.

Enrolling target populations and sustaining participation are core challenges for programs designed to improve children's early learning and language environments (Hoff-Ginsberg 1991; Suskind and Leffel 2013). As evidenced by scaled parent support programs, optimizing parent participation at scale is a particularly acute challenge (Baker et al. 2011; Bloomquist et al. 2012; Coatsworth et al. 2006; Dawson-McClure et al. 2015). Evidence indicates that a sizeable portion of eligible families decline to participate (Chacko et al. 2016). When enrolled, up to half of the families leave the program before completion (Gomby 2005). Moreover, majority of families who remained in the programs do not receive the full dose of the intervention (Daro et al. 2012), potentially diluting the program effects (Axford et al. 2012).

Optimizing participation in parent support programs may be especially critical for families from socioeconomically disadvantaged backgrounds. The spectrum of daily financial stressors on low-income parents' lives—including erratic employment and income instability, absence of paid parental leave, unreliable child care and transportation, unstable housing can place cognitive and emotional demands on parents' attentional resources and self-control in the present (Mullainathan and Shafir 2010; Spears 2011). The focus, energy, and planning required to attend to the available information about parenting and children's health and development—even when free and publicly accessible—are often unintentionally set aside to attend to these types of daily demands (Gennetian and Shafir 2015; Mani et al. 2013; Mullainathan and Shafir 2009; Shah et al. 2012). Consequently, the very people who could benefit most from interventions are stressed to the point where it is difficult for them to find and use the resources that are available to them (Gennetian and Shafir 2015; Mani et al. 2013; Mullainathan and Shafir 2009, 2013; Shah et al. 2012).

Enrollment Options and Parent Participation

On a daily basis, parents manage their lives and balance their roles across work, family life, and parenting within the bounds of time, budget, and cognitive processing constraints. This balancing act is made more difficult among lower income parents who have less economic cushion to absorb economic instability and, simultaneously, to practice positive parenting. Like time and money, parents have a finite amount of attention to bring to the myriad of parenting tasks and decisions, and this attention can be drained or replenished depending on demands and circumstances (Mischel et al. 2011); poverty further constrains an already limited attention system (Mullainathan and Shafir 2013).

The implication of this limited attention is that seemingly simple and straightforward tasks—such as voluntarily enrolling in a text-based parenting support program—might never be completed, as parents are preoccupied with many other things which deplete the mental energy, focus, and resources needed to execute those tasks. Strategies to help mitigate this drained attention include re-designing default options in ways that require less parental effort (Beshears et al. 2009; Chapman et al. 2011; Johnson and Goldstein 2003).

Defaults are the pre-set courses of action that will go into effect without the explicit action of potential decision-makers (Thaler and Sunstein 2008), who may have a proclivity toward procrastination and inertia, be overwhelmed in the face of complex choices, or have limited attention to bring to the decision-making process. Defaults can be designed in ways that preserve autonomy by reducing barriers to take action without imposing restrictions on choices. The default enrollment option for programs serving parents and children may have important implications for parental participation: are parents required to *make* an active choice to enroll in a program (i.e., opt-in) or is their automatic enrollment the default option, with opting-out as the active choice on the parents' part? A growing body of research suggests that setting the default to opt-out increases enrollment in programs without infringing on personal choice, as evidenced in contexts of 401(k) contributions (Carroll et al. 2009; Choi et al. 2004) and organ donations (Johnson and Goldstein 2003).

Under the good intentions of protecting parent choice, the majority of programs serving parents and children outside of the domains of medicine and formal schooling require parents to actively choose to enroll in the program. In doing so, programs overlook the inertia, uncertainty, and multiple other demands on attention that may interfere with parents' intent to enroll.

A Theory of Change

Our objective in this study was to experimentally test the impact of changing the enrollment option to voluntarily leave from the option to voluntarily enroll into a community-based program, NYC's Talk to Your Baby that is similar to many other existing text-based programs available to parents throughout the U.S. We aimed to answer the question as to how automatic enrollment in an early education literacy texting program affects the proportion of parents who enrolled and remained in the program over a duration of 26 weeks. The logic model and the overlay of automatic enrollment is presented in Fig. 1.

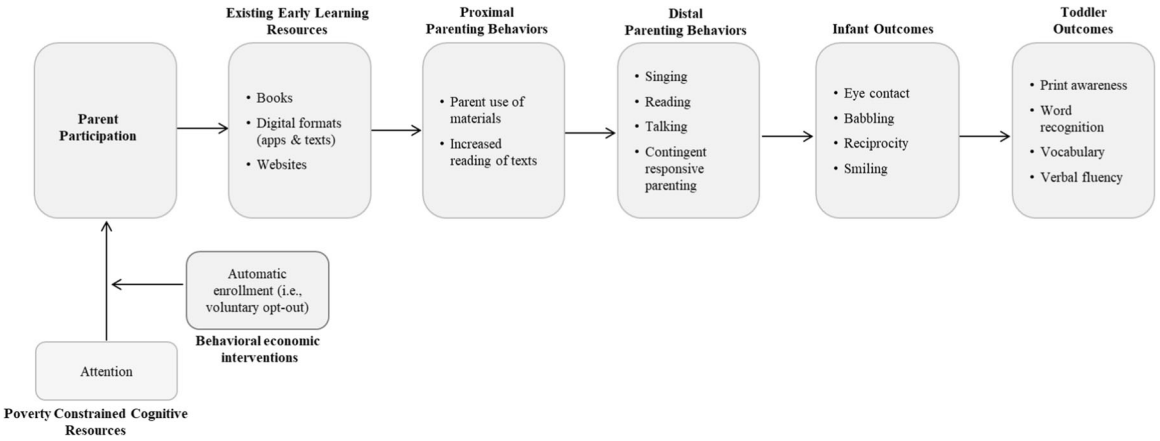

Fig. 1 The logic model and overlay of automatic enrollment

As this model shows, parents' participation via enrollment and subsequent use of early learning resources is hypothesized to increase the amount of literacy-based behaviors to which infants are exposed, favorably influencing their proximal and distal literacy outcomes. We hypothesized that parents face many competing demands on their attention in their daily lives and, in turn, may not take full advantage of early learning resources even when they are free and publicly available. Automatic program enrollment is expected to reduce the attention required to sign up for services, and thus facilitate greater parent exposure to program content. We further hypothesized that poverty imposes an additional cognitive burden on parents' limited attentional resources, and thus tested the impact of altering the default option from voluntary to automatic enrollment among a population of low income mothers. We additionally examined whether parent participation varied by maternal and household level characteristics that may potentially deplete mothers' attention and interfere with engagement in early learning resources as shown in prior literature.

Methods

Procedure

In a collaboration with New York City Department of Health and Mental Hygiene (DOHMH), we had the opportunity to integrate two programs providing parenting support to low income mothers at the time of birth. In February 2014, Children's Cabinet comprised of over 20 citywide agencies was formed to coordinate a variety of early childhood initiatives in New York City. In response, DOHMH launched a social media campaign; one key component of the campaign was Talk to Your Baby (TTYB), a text-based curriculum to promote and support early language development for 0 to 3 year olds. TTYB texts are sent over a 26-week period and focus on three essential elements: talking reading, and singing.

DOHMH launched the Newborn Home Visiting Program (NHVP) in 2004. Developed from a public health education model, trained public health advisors offer home visits to families with a new baby who reside in neighborhoods facing the most significant social, economic, and health challenges. NHVP provides new mothers with free breastfeeding support, safe sleep education, and guidance on health and safety in the home, as well as information on infant development and community resources. Via partnerships with seven hospitals that serve predominantly low-income, minority families in select neighborhoods, NHVP serves approximately 3600 low-income mothers and their infants per year citywide. Most new mothers are recruited at hospital bedside, just after giving birth, and receive 1–2 home visits as soon as possible after hospital discharge.

At first NHVP home visit, public health advisors briefly describe the present study to new mothers and inquired if they were willing to participate. Those mothers who consented were asked to pull a wooden token out of a bag and were randomized into control and experimental groups. All mothers randomized into the control group received the usual free educational packet provided by NHVP public health advisors, including information about immunizations, local services, children's early developmental milestones, and a handout about early language and literacy resources, including TTYB. Control group participants could voluntarily enroll in the text-based parenting curriculum by texting the phone number provided in the handout.

Mothers in the experimental group were automatically enrolled into the TTYB texting program; this capitalizes on the behavioral principle of default options to ease

participant decision-making, as previously described. Few weeks after their first home visit, mothers in the experimental group received a text message welcoming them to TTYB. In that first text message, mothers were informed that they could opt out of messaging by simply texting STOP at any time. Mothers in the experimental group also received reminders with developmentally appropriate "tips" via text messaging. These messages supplementing TTYB texts were intended to direct mothers' attention to early literacy behaviors and to reinforce daily habits that can support the development of positive parenting practices. These text reminders were interspersed between and reinforced the TTYB text content. Examples include "Find time to sing to {child_name} for at least 5 min today" (postpartum day 41), and "Being a good mom is important and hard work. Remember to relax, breathe, and enjoy your time with {child_name}" (postpartum day 111). Text messages were personalized to approximate the feeling of interpersonal contact and accountability, despite the use of mass communication (Beniger 1987). In all, the experimental group received 65 texts over the course of 26 weeks. Texts were sent twice a week, spaced 3 to 4 days apart.

Participants

New mothers who received NHVP home visits in Bronx and Harlem from February 2016 through May 2018 and who provided a valid phone were eligible to participate in the present study. Over this time period, 411 mothers consented to participate in the study. Six participants (four in the experimental group and two in the control group) were removed from the final analytic sample ($N = 405$) because of an incorrect or missing phone number. Table 1 presents descriptive characteristics of the participants by treatment status. Notable characteristics of the population served by NHVP include the very low rates of concern about maternal depressive symptoms and relatively stable residential addresses. More than one-third of the study sample were first-time mothers and one third of mothers reported that they were breast-feeding their infants. Most mothers (80.0%) reported receiving support from WIC. No statistical differences were found in the reported demographic and socio-economic characteristics between mothers randomly assigned to the experimental group and those randomly assigned to the control group.

Measures

Two sources of data were used to inform our analyses. The first source was text-based platform vendors World Text (for the BE texts) and Mobile Commons (for the TTYB texts). The second source was NHVP intake data collected at the time of the first home visit by the public health advisors.

Table 1 Key characteristics of the study population, by treatment status

	Experimental ($N = 213$)	Control ($N = 192$)	Total ($N = 405$)
Demographics			
Maternal age: Mean years (*SD*)	28.77 (*5.67*)	29.08 (*6.71*)	28.92 (*6.19*)
Language spoken at intake interview			
English (%)	83.1	86.5	84.7
Spanish (%)	16.9	13.5	15.3
Maternal smoking (%)	2.4	2.1	2.2
PHA-reported maternal depression concern (%)	1.0	1.6	1.2
First time mother (%)	34.3	37.0	35.6
Receipt of WIC (%)	80.0	82.3	81.1
Percent Child gender is female	48.8	51.6	50.1
Percent breast-fed	33.8	33.3	33.4
Household characteristics			
Length of time at address: Mean years (*SD*)	3.28 (*1.31*)	3.39 (*1.36*)	3.33 (*1.33*)
# of adults in household: Mean (*SD*)	2.45 (*1.11*)	2.58 (*1.10*)	2.51 (*1.11*)
# of children in household: Mean (*SD*)	2.23 (*1.35*)	2.26 (*1.33*)	2.24 (*1.34*)
# of children under 5: Mean (*SD*)	1.44 (*0.64*)	1.42 (*0.71*)	1.43 (*0.67*)

Source: Authors calculations from Newborn Home Visiting Program intake data

No statistically significant group differences were found for demographic and household characteristics across treatment status

PHA public health advisor

Demographic and socio-economic predictors

Maternal depression concern Public health advisors recorded any indication of maternal depression concern during the first home visit based on one self-report item: "how they have been feeling since giving birth?" Based on this flag, a binary variable was created with 1 = depression concern and 0 = no depression concern.

First-time mother Based on information provided by participants, a binary variable was created with 1 = first-time mother, and 0 = previous child.

Maternal language The language participants preferred for the NHVP intake interview was used as a proxy for maternal first language.

Number of children The number of residents in the household under the age of 18, who might or might not be biologically related to the participant.

Receipt of WIC A binary variable where 1 indicates participants' self-reported current participation in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), and 0 = no current participation in WIC.

Length of time at address Indicates self-reported duration at the current residence, in years.

Outcome measures

Participation This outcome that we label as "take-up" in the tables captures whether or not the participant continued to receive program text messages over the course of program duration (i.e., the participants in the experimental group who did not opt out, and those in the control group who opted in).

Option to leave (opt-out) Participants have the option to stop receiving TTYB and/or BE enhanced text messages. BE participants who texted a "STOP" message to either or both SMS vendors were coded as opt-outs.

Option to enroll (opt-in) In contrast with participants in the intervention group who were automatically enrolled in TTYB text messages, participants assigned to the control group were given brochures for the TTYB program that included a contact number. Control group participants who texted this number to actively enroll in the TTYB program were coded as opt-ins.

Analytic Approach

To assess the association between family characteristics and program participation, we used Fisher's exact test. Fisher's exact test is an alternative to the chi-square test to explore the association between two categorical variables and is recommended when 20% of expected frequencies are smaller than or equal to 5. Because Fisher's exact test is considered somewhat conservative, we also made a note of statistically significant results from a chi-square test when they differed from the results of a Fisher's exact test. To examine the relation between a continuous predictor (i.e., number of children and length of time at address) and binary program take-up outcomes (e.g., opt-out vs. not), we used simple logistic regression. All analyses were conducted using Stata 14.

In order to be able to examine decisions regarding program participation, participating families needed to have a cell phone which they could use to opt out of the text-based parenting curriculum. After reviewing the reports provided by the texting platform, we noted that text messages to 18 participants bounced back either because their number was listed as a landline or with an unknown carrier. For this reason, we ran sensitivity analysis excluding these 18 observations.

Table 2 Participants' take-up of intervention texts

	Experimental (%)	Control (%)	Total (%)
Enrolled to receive text messages	88.7	1.0***	47.2
Opt-out	11.3	N/A	11.3
Opt-In	N/A	1.0	1.0
N	213	192	405

Statistical differences in values between experimental and control groups assessed via Fisher's exact test are indicated as follows: ***$p < 0.001$

Results

Table 2 presents participant uptake of the intervention texts. Setting the default to an opt-out statistically increased the proportion of mothers who enrolled and continued to receive the TTYB and supplemental text messages by 87.7 percentage points ($p < 0.001$, Fisher's exact test). As shown in Tables 2, 11.3% of the mothers in the experimental group opted-out of receiving the TTYB and behavioral text supplements, and only 1.0% of the control group mothers opted in. Approximately 47.0% of the pooled participant sample of mothers enrolled to receive the texts.

Table 3 presents the impact of setting the default to an opt-out by selected demographic and socio-economic characteristics of the mothers. Overall, the uptake of the text based curriculum was very low within any subpopulation of participants in the control group, participation rates ranging between 0 and 3.1%. The mothers in the experimental group were statistically more likely to receive the text-based program content in its entirety than the control group for each subpopulation ($p < 0.001$ Fisher's exact test for each comparison) with no statistical differences within subgroups. One exception is mothers identified with any maternal depressive concern by the public health advocate ($p = 0.03$, chi-square and $p = 0.10$, Fisher's exact test).

Table 4 presents program participation among various demographic and socio-economic subgroups. No statistically significant differences were found for opt-out and opt-in patterns by the background characteristics of the participants.

Table 3 Enrolled to receive text messages by selected demographic characteristics

	N	Experimental (%)	Control (%)	Total (%)
PHA-reported maternal depressive symptoms concern				
Yes	5	100.0	0.0	40.0
No	397	88.5	1.1***	47.1
First time mother				
Yes	144	87.7	1.4***	45.1
No	261	89.3	0.8***	48.3
Language spoken at intake interview				
English	343	88.7	1.2***	46.4
Spanish	62	88.9	0.0***	51.6
Number of Children				
1	135	87.7	1.6***	48.2
2 or more	270	89.3	0.8***	46.7
Receipt of WIC				
Yes	309	87.5	0.7***	45.6
No	72	92.5	3.1***	52.8
Duration of residence				
<3 years	98	84.0	0.0***	42.9
3 or more years	307	90.2	1.4***	48.5

Statistical differences in values between experimental and control groups assessed via Fisher's exact test are indicated as follows: ***$p < 0.001$

Table 4 Participant take-up of intervention texts by selected demographic characteristics

	N	Opt-Outs	Opt-In
PHA reported maternal depressive symptoms concern			
Yes	5	0	0
No	397	11.5	1.1
First time mother			
Yes	144	12.3	1.4
No	261	10.7	0.8
Language spoken at intake interview			
English	343	11.3	1.2
Spanish	62	11.1	0.0
Number of children			
1	135	12.3	1.6
2 or more	270	10.7	0.8
Receipt of WIC			
Yes	309	12.5	0.7
No	72	7.5	3.1
Duration of residence			
<3 years	98	16.0	0.0
3 or more years	307	9.8	1.4

Subgroup differences in program engagement outcomes were tested using Pearson's chi-square statistic for categorical predictor variables. Simple logistic regression was used to test the effect of continuous demographic characteristics (i.e. number of children and duration of residence) on program engagement. Opt-Outs were investigated within the experimental group ($N = 213$), and opt-ins were investigated within the control group ($N = 192$)

The sensitivity analysis to test whether findings differed with the exclusion of 18 participants with the potential landline numbers showed no substantive differences in conclusions.

Discussion

Scalable models for delivery of community-based early learning and language curricula prior to entry into formal schooling are receiving increasing attention and public investment. While the content of these campaigns is informed by neuroscience and early childhood research, the delivery has typically been informed by best practices, sometimes drawing from lessons learned from approaches used in public health and social marketing campaigns. To date, little empirical research has been conducted regarding parents' participation in such community-based initiatives and how this varies by the framing of default options for enrollment. This is an area in need of empirical scrutiny given the relatively low cost of such initiatives. For families living in poverty who are often the targets of early childhood initiatives, strain on available mental resources may further impede program participation- even when parents want to attend but fail to follow through with their good intentions due to their busy and stressful lives.

We streamlined the integration of two parallel city-wide existing services in New York City: an early language campaign and a newborn home visiting program. As such, our study was designed to answer questions about the impact of altering the default option for enrollment, hypothesizing that program participation would be positively affected by automatic enrollment, in theory by alleviating the limited attention and inertia new mothers bring to the decision-making process.

Our results show that when mothers were automatically enrolled into receiving early learning and language curricula via texts, retention was high (~89%). We also find that when programs solely relied on conventional recruitment strategies, such as pamphlets and posters, participation was very low (~1%). That is, a very small percentage of mothers are likely to sign up for early childhood programs when enrollment information is made available via conventional methods such as information leaflets. On the other hand, when automatically enrolled, an overwhelming majority of parents continued to participate in the program, suggesting that parent desire to participate may be high but follow through on this intention is challenging. Our results in the domain of parenting build on prior evidence about how

shifts in default options can alleviate inertia in ways that still protect participant options (Chapman et al. 2011; Beshears et al. 2009; Johnson and Goldstein 2003). A second substantively important result is that the impact of the opt-out vs. opt-in default structure had qualitatively similar impacts on program participation decisions across a host of demographic and socio-economic characteristics conventionally associated with differential rates of uptake.

Questions about the extent to which mothers actively read and acted upon the suggestions relayed in the text message content are important next steps for future research. We have two insights to currently share on this. First, even with a conservative assumption that as low as 5% of the mothers in the experimental group (who did not opt out) read and acted upon the suggestions in the text message content, the total number of mothers impacted would be substantively much larger than the 1% of the mothers who elected to opt-in. Second, in our objective to trace the impacts of program participation on parenting behavior, we launched an exploratory study of 31 (18 experimental and 13 control) of the 405 mothers who consented to participate. The infants of these mothers wore audio recording devices (called LENA) for a 16-h period. Over the same period of time, mothers completed time diaries of their activities with their infant and were asked to respond to a small set of questions via text regarding how much they talked, played, told stories or sang to their infants. The maternal self-reported data suggest that our intervention appeared to have shifted parenting behaviors, with higher incidence of playing and reading among experimental group mothers, compared to the control group. Analyses of these data, data gathered from the time diaries and the companion audio data is ongoing.

Strengths and Limitations

Our focus in this study revolved around questions of how altering enrollment options in a curricula influence parent participation in existing scaled early language and literacy resources. Whether such participation results in changes in parenting behavior and early language interactions with their infants is an important future inquiry. Future work will address this question via analysis of audio-data of naturalistic language interactions at home. Parent reported data collected via time diaries and text messages will accompany and triangulate results from the audio recordings.

Although the present study is unique in advancing our understanding of the role of re-setting default options in promoting parent participation in scaled community-based campaigns, it also had several limitations. One limitation is the nature of data available to identify some individual and family characteristics. For instance, maternal depression concern was based on participant responses to a general inquiry regarding mood and not based on a series of validated items to capture depressive symptoms. A second limitation is that the small sample size of participants with particular participation outcomes, such as opting in and opting out, resulted in limited power for assessing differences among subpopulations. While our findings have broad relevance in the context of a scaled community based program, it is drawn from an urban sample of new mothers residing in a large city in the American Northeast and might not be generalized to scaled programs in other large metropolitan areas.

Implications and Conclusions

Even with the best intentions, existing curricula and services—with creative, fun and research-based parenting content and information—may not be reaching their intended targets. Increasing public investment in community-based programs to support early learning and language development warrants improving outreach to families in need of services and embarking on creative, low cost, strategies to facilitate their program uptake and engagement. Our study is the first to show that restructuring choices such as setting automatic enrollment as a default in a free city-wide program is a promising strategy to promote participation in existing community-wide early language and learning programs. Could such an approach be another avenue toward reducing socio-economic gaps in early language and literacy (Gennetian et al. 2016)?

Mobile phones have become ubiquitous in today's society. For this reason, text-messages may be an effective and low-cost medium for reaching out to families and delivering them parenting information and support. Delivery of parenting curriculum through text messages may help eliminate structural barriers to program participation including lack of transportation and childcare and conflicting schedules. Text messages can also be an effective tool to refocus the attention of overwhelmed parents, particularly low-income ones, whose mental resources are already taxed by additional stressors such as financial instability, unemployment, and limited or no access to childcare. Additionally, affirmation and praise of participants' parenting efforts via text messages may promote open-minded reception of parenting information, obviate stigma that can be attached to parenting programs, and encourage positive behavior change. However, more needs to be understood about reliability of mobile phone access and costs of text and data coverage.

Acknowledgements We gratefully acknowledge financial support from the Bezos Family Foundation and the National Institute for Child Health and Human Development R03 HD090280. We are enormously grateful to the Department of Health and Mental Hygiene Newborn Home Visiting Program Harlem Team for their support of this research

and recruiting participants for the study; and, the families for their willingness to participate.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval This study was approved by the New York University's Institutional Review Board following an Expedited Review at 45 CFR 46 110(b)[1] Category 7. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all participants included in this study.

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