Children and Youth Services Review 73 (2017) 66–73

Contents lists available at ScienceDirect

Children and Youth Services Review

journal homepage: www.elsevier.com/locate/childyouth

Reducing hostile parenting through computer-mediated parenting education

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ARTICLE INFO

Article history:
Received 1 August 2016
Received in revised form 29 November 2016
Accepted 30 November 2016
Available online 1 December 2016

Keywords:
Parent education
Computer-mediated services
Employer-based service provision
Hostile parenting

ABSTRACT

Objective: The present study evaluated a computer-mediated parent education program aimed at improving parents' self-concept and dysfunctional parenting practices.
Design: Employer-based parent education services were offered as part of a corporation's employee wellness program. Participants (N = 247) were asked to complete pre- and post-test surveys including surveys of demographic information, parental self-concept, and dysfunctional parenting behaviors.
Results: Participants reported clinically significant levels of dysfunctional parenting practices at baseline. Results from the single-dose intervention indicated a significant decrease in hostile parenting from pre-test to post-test, which was likely predicted by parents' sense of competence at baseline.
Conclusion: Computer-mediated parent education workshops were efficacious in improving parents' self-concept and reducing parents' use of hostile parenting tactics. The study provides an important contribution to the extant literature by documenting the effectiveness of computer-mediated parenting programs, particularly those offered through the workplace.

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1. Introduction

Parents create a home environment for their children that serves as the context of children's social, emotional, and physical development, and it is patterns of parenting behavior, in part, that create the emotional tenor of this context. Parents may be warm, caring, and empathetic, or they may be cold, harsh, and insensitive, each general style – if consistent over time – then impacts the child's development in predictable ways. For example, parenting that is warm, sensitive, and supportive facilitates children's socioemotional development, as children from these environments tend to show more positive affect, less negative affect, and fewer externalizing behaviors (Eisenberg et al., 2001; Kaplan, Evans, & Monk, 2008). Conversely, evidence shows that hostile discipline is associated with children's internalizing and externalizing behaviors, peer interpersonal violence, misbehavior, academic struggles, aggression and delinquency, and can predict psychopathology symptoms in adolescence (Bayer et al., 2012; Brannigan, Gemmell, Pevalin, & Wade, 2002; Cole et al., 2014; Jia, Wang, & Shi, 2014; Hallquist, Hipwell, & Stepp, 2015; Hinnant, Erath, & El-Sheikh, 2015; Tang & Davis-Kean, 2015). Though parent-child relationships change over time, hostile parenting at all stages is a risk factor for lasting negative emotional outcomes for children (Brannigan et al., 2002; Lorber & Egeland, 2009). As evidence, Lorber and Egeland (2009) found that poor quality parenting during infancy, as defined by negative affect, negative regard for child, and insensitivity, remained a significant predictor of externalizing behavior in individuals through their mid-twenties.

Hostile parenting practices include overly critical responses to children, high levels of control, censorship of children, and punishment that is inconsistent, may be aggressive or physical, and relies on lecturing, limiting, and controlling, rather than teaching and redirecting (Brannigan et al., 2002; Cole et al., 2014; Hallquist et al., 2015; Tang & Davis-Kean, 2015). Children parented in environments characterized by pervasive negativity and stress are impacted on a biological level, as research indicates their cognitive reactivity systems are associated with increased negative emotionality and heightened sensitivity to stress over the long-term (Brooker & Buss, 2014; Cole et al., 2014; Hinnant et al., 2015).

In the extreme, hostile feelings directed toward children are expressed as neglect or abusive behaviors (Crouch, Skowronski, Milner, & Harris, 2008). However, even in less severe cases, children whose parents engage in hostile, aggressive, and insensitive interactions, whether these interactions are directed toward the child or not, are reared in contexts that accept, condone, and encourage such behaviors (Kempes, Matthys, de Vries, & van Engeland, 2005). Social cognitive theory posits that children reared by hostile parents will imitate the behaviors they have seen modeled in their environment and turn to similarly hostile and aggressive interaction styles, believing that this interaction style is effective to meet their goals (Bandura, 1977; Jia et al., 2014; Kempes et al., 2005). Similarly, other family members may

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http://dx.doi.org/10.1016/j.childyouth.2016.11.036
0190-7409/Published by Elsevier Ltd.

learn from and imitate behaviors that they see modeled by a hostile or aggressive parent. In two parent families, for example, one parent's negative or hostile interactions with a child impact the second parent's interactions with the child, leading to increased negativity in the parent-child relationship with the second parent as well (Kim, Lee, Taylor, & Guterman, 2014). Children who are disciplined more (particularly if the punishment is physical or aggressive, but even if it is nonviolent) are more likely to display behavior problems, as the parent and child engage in a reciprocal pattern of repeated misbehavior and punishment (Kim et al., 2014). Systems theory asserts that all parts of the family system contribute to the interactions that occur within the family, hence hostile interactions between parent and child contribute to overall patterns of family functioning predictive of individual health and wellbeing outcomes into adulthood (Darling, 2007; Elgar, Craig, & Trites, 2013; Freed, Rubenstein, Daryanani, Olino, & Alloy, 2016; Lerner, 2006; Whitchurch & Constantine, 1993; Yap, Pilkington, Ryan, & Jorm, 2014). For example, parents struggling with parenting-related stress are more likely to discipline their children, as are parents who have a poor quality partner relationship or those who are living in a violent community context (Kim et al., 2014).

Supportive, positive parenting is associated with parents' sense of efficacy, an optimistic belief that they are competent parents, and an internal locus of control with a self-enabling belief in their ability to affect their child's behavior (Bandura, 2012; Evans, Nelson, Porter, Nelson, & Hart, 2012). Parents who experience a great deal of stress are less likely to have an internal locus of control, and instead hold a self-debilitating belief that they have no control over their child's behavior (Bandura, 2012; Bernstein, Laurent, Measelle, Hailey, & Ablow, 2013). Bandura (1977, 2012) emphasized the importance of self-efficacy in completing a task, describing an efficacious individual as one who is motivated to persevere at a difficult task and have success. Therefore, an efficacious parent will persist in their efforts to foster positive behavior in their children, even when they are under stress or the task is difficult. There is evidence, for example, that increases in parental efficacy predict decreases in child's disruptive behavior (O'Connor, Rodriguez, Cappella, Morris, & Mcclowry, 2012). Conversely, parents with a low level of efficacy engage in ineffective parenting practices that foster poor child behavior - corporal punishment or increased use of punitive interactions that focus on criticizing and scolding the child and demanding compliance - confirming the parent's belief that they have little ability to change their child's behavior (Evans et al., 2012; Sanders & Woolley, 2005). This increased poor behavior then further decreases the parent's self-efficacy, which breeds more misconduct and adjustment difficulties, creating a cycle of poor behavior and ineffective parenting (Kim et al., 2014; Khoury-Kassabri, Attar-Schwartz, & Zur, 2014; Yaman, Mesman, van IJzendoorn, & Bakermans-Kranenburg, 2010). Systems theory picks up this self-efficacy theme from social cognitive theory and asserts that the parents' level of efficacy and locus of control are associated with child behavior, with parent and child reciprocally influencing one another in an interdependent and bi-directional way (Darling, 2007; Lerner, 2006).

1.1. Parenting support services

The vast majority of parents with children under age 18 (75%) seek information about parenting online (Duggan et al., 2015). Social media is an Internet forum that is particularly popular with these parents, as approximately 75% turn to social media for social support, and more than half (59%) consider the parenting information they find on social media to be valuable. Technology-based service provision options are a means of connecting with families seeking parenting support and information through widely used and trusted mechanisms. Literature on computer-mediated parenting education emphasizes that this type of service provision is growing and has the potential to positively impact a large number of families, but research has yet to examine whether it reaches comparable in-need groups as those served through traditional parent education settings (Breitenstein, Gross, & Christophersen, 2014). In a recent paper, Kazdin and Blase (2011) acknowledge this outstanding need and asked, *What models of intervention delivery will help reach the population of individuals in need?* wherein the authors call for "a portfolio of preventive interventions with various models" (p. 28), and evidence on the efficacy of each model.

There is an undeniable need for an examination of which service models work best for whom and which outcomes are amenable to change through computer-mediated service delivery mechanisms; researchers are slowly moving beyond feasibility studies to assess the influence that such programs have on both parents and children (Breitenstein et al., 2014; Hall & Bierman, 2015; Powell, 2013). As an example of the slowly accumulating evidence for the efficacy of computer-mediated parenting services, Gelatt, Adler-Baeder, and Seeley (2010) conducted a randomized control trial of participants in a web-based education program for stepfamilies and found that the program significantly decreased over-reactive parenting. Similarly, Sanders and colleagues (Sanders, Baker, & Turner, 2012; Sanders, Calam, Durand, Liversidge, & Carmont, 2008) have shown evidence from randomized controlled trials that online adaptations of Triple P (Positive Parenting Program) consistently yield positive parent and child outcomes for families of children with disruptive behavior, while Enebrink, Högström, Forster, and Ghaderi (2012) report that in a randomized controlled study of parents of children aged 3–12 with clinical conduct problems, computer-mediated parent training yielded parent and child outcomes comparable to in-person parenting programs. In a randomized controlled trial of parents with serious mental illness, Kaplan, Solomon, Salzer, and Brusilovskiy (2014) found that an online parenting program offering education and support effectively improved parenting and coping and decreased parenting stress.

These studies specifically target particular at-risk portions of the population, often selecting samples based on problem behavior or clinical diagnosis. Prevention efforts prior to clinical diagnosis are a crucial mechanism for closing the gap between the presentation of problematic behavior or mental health symptoms and the estimated relief provided through psychobehavioral or pharmacological treatments (estimated at only 50%, given maximized coverage of those seeking treatment, clinician efficacy, and treatment compliance; Hahlweg, Heinrichs, Kuschel, Bertram, & Naumann, 2010). Indeed, the widely recognized mediation of children's behavior problem by parenting practices has led to the acknowledgment that universal prevention is a key component of a public health approach to bolstering child and family wellbeing, given that treatment through family services can never hope to reach full coverage for children's behavior problems. Given the pervasive implications of self-efficacious parenting for all families and the impacts harsh and aggressive parenting practices may have on children's outcomes, interventions that specifically aim to reduce hostile parenting behaviors in an effort to improve parent-child interactions represent a promising universal prevention effort that may prove pragmatically delivered through computer-based platforms. Although the US Department of Health and Human Services (2011) National Prevention Strategy calls for clinical and community services as one of the four strategic directions, few parenting efforts have addressed the community service component from a universal or primary prevention perspective.

1.2. The present study

The studies mentioned above indicate that secondary prevention, or targeted computer-mediated parenting programs are beneficial to clinical populations – particularly in samples of families with young children. Clearly, more work is needed before broader claims of effectiveness for computer-mediated service delivery models can be confidently made in non-clinical settings for a range of families, particularly when considering impacts for specific parenting outcomes like hostile or over-reactive parenting. The goal of this paper is to build the parenting service delivery literature by exploring outcomes from a

computer-mediated primary prevention parenting education service. Our aim is to demonstrate that parents engaged in computer-mediated parent education experience significant improvements in parenting outcomes (i.e., hostile parenting, or sense of self-efficacy/competence). Evidence suggests that employment-based services are ideally suited to address working parents' parenting needs. Not only do parents struggle to navigate the pressures of family life and employment in ways that reduce optimal parenting practices (Cooklin et al., 2016; Vieira, Matias, Ferreira, Lopez, & Matos, 2016) and productivity in the workplace (Duncan & Pettigrew, 2012; Vanderpool & Way, 2013), but they also experience limitations on time and energy stemming from employment that are frequent barriers to family service engagement (Kazdin, Holland, Crowley, & Breton, 1997; Koerting et al., 2013). Therefore, we partnered with an employment-based service provider working with families through an online platform to overcome often cited barriers to service engagement while providing benefits to both employers and their employees.

This work was shaped by two research questions: Would associations between parenting self-concept that reflect self-efficacy, including sense of competence and locus of control, be significantly related to parenting style? Could a single intervention session foster improvements in self-reported parenting outcomes? In our study of parenting supports that emphasized positive parenting practices offered to all employees through a corporate employer, we hypothesized that parents' sense of competence would be positively related to their locus of control, and negatively related to dysfunctional parenting practices, particularly those that related to hostile and over-reactive parenting behaviors. We also hypothesized that parents would have increased sense of competence, increased locus of control, and decreased reports of hostile and over-reactive parenting after attending a computer-based parenting webinar session. Finally, we hypothesized that parents' self-concept would positively predict their parenting practices.

2. Methods

The Institutional Review Board at the University of Connecticut and the legal review team of our corporate partner approved all study materials in 2014.

2.1. Participants

All study participants attended at least one parenting education webinar offered by their employer, a global insurance company. The company employs approximately 47,860 individuals, 76% of whom are female. We collected data from participants separately at baseline before the start of the webinar and again at post-test in the weeks after the webinar. After removing duplicate entries by participants who attended subsequent webinars, the data set included N = 247 uniquely identified cases for individuals attending their first webinar in the series. Of these, a total of 195 participants completed the baseline survey, 45 of whom completed both baseline and post-test surveys (longitudinal group). An additional 52 participants completed only post-test assessments, likely opting to provide feedback after the webinar in response to the facilitator's request for evaluations and thus missing the pre-test opportunity; these post-test only data are omitted from all analyses.

Due to policies of our corporate partner, we were only able to collect demographic data on participating employees at baseline; therefore, demographic data is available only for those 195 participants who completed baseline surveys. Racial diversity within this employee population is comprised of 69% European Caucasian/White, 17% African American/Black, 5% Asian, <1% Native Hawaiian/Pacific Islander, 1% American Indian/Alaskan Native. Based on demographic data reported at baseline (n = 195), our sample is representative of this employee population with 25.4% racial minority participants (74.6% European Caucasian/White). Participants, mostly female (89.6%), had an average age of 40.2 years (SD = 7.9), 97.4% of whom report being employed fulltime. Most parents reported having multiple children younger than 14 years of age: Over three quarters (80%) of participants reported 1 or 2 children younger than 18 living in the home, with the largest family size of 5 children. Children's ages ranged from younger than one-year-old to older than 18-years-old, with an average child age of eight-years-old. Table 1 summarizes participant characteristics including race and ethnicity breakdown, marital status (77.2% married/partnered), highest education level (57.7% Bachelor's degree or higher), and annual household income (49.2% more than $100K). More than half (55%) of the sample had experience attending a previous parent education class, 83% of whom indicated their previous parent education participation was through a webinar.

2.2. Measures

Participants completed electronic surveys following a pre and post-test evaluation design. Pre-test surveys, which assessed demographic characteristics and parenting, were distributed 24 h before the webinar began. Post-test surveys were distributed within 4 weeks after the webinar session.

2.2.1. Demographics Sheet

The Demographics Sheet included questions on participants' racial and ethnic background, gender, marital status, employment status, level of household income, highest level of education completed, number and ages of children living in the home, and parent education history (i.e., experience having taken any previous parent education classes, including experience with computer-mediated classes).

2.2.2. Parental Locus of Control Scale

The Parental Control of Child's Behavior (PCCB) subscale of the Parental Locus of Control Scale (LoC-CB; Campis, Lyman, & Prentice-Dunn, 1986) is a 10-item questionnaire that identifies the extent to which parents feel able to control their children's behavior. High scores indicate parents who have an external locus of control when faced with the stresses of parenting and a perceived inability to control their children's behavior. The measure uses a 5-point Likert

Table 1
Descriptive results at baseline.

Demographic characteristics (N = 195)		n	%
Gender	Male	20	10.4
	Female	173	89.6
Ethnicity	Hispanic/Latino	9	4.7
	Non-Hispanic/Latino		
Race	African American/Black	14	7.3
	European Caucasian/White	144	74.6
	Asian American	8	4.1
	Pacific Islander	2	1.0
	Multiracial	3	1.6
	Other	13	6.7
Marital status	Single, never married	15	7.8
	Single, living with partner	4	2.1
	Married or partnered	149	77.2
	Married, separated from partner	2	1
	Divorced	21	10.9
	Widowed	2	1
Highest level education	High school diploma/equivalent	8	4.1
	Some college, but no degree	37	19.1
	Associate's degree	37	19.1
	Bachelor's degree	65	33.5
	Some graduate, no degree	9	4.6
	Master's degree	37	19.1
	Doctorate degree	1	0.5
Household income	$20,000–$38,999	9	4.7
	$39,000–$59,999	18	9.3
	$60,000–$99,999	71	36.8
	More than $100,000	95	49.2

scale (5 = *strongly agree* and 1 = *strongly disagree*) and has acceptable internal consistency with a Cronbach's alpha of 0.71 (Campis et al., 1986). In the present sample, alpha was 0.89.

2.2.3. Parenting Sense of Competence

The Parenting Sense of Competence (PSoC; Johnston & Mash, 1989) scale is a measure of parental self-efficacy, where higher scores indicate greater parenting self-efficacy. Parents rate the extent to which they agree or disagree with statements regarding childrearing-related feelings of accomplishment and competence using a 6-point Likert scale (6 = *strongly disagree* and 1 = *strongly agree*). Internal consistencies are high for the Satisfaction scale (alpha of 0.75), for the Efficacy scale (alpha of 0.76), and for the overall scale (alpha of 0.79; Johnston & Mash, 1989). Alphas for the Satisfaction scale, Efficacy scale, and total scale were also high in the current study, at 0.79, 0.81, and 0.83 respectively.

2.2.4. Parenting Scale

The Parenting Scale (Arnold, O'Leary, Wolff, & Acker, 1993; Rhoades & O'Leary, 2007) is a 30-item scale that assesses the extent to which parents use dysfunctional discipline practices, with higher scores indicating greater use of dysfunctional parenting practices. Parents indicate their tendencies to use specific discipline strategies using a 7-point Likert scale (7 = *frequent use of discipline mistake* and 1 = *frequent use of effective discipline*). According to the factor structure proposed by Rhoades and O'Leary (2007), the measure focuses on three dysfunctional discipline practices in particular. These subscales include laxness (i.e., permissive, inconsistent discipline), over-reactivity (i.e., irritability and harsh, authoritarian discipline), and hostility (use of verbal or physical force). The measure has acceptable internal consistency with Cronbach's alphas of 0.83 for laxness, 0.82 for over-reactivity, and 0.81 for hostility. In the present sample, alphas are 0.72 0.78, and 0.54 for laxness, over-reactivity, and hostility respectively.

2.3. Procedure

At the beginning of each month, all corporate employees were invited to participate in Wellness Program offerings that took place during their noon lunch hour; many of these offerings were provided through web-based platforms, which allowed for real-time conversation with the group facilitator via chat windows, and drew an average group size of 75–110 participants. Recruitment spanned 12 parent education webinars offered over 4 months, on topics such as Toxic Stress and Positive Discipline. Our corporate employer had specific requests for session content to meet topical interests (e.g., “money and kids”, or “social media for parents”) and offer a broad range of topics to draw the most interest from employees. This precluded the use of a published curriculum, hence the series of offerings was created for this study, tailored to respond to our partners' interests. Though each session focused on a different aspect of parenting (such as stress or discipline), all sessions emphasized the overarching theme of positive, supportive parenting and reducing aggression/hostility at home, and provided examples and strategies to parents specifically to bolster parental efficacy. An average of 19% of total webinar attendees per session volunteered to participate in the present evaluation.

Employees who registered for a parent education webinar received an email from the company's wellness program 24 h prior to the webinar's start. The email contained a link to the survey website, where interested parents gave consent and enrolled in the study. Employees were not required to pre-register for webinars, and they were not required to participate in this evaluation study or to complete the baseline survey set in order to participate in the webinar. Any employee was free to join a webinar on the day of each session provided there was audience space for the session remaining. Participants logged into an audiovisual conferencing program to attend the webinar wherein participants had access to a PowerPoint presentation created and presented by the facilitator live (as opposed to a pre-recorded delivery), and the audio capabilities and live chat text window were enabled for a more interactive experience. The facilitator, a licensed social worker with over 30 years of experience as a parent educator, regularly used the interaction features of the webinar software to boost audience engagement by asking participants to respond every few minutes to simple questions via the “raise your hand” function, for example. Links to the post-test survey and a separate consent form were distributed to all webinar participants via email within 4 weeks after the webinar session.

2.4. Analysis

We first present group data from the baseline group (all participants who completed baseline measures, n = 195), which assesses participant demographic and parenting characteristics, then we assess changes over time with paired-sample analyses using longitudinal data from the longitudinal group (the subset of participants who completed both baseline and post-test surveys, n = 45). Missing data at baseline were <2% for demographic variables, approximately, 5% for sense of control scale items, 13% for sense of competence items, and 16% on parenting discipline style items. More data were missing in post-test batteries, for example 11% on the sense of control scale items, however, isolated missing items appeared to be missing at random. A pattern of missing entire scales was the result of participants' failure to complete the later portions of the assessment battery and, therefore, differentially impacted measures at the end of the survey set (i.e., sense of competence at the end of the baseline assessment). Individual items missing within scales were replaced by mean imputation; cases with scales missing in their entirety were omitted from analysis.

3. Results

3.1. Baseline analyses

Parenting variables (discipline style, locus of control, and sense of parenting competence) at baseline did not differ based on parents' ethnicity, age, or highest level of education (see Table 1 for means and standard deviations). At baseline, parents in this sample were more likely to use over-reactive discipline styles ($\mu = 3.8$) than either hostile ($\mu = 2.1$) or lax responses ($\mu = 2.7$). Although at baseline the mean scores for the sample fell below the clinical cutoffs for each discipline style (3.9, 2.9, and 3.5 respectively; Rhoades & O'Leary, 2007), half (50.6%) of participants were over the clinical cutoff for over-reactivity, a quarter (24.4%) of participants were over the clinical threshold for hostility, and one fifth (19.5%) of participants were over the clinical cutoff for laxness. Based on the majority trends from these three measures of parenting, this sample could be summarized as having some confidence in their general abilities as a parent but struggle to feel a sense of control over their children's behavior (see Table 3), with the greatest number of parents tending toward over-reactive discipline. [For in-depth discussion of trends in service utilization at baseline, see Russell et al., 2015.]

In addition to the results summarized in Table 3, significant positive associations between parents' income, age, and education exist (no associations with child age reached significance). Parents' sense of competence is negatively correlated with their perceived inability to control their child's behavior and negatively correlated with each of the dysfunctional discipline styles measured by the Parenting Scale (laxness, over-reactivity, and hostility; see table 3), findings that support our hypothesis. Conversely, parents' perceived inability to control their child's behavior is positively correlated with each of the dysfunctional discipline styles measured by the Parenting Scale (in addition to expected associations between all subscales of the Parenting Scale). These relationships point to the co-existence of multiple parenting practices that are less than optimal, particularly for parents who do not feel competent in their role as a parent.

3.2. Longitudinal analyses

Looking longitudinally at participants with linked baseline and post-test data, significant differences were found for hostility ($t_{(33)} = 2.1$, $p < 0.05$) and laxness ($t_{(31)} = 4.0$, $p < 0.001$; Table 2). Hostility scores decreased over time for these participants from a mean of 2.1 (SD = 1.2) to 1.9 (SD = 1.2), and laxness increased from 2.5 (SD = 0.9) to 3.0 (SD = 0.6). These results suggest parents used significantly less verbal aggression and physical force, and were more permissive in disciplining their children after participating in this study. The difference in PCCB scores from a mean of 27.6 (SD = 8.2) to 26.0 (SD = 7.7) trended to indicate greater perceived control over children's behavior over time, but this trend was not significant ($t_{(36)} = 1.7$, $p = 0.11$). No significant differences were found in parents' reports of their sense of competence. These findings partially support our hypothesis that meaningful differences in parenting behaviors would exist from pre-test to post-test.

As expected, correlations between pre- and post-test measures were uniformly high (Pearson correlations ranging from 0.6 to 0.95, all $p < 0.001$; Table 3). Significant correlations were found across scales in post-test scores: hostility with over-reactivity ($r = 0.58$, $p < 0.001$), PCCB with over-reactivity ($r = 0.52$, $p < 0.01$), and parents' sense of competence with over-reactivity ($r = -0.484$, $p < 0.01$), hostility ($r = -0.463$, $p < 0.01$), and PCCB ($r = -0.541$, $p < 0.01$). Subsequently, we explored what might drive changes in hostility for those who experienced change from baseline ($n = 21$). Linear regression analyses indicated that parents' sense of competence at baseline is the most likely predictor of change in hostility after participating in these webinars ($R^2 = 0.187$, beta $= -0.432$, $F_{(1,18)} = 4.1$, $p = 0.06$), such that higher parents' sense of competence at baseline predicted greater decreases in hostility at post-test. Given the small sample size of those who experienced change, this trend would likely reach significance with a larger sample (Cohen, 1992).

4. Discussion

The empirical, outcomes-based assessment of this computer-mediated parent education series contributes to the emerging literature on the efficacy of this type of service provision. Though many parent education programs, online or otherwise, focus on targeted populations (i.e., families facing specific challenges associated with a particular diagnosis such as conduct disorders, Autism spectrum disorders, or attention disorders), this study focused on primary prevention outcomes in the general population of corporate employees. Examinations of employer-based wellness programs like these add real world evidence to our understanding of family interventions, capturing an ecologically valid context of use that addresses well-documented barriers to service engagement for working parents. An additional strength to this study is the partnership with a large-scale private sector business, which informs the design of interventions that will be acceptable to stakeholders likely to widely implement similar programs (in contrast to the prevalent, small-scale patchwork of parent education historically available in many communities). While collaborations like these can encounter obstacles originating from policies and procedures not intended to accommodate research (i.e., privacy protections relevant to longitudinal data collection beyond those commonly observed in academic settings), these challenges are off-set by the valuable insights gained from access to large samples of working parents who may otherwise struggle to fit research participation into their schedules (see Kazdin et al., 1997; Koerting et al., 2013).

Support seeking through distance learning, social networking, and other online support group platforms is growing exponentially (Johnson, 2015), hence examinations of parenting outcomes over time are a necessary step in building a reliable evidence base. One of the potential benefits of using computer-mediated service delivery is the possibility for greater access to a broader population than those facing diagnosis-specific needs; this has specific appeal for promoting parenting support for the general population, as parenting education offers families support that is, on average, more cost-effective than therapeutic treatments (Crane & Payne, 2011). Further, prevention efforts that address family concerns prior to clinical diagnosis are in line with the US Department of Health and Human Services (2011) National Prevention Strategy and specifically address the need for stronger community prevention services (apart from the on-going pursuit of improving clinical intervention approaches). Our study is among the first to examine the nexus of two unusual settings for parenting services – the corporate workplace and the online service provision mechanism.

The present findings carry meaningful prevention implications given the importance of parents' self-concept in the effectiveness of their parenting practices as discussed by both social cognitive and systems theories (Bandura, 1977; Bandura, 2012; Darling, 2007; Lerner, 2006). Parents who possess an internal locus of control, believe that they can impact their child's behavior, are confident in their parenting skills, and ascribe positive attributes to their parenting are more likely to enjoy their role as parents and are more successful in engaging in positive parent-child relationships and in parenting behaviors that promote positive child outcomes (Ardelt & Eccles, 2001; Bernstein et al., 2013; Campis et al., 1986; Coleman & Karraker, 1997; O'Connor et al., 2012; Wilson, Gardener, Burton, & Leung, 2007). For example, intervention results reported by O'Connor et al. (2012) indicate post intervention improvements in parenting self-efficacy (Cohen's *d* for improved efficacy from pre to post test of 0.5), with subsequent positive impacts on child behavior outcomes over time. Further, extant literature on the negative impact of hostile and aggressive parenting on children's social and emotional development emphasizes a need to decrease the prevalence of such destructive parenting practices. Our results indicate that parents' sense of control and hostile, aggressive parenting behaviors are amenable to change with even a single dose of parent education offered via a computer-mediated platform (see Table 2 for effect sizes). It is this finding that has perhaps the most dramatic implications, as the present effort was not a targeted intervention. We did not specifically select participants with a particular set of parenting attitudes or behaviors, but parents from the general corporate environment in which this parent education occurred self-selected for these services. Many

Table 2
Descriptive statistics for variables of interest.

Variable of interest	Pre-test M (SD)	Post-test mean (SD)	Pre to post-test t	Cohen's *d*
Number of children	1.70 (0.87)	–	NA	
Parent age (years)	40.24 (7.85)	–	NA	
Child age (years)	8.41 (4.65)	–	NA	
PSOC	3.86 (0.63)	3.74 (0.61)	ns	
Parenting - laxness	2.54 (0.88)	3.04 (0.56)	$t_{(31)} = 4.00^{***}$	0.78
Parenting - overreactivity	3.77 (1.39)	3.95 (0.89)	ns	
Parenting - hostility	2.15 (1.18)	1.89 (1.23)	$t_{(33)} = 2.15^{*}$	0.36
LoC over child behavior	27.57 (8.822)	25.97 (7.70)	ns	

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 3
Baseline associations among participant characteristics and variables of interest.

Variable of interest	1	2	3	4	5	6	7
Number of children	–	0.03	−0.17*	−0.01	0.16*	0.03	0.13
Income		–	0.03	0.03	−0.06	−0.18*	−0.05
PSOC			–	−0.42***	−0.63***	−0.25**	−0.67***
Parenting - laxness				–	0.38***	0.28***	0.44***
Parenting - overreactivity					–	0.48***	0.66***
Parenting - hostility						–	0.36***
LoC over child behavior							–

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

participants scored above the clinical cutoff on one or more of the dysfunctional parenting practices assessed at baseline (laxness, overreactivity, hostility), indicating that this type of service attracted a population with clinical needs nonetheless. The prevention implication is powerful in light of the harmful consequences of parental hostility and the impact that parents' perceived control has on their parenting behaviors. Computer-mediated parenting services are convenient for both participants and service providers and are enjoyed by participants who volunteer to attend them (Breitenstein et al., 2014; Hall & Bierman, 2015; Russell, Maksut, Lincoln, & Leland, 2015). These results provide much needed further evidence that such services can be efficacious; however, future efforts in this vein should go beyond feasibility testing and preliminary efficacy methods and shift to rigorous intervention evaluation designs. These steps should include the use of a longer term follow-up assessment and a comparison sample (ideally, a randomized assignment of participants to multiple intervention conditions including an untreated control group).

Attention to the increased laxness reported by participants in the post-test assessment survey is warranted as there is evidence that permissive parenting including lax or inconsistent discipline is associated with increased problem behavior (Dowling, Slep, & O'Leary, 2009). Parenting practices are often described along a continuum, where optimal behavior falls between two extremes. To the extent that parents use consistent discipline approaches, parents must balance responses to their children that are adequately demanding without going as far as intrusive and over-controlling actions – which are also associated with less adaptive child and adolescent outcomes (Barber, 2002; Bayer, Sanson, & Hemphill, 2006; Hudson, Comer, & Kendall, 2008; LaFleur, Zhao, Zeringue, & Laird, 2016; Stattin & Kerr, 2000; Wagner, Propper, Gueron-Sela, & Mills-Koonce, 2016). Fine-tuning parents' approach to discipline by targeting an optimal balance in the middle of the continuum may not be as efficaciously done through a single dose, computer-mediated platform as targeting the far more straight-forward aim of pulling away from a single extreme and reducing harsh or hostile interactions, for example. Future studies designed to support parents as they navigate toward a balanced discipline style between permissive/laxness and over-controlling/intrusiveness should consider the added benefits of repeated dose parenting interventions and careful measurement of family dynamics that could examine open communication, conflict, cohesion, and adaptability in addition to discipline styles.

4.1. Limitations & future directions

According to mean scores on measures of parenting attitudes and behaviors, participants in the present study seem to lack efficacy in their parenting practices, but we do not directly measure parenting stress or attributions beyond self-concept in this study, nor do we directly observe parenting behaviors. As this study was conducted in the workplace, we were cognizant of participant burden and were limited in our ability to observe parents with their children. Similarly, we were unable to obtain perceptions of parenting behaviors from participants' children. Perhaps our largest pragmatic obstacle concerned our inability to use participant identification information to match pre- and post-test data. Privacy policies of our corporate partners precluded us from collecting extensive demographic data or assigning, tracking, or documenting participant numbers; as a result, this study relied on participants to create and remember their own unique identifier, a practice that was largely ineffective. We chose an inclusive approach to resolving this problem by including any participant data available for baseline analyses regardless of whether or not we could link the data over time. While this decision led to a large disparity in pre and post-test group sizes, we chose to present data on the larger set at baseline to best represent the set of participants overall, and focused longitudinal analyses on the small subset of participants who did have both baseline and post-test data. In cases where improved participant tracking practices are possible, extensions of this research might consider following participants over time to assess any long-term effects. Future steps to improve the evaluation of online parenting services provided in the workplace should move beyond intervention designs of preliminary feasibility testing, like the pre-post design used in the present study, to include elements of best practice standards in efficacy trials, as noted above.

While this paper addresses a gap in the literature on computer-mediated parent education by providing evidence for the feasibility of this format and preliminary efficacy of the program, it is important to address the generalizability of the study results. These study results are derived from employees at a single corporate employer. Though the company is a global corporation, the sample includes largely European Caucasian/White, female, and full-time employees who necessarily had access to a computer during their noon lunch hour. These demographics mirror the samples that are generally derived from computer-mediated parent education groups in that they tended to be partnered, have annual incomes higher than the national average, and are more educated than the typical population of human service recipients (Gelatt et al., 2010; Pacifici, Delaney, White, Nelson, & Cummings, 2006; Taylor et al., 2008), which does restrict the study's generalizability. Nevertheless, there is evidence to suggest that affluent populations have unique parenting needs that may be addressed by digital workplace programs (Dearing & Taylor, 2007; Luthar & Barkin, 2012; Luthar & Latendresse, 2005; Randall, Bohnert, & Travers, 2015; Russell et al., 2015). Further, though the present sample included more females than would be expected given the corporation's gender distribution, it is consistent with previous research that indicates fathers are far less likely to participate in parent education programs than are mothers (Stahlschmidt, Threlfall, Seay, Lewis, & Kohl, 2013). Future research should address this concern by specifically targeting fathers to participate in parent education programs, particularly those offered online, as women are more likely to use Internet-based services to meet their parenting needs (Duggan, Lenhart, Lampe, & Ellison, 2015). Of final concern is the quantity of missing data in the present study. Participants often skipped measures that appeared at the end of the survey battery. Future research may benefit from randomizing the survey order to ensure missing data are more uniform. This is especially a concern for research conducted in the workplace, where employers are

likely to have rigid time constraints and become distracted by work-related tasks before completing the entire survey set.

Employers are in a unique position to improve employee performance by offering wellness supports to their employees that address work/family balance. Previous research indicates that workers who experience work-family conflict are less committed to their employer and less productive at work, findings that should motivate employers to assist their employees in finding the desired work-family balance (Duncan & Pettigrew, 2012; Vanderpool & Way, 2013) Computer-mediated programs are ideally suited to meet the needs of both employers and employees by providing an efficacious means of improving employees' family lives while avoiding parents' often cited obstacles to engaging in service provision (Kazdin et al., 1997; Koerting et al., 2013). Further, family systems theory would assert that improving parents' work-family balance and decreasing parents' stress would have important impacts on child as well as parent outcomes (Darling, 2007). Parents who are less stressed perceive more control in their parenting role and engage in fewer hostile and aggressive practices, which then promotes positive child behaviors and further encourages adaptive and successful parenting practices (Bernstein et al., 2013; Bugental, Blue, & Cruzcosa, 1989; Evans et al., 2012; Kim et al., 2014). Helping parents to reduce their hostile parenting tendencies has positive implications for employers, parents, and children alike. Even one-time, computer-mediated parent education workshops work toward this goal, with reported Cohen's *d* effect sizes for parent outcomes ranging from 0.08 to 0.84 (Breitenstein et al., 2014). Evaluations of these efforts – including the present study's comparable effects (Cohen's *d*s of 0.78 and 0.36, Table 2) - address a gap in the computer-mediated parent education literature and suggest future intervention approaches may find success using this new mode of service delivery.

Acknowledgments

The authors wish to thank Ruth Freeman, LCSW, of Positive Parenting CT, for her tireless energy and exemplary skills as a parent educator committed to evidence-based practice. We also thank our corporate partners who supported this study and their employees who generously gave their time to participate. Finally, we offer sincere thanks to Dr. J. J. Trudeau for his data management insights and thorough reviews of earlier drafts.

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