Published in final edited form as:

Child Youth Serv Rev. 2018 January ; 84: 198–205. doi:10.1016/j.childyouth.2017.12.004.

Feasibility of Internet-based Parent Training for Low-income Parents of Young Children

Lucy McGoron, Ph.D.^a, Erica Hvizdos, M.S.W.^a, Erika L. Bocknek, Ph.D.^{a,b}, Erica Montgomery, M.S.W.^a, and Steven J. Ondersma, Ph.D.^{a,c}

^aMerrill Palmer Skillman Institute, Wayne State University, 71 E. Ferry Ave. Detroit, Michigan 48202

^bCollege of Education, Wayne State University, 42. W. Warren Ave. Detroit, MI 48202

^cDepartment of Psychiatry & Behavioral Neurosciences, Tolan Park Medical Building, 3901 Chrysler Service Drive, Detroit MI 48201

Abstract

Parent training programs promote positive parenting and benefit low-income children, but are rarely used. Internet-based delivery may help expand the reach of parent training programs, although feasibility among low-income populations is still unclear. We examined the feasibility of internet-based parent training, in terms of internet access/use and engagement, through two studies. In Study 1, 160 parents recruited from Women, Infants, and Children (WIC) centers completed a brief paper survey regarding internet access and use (all parents received government aid). We found high levels of access, openness, and comfort with the internet and internet-enabled devices. In Study 2, a pilot study, we assessed use of an online parenting program in a project with a sample of 89 predominately low-income parents (75% received government aid). Parents learned about a new, online parenting program (the “5-a-Day Parenting Program”) and provided ratings of level of interest and program use 2-weeks and 4-weeks later. Local website traffic was also monitored. At baseline, parents were very interested in using the web-based program, and the majority of parents (69.6%) reported visiting the website at least once. However, in-depth use was rare (only 9% of parents reported frequent use of the online program). Results support the feasibility of internet-based parent training for low-income parents, as most parent were able to use the program and were interested in doing so. However, results also suggest the need to develop strategies to promote in-depth program use.

Keywords

parent education; internet-based parent education; technology; feasibility; school readiness

It is critical that research-informed programs and interventions reach the populations which they are designed to benefit. This is particularly true of young, low-income children, who are at increased risk for a host of negative outcomes including behavior problems (Bradley &

Corwyn, 2002) and deficits in school-readiness skills (Baker, Cameron, Rimm-Kaufman, Grissmer, 2012; Kaiser, Hancock, Cai, Foster, & Hester, 2000; Raz & Bryant, 1990). Positive parenting mitigates risk for low-income children (Lugo-Gil & Tamis-LeMonda, 2008), and a number of parent training programs have demonstrated efficacy with this population (e.g., Gross, Fogg, Webster-Stratton, Garvey, Julion, & Grady, 2003). However, only a small minority of the parents of at-risk children ever receive such an intervention (see McGoron & Ondersma, 2015, for a review). Specially, uptake and retention in parenting programs is low in general, particularly among low-income parents (e.g., Garvey, Julion, Fogg, Kratovil, & Gross, 2006), with factors such as lack of time and scheduling conflicts being salient barriers to program engagement (Spath & Redmond, 2000). Unique approaches to connect low-income parents with research-informed parent training programs are clearly needed.

Internet-delivered programs are one possible path for expanding intervention reach. For example, Baker, Sanders, and Morawska (2017) report that most Australian parents (65%) already use the internet to obtain parenting information. Additionally, results demonstrating the efficacy of internet-delivered interventions for a variety of populations are accumulating (e.g., anxiety and depression [Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010] and substance use [Roos, Thorsteinsson, Karpin, Copeland & Allsop, 2010]). Internet-based parent training programs are also showing positive results in efficacy trials (see McGoron & Ondersma, 2015, and Breitenstein, Gross, & Christophersen, 2014, for reviews).

Two programs in particular are worth highlighting: the 8-session Triple P online program (Sanders, Baker, & Turner, 2012) and the 7-session Internet-based Parent Management Training (Enebrink, Hogstrom, Forster, & Ghaderi, 2012). In the Sanders et al. (2012), 116 Australian parents of children, ages 2–9, with disruptive behavior problems participated. Although parents' income was not reported, the sample was low risk as 90% of parents were married, over half had a university degree, and only 13% reported worrying about food running out before they could afford to buy more. Eighty percent of participating parents reported using the internet daily and 81% reported feeling very confident using a computer. In the Enebrink et al. (2012), 104 Swedish parents of children with clinical-level behavior problems participated. Children were, on average, over 6 years old and the majority of parents completed a university degree. Evaluations of both programs showed that parents reported reduced child behavior problems and reduced dysfunctional parenting at follow-up. However, given that these were low-risk families with clinical level child behavior problems in Australia and Sweden and parents sought to participate after learning about the project through community postings (i.e., a reactive recruitment approach), it is not clear if this approach would be effective with low-income parents in the United States with a program for the general population (i.e., not clinical-level problems; not treatment seeking). Online approaches to parent training programs could fall well short of their goal if they are not helpful for low-income populations. Determining that this approach is feasible for this population is a necessary first step.

The feasibility of internet-based parent training for low-income parents

Several conditions must be met in order to establish the feasibility of internet-based parent training programs for low-income families. First, low-income parents must have regular access to an internet-enabled device (i.e., Smartphone, tablet, or computer), ideally via ownership of such a device. Second, low-income parents must be comfortable using internet-enabled devices and obtaining information from the internet. If parents are uncomfortable using internet-enabled devices, or getting information from the internet, it would likely impact their perceptions of what the Unified Theory of Acceptance and use of Technology (UTAUT) terms “effort expectancy,” or the perceived ease of use (Venkatesh, Morris, Davis, & DAVE, 2003). According to the UTAUT, effort expectancy is an important element that influences intentions to use a technology, and particularly influences initial program use. Third, low-income parents must be open to receiving *parenting-related* information through the internet. Although not sufficient to ensure use, these elements are necessary preconditions that set the stage for actual engagement in internet-based parent training.

Recent investigations suggest that some of these conditions may be satisfied in samples of low-income parents, but key questions remain unanswered. For instance, Mitchell, Godoy, Shabazz & Horn, (2014) asked a predominately low-income sample of parents in the United States about home internet access and cell phone ownership. Of participants reporting incomes under \$25,000 per year, 66.9% reported having *home* internet access and 78.5% reported using their cell phone to access the internet (rates of Smartphone ownership were not measured). Similarly, Gilbert, Schnoll, Srinivas, Pond, Curtis, Henry & Kranzler, (2015) found that 85% of low-income, pregnant women in the United States reported access to the internet, but did not measure Smartphone ownership. Data regarding Smartphone ownership is critical, particularly given their role in helping to close the gap in internet access between low- and high-income populations (Smith, 2015). Although these investigations have begun to establish rates of internet access in low-income parents, regularity of access and mode of access still remain uncertain in populations of low-income parents. Moreover, these investigations have not established low-income parents’ comfort using internet-enabled devices or obtaining information from the internet.

Evidence of engagement in internet-based parenting interventions

Breitenstein and colleagues (Breitenstein & Gross, 2013; Breitenstein, Fogg, Ocampo, Acosta, & Gross, 2016; Breitenstein et al., 2017) created a tablet-based parent training program specifically for low-income parents. In a small ($n = 9$) initial investigation in the United States, parents completed two sessions of the program over two weeks and provided feedback. Seven parents completed both sessions and two parents completed most, but not all, of the two sessions. Parents rated the program as easy to use. In a subsequent clinical trial (Breitenstein et al., 2016), parents were randomized to either the full, 6-module tablet-based parent training program ($n = 42$) or a control condition ($n = 41$). Rates of program completion were examined in comparison to past attendance at the face-to-face parent training program. In the intervention group, program use was high (average of 85% use across all modules) as was satisfaction with the program. Usage rates were higher than that of the face-to-face parent training program. More recently, Breitenstein and et al. (2017)

reported that only 2% of parents that were in the intervention group never completed the intervention, and that of the 98% of parents that did use the program, most spent over half an hour on each module. However, participants in all these studies were lent tablets in order to complete the program. Rates of usage and possible barriers with respect to use of parents' own devices are unclear. Parents also sought to participate in the intervention evaluation after learning about the program.

Investigators have also examined engagement with Triple P online (Baker & Sanders, 2017). One-hundred Australian parents, who sought to participate in the program after learning about it through community postings, were randomized to the online intervention. Of these parents, 98 activated their program accounts; 13% of those that activated their account did not do more than the introduction module and 25% did not complete any modules. While parents used their own devices to access the program, it is important to note that this was not a low-income sample (i.e., most parents reported a university degree) and income was also not examined in relation to program engagement. Additionally, participants sought to be in the program (i.e., a treatment seeking population). Thus, these results do little to inform our understanding of use of an online parent training program by low-income parents in the United States.

Further examination of feasibility: the present investigations

We sought to further examine the conditions needed to demonstrate the feasibility of internet-based parent training for low-income parents through two separate studies. Although there is no universally agreed-upon definition of low-income status, for this investigation we operationally defined low-income to be receipt of income-dependent assistance from the United States government (e.g., nutritional, medical, cash, or child care support). In Study 1, we surveyed low-income parents to measure rates of regular access to the internet, how parents access the internet use of the internet to obtain general and parenting-specific information, comfort using various internet-enabled devices, and openness to using the internet to obtain general and parenting-specific information. We also specifically asked about Smartphone ownership given the important role Smartphones (and tablets, which have similar functionality) have in delivering internet-based interventions. In Study 2, a pilot investigation, we examined use of an internet-based parent training program among a predominately low-income sample. A new parent education program was created by the study authors: the program is called the 5-a-Day Parenting Program and encourages brief, daily positive parenting activities to promote children's school readiness. The program was introduced to parents in a community setting and then they were given the opportunity to use the program on their own. Importantly, parents in this study were not actively seeking parenting assistance or information of any kind nor did they do steps to seek program participation (i.e., they were approached in a community setting, they did not respond to an advertisement), and were asked to use their own internet-enabled device to access the parenting training program. The purpose of Study 2 was not to thoroughly evaluate the impact of the program, but rather to gather a preliminary understanding of if parents were open to using a general online parenting program and if they would make use of it.

Study 1

Method

Participants—Participants in Study 1 were 160 parents recruited from six Women, Infants, and Children (WIC) centers in Detroit, Michigan (United States). WIC is a federal assistance program that provides food and nutritional information to low-income pregnant woman and children under age 5; thus using WIC is indicative of low-income status (i.e., to be eligible for WIC, families can have an income that is no more than 185% of the federal poverty line; for a family of 4, this would mean an annual income of \$45,510 or less). Eligibility criteria included being the parent of a young child (i.e., age 5 or younger), the ability to read English, and report of receipt of United States government benefits for low-income families (e.g., WIC). For detailed demographic information, see Table 1. The racial makeup of study participants was representative of the city of Detroit.

Procedures—All procedures were approved by the Wayne State University Institutional Review Board (ethics review body) prior to data collection. Parents were approached while waiting to be seen at the WIC center. Those meeting eligibility criteria and providing verbal consent after reading an information sheet were asked to complete a paper and pencil questionnaire. The questionnaire was purposefully brief (i.e., the front and back of a paper; taking no more than 5 minutes to complete) in order to be completed by a large number of parents in busy WIC clinics. Parents were given a children's book as a thank you upon completion of the questionnaire.

Measures—The brief paper survey included 28 questions written for the project. Questions were written by a developmental and clinical psychologist with a goal of brevity and readability (survey items were under a 7th grade reading level). Questions of similar surveys (e.g., PEW Research Center) were reviewed prior to survey construction. Ten questions assessed demographics, including parents' gender, age, education, race, ethnicity, employment, receipt of government benefits, estimated income, family size, and their children's ages. The remaining questions assessed access to the internet, ways of accessing the internet, Smartphone ownership, use of internet for skill acquisition, and use of internet to gather parenting information. We also assessed comfort using different devices (i.e., computer, tablet, Smartphone; 4 items) and openness to gaining general and parenting-specific information (7 items) through the internet using a 3-point scale (i.e., "Not at all," "Somewhat," and "Very much"; scored 0, 1, and 2). Items assessing comfort and items assessing openness were each summed to create total comfort (possible range of 0–8) and total openness (possible range of 0–14) composite scores. Each composite had strong internal consistency (Cronbach's $\alpha = .83$ and $\alpha = .93$).

Data analyses—Survey responses were initially examined via descriptive analyses. The extent to which participants' survey responses differed by demographic characteristics including educational level (high graduate vs. not), African American race, income (incomes under \$20,000 per year vs. incomes at or above \$20,000 per year) or age (young [28 or younger] vs. older [over 28]; median split) was explored using chi square or t-tests.

Results

Internet access and Smartphone ownership among low-income parents—As seen in Table 2, the majority of participating parents reported owning a Smartphone (82.5%) and having access to the internet for personal use (86.3%). With regard to regularity of access, 97 parents (60.6%) reported always having access to the internet, 14 (8.8%) reported having access most of the time, 39 (24.4%) reported sometimes having access, and 9 (5.6%) reported rarely or never having access. The most commonly reported method of accessing the internet was via Smartphone (99, 61.9%), followed by using a PC at home (26 parents, 16.3%), their own tablet (6 parents, 3.8%), a PC, Smartphone, or tablet they do not own (16, 10%; i.e., at a library, work, or a friend's device), or a way that was not listed (7 parents, 4.4%). Only 3 participants (1.9%) reported never accessing the internet. Three participants (1.9%) did not provide an answer.

Use of internet to gain information—As seen in Table 1, 85% of parents reported using the internet to obtain learn a skill and 75% reported using the internet to obtain parenting-specific information. However, regularly accessing a particular website to gain parenting specific information was less common.

Comfort and Openness to Using Technology—Participants reported high levels of comfort in using technology (Table 3). Average levels of comfort are reported in table 3 (i.e., see *total comfort score*, a sum off all comfort items). Parents rated moderate to high levels of openness to gaining general and parenting-specific information through the internet. Table 3 presents average levels of openness (i.e., M of *total openness score*, a sum of all items)

Impact of demographic characteristics

The impact of education—Participants' educational level was unrelated to having regular internet access for personal use ($\chi^2 [1, N = 155] = 1.09, p = .30$), Smartphone ownership ($\chi^2 [1, N = 154] = .98, p = .32$), using the internet to obtain parenting information ($\chi^2 [1, N = 157] = .73, p = .39$), total comfort using internet-enabled devices ($t [89.21] = -1.72, p = .07$), or total openness to using the internet to obtain information ($t [150] = -.91, p = .36$).

The impact of being African American—Compared to participants of another race, African American parents did not report higher rates of regular internet access for personal use ($\chi^2 [1, N = 160] = .09, p = .92$) or Smartphone ownership ($\chi^2 [1, N = 156] = 1.42, p = .23$). African American parents did not report more frequent use of the internet to obtain parenting information ($\chi^2 [1, N = 159] = 2.75, p = .10$). However, African American parents did report higher comfort using internet-enabled devices ($M = 6.63 [SD = 2.09]$ vs. $M = 4.92 [SD = 2.78]$, respectively; $t [30.86] = -2.97, p < .01$), and higher levels of openness to using the internet to obtain information ($M = 8.43 [SD = 3.77]$ and $M = 6.33 [SD = 4.00]$, respectively; $t [152] = -2.48, p = .02$).

The impact of income—Participants' income level was unrelated to having regular internet access for personal use ($\chi^2 [1, N = 150] = 1.86, p = .17$), Smartphone ownership ($\chi^2 [1, N = 149] = .56, p = .54$), using the internet to obtain parenting information ($\chi^2 [1, N$

= 152] = .61, $p = .43$), total comfort using internet-enabled devices ($t[148] = -.61$, $p = .54$), or total openness to using the internet to obtain information ($t[145] = .36$, $p = .54$).

The impact of age—Participants' income level was unrelated to having regular internet access for personal use ($\chi^2[1, N = 133] = 1.64$, $p = .20$), Smartphone ownership ($\chi^2[1, N = 132] = .04$, $p = .84$) or using the internet to obtain parenting information ($\chi^2[1, N = 135] = .19$, $p = .66$). Age did impact total comfort using internet-enabled devices (parents over age 28 $M = 6.05$, $SD = 2.54$ vs. parents at or below age 28 $M = 6.88$, $SD = 1.79$; $t[112.48] = 2.18$, $p < .05$), but did not impact total openness to using the internet to obtain information ($t[128] = .68$, $p = .50$).

Study 2

Method

Participants—Participants in Study 2 were 89 parents of young children. Demographic information is presented in Table 1. To be eligible, participants had to have regular access to the internet, be able to read English, and have a child between 2 and 5 years of age. The racial makeup of the sample is representative of the city of Detroit.

Intervention—The 5-a-Day Parenting program is a newly developed program that encourages parents to do the 5 daily parenting activities and learn ways to make the most out of this time together. The program was created by a developmental psychologist after reviewing the literature on parenting practices and positive development in young children. Input from clinical psychologists, early childhood educators, and pediatricians guided program content. Five parenting behaviors were chosen for promotion: 1) reading children at least one book a day, 2) playing with children at least 10 minutes a day, 3) sharing at least one meal a day with children, 4) doing/saying something every day to show children affection, and 5) following a bedtime routine every night. The program is completely internet-based and can be viewed on a Smartphone or any other internet-enabled device (e.g., tablet, computer). It was created to have relevance for most parents of young children, through the promotion of positive parenting practices, but also particularly geared towards parents of low-income children, who are at risk for behavioral and school readiness challenges (Baker, Cameron, Rimm-Kaufman, Grissmer, 2012; Kaiser, Hancock, Cai, Foster, & Hester, 2000; Raz & Bryant, 1990). Activities promoted in the program are purposefully brief in order to fit into the lives of busy parents. An overarching goal of the program is to give parents access to research-informed parenting information relevant to young children's positive development, with an aim of promoting parent-child engagement, children's exposure to language, and daily routines. Through brief videos, which are presented in different sections of the website by racially diverse female and male animated narrators, the program aims to share information with parents about how research suggests these activities can promote children's school readiness, help parents plan how to regularly do these activities, give tips and suggests on how to make the most of this time with their children, and help parents problem solve challenges that may make doing each activity difficult.

Procedures—All procedures were approved by a University Institutional Review Board prior to data collection. All recruitment took place in Detroit, Michigan. Parents were recruited when waiting at an appointment at a WIC office ($n = 65$), at pick-up/drop-off time at their child care centers or through an email sent by their child care director ($n = 20$), or through a local classified advertisement website in the United States ($n = 4$). Participants either completed baseline procedures at the office/center immediately using a study tablet or participated remotely using their own device. Participation included three time points.

First, at baseline, parents completed an online consent form and a brief online survey using a study-provided tablet or on their own device. Baseline participation took approximately 15–20 minutes. At the beginning of this survey, parents answered questions about themselves and their young child, including providing demographic information. Parents were also asked about how often they currently do the 5 target parenting activities (i.e., reading to their child, playing with their child for at least ten minutes a day, daily meal sharing, showing affection each day, and following a bedtime routine). Next, embedded within this survey was information about the 5-a-Day Parenting program (www.5adayparenting.org). In order to learn about the web-based program, at baseline, parents watched a brief, 3.5-minute video, overviewing the program and encouraging parents to use the program website. The video was narrated by an animated African-American character, and described the five activities promoted by the program and how they can help children with school readiness. The video incorporated animated vignettes, as well as photos of diverse families engaging in the five described activities. The video was purposefully brief in order to fit into the busy lives of low-income families, and also acknowledged the busy schedules, and conflicting parenting information that parents often receive. After watching the video about the internet-based program, parents answered questions about their perception and interest in the internet-based parenting program. Given that adopting all 5 daily parenting behaviors would be challenging, parents were asked which one of the 5 parenting behaviors with which they would like to focus. Parents were then free to use the internet-based parenting program. Parents received a \$25 gift card for completing baseline questions, however, compensation was not tied to program use; parents were encouraged to use the website but were told they could use it as much, or as little as they chose.

The second time point was two-weeks after baseline. Parents (69 were reached) answered brief questions about use of the website through a phone call with a research assistant. The third and final time point was four-weeks after baseline. Parents (66 were reached) were sent a link, via text or email, to complete a brief online survey. The survey contained 65 questions about program use, child behavior, and parenting practices. Relevant to this report is one question about website use. Parents received gift cards for answering questions at each time point (\$25, \$5, and \$20, respectively), however, compensation was in no way tied to use of the website.

Measures—At baseline, parents were asked about their demographic information. Additionally, after watching the brief video about the 5-a-Day Parenting Program, parents were asked three questions to gain their interest in the program. First, parents were asked “Please rate how much you liked the brief video you watched about the program,” with response options ranging from “Liked it a great deal,” to “Disliked it a great deal.” Second,

parents were asked, “Please rate how much you liked the idea of using the 5 daily parenting activities to promote your child’s school readiness,” with response options ranging from “Liked it a great deal,” to “Disliked it a great deal.” Third, parents were asked, “How likely are you to visit the 5-a-Day Parenting website?” with responses ranging from “Extremely likely,” to “Extremely unlikely.”

The two-week phone follow-up very briefly asked participants if they had used the website in the past two weeks. If parents reported they had not used the website, the research assistant inquired as to why the website was not used and then recorded their answer.

The 4-week follow-up obtained more detailed participation information including extent of website use in the past 4 weeks (i.e., “We would like your feedback about the 5-a-Day Parenting Website [www.5adayparenting.org]. Please rate the item that is true about your use of the website.” Response options ranged from “I did not use the website at all,” to “I used the website a lot.”).

In addition to parents’ reports of website use, “hits” on the website were also tracked using Google Analytics. Importantly, analyses of data collected through Google Analytics was restricted to local usage (i.e., only looking at use of the website in the Detroit area). This was done to increase the likelihood that website hits reflected usage from study participants.

Results

Baseline ratings of the program and selected goal—When asked to rate the video introducing them to the 5-a-Day Parenting Program, 76 (85.4%) reported they liked it a great deal, 12 (13.5%) reported they liked it somewhat, and 1 (1.1%) reported being unsure. No parents reported disliking the video. Parents also rated the idea of doing the 5 daily parenting activities favorable (i.e., 81 [91%] reported they liked it a great deal and 8 [9%] reported they liked it somewhat; no parents reported they disliked it). Parents selected one of the 5 parenting areas on which they would like to focus (37 [41.6%] picked reading, 21 [23.6%] selected sleep, 20 (22.5%) picked play, 4 [4.5%] picked meal sharing, 1 [1.1%] picked affection, and 6 [6.7%] said they were not interested in any of the 5 activities. Finally, parents were asked how likely they are to visit the parenting website. Sixty-four parents (71.9%) reported being extremely likely to visit the website, 19 (21.3%) reported being somewhat likely to visit the website, and none reported unsure or not at all likely to visit the website.

Reported website use two and four weeks after baseline—At the 2-week follow-up, 41 parents (46.1%) reported using the website and 28 (31.5%) reported they did not use the website (20 participants [22.5%] were not reached for follow-up). Of the parents reporting not using the website, 15 (53.6%) said they were too busy with other obligations or responsibilities (e.g., work, kids), 3 (10.7%) reported access problems (e.g., slow internet connection, service interruption), 2 (7.1%) reported not seeing a need to use the website because they already engage in the activities taught in the program, 4 (14.3%) forgot about the program, and 4 (14.3%) lost the website URL. At the 4-week follow-up, 8 parents (9%) reported using the website a lot, 18 (20.2%) reported using it more than once or twice, but

not a lot, 36 (40.4%) reported using it once or twice, and four parents (4.5%) reported not using the website at all. Twenty-three parents (25.8%) could not be reached for follow-up.

Association of program use and demographic characteristics—As seen in Table 4, there was little association between participant characteristics and reported website use.

Website traffic—Figure 1 details the number of participants and the number of website visits over the 12 weeks of the data collection. As seen in Figure 1, website hits increased as additional participants were recruited during the data collection period. However, these data suggest less than one website visit per participant (collaborating self-report data that the website was used by most parents, but not in-depth).

Discussion

Internet-based programs may expand the reach of parent training. However, the impact of such programs will be limited if they are not feasible for low-income families. With this in mind, we examined feasibility of internet-based parent training in two studies. In study 1, low-income parents answered questions about internet access, comfort with using technology, and openness to obtaining information online. In study 2, a predominately low-income sample of parents learned about the 5-a-Day Parenting Program, a newly created, online program. Given that programs need to be used in order to be effective, the first step in evaluating this new program was examining parents' openness to using the program and reported use at follow up.

Results of study 1 are encouraging. We found practical barriers to use of an internet-based parenting program were rare in this low-income sample of parents of young children. Eighty-six percent of participants reported regular access to the internet; a rate that is comparable to the 85% reported by Gilbert, et al. (2015). Rates of Smartphone ownership, comfort using internet-enabled devices, and openness to using the internet to obtain general and parenting specific information were also high. Seventy-five percent of parents also reported using the internet to obtain parenting information; a rate that is higher to the 65% of Australian parents that Baker et al. (2017) reported using online parenting resources. Results suggest an internet-based approach to parent training is feasible for most, but not all, low-income parents. Results suggest internet-based parent training may be less feasible with older parents due to less comfort with internet-enabled devices. Importantly, our results are consistent with the suggestions of Smith (2015) that internet access is becoming ubiquitous and Smartphone ownership is playing a role in increased access in low-income populations. High rates of Smartphone usage in Study 1 suggest that internet-based parenting training programs should be Smartphone compatible (as with the parent training program created for Study 2).

Notably, Study 1 (and Study 2) did not measure interruptions in Smartphone service. Both Gilbert and colleagues (2015) and Mitchell and colleagues (2014) found that approximately a quarter of low-income parents report having had a cell phone service disruption in the past year. Keeping the prevalence of cell phone disruptions in mind is important, as these

disruptions would make parents temporarily unable to move through an internet-based parenting training program.

In study 1, demographic factors had no impact on access to the internet or Smartphone ownership, although we caution against generalization of results due to a restricted sample of primarily African-American mothers in an urban area in the United States. Several interesting findings emerged. Compared to parents of other races, African-American parents also reported higher levels of comfort using internet-enabled devices and openness to obtaining information from the internet; although comfort and openness were generally high for both groups. In terms of openness to obtain parenting information, one interesting exception is that over 30% of parents surveyed were not open to receiving information about discipline through the internet. This may suggest that internet-based programs should focus more on positive parenting approaches. Of course, the rarity of practical barriers to use an internet-based program do not necessarily translate into actual use. In order to examine actual use, study 2 was a pilot investigation to see if parents would make use of internet-based parenting information relevant to young children's development.

In Study 2, a pilot project, a sample of predominately low-income parents (75% receive government aid) learned about a newly created internet-based parenting program: The 5-a-Day Parenting Program. Findings suggest that most parents are interested in and open to using an internet-based parenting program and will make *some* use of it. It is promising that self-reported program use was not impacted by low-income status (i.e., receipt of government aid). However, given that google analytics results showed an average of less than one website visit per participant, it is clear that in-depth use of the program was rare. These results are in contrast to those of Breitenstain et al. (2017), who found nearly all low-income parent-participants used an online parent training program. An important difference between that investigation and the current investigation is that in that investigation, parents were lent a tablet to use, while in the current investigation parents were asked to use their own device. However, all participants reported having access to the internet and all parents reported interest in using the parenting program. Despite these intentions, in-depth use was rare in Study 2.

One possibility is that that service disruption were a barrier to program use. Additionally, the limited program use may due to the nature of the 5-a-Day Parenting program, which can be described as "self-service," meaning that parents were expected to move themselves through the program. Overall, it is clear a more thorough evaluation is needed to understand factors that inhibited in-depth program use. Thus, results should be interpreted cautiously and not generalized to all internet-based parenting training programs; different programs may engender more, or less, use than this specific internet-based parenting program. There may be general barriers that inhibit use of an internet-based program and also program-specific conditions of the 5-a-Day Parenting Program that limited use. One way to tap into these barriers is obtaining qualitative input from parents who have learned about the program, asking about their perceptions, needs, and goals. A useful framework for in-depth examinations of factors that enhance/inhibit program use is the Uses and Gratifications approach, which suggests that engagement in a system is strengthened when users perceive the system meets their needs and helps them attain their goals (Severin & Tankeard, 1997).

Possibly, parents that learned about the 5-a-Day Parenting Program did not view the program as meeting their needs or were able to meet their needs through using the program 1 or 2 times. It is important to keep in mind that the participating parents were not seeking an intervention; thus, they may have had less needs than a clinical population of parents.

Findings from Study 2 have informed changes to the 5-a-Day Parenting Program. Specifically, in order to promote additional use of the online parenting program, we have created a text messaging system that would prompt parents to go through different content areas of the program, reinforce content from the website, and serve as a reminder. Second, we have created a social media presence (i.e., Facebook and Twitter) to help parents keep the program in mind. These enhancements may have helped parents that did not visit the website due to simply forgetting about the program or not remembering the website URL. However, these enhancements may not improve program use for parents who are too busy to visit the website. Using text messages to highlight the brief nature of program content may be helpful for these parents (e.g., a text that links parents to a video and tells them the video is only 3 minutes long).

Strengths, Limitations, and Future Directions

Study 1 contributes important information regarding the feasibility of internet-based parenting training. However, these findings are limited by having a homogenous sample; participants were primarily young, African-American mothers. The homogenous racial makeup led to uneven sample sizes when examining the impact of being African American, which limits interpretation of these results. Results may differ in other low-income populations. Additionally, the utilized questionnaire was brief and items were made specifically for this investigation.

Study 2 provides rates of online intervention use among low-income parents using their own devices, and thus is much more likely to reflect real-world penetration than studies involving provision of study-funded devices. One strength of the investigation is that participants were not intervention seeking, unlike many parent training evaluations. That is, parents did not seek out the intervention information, but were rather approached and given information about the program. Results regarding rates of program use need to be interpreted within this context.

Attrition in this study (over 25% of participating parents were not reached for the 4-week follow up) was high, complicating efforts to estimate real-world engagement and retention. Moreover, although compensation was not tied to program use, receipt of gift cards after completing baseline and follow-up surveys may have influenced website usage. Moreover, we looked at website “hits,” in order to get a general, preliminary sense of local website use during data collection. We did not, however, track each participant’s individual use. Currently, a more thorough evaluation of the program is under way, which tracks use of each individual participant and assesses the impact of the 5-a-Day Parenting Program. Beyond this specific program, findings may suggest that online parent education for low-income parents in the United States in general is feasible, as many of the barriers assumed to be there (e.g., lack of internet access) are actually not present, but that work needs to be done to understand how to

best engage low-income parents in online parenting-focused programs as well as the goals, needs, and wants of this population in terms of internet-based parenting information.

Acknowledgments

These studies were funded by a grant received from Community Telecommunications Network of Southeast Michigan

References

- Andrews G, Cuijpers P, Craske M, McEvoy P, Titov N. Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: a meta-analysis. *PLOS One*. 2010; 5(10):e13196.doi: 10.1371/journal.pone.0013196 [PubMed: 20967242]
- Baker C, Cameron C, Rimm-Kaufman S, Grissmer D. Family and sociodemographic predictors of school readiness among African American boys in Kindergarten. *Early Education and Development*. 2012; 23(6):833–854. DOI: 10.1080/10409289.2011.607359
- Baker S, Sanders MR. Predictors of program use and child and parent outcomes of a brief online parenting intervention. *Child Psychiatry And Human Development*. 2017; 48(5):807–817. DOI: 10.1007/s10578-016-0706-8 [PubMed: 28035556]
- Baker S, Sanders MR, Morawska A. Who uses online parenting support? A cross-sectional survey exploring Australian parents' internet use for parenting. *Journal of Child And Family Studies*. 2017; 26(3):916–927. DOI: 10.1007/s10826-016-0608-1
- Bradley R, Corwyn R. Socioeconomic status and child development. *Annual Review of Psychology*. 2002; 53:371–99. DOI: 10.1146/annurev.psych.53.100901.135233
- Breitenstein S, Fogg L, Ocampo E, Acosta D, Gross D. Parent use and efficacy of a self-administered, tablet-based parent training intervention: a randomized control trial. *JMIR mHealth and uHealth*. 2016; 4(2):e36.doi: 10.2196/mhealth.5202 [PubMed: 27098111]
- Breitenstein S, Gross D. Web-based delivery of a preventative parent training intervention: a feasibility study. *Journal of Child and Adolescent Psychiatric Nursing*. 2013; 26(2):149.doi: 10.1111/jcap.12031 [PubMed: 23607827]
- Breitenstein S, Gross D, Christophersen R. Digital delivery methods of parenting training interventions: a systematic review. *Worldviews on Evidence-Based Nursing*. 2014; 11(3):168–176. DOI: 10.1111/wvn.12040 [PubMed: 24842341]
- Davis F. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*. 1989; 13(3):319–340.
- Enebrink P, Högstöm J, Forster M, Ghaderi A. Internet-based parent management training: A randomized controlled study. *Behaviour Research and Therapy*. 2012; 50(4):240–249. DOI: 10.1016/j.brat.2012.01.006 [PubMed: 22398153]
- Garvey C, Julion W, Fogg L, Kratochvil A, Gross D. Measuring participation in a prevention trial with parents of young children. *Research in Nursing and Health*. 2006; 29(3):212–222. DOI: 10.1002/nur.20127 [PubMed: 16676341]
- Gilbert J, Schnoll R, Srinivas SK, Pond T, Curtis B, Henry J, Kranzler HR. Smoking and cellular telephone use among pregnant women seeking prenatal care: opportunities for intervention. *Addictive Disorders and Their Treatment*. 2015; 14(4):203–210. DOI: 10.1097/ADT.000000000000053 [PubMed: 26755894]
- Gross D, Fogg L, Webster-Stratton C, Garvey C, Julion W, Grady J. Parent training of toddlers in day care in low-income urban communities. *Journal of Consulting and Clinical Psychology*. 2003; 71(2):261–278. <http://dx.doi.org/10.1037/0022-006X.71.2.261>. [PubMed: 12699021]
- Kaiser A, Hancock T, Cai X, Foster M, Hester P. Parent-reported behavioral problems and language delays in boys and girls enrolled in Head Start classrooms. *Behavioral Disorders*. 2000; 26(1):26–41. <http://www.jstor.org/stable/23889057>.
- Lugo-Gil J, Tamis-LeMonda C. Family resources and parenting quality: links to children's cognitive development across the first 3 years. *Child Development*. 2008; 79(4):1065–1085. DOI: 10.1111/j.1467-8624.2008.01176.x [PubMed: 18717907]

- McGoron L, Ondersma S. Reviewing the need for technological and other expansions of evidence-based parent training for young children. *Children and Youth Services Review*. 2015; 59:71–83. DOI: 10.1016/j.childyouth.2015.10.012
- Mitchell S, Godoy L, Shabazz K, Horn I. Internet and mobile technology use among urban African American parents: survey study of a clinical population. *Journal of Medical Internet Research*. 2014; 16(9):e9.doi: 10.2196/jmir.2673 [PubMed: 24418967]
- Raz I, Bryant P. Social background, phonological awareness and children's reading. *British Journal of Developmental Psychology*. 1990; 8(3):209–225. DOI: 10.1111/j.2044-835X.1990.tb00837.x
- Rooke S, Thorsteinsson E, Karpin A, Copeland J, Allsop D. Computer delivered interventions for alcohol and tobacco use: a meta-analysis. *Addiction*. 2010; 105(8):1381–1390. DOI: 10.1111/j.1360-0443.2010.02975.x [PubMed: 20528806]
- Sanders MR, Baker S, Turner KM. A randomized controlled trial evaluating the efficacy of Triple P Online with parents of children with early-onset conduct problems. *Behaviour Research and Therapy*. 2012; 50(11):675–684. DOI: 10.1016/j.brat.2012.07.004 [PubMed: 22982082]
- Severin, W., Tankard, J. *Communication theories: Origins, methods, and uses in the mass media*. Longman; 1997.
- Smith, A. U.S. Smartphone Use in 2015. 2015. Retrieved from Pew Internet & American Life Project Website. <http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/>
- Spoth R, Redmond C. Research on family engagement in preventive interventions: Toward improved use of scientific findings in primary prevention practice. *The Journal of Primary Prevention*. 2000; 21(2):267–284.
- Venkatesh V, Morris MG, Davis GB, Davis FD. User acceptance of information technology: Toward a unified view. *MIS Quarterly*. 2003; 27(3):425–478.

Figure 1.
Number of participants and recorded website hits through Google Analytics over the 12-week study period (Study 2)

Table 1

Participant demographics for Study 1 (N = 160) and Study 2 (N = 89)

	Study 1 n (%)	Study 2 n (%)
<u>Sex</u>		
Female	144 (90%)	77 (86.5%)
Male	14 (8.8%)	10 (11.2%)
Did Not Provide Response	2 (1.3%)	2 (1.2%)
<u>Race and Ethnicity</u>		
African American/Black	132 (82.5%)	69 (77.5%)
Caucasian/White	15 (9.4%)	13 (14.6%)
Hispanic	6 (3.8%)	3 (3.4%)
American Indian	2 (1.3%)	2 (2.2%)
Asian Indian	1 (.6%)	1 (1.1%)
Middle Eastern	5 (3.1%)	3 (3.4%)
Asian	2 (1.3%)	1 (1.1%)
Other	0 (0.0%)	1 (1.1%)
Did Not Respond	0 (0.0%)	2 (2.2%)
<u>Highest level of Education</u>		
Did Not Graduate High School/Received GED	54 (33.8%)	17 (19%)
High School Graduate	84 (52.5%)	18 (20%)
Associate's Degree or Some College	11 (6.3%)	34 (38.2%)
Bachelor's Degree	1 (0.6%)	7 (7.9%)
Graduate Degree	3 (1.9%)	10 (11.3%)
Did Not Provide Response	2 (1.3%)	3 (3.4%)
<u>Government Benefits</u>		
WIC	134 (83.3%)	58 (65.2%)
SNAP	112 (70.0%)	52 (58.4%)
Unemployment	2 (1.3%)	0 (0%)
SSI	20 (12.5%)	0 (0%)
Cash Benefits	13 (8.1%)	4 (4.5%)
Medicaid	79 (49.4%)	43 (48.3%)
Childcare Subsidies	9 (5.6%)	5 (5.6%)
No Benefits	0 (0.0%)	20 (22.5%)
<u>Estimated Income</u>		
\$0–\$19,999	116 (73.0%)	-----
\$20,000–\$24,999	27 (16.9%)	-----
\$30,000–\$34,999	6 (3.8%)	-----
\$40,000–\$44,999	4 (2.5%)	-----
Did Not Provide Response	7 (4.4%)	-----

	Study 1 <i>n</i> (%)	Study 2 <i>n</i> (%)
<u>Financial Security</u>		
Rarely or never	-----	5 (5.6%)
Sometimes	-----	21 (23.6%)
About half the time	-----	21 (23.6%)
Always	-----	38 (42.7%)
Did not provide response	-----	4 (4.5%)

Table 2

Low-income parents reported access to the internet, smartphone ownership, and use of the internet to obtain information (Study 1; N = 160)

	<i>Yes n (%)</i>	<i>No n (%)</i>	<i>Did not respond n (%)</i>
Do you have access to the internet for your personal use?	138 (86.3%)	19 (11.9%)	3 (1.9%)
Do you own a Smartphone?	132 (82.5%)	24 (15.0%)	4 (2.5%)
Do you ever use the internet to learn new skills?	137 (85.6%)	22 (13.5%)	1 (0.6%)
Have you ever looked on a website (or googled a question) to get information about parenting, your child's behavior, or your child's development?	120 (75.0%)	39 (24.4%)	1 (0.6%)
Are there websites you visit regularly to get information about parenting, your child's behavior, or your child's development?	43 (26.9%)	115 (71.9%)	2 (1.3%)

Table 3

Low-income parents reported comfort using various forms of technology and openness to using the internet to obtain general and parenting specific information (Study 1; N = 160)

	Not at all n (%)	Somewhat n (%)	Very Much n (%)	No response n (%)	Summed Items M (SD)
Comfort Using Technology:					6.35 (2.30)
Using a computer	7 (4.4%)	38 (23.8%)	105 (65.6%)	10 (6.3%)	
Using a Smartphone	7 (4.4%)	20 (12.5%)	120 (75.0%)	13 (8.1%)	
Using a tablet	16 (10.0%)	27 (16.9%)	104 (65%)	13 (8.1%)	
Getting information from the internet	6 (3.8%)	26 (16.3%)	114 (71.3%)	14 (8.8%)	
Openness to using the internet to obtain information:					8.10 (3.87)
Learning a <i>new skill</i> through the internet.	7 (4.4%)	42 (26.3%)	105 (65.6%)	6 (3.8%)	
Getting information about <i>child development</i> through the internet	15 (9.4%)	49 (30.6%)	83 (51.9%)	13 (8.1%)	
Getting information about <i>child behavior</i> through the internet	20 (12.5%)	50 (31.3%)	80 (50.0%)	10 (6.3%)	
Getting information about how I can help my child <i>be successful in school</i> through the internet	23 (14.4%)	38 (23.8%)	92 (57.5%)	7 (4.4%)	
Getting information about <i>parenting</i> through the internet	30 (18.8%)	46 (28.8%)	76 (47.5%)	8 (5.0%)	
Getting information about <i>discipline strategies for my child</i> through the internet	50 (31.3%)	37 (23.1%)	65 (40.6%)	8 (5.0%)	
Getting information about <i>activities I can do with my child</i> through the internet	14 (8.8%)	40 (25.0%)	98 (61.3%)	8 (5.0%)	

Self-Reported website use at 2 and 4-weeks, by racial and economic characteristics (Study 2; n = 69 for 2-week follow-up; n = 66 for 4-week follow-up)

Table 4

	2-week Follow-up				4-week Follow-up			
	No n (%)	Yes n (%)	χ^2	p	No n (%)	Yes n (%)	χ^2	p
Race			.61	.44			.02	.88
African American	23 (42.6%)	31 (57.4%)			3 (6%)	47 (94%)		
Other	4 (30.8%)	9 (69.1%)			1 (7.1%)	13 (92.9%)		
Government Benefits			2.56	.11			3.80	.05
No	5 (25%)	15 (75%)			3 (15%)	17 (85%)		
Yes	22 (45.8%)	26 (54.2%)			1 (2.3%)	43 (97.7%)		
Education			3.99	.05			2.40	.12
Did not graduate high school	5 (50%)	5 (50%)			0 (0%)	8 (100%)		
High school graduate	21 (37.5%)	35 (62.5%)			4 (6.2%)	61 (93.8%)		
Financial Insecurity			.01	.92			4.68	.05
Not always able to buy basics	14 (40%)	21 (60%)			0 (0%)	34 (100%)		
Always able to buy basics	12 (38.7%)	19 (61.3%)			4 (12.9%)	27 (87.1%)		