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TECHNOLOGY IN PARENTING PROGRAMS: A SYSTEMATIC REVIEW  
AND PILOT STUDY OF AN APP-BASED INTERVENTION  
FOR LATINX FAMILIES

by

Samantha M. Corralejo

A dissertation submitted in partial fulfillment  
of the requirements for the degree

of

DOCTOR OF PHILOSOPHY

in

Psychology

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2019

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## ABSTRACT

Technology in Parenting Programs: A Systematic Review and Pilot Study of an App-based Intervention for Latinx Families

by

Samantha M. Corralejo, Master of Science

Utah State University, 2019

Major Professor: Dr. Melanie M. Domenech Rodríguez  
Department: Psychology

Behavioral parent training is an evidence-based intervention that reduces child problem behavior. Unfortunately, there are notable disparities in access to and use of evidence-based parenting interventions, including BPT. One way to address the service gap is through technology-based parenting interventions. The purpose of this research was to first, identify the populations targeted in technology-based parenting interventions, the effectiveness of these interventions, and where future research was warranted. We coded 25 treatment outcome studies and six feasibility studies. Technology-based parenting interventions have successfully improved parenting variables such as parent knowledge, behavior, and self-efficacy. Yet the vast majority of these interventions were validated with White American families and lacked adaptations that could make them more accessible to underserved populations. The findings of the first project informed the development of the second: use a multiple baseline single subject design to assess the efficacy of the first three modules of *Padres Preparados* delivered through a mobile

application with virtual coaching. *Padres Preparados* is a culturally adapted parent training intervention that is part of the GenerationPMTO™ Family. Parent outcomes were generally positive across measures of parenting stress, child problem behavior, and parent knowledge. Each family had a 50% improvement on at least one variable. Additionally, parents reported strong satisfaction with the intervention. As the burgeoning area of technology-based interventions continues to grow, researchers should consider underserved populations and appropriate cultural adaptations that could reduce mental health disparities and increase the scope of evidence-based interventions.

(135 pages)

## PUBLIC ABSTRACT

Technology in Parenting Programs: A Systematic Review and Pilot Study of an App-based Intervention for Latinx Families

Samantha M. Corralejo

Technology and psychological treatments have increasingly been used together to increase the reach of psychotherapy and potentially reduce treatment costs. This research focused on how technology has been used to deliver or facilitate treatments focused on behavioral parent training. Behavioral parent training is a research-supported method of improving parenting skills and child behavior. We first reviewed any existing research on the topic, and found that treatments that used technology to teach parenting skills were generally successful at improving parent and child behavior. The review also identified many research questions that have yet to be answered about the cost of such interventions, how they work with diverse groups of people, and what makes someone likely to stay with the treatment. The next study in this research project tested a shortened version of a technology-based treatment adapted from a group-based manual that was created for Spanish-speaking families. The program was called *Padres Preparados Online* (Prepared Parents Online), and it taught three parenting skills on a system that was available online or using an app. Parent coaching, typically carried out in in-person groups or on the phone, was also conducted online. Parents uploaded videos of themselves to an online system and the therapist would record and post video, audio, and text coaching comments to support parents in strengthening the skills they were learning. Results showed that parents and children improved in a variety of ways, ranging from

decreased problematic child behavior to decreased parenting stress. This study demonstrated that technology can be used to deliver a parenting program to Latinx families, and helped the study team identify limitations and questions for future research.

This research was financially supported by the Utah State University Psychology Department and Emma Eccles Jones College of Education and Human Services.

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Samantha M. Corralejo



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## CHAPTER I

### GENERAL INTRODUCTION

Parents are key contributors to a child's cognitive, behavioral, and academic development and long-term outcomes (Darling & Steinberg, 1993). Teaching parents the most effective ways to interact with their children through behavioral parent training is one scientifically supported way to increase the probability of positive child outcomes (Kaminski & Claussen, 2017). Behavioral parent training programs cover topics beyond discipline, focusing also on positive involvement, shaping desirable behavior, problem solving, and monitoring (Kaminski, Valle, Filene, & Boyle, 2008). Parent training programs aim to combat disruptive behavior disorders (Kaminski & Claussen, 2017). Disruptive behavior disorders in children are often diagnosed as oppositional defiant disorder (commonly diagnosed between preschool age and early adolescence; Rowe, Costello, Angold, Copeland, & Maughan, 2010) or conduct disorder (symptoms emerging between childhood and middle adolescence; American Psychiatric Association, 2013).

Evidence-based parent training interventions have been in existence for about 50 years (Forehand, Jones, & Parent, 2013). However, these programs are not currently benefiting all populations. Latinxs, among many other ethnic and sexual or gender minorities, are an underserved population who experience mental health disparities and have less access to services (Kataoka, Zhang, & Wells, 2002; U.S. Department of Health and Human Services, 2013). Working to provide interventions to underserved populations is an act of social justice, effective practice, and simply ethical (Domenech Rodríguez & Bernal, 2012). Services for Latinx families should have always been there,

but because of an unjust and prejudiced system, their marginalization has only become more pervasive. Consistent with the Multicultural Guidelines for psychologists (American Psychological Association, 2017), focusing on interventions for Latinx families is a way of helping to right the system, being an advocate for social justice, and working to stop trajectories of more serious conduct disorders for Latinx youth.

Technology-based interventions for child problem behavior have increased in popularity over the last several years (Baumel, Pawar, Kane, & Correll, 2016; Hall & Bierman, 2015; Meadan & Daczewitz, 2015; Tarver, Daley, Lockwood, & Sayal, 2014). Their potential for cost-effective dissemination of evidence-based interventions (Kazdin & Blase, 2011) paired with the increasing normalcy of internet-access in Latinx homes (File & Ryan, 2014), makes technology-based interventions an ideal research avenue to disseminate evidence-based interventions in the service of reducing health disparities. The present research focuses on technology-based parenting interventions for Latinx families. The first paper provides a review of existing parenting interventions that utilize technology, highlighting the paucity of research targeting underserved populations. The second paper reports on a single-subject design pilot study of a mobile-based parenting intervention for Spanish-speaking families of preschoolers. The body of research advances the cause of decreasing mental health disparities and expanding the reach of evidence-based services by intentionally focusing on an underserved population in a culturally competent manner.

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## CHAPTER II

### TECHNOLOGY IN PARENTING PROGRAMS

The first manuscript is titled, *Technology in Parenting Programs: A Systematic Review of Existing Interventions*. The authors are Samantha M. Corralejo and Melanie M. Domenech Rodríguez. The manuscript was submitted to *Journal of Family Studies* on 09/11/2017, returned for revisions on 03/05/2018 and accepted on 05/17/2018. A prior version of this manuscript was presented in October, 2016 at the conference of the National Latina/o Psychological Association in Orlando, FL. The remainder of this chapter is the pre-print of the accepted manuscript. The journal print version can be found at <https://doi.org/10.1007/s10826-018-1117-1>.

#### **Introduction**

Over five decades of research on behavioral parent training interventions point to their utility in improving child, maternal, and family well-being across a host of populations from prevention to clinical samples. However, notable disparities are documented in the access to quality interventions, especially for families that are marginalized due to geography (rural) or social position (race/ethnicity, socioeconomic status). Technology may hold great promise in narrowing disparities created by differential accessibility and/or relevance. The purpose of this manuscript is to identify available technology-based parent-training interventions, examine their outcomes, and document the variety of populations reached. We were particularly interested in identifying interventions that have been adapted for use in diverse geographical and cultural contexts as well as those that provided coaching from a therapist.

Behavioral parent training (BPT) focuses on building parent skills and knowledge by training parents on a variety of parenting skills aimed to improve child behavior (Forehand, Lafko, Parent, & Burt, 2014). Their effectiveness has been documented across developmental, cultural, and severity contexts (Dishion, Forgatch, Chamberlain, & Pelham, 2016; Forehand et al. 2014). Although packaged under different names, commonly covered intervention components include increasing praise and rewards for good behavior, providing effective commands/directions, developing contingency plans, and effectively implementing time-out (Kaminski, Valle, Filene, & Boyle, 2008). Numerous research studies have demonstrated the efficacy of several behavioral parent training programs, including The Incredible Years (Webster-Stratton, 1990), Parent Management Training Oregon Model (Dishion et al., 2016), Parent-Child Interaction Therapy (Eyberg & Robinson, 1983) and Triple-P Positive Parenting (Bor, Sanders, & Markie-Dadds, 2002; see Eyberg, Nelson, & Boggs, 2008 for a comprehensive review). These programs are most commonly taught in a clinic setting over 10-12 weeks and exist in individual and group formats.

There are a number of factors that inhibit the success of BPT programs. The most severe and prevalent problem programs face is attrition (Assemany & McIntosh 2002; Nock & Ferriter 2005; Staudt 2007). Attrition rates in BPT programs can be as high as 48% (Assemany & McIntosh, 2002). One reason for high levels of attrition may be the inconvenience of scheduling and attending weekly appointments when parent/caregiver time is sparse and life demands (e.g., work, family responsibilities, school) are high (Middlemiss, 1996). Low socioeconomic status is also a predictor of attrition in BPT (Rinn, Vernon, & Rise, 1975; Snow, Kern, & Curlette, 2001). Another challenge to

meeting the potential of BPT is consistent access to psychological services. Limited access can occur for a number of reasons, including living in a rural community (Angold et al., 2002; Nordal, Copans, & Stamm, 2003), membership in an underserved ethnic and racial minority group (U.S. Department of Health and Human Services, 2001), and/or lack of means to attend a class (e.g., inflexible work schedule, lack of transportation; Middlemiss, 1996; Prinz & Miller, 1996). All of these issues may be addressed through the skillful use of technology. Delivering parenting interventions via computer programs, cell phones, and websites, among other media, increases the flexibility of when and where the program needs to be completed. Furthermore, culturally appropriate interventions that are less practitioner-dependent could increase access for those individuals who do not have access to a trained, culturally competent practitioner.

Racial and ethnic minorities account for a growing proportion of the United States population; in 2010 racial and ethnic minorities made up 22.5% of the U.S. population and an additional 2.4% of respondents reported identifying with two or more races (Humes, Jones, & Ramirez, 2011). Recent population projections estimate that over half of the U.S. population will belong to a racial or ethnic minority group by 2044, and that by 2060 almost 20% of the population will be foreign born (Colby & Ortman, 2015). Racial and ethnic minority children are more likely to live in families classified as low-income or poor and encounter a heightened number of risk factors as a result (Alegría, Vallas, & Pumariega, 2010; Jiang, Granja, & Koball, 2017). Food insecurity, one risk factor linked with poverty, has been associated with more prevalent internalizing and externalizing problem behaviors for children aged 4-16 (Slopen, Fitzmaurice, Williams, & Gilman, 2010). Ethnic minority children aged 3-17 are significantly less likely to

utilize mental health services than their White American counterparts (Kataoka, Zhang, & Wells, 2002).

Evidence-based culturally adapted interventions are available (Hall, Ibaraki, Huang, Marti, & Stice, 2016) with a myriad of theoretical models for adaptation (Bernal & Domenech Rodríguez, 2012) and specific examples of clinical trials (e.g., Parra-Cardona et al., 2012) and clinical case studies (Koslofsky & Domenech Rodríguez, 2016). Yet new ways of maximizing access to high quality and culturally relevant mental health care for racial and ethnic minorities are needed. Technology may provide an important avenue for access. American Community Survey data from 2013 show that the majority of Black, Asian, and Latinx households have a desktop or handheld computer (75.8%, 92.5%, and 79.5%) and internet access (61.3%, 86.6%, and 66.7%; File & Ryan, 2014). Given the steady increase in computer and internet use since the turn of the century (File, 2013), one can predict that the percentages of racial and ethnic minorities with technology access has only increased since 2014. Broad access to internet and computers makes technology-based interventions a viable option for delivering mental health services to racial and ethnic minorities.

Family conditions and unaddressed problem behavior can put children at risk for more serious externalizing behaviors in the future (Donenberg & Baker, 1993; Nock, Kazdin, Hiripi, & Kessler, 2006; Patterson & Stouthamer-Loeber, 1984; Reid & Patterson, 1989). Families living in rural communities have additional stress due to poverty, unemployment, and poor education opportunities that may put their children at risk (Conger, Conger, & Martin, 2010; Human & Wasem, 1991). While rates of childhood psychiatric disorders may be comparable in rural communities to national

samples (Angold et al., 2002; Breslau, Marshall, Pincus, & Brown, 2014), the lack of specialized providers and lack of treatment sought by rural community members heighten the treatment disparities between rural and metropolitan communities (Hogh, Willgining, Altschul, & Adelsheim, 2011; Nordal et al., 2003).

There are 46.2 million people living in rural communities in the United States as of 2014 (U.S. Department of Agriculture, 2015). Fifteen percent of the entire U.S. population is distributed over 72% of the United States land area. With rural Americans spread so thinly across large geographical areas, having mental health providers in each town or community is not currently feasible. According to the Health Resources and Services Administration (US Department of Health and Human Services, 2015), 4,223 communities qualify as Health Professional Shortage Areas (HPSA) for Mental Health. HPSAs are defined as areas that have a ratio of one psychiatrist to every 30,000 people. Of those that live in rural communities, 60% live in HPSAs for mental health. Despite living in areas with less access to goods in general, internet use in rural communities has increased over the last 15 years from 42% to 78% of adults (Perrin & Duggan, 2015). This is only 7% less than adults in urban and suburban communities. Furthermore, rural communities have a larger ratio of older adults. This may account for the 7% difference since older adults in general report lower internet usage. These statistics suggest that computer-based parenting interventions may be a viable option in underserved rural communities.

Telemedicine (medical services delivered via technology instead of face-to-face) was the first step into the world of integrating technology and psychological interventions. Early telemedicine included the use of telephone calls, e-mail, and video

conferencing (Zundel, 1996). Telemedicine became an official term used in medical journals in 1993 and continued to gain momentum in the field of psychology in the years to come (Stamm, 1998; Zundel, 1996). Technology has since evolved from being solely the medium of intervention to the mode of intervention. Researchers have been creating technology-based interventions for a variety of presenting problems, such as substance abuse (Fowler, Holt, & Joshi, 2016), smoking cessation (Bravin et al., 2015), weight loss (Khaylis, Yiaslas, Bergstrom, & Gore-Felton, 2010), eating disorders (Schlegl, Bürger, Schmidt, Herbst, & Voderholzer, 2015), bipolar disorder (Hidalgo-Mazzei et al., 2015) and autism spectrum disorder (Meadan & Daczewitz, 2015).

Interventions for child behavior and families have also begun to use technology-based interventions (Baumel, Pawar, Kane, & Correll, 2016; Hall & Bierman, 2015; Meadan & Daczewitz, 2015; Tarver, Daley, Lockwood, & Sayal, 2014). In the field of nursing, Breitenstein, Gross, and Christophersen (2014) conducted a meta-analysis to examine technology-based interventions. They excluded technology based interventions that had face-to-face or group components, articles published before 2000, and interventions targeting specific disorders such as autism. Hall and Bierman (2015) reviewed feasibility, acceptability, and support for a variety of interventions targeting parents of children aged 0-5. Meadan and Daczewitz (2015) gathered current evidence for technology-based early interventions for children diagnoses with autism. Using only randomized control trials, Tarver et al. (2014) conducted a systematic review and meta-analysis of self-directed parenting interventions for externalizing behaviors compared to parenting interventions with a therapist.

Parenting programs are an effective way to decrease externalizing child problem behaviors, however there are a limited number of bilingual/bicultural treatment providers in both urban and rural areas, and few specialized providers in rural areas. Efforts are underway to incorporate technology with parenting interventions, however data on the scope and success of such interventions is limited (Breitenstein et al., 2014). Technology in parenting interventions can include email, texting, apps, websites, DVDs, and computer programs, among other formats. Some potential functions of technology may be to increase communication between treatment providers and parents, to deliver content, or to assess learning.

The purpose of the current paper is to provide a systematic review of existing technology-based parenting interventions and to serve as a resource in guiding future research that uses technology to decrease mental health disparities for parents and children. Results of this systematic review could (a) provide information on what BPT interventions have been adapted thus far, (b) evaluate the efficacy of technology-based interventions and compare evidence for different forms of technology-based interventions, and (c) identify limitations of existing research and interventions or populations that merit future research.

## **Method**

We conducted a search for articles assessing technology-based parenting interventions and coding the articles that met inclusion criteria based on a coding sheet created by the author (available upon request). Finally, we synthesized the data collected for presentation.

### **Literature Search**

Because the first article on telemedicine was published in 1993, we conducted a detailed search of research published in the last 23 years relevant to technology-based parenting interventions. We searched PsycINFO, PsycARTICLES, and SciELO. Published meta-analyses of technology-based parenting interventions found in this initial search served as search-forward articles to identify any missing search results. Preliminary search terms and phrases included combinations of the following keywords: *online interventions, parent training, web-based interventions, digital delivery, computer delivered, parenting, online interventions.*

### **Inclusion/Exclusion Criteria**

In order to be included in the analysis, articles needed to meet the following criteria: (a) they were treatment outcome studies using web-based interventions or (b) they discussed methodologies or models pertaining to web-based interventions, (c) they specified demographic information such as race, ethnicity, or SES, and (d) they were published in English or Spanish. Articles that discussed cultural adaptations or rural healthcare without including a technology-based approach were excluded from the analysis.

### **Coding**

Prior to the literature search the first author developed a coding sheet meant to highlight several important components of the study using Google Forms. The sheet contained four sections in addition to general publication information: Research Design, Sample Characteristics, Intervention Characteristics, and Results. The Research Design section included the design implemented, types of dependent measures used, types of outcomes assessed, and threats to internal and external validity. Sample Characteristics



included demographic information for parents and children, participant selection criteria, comorbidities, and concurrent child medications. Intervention Characteristics consisted of the parenting program adapted from, the format of the intervention, whether intervention delivery included coaching, the number of sessions, and the structure of delivery (individual or group). The Results section consisted of completion and attrition rates, whether the hypothesis was supported or not supported, clinical and statistical significance outcomes, follow up outcomes, effect sizes, limitations, and implications.

### **Reliability**

Two undergraduate students independently coded all articles included in the analysis (i.e., between the two students they coded 100% of the articles). The two coders trained with the first author by reviewing the coding sheet together and completing the first three articles with questions and feedback after each article. Coders resolved any disagreements through consideration of the specific disagreement and joint review/discussion of the article until they reached a consensus on the correct classification of information.

### **Validity**

Two main threats to validity exist in meta-analyses: publication bias and quality of studies reviewed (Sutton, Abrams, & Jones, 2001). Publication bias refers to the tendency for only studies with positive results (statistically significant, novel data) to be published (Song, Easterwood, Gilbody, Duley, & Sutton, 2000). A related form of bias is language bias, where non-native English-speaking researchers publish negative results in non-English journals and positive results in English journals (Song et al., 2000). To address possible language bias, we included articles published in English and Spanish.

One way to control for positive results in low-quality studies is by including a coding item on clinical significance (a form of analysis that considers clinically meaningful change as opposed to statistically significant change; Jacobson & Truax, 1991; Kendall, Mars-Garcia, Nath, & Sheldrick, 1999). Studies were coded as including clinical significance measures if the authors reported percent change, normative comparisons, or reliable change indices. Coders rated subjective quality of each study on a scale from 1 to 5, with 1 being *low quality* and 5 being *high quality*. Coders rated 80% of the studies as a 3, 4, or 5.

## **Results**

The PsychINFO search yielded 56 initial results. Of those results, 25 intervention studies and six feasibility studies met inclusion criteria and were coded (Tse, McCarty, Vander Stoep, and Myers [2015] was both an intervention and feasibility study, so it was coded as both). Reference list scanning and search forwards of the four meta-analyses cited in the introduction did not yield additional articles for the current review. For the intervention studies, Table 1 contains information about study design, participants, and outcomes and Table 2 summarizes demographic parent coaching information.

The intervention studies consisted of 19 experimental, three quasi experimental, and three pre-post designs. Target populations included parents of children with externalizing behaviors (40% of studies), racial and ethnic minority and/or impoverished families (16% of studies), parents of children with autism spectrum disorder (12% of studies), and parents with mental illness (8% of studies). Common outcome variables were parent behavior, child behavior, knowledge acquisition, and satisfaction with the intervention. Of the 19 studies that reported statistical results for parent outcomes, 47%

reported statistical significance, 42% reported mixed statistical results, and 11% reported non-significant findings. Child outcomes were reported for 17 studies; 35% of studies reported statistically significant results, 41% reported mixed statistical results, and 24% reported non-significant findings. Eleven of the 25 studies did not report effect sizes, and effect sizes for parent and child outcomes varied by study. Where possible, effect sizes were calculated from data provided in the publication. For parent outcomes, eight studies reported large effect sizes, 12 reported moderate effect sizes, and eight reported small effect sizes. For child outcomes, eight studies reported large effect sizes, seven reported moderate effect sizes, and four reported small effect sizes. Parent outcomes were clinically significant for four of the five studies that reported those data, and for five of seven studies for child outcomes.

Ethnicity percentages were reported for 24 of the feasibility and intervention studies. Of those 24 studies, 18 had predominantly White samples. Four studies had an ethnic minority group as the majority of the sample: Chinese, Asian/Pacific Islander, Native American, and African American. Seven studies included some Latinx participants and four studies included some participants with mixed race/ethnicity. Only three of the interventions included cultural adaptations. The cultural adaptations consisted of diverse actors in video models, using goals informed by parents' values and traditions, and using measures validated with the target population. Ironically, none of the studies that were targeting racial/ethnic minorities culturally adapted the intervention. Coaching was a component for just over half (52%) of the interventions. Email was the most common medium for coaching (53.8% of coaching delivered via email), followed by websites and forums (30.8%), video conferencing and in-person meetings (23.1%), and

telephone (15.4%). Some interventions used a combination of media for coaching (e.g., email for one on one coaching and a forum for coaching with other parents). Coaches were research assistants, graduate students, community professionals, certified professionals, and faculty members.

Feasibility studies also primarily assessed interventions targeting externalizing behaviors (four of six studies). The other two targeted parent-infant dyads and children diagnosed with ADHD. While the authors of feasibility studies mostly highlighted differing strengths of their interventions, parents across three studies reported satisfaction with the technology-based intervention. Barriers had a theme of lacking universal effectiveness and buy-in. See Table 6 for more study-specific findings.

### **Discussion**

This systematic review provides an up-to-date summary of the current research on technology-based parenting interventions. We coded several important components of outcome research, including demographics, platform of the intervention, follow up points, outcome measures, magnitude of effect for parent and child outcomes, and clinical significance. Our focus on cultural adaptations and the use of coaching provided additional information that has not been covered in previous reviews.

The overall findings from this review reflect the ubiquitous use of technology to deliver evidence-based parenting interventions. These treatments came in several formats, the most common being websites and computer programs. Tablets, podcasts, and DVDs were also used. Parent outcomes were more commonly reported than child behavior outcomes, perhaps because parent knowledge and behavior must change in order to effect change in child behavior. While the majority of interventions targeted

some form of child externalizing behavior, there were a handful of interventions that targeted other issues, such as asthma and children born into at-risk contexts. We found few studies with ethnic and culturally representative samples and even fewer reporting on programs adapted for those populations. The use of coaching in the interventions was fairly common, with just over half of the interventions including a coaching component. Interestingly, none of the studies compared interventions with and without coaching.

Feasibility studies pointed to the promising prospect of technology-based interventions in terms of parent satisfaction, transportability, and adaptability of existing interventions for individuals with varying educational and ethnic backgrounds. Questions that remain to be answered pertain to cost-benefit analysis, parent propensity for success with a technology platform, additive effects of coaching or therapist consultation, and insurance coverage of technology-based interventions.

Our research approach has some limitations. While meta-analysis would have provided more statistical support than a systematic review, our purpose was broader than identifying impact or a specific effect but rather to understand the state of knowledge regarding study design, feasibility, and cultural diversity. Researchers can draw from the information learned/strengths and weaknesses/content of the studies reviewed here in order to continue advancing and improving research in the realm of technology-based interventions.

The number of technology-based interventions is increasing rapidly. Such interventions provide several potential benefits, such as cost reductions, flexible hours and location, and widespread reach. The Triple-P Positive Parenting Program, for example, uses a public health approach to dissemination, which is greatly facilitated by

the use of several forms of media and technology (Sanders, 2012). When given the option of in-person or self-delivered Triple-P interventions, the majority of parents chose self-delivered methods (Metzler, Sanders, Rusby, & Crowley, 2012). Mental health disparities could be targeted through technology-based interventions, however as of yet few culturally and linguistically adapted versions of such programs exist. The most common form of cultural adaptation found in this review was a surface-level adaptation: diverse actors for video models. The two other types of adaptations found in this review were the use of a measure specifically designed for the participant population and parent-developed goals based on cultural values and traditions.

Now that the basic effectiveness of technology-based parenting interventions has been demonstrated across a variety of emphasis areas (e.g., pediatric care, young children, children diagnosed with autism, externalizing behaviors), researchers should focus their efforts on refining interventions and increasing reach. Our review of feasibility studies revealed methodological strengths and limitations of developing and implementing technology-based interventions. These findings should serve as a guide for future research seeking to evaluate new interventions or improve existing programs. Specific areas that may be of interest include cost-benefit analysis, differential effectiveness across populations, predictors of success in technology-based interventions, and the effect of adding a coaching component to the intervention.

With the growing number of racial and ethnic minorities in the United States, more research should be dedicated to interventions aiming to benefit these vulnerable populations. Cultural adaptations exist in many forms and are well researched (Bernal & Domenech Rodríguez, 2012; Hall et al., 2016); research with technology-based

interventions should consider adaptations beyond hiring diverse actors to better serve diverse communities. As stated in the introduction, the number of racial and ethnic minorities is rising while mental health disparities remain an issue. Technology-based interventions are an ideal means of addressing such disparities, especially given the widespread access to technology across racial and ethnic minorities and in rural communities.

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Table 1

*Basic Study Details and Outcomes of Technology-Based Parenting Intervention Studies*

Authors	Study Type	Target Population	Sample Size	Follow-up points	Dependent Variables	Effect Size on Parent DV	Effect Size on Child DV
Baggett et al., 2010	Experimental	Low SES families, EHS and WIC eligible	38 infants/mothers	0	Parent bx, child bx, ease of use of technology, satisfaction w/ intervention, program engagement, and maternal depression	Moderate to large	Moderate to large
Bert, Farris, & Borkowski, 2008	Experimental	Convenience sample	134 mothers	0	Knowledge acquisition, and satisfaction w/ intervention	Not reported	Not reported
Clarke, Calam, Morawska, & Sanders, 2014	Experimental	Children w/ asthma	13 parents <sup>a</sup>	0	Parent bx, child bx, medical information, weekly asthma diary card, and self-efficacy	Not reported	Not reported
Cotter, Bacallao, Smokowski, & Robertson, 2013	Quasi-Experimental	Rural, impoverished, and ethnically diverse families	144 parents	0	Parent bx, child bx, self-efficacy, and satisfaction w/ intervention	Small to moderate	Small
Enebrink, Högström, Forster, & Ghaderi, 2012	Experimental	Externalizing bxs	104 families	1	Parent bx, child bx, and diagnosis	Moderate	Moderate
Heitzman-Powell, Buzhardt, Rusinko, & Miller, 2014	Pre-post single subject design	Children w/ Autism Spectrum Disorder	7 parents from 4 families	0	Parent bx, knowledge acquisition, and satisfaction w/ intervention	Not reported	Not reported

Hudson, Campbell-Grossman, & Hertzog, 2012	Experimental	Single, low income, young African American mothers	34 mothers	0	Parent bx, self-efficacy, maternal depression, stress, loneliness, satisfaction w/ parenting, social support, and number of medical visits	Small to moderate	n/a
Hudson, Campbell-Grossman, Fleck, Elek, & Shipman, 2003	Quasi-Experimental	First-time fathers	34 fathers	0	Satisfaction w/ intervention, self-efficacy, and parenting satisfaction	Small, large <sup>b</sup>	n/a
Jones, Calam, Sanders, Diggle, Dempsey, Sadhnani, 2014	Experimental	Parents w/ bipolar disorder	39 parents	0	Parent bx and child bx	Moderate	Large
MacKenzie & Hilgedick, 2000	Experimental	Externalizing bxs	52 parents	1	Parent bx, child bx, knowledge acquisition, satisfaction w/ intervention, parenting stress, and limit setting	Not reported	Not reported
Morawska, Tometzki, & Sanders, 2014	Experimental	Externalizing bxs, emotional problems	139 parents	1	Parent bx, child bx, satisfaction w/ intervention, and self-efficacy	Small to large	Small to moderate
Na & Chia, 2008	Experimental	Parents in Singapore	821 Singaporean parents	0	Parent bx, knowledge acquisition, and self-efficacy	Not reported	n/a
Pacifici, Delaney, White, Cummings, & Nelson, 2005	Experimental	Foster parents of children w/ externalizing bxs	74 foster parents	0	Knowledge acquisition, satisfaction w/ intervention, parent perception of child's bx, and time engaging w/ program	Moderate	Not reported*

Rabbitt et al., 2016	Experimental	Externalizing bxs	86 children and their primary caregivers		Parent behavior, child behavior, satisfaction with intervention, diagnosis, family environment, therapeutic alliance, and treatment adherence	Moderate to Large	Large
Sanders, Baker, & Turner, 2012	Experimental	Externalizing bxs	116	1	Parent bx, child bx, satisfaction w/ intervention, and self-efficacy	Small to large*	Small to large*
Sanders, Calam, Durand, Liversidge, & Carmont, 2008	Experimental	Externalizing bxs	454 parents	1	Parent bx, child bx, satisfaction w/ intervention, self-efficacy, and depression/anxiety	Small to large	Moderate to large
Sanders, Dittman, Farruggia, Keown, 2014	Experimental	Externalizing bxs	Families of 193 children	1	Parent bx, child bx, and satisfaction w/ intervention	Small to large*	Moderate to large
Schramm & McCaulley, 2012	Quasi-Experimental	Children of separated parents	1295 parents	0	Parent bx, knowledge acquisition, and satisfaction w/ intervention	Small*	Not reported*
Self-Brown et al., 2015	Pre-post	At-risk African American fathers	4 fathers	0	Parent bx and satisfaction w/ intervention	Not reported*	Not reported*
Taylor et al., 2015	Experimental	Externalizing bxs and social deficits	77 families	0	Parent bx, child bx, knowledge acquisition, and parent-adolescent relationship quality	Large	Moderate to large



Taylor et al., 2008	Experimental	Externalizing bxs	90 head start families (one parent from each family)	n/a*	Satisfaction w/ intervention, goal achievement, and participation	Not reported	n/a*
Tse, McCarty, Vander Stoep, & Myers, 2015	Experimental	ADHD	37 families	0	Parent bx, child bx, and satisfaction w/ intervention	Not reported	
van der Zanden, Speetjens, Arntz, & Onrust, 2010	Pre-post	Parents w/ mental illness	48 parents	0	Parent bx, child bx, satisfaction w/ intervention, and self-efficacy	Moderate	Small
Vismara, McCormick, Young, Nadhan, & Monlux, 2013	Experimental, single subject	Children w/ Autism Spectrum Disorder	8 children and parent(s)	3	Parent bx, child bx, and satisfaction w/ intervention	Not available	Large
Wainer & Ingersoll, 2015	Experimental, single subject	Social deficits, children w/Autism Spectrum Disorder	5 families	2	Parent bx, child bx, knowledge acquisition, satisfaction w/ intervention, and parent engagement	Not available	Not available

<sup>a</sup> 100% attrition, <sup>b</sup> calculated from data reported by authors

Table 2

*Demographic and Coaching Data of Technology-Based Parenting Intervention Studies*

Authors	Ethnicity	Ethnicity Percentages	SES/Education	Cultural Adaptation	Type of Cultural Adaptation	Coaching	Coaching Frequency	Coach
Baggett et al., 2010	White, Latino, Black, American Indian, Asian, and Multiple Ethnicities	Mothers: 15% Hispanic/Latina, 2.5% American Indian, 5% African American, 82.5% White, 7.5% multiple ethnicities, and 2.5% not reported Children- 25% Hispanic/Latino, 5% American Indian, 2.5% Asian, 5% African American, 65% White, and 22.5% multiple ethnicities	Low; 8% no high school (HS), 22% HS, 44% some college, 28% college graduate	Yes	Used diverse actors for video models	Email, phone, website	Weekly	Graduate student
Bert, Farris, & Borkowski, 2008	White, Latino, Black, Asian, and Multiple Ethnicities	81.6 % European-American, 10.7% African-American, 4.9% Asian-American, and 4.1% Latina	Collected but not reported	No	n/a	None	n/a	n/a
Clarke, Calam, Morawska, & Sanders, 2014	White, Pakastani, and Multiple Ethnicities	77% White, 8% Pakistani, and 15% multiple ethnicities	Collected but not reported	No	n/a	None	n/a	n/a

Cotter, Bacallao, Smokowski, & Robertson, 2013	White, Latino, Black, Native American, and Multiple Ethnicities	53% Native American, 27% African American, 10% Hispanic, 8% White, and 2% multiple ethnicities	Low	No	n/a	None	n/a	n/a
Enebrink, Högström, Forster, & Ghaderi, 2012	White	97% Swedish	74% with HS education	No	n/a	Website	Weekly	Research assistant
Heitzman-Powell, Buzhardt, Rusinko, & Miller, 2014	Not reported	Not reported	Education range HS diploma to graduate degree	No	n/a	Video conference	90-120 mins after each module; Average of 17 sessions per family	Research assistant
Hudson, Campbell-Grossman, & Hertzog, 2012	Black	100% African-American	Low	No	n/a	Email, Forum	As needed, freely available	Community professional
Hudson, Campbell-Grossman, Fleck, Elek, & Shipman, 2003	White	100% White	Mixed, intervention group: all had some post HS education. 64% college grads.	No	n/a	Email, Forum	As needed, freely available	Community professional
Jones, Calam, Sanders, Diggle, Dempsey, Sadhnani, 2014	Not reported		Mixed	No	n/a	None	n/a	n/a

MacKenzie & Hilgedick, 2000	White and Black	82.14% White, 8.92% African American, and 8.94% other	Middle to upper middle class; Mean education 16.65 yrs ( <i>SD</i> = 2.5)	No	n/a	In person	Three to five 30-90 min study sessions	Graduate student
Morawska, Tometzki, & Sanders, 2014	Conducted in Australia	Not reported	Not reported	No	n/a	None	n/a	n/a
Na & Chia, 2008	Asian	87% Chinese, 4% Indian, 2% Malay, 1% other, and 6% not reported	59% diploma or basic degree, 22% post-graduate education	No	Developed for families in Singapore but used information from North American and European research n/a	None	n/a	n/a
Pacifici, Delaney, White, Cummings, & Nelson, 2005	White, Latino, and "other"	90% non-Hispanic, 3% Hispanic, and 7% not reported; 20% not White	Mean college education two yrs	No		None	n/a	n/a
Rabbitt et al., 2016	White, Latino, Black, Asian, and multiple ethnicities	86.7% White, 5% Black, 5% Asian, and 1.7% multiple ethnicities; 8.3% Hispanic	Mixed; 48.3% graduate level education and 28.3% undergraduate degree	No	n/a	Email and phone	15-20 minute call every two weeks and as needed	Certified professional

Sanders, Baker, & Turner, 2012	Australian	91% White	Mixed	Yes	Multicultural video models. Goals informed by parents' values and traditions	None	n/a	n/a
Sanders, Calam, Durand, Liversidge, & Carmont, 2008	White and Multiple Ethnicities	94.7% White and 3.8% multiple ethnicities	Mixed	No	n/a	Email	As needed	Certified professional
Sanders, Dittman, Farruggia, Keown, 2014	White	90% New Zealander with European background	54% with income over \$57,000	No	n/a	None	n/a	n/a
Schramm & McCaulley, 2012	White	92% (control) and 88% (online) White	39% HS grad, 28% some college, 26% college degree, 6% graduate degree	No	n/a	None	n/a	n/a
Self-Brown et al., 2015	Black	100% Black	Low to middle	No	n/a	In person	Every session	Graduate student, community professional
Taylor et al., 2015	White, Latino, Black, and Asian	77% White, 4% Latino, 14% Black, and 5% Asian	68% college degree or higher	No	n/a	None	n/a	n/a

Taylor et al., 2008	White, Latino, Black, Asian, Indian/Alaska Native, and Multiple Ethnicities	18% Hispanic/Latino, 85% non-Hispanic; 81% White, 4% Indian/Alaska Native, 2% Asian, 1% Native Hawaiian, 3% Black, 7% multiple ethnicities, and 2% not reported	14% less than HS education, 27% high school diploma or equivalent, 51% some college, 8% college graduate	No	n/a	In person, Website	Five home visits, weekly phone calls, electronic messages as needed	Certified professional
Tse, McCarty, Vander Stoep, & Myers, 2015	White	90% White	Middle; 50% college degree or higher	No	n/a	No	n/a	Community professional
van der Zanden, Speetjens, Arntz, & Onrust, 2010	White	90% Dutch, 10% Belgian, Turkish, and Danish.	42% intermediate and 27% higher vocational education	Yes	Parenting competence measured using a Dutch scale	Email, Forum	Weekly/as needed	Community professional
Vismara, McCormick, Young, Nadhan, & Monlux, 2013	White and Latino	25% Latino and 75% White	Middle; 100% college graduates	No	n/a	Forum, Video conference, Website	1.5 hours weekly	Research assistant, faculty
Wainer & Ingersoll, 2015	White, Latino, Asian, Multiple Ethnicities	40% Asian/Pacific Islander, 20% multiracial, 20% White, 20% Hispanic	80% graduate degree	No	n/a	Email, Video conference	3 x 30 mins	Not reported

Table 3

*Effect Sizes for Child Behavior Outcome Measures*

Authors	Outcome	Treatment Effect	Absolute Effect	Relative Effect
Baggett et al. (2010)	Infant positive behavior		$\eta^2 = .11$	
Cotter, Bacallao, Smokowski, & Robertson (2013)	CBCL - Externalizing	$d = 0.20$		
Enebrink, Högström, Forster, & Ghaderi (2012)	ECBI - Intensity, Problem		$\eta^2 = .10, .22$	
Jones, Calam, Sanders, Diggle, Dempsey, & Sadhnani (2014)	Strengths and Difficulties Questionnaire		$d = 1.00$	
Morawska, Tometzki, & Sanders (2014)	ECBI - Intensity, Problem		$d = 0.56, 0.39$	
Sanders, Baker, & Turner (2012)	ECBI - Intensity, Problem; SDQ - Conduct, Emotion		$d = 0.60, 0.74$ $d = 0.43, 0.22$	
Sanders, Calam, Durand, Liversidge, & Carmont (2008)	ECBI - Problem	$d = 0.63$		$d = 0.28$
Sanders, Dittman, Farruggia, & Keown (2014)	ECBI - Intensity, Problem for mothers and fathers			$d = 1.54, 1.44$ $d = 0.85, 0.73$
Taylor et al. (2015)	PSI Difficult Teen		$d = 1.18$	$d = 0.37$
Tse, McCarty, Vander Stoep, & Myers (2015)	Vanderbilt ADHD Rating Scale - Inactivity, Hyperactivity, ODD, Role Performance			$d = -0.01, 0.20, -0.14, 0.25$
Rabbitt et al. (2016)	CBCL Externalizing; Interview for Antisocial Behavior; Child Global Assessment scale	$d = 1.06$ $d = 0.78$ $d = 0.92$		

*Note.* CBCL = Child Behavior Checklist; ECBI = Eyberg Child Behavior Inventory; PSI = Parenting Stress Index

Table 4

*Effect Sizes for Parent Behavior Outcome Measures*

Authors	Outcome	Treatment Effect	Absolute Effect	Relative Effect
Baggett et al. (2010)	Parent responsiveness		$\eta^2 = .05$	
Cotter, Bacallao, Smokowski, & Robertson (2013)	Problem solving			$d = -0.49$
Enebrink, Högström, Forster, & Ghaderi (2012)	Parenting Practices Interview		$\eta^2 = .17$	
Jones, Calam, Sanders, Diggle, Dempsey, & Sadhnani (2014)	Parenting Scale		$d = 0.73$	
Morawska, Tometzki, & Sanders (2014)	Parenting Scale – Laxness, Overreactivity, Verbosity		$d = 0.49, 0.39, 0.88$	
Sanders, Baker, & Turner (2012)	Parenting Scale – Laxness, Overreactivity, Verbosity		$d = 0.53, 0.61, 0.57$	
Sanders, Calam, Durand, Liversidge, & Carmont (2008)	Parenting Scale	$d = 0.67$		$d = 0.36$
Sanders, Dittman, Farruggia, & Keown (2014)	Parenting Scale – Laxness, Overreactivity, Verbosity for mothers and fathers			$d = 1.20, 1.00, 1.06$ $d = 0.45, 0.41, 0.36$
Taylor et al. (2015)	Monitoring		$d = 0.74$	$d = 0.84$
van der Zanden, Speetjens, Arntz, & Onrust (2010)	Parenting Scale – Laxness, Overreactivity	$d = 0.52, 0.48$		
Rabbitt et al. (2016)	Family Environment Scale - Relationship Total	$d = 0.57$		

*Note.* Negative effect sizes indicate results favoring the comparison group.



Table 5

*Effect Sizes for Parent Self-efficacy Outcome Measures*

Authors	Outcome	Treatment Effect	Absolute Effect	Relative Effect
Cotter, Bacallao, Smokowski, & Robertson (2013)	Parenting Sense of Competence scale;	$d = 0.55$		
	Parenting Self-efficacy scale	$d = 0.75$		
Hudson, Campbell-Grossman, & Hertzog (2012)	How I Deal With Problems Regarding Care of My Baby		$d = 0.02$	
Hudson, Campbell-Grossman, Fleck, Elek, & Shipman (2003)	Infant Care Survey			$d = -0.05$
Morawska, Tometzki, & Sanders (2014)	PTC – Behavior, Setting; Child Adjustment and Parent Self Efficacy Scale – Confidence		$d = 0.57, 0.19$	
			$d = 0.38$	
Sanders, Baker, & Turner (2012)	PTC – Behavior, Setting		$d = 0.84, 0.64$	
Sanders, Calam, Durand, Liversidge, & Carmont (2008)	PTC	$d = 0.66$		$d = 0.22$
Sanders, Dittman, Farruggia, & Keown (2014)	PTC – Behavior, Setting for mothers and fathers			$d = 1.27, 1.38$ $d = 0.41, 0.54$
van der Zanden, Speetjens, Arntz, & Onrust (2010)	Opvattingen over Opvoeding questionnaire – Incompetence, Competence	$d = 0.61, 0.46$		

*Note.* Negative effect sizes indicate results favoring the comparison group. PTC = Parenting Tasks Checklist.

Table 6

*Findings Gathered from Feasibility Studies of Technology-Based Parenting Interventions*

Authors	Program Used	Target Population	What worked/pros of intervention	Challenges/Barriers	Parent feedback	Unanswered Research Questions
Breitenstein & Gross 2013	Chicago Parent Program	Externalizing bxs in preschoolers	<ul style="list-style-type: none"> <li>-Most parents found the tablet easy to use (transportable was benefit), completed HW, and felt they learned something.</li> <li>- High completion rates, practice assignment completion, and parent reported satisfaction, ease of use, and usefulness.</li> </ul>	<ul style="list-style-type: none"> <li>- One parent said intervention did not help.</li> <li>- Engagement data were self-reported.</li> <li>- All measures used self-report.</li> <li>- Authors believe not all parents will find web-based learning motivating or helpful.</li> </ul>	<ul style="list-style-type: none"> <li>- Should spend two weeks on each content session instead of one week.</li> <li>- Reflection questions very helpful and the intervention very easy to use (89%).</li> <li>- Found the intervention very helpful (78%).</li> <li>- Positive qualitative feedback.</li> </ul>	<ul style="list-style-type: none"> <li>- Would coaching help the parent who felt the intervention did not help?</li> <li>- Would an introduction to the program and tablet be helpful before measuring engagement?</li> <li>- What parent characteristics predict responsiveness to web-based interventions? What impact might this approach have on clinical and preventative care?</li> </ul>

Feil et al., 2008	The Playing and Learning Strategies (PALS) program; Infant-net	Parent-infant dyads	<ul style="list-style-type: none"> <li>- Adapted from an evidence-based program.</li> <li>- Utilized videos from the original program.</li> <li>- All text information was also narrated.</li> <li>- The program required little keyboarding skills.</li> <li>- Parents submitted videos.</li> </ul>	<ul style="list-style-type: none"> <li>- Low income and/or rural families have limited access to medical coverage, transportation, preventative care, and other parenting interventions in general.</li> </ul>	<ul style="list-style-type: none"> <li>- Reported mean satisfaction ranging from 4.7-5 across items on a five-point Likert scale satisfaction questionnaire.</li> </ul>	<ul style="list-style-type: none"> <li>- How can costs of the intervention be reduced?</li> <li>- How can we increase the perceived acceptability of internet-based treatments?</li> </ul>
Gordon, 2000	Parenting Wisely	Externalizing behaviors	<ul style="list-style-type: none"> <li>- Sought to integrate into already existing services.</li> <li>- Feedback presented by a computer is potentially less threatening.</li> <li>- Using a CD-ROM takes less commitment than attending groups.</li> <li>- Clinically significant changes occurred in one study for 42% of the Parenting Wisely group as opposed to 27% in a comparison group</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of equipment, funding, technological expertise, and interventionist training.</li> <li>- Resistance from mental health providers who worry about therapeutic integrity.</li> <li>- Need experimental designs to demonstrate causality.</li> <li>- Method isn't widely publicized.</li> </ul>	Not reported	<ul style="list-style-type: none"> <li>- Do the costs of this program outweigh the benefits?</li> <li>- Would including other family members enhance the intervention?</li> <li>- Is this intervention appropriate and effective for other cultures?</li> <li>- Can effects be enhanced through maintenance sessions or adding brief therapist consultation?</li> <li>- What are the predictors of parent resistance and how do practitioners address resistance?</li> <li>- Will insurance reimburse this type of treatment?</li> </ul>

Gordon & Rolland Stanar, 2003	Parenting Wisely	Externalizing behaviors	<ul style="list-style-type: none"> <li>- Disseminated interventions at conferences.</li> <li>Tracked treatment fidelity as time spent on program.</li> <li>- Low cost</li> <li>- Ease of dissemination</li> <li>- High completion rates</li> <li>- Large effect sizes</li> </ul>	<ul style="list-style-type: none"> <li>- Method isn't widely accepted by clinical/medical communities.</li> <li>- Therapists need to be trained in the use of technology.</li> <li>- Parents don't always see the link between their parenting methods and their children's behavior.</li> </ul>	Not reported	
Metzler, Sanders, Rusby, & Crowley, 2012	Triple-P	Externalizing behaviors	<ul style="list-style-type: none"> <li>- Videos can be dubbed/subtitled in different languages.</li> <li>- Examples of universal situations results in high acceptability for multiple ethnic groups.</li> </ul>	<ul style="list-style-type: none"> <li>- The sample was recruited online, biasing recruitment towards "tech savvy" - parents.</li> </ul>	<ul style="list-style-type: none"> <li>- Preferred delivery modality: TV and other self-administered programs. Clinical-level families preferred a therapist. Home visit least preferred.</li> <li>- Trend of lower income families rating higher watchability.</li> </ul>	<ul style="list-style-type: none"> <li>- Would the parents' treatment preferences change after being exposed to the different formats?</li> </ul>
Tse, McCarty, Vander Stoep, & Myers, 2015	Manualized Caregiver Behavior Training Intervention; Children's attention-deficit hyperactivity disorder telemental health treatment study (CATTS)	ADHD	<ul style="list-style-type: none"> <li>- This study lays foundation for future randomized experiments with larger samples.</li> </ul>	<ul style="list-style-type: none"> <li>- No significant treatment differences in child outcomes.</li> <li>- Caregiver outcomes showed less impact in teletherapy group than in in person.</li> </ul>		<ul style="list-style-type: none"> <li>- Why did these results differ from previous two studies on caregiver outcomes?</li> </ul>

## CHAPTER III

### PADRES PREPARADOS ONLINE

The second manuscript is titled, *Padres Preparados Online: A Pilot Study of an App-based Intervention for Latinx Families*. The authors are Samantha M. Corralejo and Melanie M. Domenech Rodríguez. The manuscript is currently being prepared for submission to the Journal of Clinical Child & Adolescent Psychology according to their formatting standards. A prior version of this manuscript was presented in November, 2018 at the conference of the Association for Behavioral and Cognitive Therapies in Washington, D.C.

#### **Introduction**

Child mental health disparities continue to be evident across ethnic and cultural groups (Alegría, Green, McLaughlin, & Loder, 2015; Kataoka, Zhang, & Wells, 2002). Early interventions delivered through parents have been touted as a cost-effective method of curbing trajectories that place children and families at risk for short- and long-term harmful outcomes (Forehand, Lafko, Parent, & Burt, 2014). These outcomes range from academic achievement (Lynch, Dickerson, Pears, & Fisher, 2017) to substance use (Griffin & Botvin, 2010), externalizing behaviors (Dretzke et al., 2005), economic advancement (DeGarmo & Forgatch, 1999), and anxiety (Mihaloupolos et al., 2015). Parents are uniquely positioned to teach early skills to children; therefore, parenting interventions are particularly useful to change the course and impact of risk for the vast majority of children in the US (Forehand et al., 2014). In Latinx populations specifically, disparities are evident in the access to and acceptability of treatments. Existing evidence-based parenting interventions have been successfully culturally adapted for use with

Latinx parents (Baumann, Domenech Rodríguez, Amador, Forgatch, & Parra-Cardona, 2014; Domenech Rodríguez, Baumann, & Schwartz, 2011; Martinez & Eddy, 2005; Parra-Cardona et al., 2017), yet are still delivered in traditional formats for psychotherapy such as in-person individual or group meetings. Advances in technology provide another potential avenue for further reducing health disparities (Muñoz, 2010). The present manuscript examines the potential for smartphone app delivered videos and parenting intervention materials to impact parenting practices and child outcomes. The intervention included a unique app-based coaching component that allowed video communication between parents and coaches while using content from GenerationPMTO, one the most robust parenting intervention available (Forehand et al., 2014).

### **Mental Health Disparities**

Latinxs account for a growing proportion of the United States population; in 2018 Latinxs made up 18.3% of the U.S. population (U.S. Census Bureau, 2018). Estimates show that by 2020, 26% of children in the U.S. will be of Latinx origin (Child Trends, 2018). Latinxs born in the U.S. have become the main contributor to the growing Latinx population in the U.S., outpacing growth from immigration (Krogstad & Lopez, 2014). Latinx families often live in poverty and encounter a heightened number of risk factors compared to their White American counterparts (Caballero, Johnson, Muñoz Buchanan, & DeCamp, 2017; Fontenot, Semega, & Kollar, 2019; Loukas & Prelow, 2004). This setback is twofold: living in poverty often means no health insurance and limited mental health care, while the heightened risk factors necessitate mental health services. The accumulation of risks has been associated with increasing externalizing and internalizing behavior problems (Asfour et al., 2017).

## Evidence-Based Parenting Interventions

Individual and group behavioral parenting interventions are considered well-established treatments (Kaminski & Claussen, 2017). Among these, GenerationPMTO™ has some of the most robust evidence for positive outcomes (Forehand et al., 2014). Additionally, many of these programs have been culturally adapted in the service of attempting to address health disparities. In general, meta-analytic findings support the efficacy of culturally adapted treatments (Benish, Quintana, & Wampold, 2011; Hall et al., 2016; Soto, Smith, Griner, Domenech Rodríguez, & Bernal, 2018). Various GenerationPMTO manuals have been specifically adapted for Latinx families with good results (Baumann et al., 2014; Domenech Rodríguez et al., 2011; Martinez & Eddy, 2005; Parra-Cardona et al. 2017). Indeed, other evidence-based interventions have also been culturally adapted for use with ethnically diverse families with good results (Parent-Child Interaction Therapy; McCabe & Yeh, 2009; Parent Management Training; Myers et al., 1992; Strengthening Families Program; Kumpfer, Magalhães, & Xie, 2017; The Incredible Years; Webster-Stratton, 2009).

This study utilized *Padres Preparados*, an intervention for Spanish-speaking parents of preschool aged children in Head Start or similar preschool agencies. *Padres Preparados* is in the family of GenerationPMTO™ interventions that have been developed over the past 50 years with a strong empirical base (Forgatch & Domenech Rodríguez, 2016; Forgatch & Patterson, 2010). The theoretical foundation of GenerationPMTO is social interaction learning theory, the marriage of Bandura's social learning theory and Patterson's coercion theory. Specifically, social learning theory explains how contextual factors can lead to the development of healthy or dysfunctional

adjustment through social and behavioral learning. Coercion theory then explains how cycles of coercive behaviors between parents and children are established and escalate through negative reinforcement, becoming ingrained over time (Patterson, 2016). The relationship between parenting practices and child behavior is explained through a mediation model, in which context predicts child behavior outcomes, mediated by parenting practices (Forgatch & Patterson, 2010).

*Padres Preparados* was developed for preschool-aged children to promote positive child adjustment in academic settings with a focus on literacy development and positive behaviors (e.g., minding, participating in routines) that support school success. The intervention is culturally adapted in that it uses the GenerationPMTO framework, which was originally developed in Oregon where most research studies were with low-income White families (Forgatch & Domenech Rodríguez, 2016) in order to create an original manual tailored to Spanish-speaking Latinx families. *Padres Preparados* was tested using a Randomized Controlled Trial method (Domenech Rodríguez et al., 2017). Parents in the intervention group reported improvements across all parenting practices when compared to control group families. The intervention, however, required a great deal of time and resources. *Padres Preparados* is 8 weeks long, with parents meeting for weekly groups lasting approximately 1.5 hrs and also receiving weekly calls from an intervention leader. Intervention leaders were Head Start teachers that had received training from a doctoral-level psychologist (the second author) and also received written and live coaching to troubleshoot intervention delivery issues. Given the complexity of weekly group meetings with trained interventionists, we turned to technology with the goal of simplification and broadened reach.



## **Technology and Parenting Interventions**

Technology as a form of medical communication began in the medical field as early as the 1960s as a method of medical consultation, education, and correspondence (Zundel, 1996). As the popularity and accessibility of technology increased, fields such as psychology began to incorporate technology into their interventions and research (Nickelson, 1998). While technology was used in the past to transmit information between a living practitioner and client, current use of technology has evolved such that technology itself delivers the content of the intervention (Corralejo & Domenech Rodríguez, 2018). Evidence-based interventions delivered via technology exist for a number of presenting problems, including weight loss (Khaylis, Yiaslas, Bergstrom, & Gore-Felton, 2010), bipolar disorder (Hidalgo-Mazzei, Mateu, Reinares, Matic, Vieta, & Colom, 2015), substance abuse (Fowler, Holt, & Joshi, 2016), and autism spectrum disorder (Meadan & Daczewitz, 2014). For child problem behavior, at least five published meta-analyses and systematic reviews on technology-based parenting interventions exist, with general findings to support the efficacy and feasibility of such interventions (Baumel, Pawar, Kane, & Correll, 2016; Corralejo & Domenech Rodríguez, 2018, Hall & Bierman, 2015; Meadan & Daczewitz, 2015; Tarver, Daley, Lockwood, & Sayal, 2014). Corralejo and Domenech Rodríguez (2018) noted that while technology-based parenting interventions occasionally focused on racial and ethnic minorities, none of those studies reported cultural adaptations. Of 25 studies reviewed, three that included a diverse or non-Western sample culturally adapted the intervention to some degree.

Despite these advances, Latinx children still experience heightened risk factors and mental health disparities (Alegría et al., 2015). To complicate matters, the number of

Spanish-speaking service providers is limited (American Psychological Association, 2015; Lopez, Bergren, & Painter, 2008; U.S. Department of Health and Human Services, 2001; Villatoro, Morales, & Mays, 2014). New ways of maximizing access to high quality and culturally relevant mental health care for Latinxs and other underserved ethnic groups are needed. One way to address this issue is to increase the number of technology-based interventions. Recent data show that Latinxs have access to technology and Internet via mobile devices and computers; 80% of Latinxs report accessing the internet with a mobile device, 61% subscribe to home broadband, and 63% own a computer (Anderson, 2015, 2019; Brown, López, & Hugo Lopez, 2016). Latinxs' access to internet and computers makes technology-based interventions a viable option.

The present study is a pilot for the efficacy and feasibility of the first three modules of *Padres Preparados*. We utilized a multiple-probe single subject design to allow for self-report data collection multiple times a week and observations within each module. Findings from this study will guide development of the full version of *Padres Preparados Online* and highlight important considerations when working with Latinx families and delivering interventions virtually.

## **Method**

### **Participant Characteristics**

Ten interested families initially contacted the research team. One family did not qualify according to the screener and one family began the baseline phase but ultimately did not qualify because she reported zero problem behavior at baseline. One family withdrew during baseline due to a busy schedule. Three families were placed on a waitlist. Participants were four Spanish-speaking Latinx mothers and their children. The

target child was between 3 and 5 years of age; older and younger children occasionally appeared in videos incidentally. Caregivers qualified for the study if they were interested, were the primary caregiver for a child between 3 and 5 years of age, and had not participated in a multi-week parenting intervention or intervention/services targeting child externalizing behavior prior to the study. Participants needed to identify as Latinx and report speaking Spanish as a native language. Participants were also required to have a cell phone with texting capabilities, possess the ability to text, have a smartphone or tablet with internet connection, and have Internet access in the home. Children qualified if they were between 3 and 5 years of age, were neurotypical, and had evidence of externalizing problem behavior as measured by a behavior screener (Domenech Rodríguez et al., 2013) and shortened Parent Daily Report (Chamberlain & Reid, 1987). We recruited participants from community flyer postings and a local Latinx community Facebook group in the Intermountain West. Participants were compensated with \$30 each time they uploaded a video and \$50 upon completion of the study. All of the names used to describe families are pseudonyms.

**Arroyo Family.** Mrs. Arroyo was a 34-year-old heterosexual woman from Mexico. She lived with her husband and two children and was a stay-at-home mom. She reported having lived in the United States for eight years. She had a bachelor's degree and reported a family annual income between \$40,000 and \$49,000. She reported speaking only Spanish and communicating with her child in "more Spanish than English." Her son, Andres was 4 years old at study onset and reported to be bilingual. Mrs. Arroyo identified her son as Mexican and Guatemalan. Mrs. Arroyo reported that she did not have trouble communicating with her child as a result of language

differences. Her self-identified treatment goals included helping her son control his anger when others did not understand what he was asking, helping him understand the difference between play and work, and to have a united front with her husband.

**Bautista Family.** Mrs. Bautista was a 32-year-old heterosexual Mexican woman. She was married with three children and cleaned houses for a living. She reported living in the United States for 13 years, having a high-school education, and a family annual income of \$20,000 – \$29,000. She reported speaking more English than Spanish in general and with her daughter, Belinda. Belinda was five years old and bilingual. Mrs. Bautista identified her daughter as American. Mrs. Bautista's treatment goals were to learn new ways or techniques to raise her children, and to learn whether her parenting was in the normal range and how she might improve.

**Castillo Family.** Mrs. Castillo was a 33-year-old heterosexual woman. She was born in South America and had lived in the United States for 32 years. She had a college education, worked from home, and reported a total household income of \$10,000-19,000 per year. She was married and had four children. Mrs. Castillo reported speaking more English than Spanish in her day-to-day life and with her child. Her daughter, Camila, was 4 years old and spoke English only. Mrs. Castillo identified Camila as American. She created four goals for her daughter: work on house chores together as a team, do something the first time I ask her, clean up her toys, and to be more patient with her younger brother.

**Domínguez Family.** Mrs. Domínguez was a 31-year-old heterosexual, mother of two. She was born in the United States and had Mexican heritage. Mrs. Domínguez reported an annual family income between \$40,000-49,000. She worked at a daycare four

hrs a week and attended college. She described herself and her son, Diego as bilingual, and reported that she spoke to him in more English than Spanish. Diego was 3 years old and of South-Asian and Mexican descent. Mrs. Domínguez's goals were to learn how to better control her son, how, together, her family could help her son be a better child, and how to respond better in situations where her son did not behave well.

### **Measures and Covariates**

**Screeners.** The screener was a brief measure asking caregivers to provide information about their preferred language, child's age, access to technology, technological abilities, and ethnic identification. They also provided information regarding their caregiver status and participation in psychoeducational and/or therapeutic interventions aimed to improve parenting practices. Interested participants could complete this form online or over the phone in order to qualify for the study. In addition, they answered a 14-item child behavior screener based on five levels of antisocial behavior outlined by Bird, Canino, Davies, Zhang, Ramirez, and Lahey (2001) and developed by Domenech Rodríguez et al. (2013). The screener is built to first identify behavior problems at Level 1 (e.g., common arguing, disobedience) and Level 2 (e.g., bullying, stealing from the home, minor shoplifting), and then assess for problem behavior at Level 3 (e.g., police involvement, cruelty to animals or others, property destruction). Children with Level 1 or 2 problem behavior were eligible to participate in the study. This screener has been used in multiple studies with Spanish-speaking parents in the Mexico, Puerto Rico, and the U.S., (e.g., Amador et al., under review; Domenech Rodríguez et al., 2011; Domenech Rodríguez, Franceschi Rivera, Sella Nieves, & Félix Fermín, 2013).

**Demographics.** Caregivers provided information about age, gender identity, country of origin, highest level of education, relationship status, sexual orientation, number and age of children, subjective economic status, and household composition following models for inclusive demographics (Hughes, Camden, & Yanchen, 2016). The demographics were translated by a bilingual team (Reeves, Joosten, Alvarez, Vazquez, & Domenech Rodríguez, 2018) and utilized in a parenting study with English and Spanish-dominant participants (Kemple Reeves, 2018).

**Child behavior.** Children's behavior pre- and post-intervention was measured with the Strengths and Difficulties Questionnaire (SDQ; [sdqinfo.com](http://sdqinfo.com)), a 25-item self-report form available in multiple languages including Spanish. The SDQ has five scales: Hyperactivity, Emotional Symptoms, Conduct Problems, Peer Problems, and Prosocial (Goodman, 1997). Items are rated as *not true* (0), *somewhat true* (1), or *certainly true* (2). Items on the first four scales are summed to create a Total Difficulties scale that ranges from 0-40. The SDQ website provides provisional banding of scores for the Total Difficulties scale for 2-4 year olds: *close to average* (0-12), *slightly raised* (13-15), *high* (16-18), and *very high* (19-40). The SDQ has demonstrated adequate internal consistency, interrater agreement, and concurrent validity in multiple languages and countries (Rønning, Handegaard, Sourander, & Mørch, 2004; [sdqinfo.com](http://sdqinfo.com)). Because most of research on the Spanish version of the SDQ studied Spanish children (Gómez-Beneyto et al., 2013), we used comparative norms from a U.S. sample (Bourdon, Goodman, Rae, Simpson, & Koretz, 2005).

**Parental self-efficacy.** We used an adapted version of the Parenting Sense of Competence Scale-Short Form (PSOC-SF; Johnston & Mash, 1989) to measure self-

efficacy. The PSOC-SF has established validity and measures caregiver self-efficacy in the overall parenting role; it is translated to Spanish, but not originally created for Latinx parents. The version of the scale we used has seven items and one factor (efficacy). Scores ranged from 7 to 35 with higher scores representing more self-efficacy. In the *Padres Preparados* trial, the PSOC-SF demonstrated strong internal reliability (Cronbach's  $\alpha = .86$  at pretest and  $.85$  at posttest; Domenech Rodríguez et al., 2017).

**Parenting stress.** Caregivers completed the Parenting Stress Index-Short Form (PSI-SF) in Spanish before and after the intervention. The PSI-SF is a 36-item measure that provides a Total Stress score and three subscales: Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child (Abidin, 2012). Using English-only based norms, the manual considers a score in the 85<sup>th</sup>-89<sup>th</sup> percentile to be in the borderline clinical range and scores in the 90<sup>th</sup> percentile or higher clinically significant. Each item is rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores representing higher levels of stress (range = 36-180). The PSI-SF has high internal consistency, with Cronbach's alphas of .96 or greater across all scales. The Spanish-translated version of the PSI-SF demonstrated acceptable reliability (Cronbach's  $\alpha = .94$ ,  $.88$ , and  $.92$ ) and validity (Solis & Abidin, 1991).

**Caregiver goals.** Caregivers created their own treatment goals at the initial meeting. Discussing with the first author as needed, parents wrote their goals down knowing that they would re-visit them at the end of the course. These goals were formatted to fit a rating scale of progress towards goal from 0 (*no progress*) to 10 (*goal achieved*). Caregivers were reminded of their goals during the class through coaching feedback. Caregivers rated their progress on their goal at the post intervention meeting.

**Daily reports.** Daily reports of child behavior and parent stress were acquired with the Shortened Parent Daily Report (sPDR; Chamberlain & Reid, 1987). The original Parent Daily Report is a 34-item, two-part phone interview which asks caregivers to report on their child's behavior in Part A and on their own stress and support in Part B. The Parent Daily Report was originally validated with children ages 4-10. Parents were given the option of completing the sPDR over the phone or via online survey; all parents chose the online option. For the present study, caregivers completed a shortened, 21-item version of Part A. The 21 items were selected for their focus on externalizing behavior and age-appropriateness for the present study. Part A asks caregivers to report whether a specific problem behavior occurred by answering *yes* (1) or *no* (0). Items were summed to create a total sPDR score thus scores could range from 0 to 21. Caregivers also identified one positive behavior that they observed in their child over the last 24 hrs. PDR scores have been correlated with observation data of child behavior (Chamberlain & Reid, 1987) and in previous research have high inter-call reliability at baseline (Cronbach's  $\alpha = .84$ ) and termination (Cronbach's  $\alpha = .83$ ; Chamberlain, Price, Leve, Laurent, Landsverk, & Reid, 2008).

**Caregiver knowledge.** At the end of each module, caregivers completed a 14-item quiz. The quiz had questions specific to each of the skills taught (praise, good directions, and routines) assessing caregiver conceptual and practical knowledge. The quiz included items requiring application of the knowledge acquired to hypothetical situations. This quiz was developed specifically for the original *Padres Preparados* intervention (Domenech Rodríguez et al., 2017). Caregivers took the complete Caregiver Knowledge quiz (the three skill question sets combined) before and after the intervention.



The quiz was scored as percent correct. In addition, the skill-specific questions served as a measure of mastery; caregivers were required to score 80% or higher on the skill questions for each module before recording observation videos and gaining access to the subsequent module.

**Observed caregiver-child interactions.** The Family Interaction Brief Rating Scale: Research (FIBRS-R; Domenech Rodríguez, Sigmarisdóttir, Forgatch, & Rains, 2019) was used to code the 30 min videos of caregiver-child interactions. The FIBRS-R includes a child and caregiver behavior scale. Both scales use a 5-point Likert-type scale ranging from 1 (*never/almost never*) to 5 (*most of the time*). Higher scores indicate caregiver use of behaviors taught in the intervention and better child adjustment. The complete caregiver scale includes 32 items and the child scale has 20. The caregiver scale has five core parenting practices: Skills Encouragement, Positive Involvement, Communication, Problem Solving, and Discipline. The original scale (Parent Child Checklist) was developed by Domenech Rodríguez and Forgatch (2012) and was used without a manual to code visitations as part of the Kansas Intensive Permanency Project. The Parent Child Checklist demonstrated adequate reliability for an exploratory study (Cronbach's  $\alpha = .65$  to  $.88$ ) and good concurrent, convergent, and predictive validity (Akin, Domenech Rodríguez, Yan, DeGarmo, McDonald, & Forgatch, 2016).

**Satisfaction.** We measured satisfaction with the intervention, technology, and procedures. Caregivers completed the satisfaction survey upon completion of the intervention. The survey was a combination of items developed by the *Padres Preparados* team, items written specifically for the *Padres Preparados Online* intervention, and the System Usability Scale (SUS; Brooke, 1996). Quantitative items

varied in their scale size and anchors. The SUS contains 10 items focused on the utilization of the technology system based on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Raw scores are converted to a scaled score (range = 0-100); a score of 68 is considered average (Sauro, 2011). Parents completed the SUS once, treating the Canvas and GoReact systems as one overall system. Open-ended items asked caregivers for additional feedback about strengths of the program, areas where the program could change or improve, and any other feedback they wished to give.

### **Procedure**

All delivery of the intervention content took place online via the Canvas system. Canvas is a Learning Management System used primarily to host academic course content and assignment submission and offers data protections consistent with US Federal regulations for the protection of student and clinical services data. Canvas is accessible through login on web browsers or as a smartphone app. The intervention included caregivers watching one brief video per module, answering questions about the videos, practicing the skills with their children, and writing down questions about what they were learning and practicing. Caregivers participated in baseline, intervention, and maintenance phases with an additional 2-week follow up observation. After interacting with all of the module materials (videos, PDF handouts, and questions), caregivers were given access to the Caregiver Knowledge quiz for that module. When caregivers passed the Caregiver Knowledge quiz with a score of 80% or higher, they were prompted via text message to upload a 15 min video of themselves practicing the target skill with their child and receive coaching, all through an online program called GoReact (<https://get.goreact.com>). GoReact is an online video feedback tool that allows users to

upload or record videos from their phones or computers to an online course for feedback from the course instructor. The course instructor can provide written, audio, or video feedback at specific time-points in the user's video. Canvas and GoReact were selected because they were freely available to the researchers through their academic institution. The first author collected the sPDR four times a week (every other day) during the baseline phase. When a participant was ready to begin the intervention, caregivers completed consecutive daily sPDRs in order to establish a stable baseline. During the intervention phase, participants completed the sPDR every other day, totaling four days a week. We also collected one follow-up sPDR and observation video two weeks post-intervention. The first author sent text message reminders as needed to keep parents on-track with the study. As long as participants continued to communicate a plan for completion of study requirements, they were not withdrawn.

**Screening.** Parents interested in participating completed the screener to determine eligibility over the phone, online, or in person, whichever worked best for the family. Parents were also provided a copy of the informed consent document to review at this time. After completing the screener, parents were notified within one week whether or not they qualified for the study.

**Initial meeting.** Upon arrival at the family's house, the first author reviewed the informed consent document and secured consent. Once the participant had any questions answered and signed the informed consent document, caregivers completed the Strengths and Difficulties Questionnaire, PSOC-SF, PSI-SF, and Caregiver Knowledge forms. They also established Caregiver Goals for the intervention. During the initial meeting, the

caregiver was introduced to the apps and websites that were to be used during the intervention.

**Baseline.** After the initial meeting, we collected daily sPDRs for the Arroyos and every-other-day sPDRs for the Bautistas, Castillos, and Domínguezes using the sPDR. The Arroyos began the intervention as soon as a stable baseline trend of three data points was established. The other families began the intervention after a staggered amount of weekly baseline data (e.g., two weeks for the Bautistas, four weeks for the Castillos) and after demonstrating a stable baseline for three consecutive data points within one week. Baseline data were collected nonconcurrently.

**Observation meeting.** The purpose of this meeting was to help the caregiver record a 30 min video of the participating caregiver interacting with their child using GoReact. The interaction was semi-structured, using a modified version of the Tareas de Interacción Familiar Protocol (TIF; Amador Buenabad et al., 2009 based on Forgatch & DeGarmo, 1999 and Gewirtz, DeGarmo, Plowman, August, & Realmuto, 2009). At this point, the researcher also introduced a paper copy of the *Padres Preparados* “Parenting Map” (*El Mapa de Parentalidad*; Domenech Rodríguez & Iris Educational Media, 2016) that demonstrated how values are used to achieve goals despite obstacles. The Parenting Map was referenced throughout the intervention. Lastly, the researcher confirmed that the caregiver had downloaded and logged in to the appropriate apps and websites in order to access the intervention.

**Intervention.** The shortened pilot intervention consisted of lessons 2 (Ready to Teach Positive Behavior), 3 (Ready to Give Clear Directions) and 4 (Ready to Teach Routines) of *Padres Preparados*. Table 1 describes the key differences between *Padres*

*Preparados and Padres Preparados Online* We chose these modules as they are foundational to the remaining modules. The lessons were introduced over the course of approximately 6 weeks. The amount of time caregivers spent on each module varied, as caregivers were not given access to the subsequent module until they had mastered the current skill. Caregivers were expected to complete each module in two weeks or less, although they sometimes took up to three weeks. Mastery was determined using skill-specific Caregiver Knowledge quizzes; a score of 80% or higher was considered written mastery of the skill.

The structure of each module was the same across all skills: starting with watching a 4-6 min video, answering discussion questions, writing down personal questions about the topic, accessing informational digital documents, taking a knowledge quiz, and uploading a 15 min caregiver-child interaction video to GoReact. Caregivers were told they had 1-2 weeks to complete each lesson, although some families were given more time if they communicated intent to complete the lesson. The Appendix provides a visual representation of the intervention with screenshots of the lessons as accessed through the Canvas program.

For illustrative purposes, we describe the first module here. The first module was *Listos Para Enseñar la Conducta Deseada* (Ready to Teach Positive Behavior) and focused on skills building, one of GenerationPMTO's five core parenting practices. Caregivers watched a 4 min video, which outlined how to help children learn new and desirable skills. They then answered seven discussion questions either by typing in a text box or recording an audio response. There was also an option for caregivers to report any questions they had about the topic. If caregivers needed more help with the topic (i.e., did

not pass the knowledge mastery criteria), the coach provided written or audio responses to the questions. Caregivers also had access to a digital version of “Praise-Worthy Behaviors,” a handout from the original manual. Their homework for the week was to practice praising their child daily using the “See it, Say it” (*Verlo, Decirlo*) method. An additional troubleshooting resource page adapted from manual content with basic tips was also be available for caregivers to view. Once caregivers had viewed all materials, completed all discussion questions, and recorded their own questions, they were prompted to complete the Caregiver Knowledge quiz with items specific to that module. Caregivers received their scores immediately. If they answered 80% or more of the questions correctly, the caregiver was prompted to plan and record a 15 min caregiver-child interaction video GoReact within a week. If the caregiver scored lower than 80%, the caregiver was instructed to wait for answers to their written questions and the researcher answered the written questions (a booster coaching session). After the questions were answered, caregivers were given access once again to the knowledge quiz and the process will be repeated until they met mastery criteria and could record a caregiver-child interaction video.

The coach (first author) then reviewed the caregiver-child interaction video and provided video, audio, and text feedback. The feedback was tagged at specific time-points throughout the video for the caregivers to view via the GoReact website. The coach aimed to make 10 comments per video, with comment type divided as equally as possible between video, audio, and text. The coaching style used was the GenerationPMTO approach, which includes methods such as Socratic questioning, focusing on the positives in a 5:1 ratio, “sandwiching” constructive feedback between

positives, and troubleshooting (Forgatch & Domenech Rodríguez, 2016). All coaching sessions were monitored for fidelity and edited prior to release by a GenerationPMTO mentor (second author).

**Final meeting.** The purpose of the final in-person meeting was to wrap-up the intervention and collect all post measures. The wrap-up included a final 30 min semi-structured video (identical to the initial observation meeting). Caregivers also completed all post-intervention measures. Caregivers received coaching via GoReact on said video.

**Follow-up.** Caregivers completed one sPDR two weeks post-intervention and uploaded one 15 min caregiver-child interaction video at the two-week mark. Parents received a final debriefing contact to assure that they had no remaining questions or concerns.

## **Research Design**

We used a multiple baseline across subjects design to assess the effects of the intervention for four families. In this design, change from baseline to intervention can be assessed for each subject, and replication across subjects with varying baseline lengths confirms the introduction of the intervention as the agent of change (Cooper, Heron, & Heward, 2007). The sPDR was collected four times a week during baseline and intervention phases. The one exception was just prior to beginning the intervention, where participants completed the SPDR daily.

## **Data Analysis**

Data analysis followed traditional single subject analysis methodology for the measures repeated throughout the intervention. Intervention phases were not introduced for any participant until a stable baseline trend of three sPDR data points was established.

We used visual analysis to assess change over time on the sPDR and parent/child observations, as is standard in single subject research (Cooper et al., 2007).

Data analysis for pre-post measures utilized a combination of severity categorization and change benchmarks based on existing research standards. We assessed the SDQ by comparing which banding category the participant fell into pre- and post-treatment, with change to a lower category signifying improvement. Furthermore, many studies assess change using a percent decrease criterion that ranges from 15-40% (Gordon, Rucklidge, Blampied, & Johnstone, 2015; Johnco, Salloum, Lewin, & Storch, 2015; Spencer et al., 2001). We considered a 40% decrease in SDQ and PSI-SF scores to signal meaningful change. Caregiver goals and caregiver knowledge were used as descriptive data assessing family progress.

## **Results**

Descriptive results are presented for each family. Summary scores of self-report measures are presented in Table 2. See Figure 1 for child problem behaviors during baseline, intervention, and follow-up. Table 3 and Figure 2 contain parent and child behavior observation scores. Caregivers' goals and self-assessed progress on goals are summarized in Table 4.

### **Arroyo Family**

Mrs. Arroyo completed all three lessons, spending an average of 2 hr and 47 min on Canvas per lesson. She reported logging into Canvas once a week, viewing the lesson video twice a week, and utilizing the lesson information six days a week. Mrs. Arroyo generally completed one lesson in 2-3 weeks. In parent-child interaction videos, she primarily spoke Spanish to Andres, but would say some sentences or words in Spanish



for clarity. Andres switched between Spanish and English when speaking to his mother, but generally spoke more Spanish than English. Mrs. Arroyo verbally confirmed viewing all coach feedback on GoReact. The number of problem behaviors per day reported during baseline were highly variable ( $M = 5.21$ , range = 0-12). Once the intervention began, there was a stable descending trend in the number of problem behaviors reported, with an average of 2.33 behaviors reported per day during the intervention phase (range: 0-12). Low occurrences of problem behavior continued at the 2-week follow up, where Mrs. Arroyo reported one problem behavior for the day.

Several pre- and post-intervention measures allowed us to assess the impact of the intervention on other variables. On the Caregiver Knowledge Quiz, Mrs. Arroyo had an increase of 50 percentage points. Her parenting self-efficacy, as measured by the PSOC, increased by seven points, raising her average Likert-scale response by one point. Mrs. Arroyo reported a dramatic decrease in parenting stress, with her original scores on the PSI-SF ranging from the 58<sup>th</sup> to 99<sup>th</sup> percentiles, and her post-intervention scores ranging from the 24<sup>th</sup> to 54<sup>th</sup> percentiles. The latter percentiles were for the Parental Distress subscale, which was above the clinical cutoff before the intervention and below the clinical cutoff after the intervention. Her Total Stress score decreased by 56%.

Mrs. Arroyo's pre-intervention report of Andres' problem behavior (Total Difficulties) on the SDQ was in the slightly raised range. After the intervention, Andres' Total Difficulties score was in the close to average range; his Total Difficulties scale score decreased by 36%. For the behavioral observations, Andres' behavior remained stable. The Parent Behavior Scale scores for Mrs. Arroyo decreased slightly. Mrs. Arroyo reported general satisfaction with the intervention, with the majority of her responses to

positive statements about the program being “agree” or “strongly agree.” She reported that the information was novel and useful.

### **Bautista Family**

Mrs. Bautista required 2-3 weeks to complete each lesson, and spent an average of 3 hr and 21 min on Canvas per lesson. She reported accessing Canvas 2-3 times a week, viewing the lesson video three times a week, and using the lesson information six days a week. Mrs. Bautista spoke almost exclusively Spanish with her daughter in parent-child interaction videos, except when playing guessing games where her daughter did not know the Spanish translation of a word. Belinda’s language use mirrored her mother’s. Mrs. Bautista verbally confirmed that she watched all coach feedback. Her daughter Belinda’s daily problem behavior initially had a decreasing trend and then stabilized. The average number of problem behaviors reported during baseline was 3.43 with a range from 1-7. Problem behavior during the intervention was variable, but generally had a slight downward trend, with several days where Mrs. Bautista reported zero instances of problem behavior. The average number of reported problem behaviors during the intervention was 1.96 (range: 0-5). Reported problem behavior slightly increased to near baseline levels at the 2-week follow-up, but was still within the range of reported counts during the intervention phase.

On the pre-post Caregiver Knowledge Quiz, Mrs. Bautista increased her score by 28.6 percentage points. Her score on the PSOC increased by 9 points, which is an average of 1.28 points higher on the 5-point Likert scale. Although her parenting stress scores were non-clinical before the intervention began (range: 36<sup>th</sup>-70<sup>th</sup> percentile), she reported a 50% decrease in overall parenting stress and on each subscale of the PSI-SF (range:

26<sup>th</sup>-65<sup>th</sup> percentile). The Defensive Responding Scale score was significant for the PSI-SF administered post-intervention, which could mean that Mrs. Bautista was trying to present herself favorably or that she truly had low levels of parenting stress.

On the SDQ Total Difficulties scale, Belinda's behavior was originally reported to be in the slightly raised range. Belinda's Total Difficulties score decreased by 47% and was in the close to average range post-intervention. Belinda and her mother's behavior according to the Child and Parent Behavior Scales stayed consistent. Mrs. Bautista generally reported being satisfied with the intervention and the material presented.

### **Castillo Family**

Mrs. Castillo completed each lesson with an average Canvas login time of 57 mins. She typically took one week to complete a lesson. She reported accessing Canvas once a week, watching the videos three times a week, and utilizing the information from the lessons five days a week. In parent-child interaction videos, Mrs. Castillo spoke almost exclusively English with Camila, who did not speak any Spanish, with a few common Spanish words every so often (e.g., papi instead of daddy). Mrs. Castillo verbally confirmed that she viewed all coaching on GoReact. Baseline levels of the sPDR were initially decreasing, and then increased. The average number of problem behaviors reported for Camila during baseline was 5.00 (range: 2-11). Reported problem behavior continued to be variable after the intervention began, with only a very slight downward trend. Mrs. Castillo reported an average of 4.78 daily problem behaviors during the intervention, ranging from 0 to 10. Problem behavior remained high (10 behaviors reported) at two-week follow-up.

After the intervention, Mrs. Castillo's Caregiver Knowledge Quiz scores increased by 35.8 percentage points. Her PSOC scores increased by four points, with her post-intervention responses averaging 4.71 out of 5. She reported low levels of parenting stress before the intervention (range: 14<sup>th</sup>-62<sup>nd</sup> percentile) and post-intervention (range: 10<sup>th</sup>-48<sup>th</sup> percentile). Her Total Stress score decreased by 44%. The Difficult Child subscale score increased slightly from the 14<sup>th</sup> to 18<sup>th</sup> percentile, while all other scale scores decreased. At post-test, the Defensive Responding Scale score was significant. This could mean that Mrs. Castillo was detached from her role as a parent, and thus not feeling typical parenting stressors, or that she was generally handling parenting successfully with minimal stress.

Problem behavior as reported on the SDQ was in the slightly raised range prior to the intervention and decreased by 29% to be in the close to average range at post-test. Semi-structured parent-child observations revealed a slight increase in positive child behavior on the Child Behavior Scale and an increase in positive caregiver behavior on the Caregiver Behavior Scale. Mrs. Castillo generally reported being satisfied with the intervention. When asked whether the information presented was new to her, she selected "more or less agree;" Mrs. Castillo was the only parent to select a response less than "agree" or "strongly agree."

### **Domínguez Family**

Mrs. Domínguez spent on average 1 hr and 48 mins on Canvas per lesson. She completed each lesson in one week, reported logging into Canvas 2-3 times a week, watching the lesson videos twice a week, and utilizing the information from the lessons five days a week. Mrs. Domínguez spoke "Spanglish" with her son, primarily Spanish

syntax with English words mixed in. She also confirmed watching all coaching feedback. During the baseline phase, Mrs. Domínguez typically reported problem behavior on an increasing trend. There were three days where Mrs. Domínguez reported low levels of problem behavior; she disclosed that her son was sick during that time. On average, problem behavior during the baseline phase was 5.10 (range: 0-8). During the intervention phase, reported problem behaviors generally followed a decreasing trend, although there were some days where problem behavior was elevated above baseline levels. Reported problem behavior during the intervention phase was 4.92 (range: 0-15). If three outliers are removed, the average during the intervention is 3.83 (range: 0-8). Problem behavior remained low at the two-week follow-up.

Mrs. Domínguez's Caregiver Knowledge Quiz scores increased by 21.4 percentage points at post-intervention. Her PSOC score increased by two points, moving her average response on the Likert-scale to 4.14 out of 5.00. On the PSI-SF, Mrs. Domínguez reported decreases in parenting stress from pre-intervention (range: 62<sup>nd</sup>-80<sup>th</sup> percentile) to post-intervention (range: 46<sup>th</sup>-62<sup>nd</sup> percentile). Her Total Stress score had a modest decrease of 22%.

Before the intervention began, Mrs. Domínguez rated Diego's behavior in the high range for the SDQ Total Difficulties scale. Diego's Total Difficulties decreased by 50% and fell into the close to average range after the intervention. His behavior on the Child Behavior Scale improved, as did his mother's behavior according to the Caregiver Behavior Scale. Mrs. Domínguez reported general satisfaction with the intervention.

### **Interrater Reliability**

The first author coded all semi-structured pre-post observation videos using the *FIBRS: For Research and Clinical Evaluation* manual (Domenech Rodríguez et al., 2019). To assure accurate coding and obtain interrater reliability (IRR) ratings, the first and second authors both coded the first two videos, checking for initial Intraclass Correlation Coefficients (ICCs) and discussing code ratings to reach consensus. One video was only discussed for consensus, given the complexity of the interactions and developmental level of the child at the time. Once the ICCs reached a satisfactory level, the second author randomly coded two additional videos. We calculated ICCs for the Child and Caregiver scales separately. ICC for the first double-coded video was .675 (moderate) for the Child Scale and .857 (good) for the Caregiver Scale (Portney & Watkins, 2009). The second double-coded video had ICCs of .787 (good) for the Child Scale and .634 (moderate) for the Caregiver scale. In coding the second video, there was a specific section of the scale that was problematic for coding. When that sub-section was removed, ICC was .838 (good) for the Caregiver scale. The first randomly coded video had an ICC of .799 (good) for the Child scale and .857 (good) for the Caregiver scale. The second randomly coded video had an ICC of .951 (excellent) for the Child Scale and .803 (good) for the Caregiver sale. This coding method of initially discussing ratings and reaching consensus followed by random checks ensured reliable coding of observations. Coders were not blinded to treatment phase.

### **Satisfaction with Intervention**

Families generally reported high satisfaction with the *Padres Preparados Online* program. On statements of class satisfaction, 81% of responses were “completely agree,” 15% were “agree,” and only 4% of responses were “somewhat agree.” Mrs. Domínguez

stated that the class “taught me how to improve my son’s behavior and how to have a better relationship with him.” Mrs. Castillo reported liking “the motivation, the reminders, and the incentive to complete [the lessons.] Similarly, for satisfaction with the lesson videos that demonstrated key skills, parents responded “completely agree” 83% of the time, “agree” 15% of the time, and “somewhat agree” 2% of the time. Parents either agreed or completely agreed that text messages sent by the researcher helped them stay attentive and reminded them to complete the class. Two families somewhat agreed to the statement: “There were too many text messages.”

Parents rated all course components (in-person meetings, materials in Canvas, and videos) as “useful” or “very useful,” and they all rated the lesson video as the most useful component of the course. Mrs. Castillo said that “seeing examples of the parents before and after [trying the skill]” was her favorite part of the videos. Mrs. Bautista liked that the videos “gave us a graphic idea of the lesson.” Parents responded to positive statements about the coaching with “completely agree” or “agree.” Two mothers reported preferring audio coaching comments over video and text, while two did not have a preference. Mrs. Arroyo stated that she liked “how detailed [the coaching] was.” Mrs. Domínguez said her favorite part of the coaching was “how to learn to change my son’s behavior.” When asked what her favorite part of the coaching was, Mrs. Castillo responded, “the praise haha.” While the response to the program was overall positive, Familia Arroyo’s recommendations to improve the program were that the coaching would be “in person” and “if there were a group of parents and that we could go to a class in person, that way we could combine our questions.”

All families rated the combined Canvas and GoReact system using the SUS. Mrs. Bautista rated the system as average, while the other three caregivers rated the system as above average (a score above 68). When asked about their favorite parts of the Canvas system, Mrs. Castillo reported liking the ease of accessing Canvas and Mrs. Arroyo stated that she liked the availability of the information at all times. Mrs. Bautista stated that “a small course at the beginning showing how to use it would be very useful.” Regarding the GoReact system, Mrs. Castillo stated that her favorite part was the “automatic upload to receive feedback” and Mrs. Domínguez reported her favorite part being “to record the videos and know how to improve.” Mrs. Arroyo liked that she could always go back to view the video. To improve the GoReact system, Mrs. Castillo recommended fixing a bug with the audio that she experienced, and Mrs. Bautista stated that the upload time should be faster.

### **Discussion**

This pilot study of *Padres Preparados Online* resulted in valuable information to scale up the program as well as apparent immediate benefit to the participating families. We evaluated the program through daily child behavior reports, pre-post observation videos, pre-post self-report measures, and surveying parent satisfaction. While all daily reported child behavior followed a decreasing trend once the intervention began, treatment impact measured using the sPDR varied by family. The Arroyos and Bautistas generally reported stronger declines in the number of daily problem behaviors. The Domínguez family reported an increased range in the number of problem behaviors during the intervention than during baseline, although still with a decreasing trend. Camila’s daily reported behavior was highly variable both before and after the



intervention. When considering treatment dosage, Camila's relatively limited behavioral change on this measure compared to the other children is consistent with the relatively lower amount of time Mrs. Castillo spent on each lesson (at least half of the time other families spent). In addition, the Castillos were experiencing several contextual challenges such as uncertainty in their living situation and varying English/Spanish language ability within the family that may have impacted their response to treatment. Careful tracking of dosage and contextual factors may be important predictors of treatment outcomes. While the results on daily child behavior are somewhat mixed, all other study results reflect consistent positive treatment impact.

Self-report measures before and after the intervention evaluated treatment impact on variables such as parenting stress, parenting self-efficacy, parenting knowledge, and child behavior. All caregivers reported a reduction in parenting stress. While only Mrs. Arroyo rated stress in the above-average range pre-intervention, she and two other caregivers reported over 40% decreases in Total Stress. The remaining caregiver, Mrs. Domínguez reported a modest decrease in Total Stress. Her less dramatic decrease in stress may be related to the relatively higher levels of daily problem behavior she reported for her son. Mrs. Arroyo and Mrs. Bautista's average self-efficacy scores increased by one full point. Although Mrs. Castillo and Mrs. Domínguez's self-efficacy scores increased only slightly, their pre-intervention scores were higher than Mrs. Arroyo and Mrs. Bautista's to begin with, meaning they had less room to grow. Caregiver knowledge scores increased from the 64<sup>th</sup> percentile or lower before the intervention to 79<sup>th</sup> percentile or higher after the intervention. Lastly, reported difficult behavior for all children decreased from the slightly raised banding range to the close to average range.

Behavioral observations before and after the intervention assessed for change in child and parent behavior. Child behavior remained relatively unchanged in the semi-structured observations. The exception was for Diego, whose Child Behavior Scale score increased by 25.8%. Interestingly, the parents who reported the most variable child behavior on the sPDR (Mrs. Castillo and Mrs. Domínguez) were observed to have relatively larger improvements in caregiver behavior (14.2 and 16.8 percent increase, respectively).

Parent satisfaction was high for all components of the intervention. Across qualitative and quantitative items, caregivers consistently expressed their satisfaction with the material, their interactions with the coach (first author), and the technology systems. Despite some technology glitches, caregivers rated Canvas and GoReact as an average or above average system. When asked what else they might like added to the program, parents requested topics that in fact are covered in the full version of *Padres Preparados*, indicating that the entire program would have been a good fit for these families. The *Padres Preparados*, and more broadly, GenerationPMTO instruction method aligns with research on effective behavior model training, and the components of the program parents selected as preferred were consistent with components that research findings identify as most effective (Taylor, Russ-Eft, & Chan, 2005). One family did report wanting a group component in the course; even though Mrs. Bautista had some of the clearest positive treatment effects and stated, “I liked the material a lot,” it seems that she would have preferred an in-person format.

As clinicians and researchers, coaching parents asynchronously after they accessed intervention materials on their own was an exciting opportunity. Parents

recorded a parent-child interaction video after each self-paced lesson. The advantage of this structure was the parents had 15 mins dedicated to practicing what they had just learned. Getting caregivers to implement what they learn in therapy is often one of the largest challenges as a clinician (Allen & Warzak, 2013; Jensen, Blumberg, & Browning, 2018); it was beautiful to watch parents put their new knowledge into practice *with* their child in the home environment. Furthermore, we were able to highlight strengths and correct errors as we saw them, all on a platform that parents could readily access whenever they wanted.

These combined findings seem to support the efficacy of *Padres Preparados Online* as an intervention on child behavior, parent skills, and parent wellbeing. Results consistently demonstrated change in the desired direction and there was strong ecological and social validity. Although behavior change was larger for some variables and smaller for others, we see these findings as very promising given that we only included the first three modules of *Padres Preparados*. Furthermore, this pilot study of *Padres Preparados Online* introduced exclusively positive parenting skills. While positive parenting skills are essential for an effective parenting program, a combination of positive parenting skills with skills for directly addressing problematic behavior (e.g., discipline) is most powerful (Patterson & Fisher, 2002). Participants benefitted from the intervention despite being a sub-clinical population. Programs such as *Padres Preparados* could be considered for prevention in addition to clinical treatment.

### **Social Justice Relevance**

Programs like *Padres Preparados Online* are valuable from social justice and public health perspectives. Access to acceptable and evidence-based psychological

treatment is not equitable. In addition to the dearth of treatments either developed or culturally adapted for diverse ethnic and cultural groups, other factors such as location, work schedules, transportation, and time are all factors that may make attending traditional psychological treatment difficult, if not impossible (Middlemiss, 1996; Prinz & Miller, 1996). Research on technology-based interventions has increased substantially, and the implications are noteworthy for the ease of access and possible cost savings that technology provides. By increasing access and reducing costs, technology has the potential to reduce mental health disparities for the families that are most likely to experience barriers to treatment. While the majority of the population may be capable of attending traditional treatment, technology-based interventions provide options for those who might traditionally “fall through the cracks.” There are currently very few technology-based parenting interventions that are culturally adapted (Corralejo & Domenech Rodríguez, 2018). Latinxs fare well *relative* to other ethnocultural groups in terms of the availability and effectiveness of culturally adapted treatments (Soto et al., 2018) and indeed recent research shows that Latinx adults may be utilizing mental health treatment at similar levels to other groups (Hines, Cooper, & Shi, 2017). However, there continues to be much room for improvement in extending the use of technology in delivering services, the access to services for Latinx children and families (compared to adults), and treatment acceptability for parenting interventions (Calzada, Basil, & Fernandez, 2012).

*Padres Preparados* includes additional social justice elements in that the intervention is tailored to Spanish-speaking families. Especially in areas where Spanish-speaking therapists may not be available or are in high-demand, flexible treatment

options that consider the client's culture and are presented in the client's native language are valuable. In our study, three of the four families spoke primarily Spanish to their children; these caregivers were able to learn concepts and view examples in the same language that they would use to apply the skills. The other caregiver was able to flexibly engage with language during the intervention. She chose to answer online discussion questions in Spanish, but record practice videos and receive coaching in English. With two-thirds to three-fourths of Latinxs speaking Spanish or English and Spanish in the home (Flores, López, & Radford, 2017; Krogstad, Stepler, & Hugo Lopez, 2015), interventions like *Padres Preparados* that are available in Spanish as well as linguistically flexible make a valuable contribution to the field.

Flexibility with time was another key advantage in this study. Our caregivers juggled parenting while working night shifts, running businesses from their homes, attending school, and functionally single-parenting while their partner worked nights. Several of the caregivers often responded to text messages or completed course lessons in the middle of the night when traditional services are not available. Caregivers also had flexibility in the amount of time they took to complete each lesson. Some parents chose to complete the lesson the same day they were given access, while others took several weeks to complete one lesson. *Padres Preparados Online*, with its self-paced content and asynchronous coaching, allowed for complete compatibility with schedules of all types. With no set meeting times, this intervention provided a flexibility that not even telehealth programs typically accomplish.

### **Limitations**

As with any study, there are limitations that should be considered when interpreting these results and considering future research. In terms of study design, the sPDR may have not been the most sensitive to behavior change, particularly as this intervention only taught positive parenting practices. One caregiver even recommended that more items be added to the sPDR in her feedback, suggesting that she felt there were behaviors she would have liked to endorse that were not on the sPDR. The research team felt that frequency and intensity, as opposed to a simple count of types of problem behaviors, would have been valuable information in this study. We also did not measure how much time a caregiver was with their child on a given day, which could have affected response values. Recording how many hours the caregiver spent with their child may have been useful for analysis. Future studies might consider having caregivers select a set number of target behaviors at the beginning of treatment and rate the frequency and duration (when applicable) of those behaviors throughout the study. Fortunately, we assessed treatment impact with other measures as well (e.g., SDQ, behavioral observations), providing a well-rounded picture of efficacy.

The behavioral observations also had some limitations. Because the activities in the observations were enjoyable and this was a generally a non-clinical population, we did not observe many difficult problem behaviors. This meant that child scores were high overall and caregivers did not have as many opportunities to practice some of their parenting skills. However, the fact that observations took place in the home did provide more naturalistic opportunities for children to be distracted with toys or desire to change the course of the interaction for their familiarity with the environment, providing some useful variability in the child's behavior.

While communicating lesson deadlines, video assignments, and sPDR reminders via text message were convenient, two of the caregivers regularly did not respond and required several prompts before they completed required intervention content (e.g., complete lessons, record videos, and view coaching feedback). The researcher took care to balance respecting participant time and providing structure and encouragement. This level of attention is likely not practical in most clinical contexts, begging the feasibility question of whether some of the caregivers would have completed the intervention with less structure. Providing parents with the flexibility to complete the intervention at their own pace was a major advantage of the study, therefore, we see finding a practical way to keep caregivers on-track as essential.

A common setback throughout the intervention was technological difficulties. Some of these difficulties were human error, while others were unknown system errors. On several occasions, parents could not view lesson content that they were supposed to have access to. This was always resolved quickly through a text message to the first author and consultation with IT support as needed, nevertheless such problems add a barrier to completing lessons and took time on both the caregiver and researcher's part. Despite a full in-person introduction to Canvas and GoReact prior to the intervention, some caregivers required additional instruction for how to upload a video, what various icons meant, or where to write answers to discussion questions. This might have been resolved with the addition of an instructional video that parents could refer to at any time. There were also difficulties with video uploads. Two caregivers had to re-record a video because the audio in their original videos did not work. Another caregiver, who unlike other caregivers was uploading videos from her phone, experienced extremely slow

upload speeds, sometimes encountering several upload errors before her upload would successfully complete. It is unclear exactly how these technological difficulties may have impacted treatment outcomes; however, we suspect that fewer errors would have resulted in a much higher rating on the SUS.

While providing coaching for parent-child interactions recorded at home had many advantages, the asynchronous coaching felt more time-consuming and effortful than in a traditional therapy context. Although coaching felt more effortful, the time spent was likely still similar to or less than the time spent in face-to-face therapy because the therapist was not delivering the intervention content. The benefit of observing and coaching parents practicing the intervention skills in their home environment may outweigh this limitation.

Another limitation of asynchronous coaching was the delay between a caregiver uploading a video and viewing the content. Parents typically received coaching on their videos within a week of uploading, however they often did not view the feedback for several weeks. This paired with self-recorded videos being ranked low on the list of useful program components on the satisfaction survey suggests that the coaching was either (a) not valuable to the parents, or (b) too effortful to obtain. Regardless, the researchers viewed the parent-child interactions and coaching as a valuable and impactful component of the intervention. Future studies should assess the differential impact of coaching compared to completely self-guided online interventions as well as ways to increase the appeal of technology-based coaching.

### **Future Directions**



Testing the transformation of a culturally adapted, group-format treatment to a technology-based, self-guided intervention with asynchronous coaching answered many questions and yielded many more. After broadly positive results of the *Padres Preparados Online* pilot study, the next logical step is to assess the impact of the complete intervention and others similar to it. In a large-scale study, researchers might also be able to assess many more family variables that may predict increased likelihood of success with an online treatment.

The researchers in this study utilized technology systems already available to them through their institution. This was beneficial in terms of cost, time saved, and system maintenance (i.e., app and website updates and improvement), but difficult in terms of content creation, confidentiality, and interface language (i.e., icons and troubleshooting tips were in English). Future research should consider the pros and cons of developing one's own platform versus utilizing existing platforms that may not be as customized as would be preferred. Relatedly, cost-benefit analyses of technology-based interventions on a large scale should be conducted. Due to the relative newness of technology-based interventions, little is known about the cost-benefit ratio of the approach (Corralejo & Domenech Rodríguez, 2018). In order for technology-based interventions to be accepted by clients, clinicians, and insurance providers alike, we need to first demonstrate that they are at least as cost-effective as traditional therapy. As stated earlier, coaching feedback did not appear to be extremely valuable to participants; researchers should assess various formats of coaching as well as interventions without a coaching component. Finally, programs that include online support groups or forums

should be compared with those that are completely individualized to determine efficacy and predictors of success in each group.

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Table 1

*Comparison of Padres Preparados and Padres Preparados Online*

Component	<i>Padres Preparados</i>	<i>Padres Preparados Online</i>
Format	Group	Individual
Number of Lessons	Eight	Three
Location	Head Starts/Preschools	Online
Lesson duration	1.5 hrs	Flexible, about 2 hrs
Progress Monitoring	Mid-week call	Caregiver Knowledge Quiz
Coaching	Mid-week call and in-person group	Asynchronous virtual
Language	Bilingual manual, flexible in group	Spanish content, flexible in coaching

Table 2

*Self-report Scores Before and After the Intervention*

Family	Measure	Pre- Intervention	Post- Intervention
Arroyo	PSOC-SF (Average Response)	19 (2.71)	26 (3.71)
	SDQ (%ile)	14 (90.0)	9 (71.8)
	Caregiver Knowledge % Correct	42.9	92.9
	PSI-SF %ile - Total Stress	82	36
	Parental Distress	≥ 99*	54
	Parent-Child Dysfunctional		
	Interaction	58	24
	Difficult Child	78	40
Bautista	PSOC-SF (Average Response)	20 (2.86)	29 (4.14)
	SDQ	15 (91.7)	8 (65.3)
	Knowledge	50	78.6
	PSI-SF %ile - Total Stress	56	28
	Parental Distress	36	26
	Parent-Child Dysfunctional		
	Interaction	50	32
	Difficult Child	70	65
Castillo	PSOC-SF (Average Response)	29 (4.14)	33 (4.71)
	SDQ (%ile)	14 (90.0)	10 (76.9)
	Knowledge	57.1	92.9
	PSI-SF %ile - Total Stress	32	18
	Parental Distress	32	10
	Parent-Child Dysfunctional		
	Interaction	62	48
	Difficult Child	14	18
Domínguez	PSOC-SF (Average Response)	27 (3.86)	29 (4.14)
	SDQ (%ile)	16 (93.7)	8 (65.3)
	Knowledge	64.3	85.7
	PSI-SF %ile - Total Stress	72	56
	Parental Distress	62	46
	Parent-Child Dysfunctional		
	Interaction	70	62
	Difficult Child	80	58

\*Score is in the clinical range.

Table 3

*Parent and Child Behavior Observation (FIBRS) Scores*

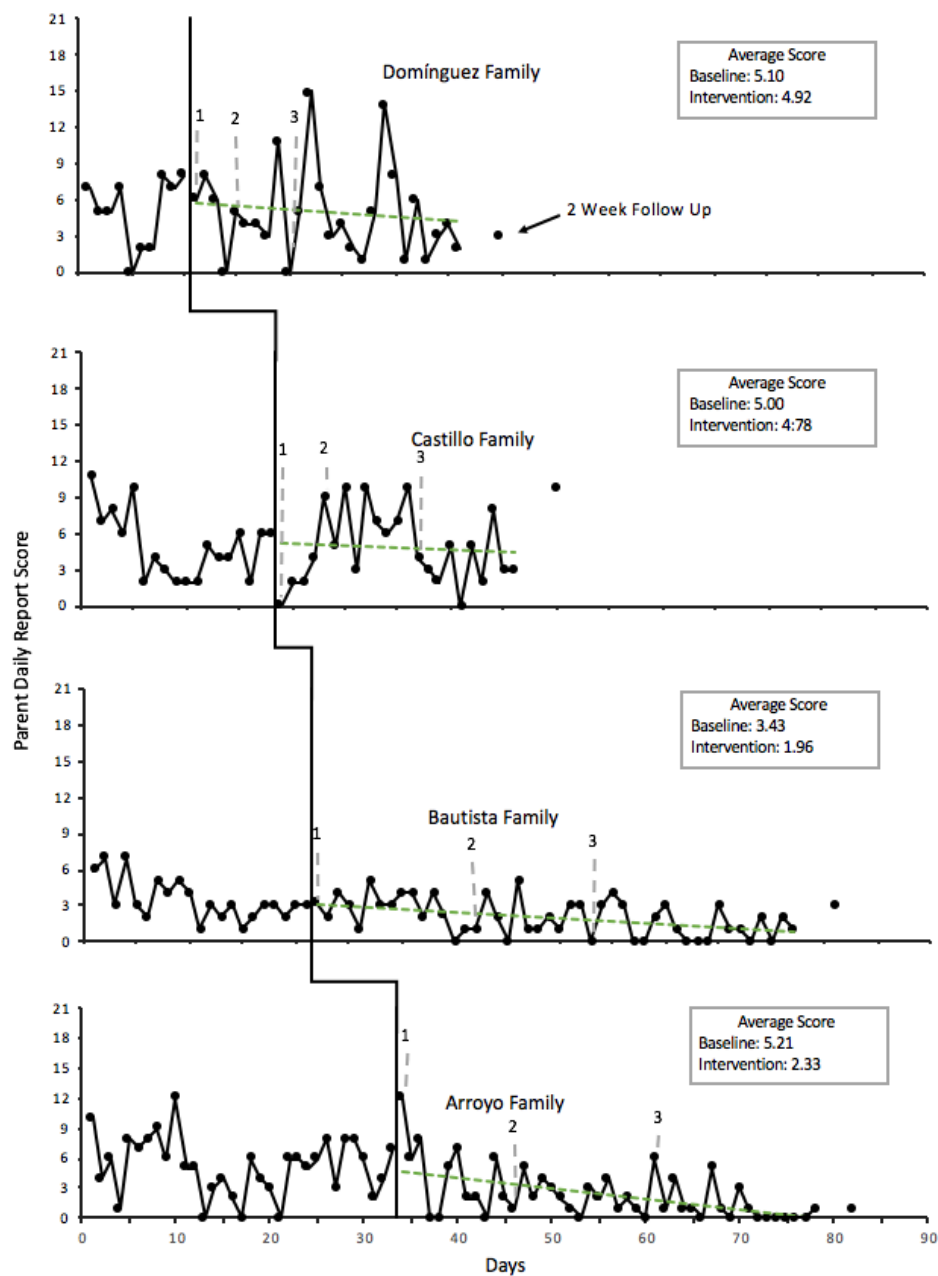
Family	Measure	Pre- Intervention	Post- Intervention	Potential Range
Arroyo	Child Behavior Scale (average)	89 (4.45)	91 (4.55)	20-100
	Caregiver Behavior Scale (average)	146 (4.56)	138 (4.31)	32-160
	Skills Encouragement	39 (4.33)	42 (4.67)	9-45
	Positive Involvement	30 (5)	28 (4.67)	6-30
	Communication	26 (4.33)	21 (3.5)	6-30
	Problem Solving	23 (4.6)	19 (3.8)	5-25
	Discipline	28 (4.67)	28 (4.67)	6-30
Bautista	Child Behavior Scale (average)	94 (4.7)	95 (4.75)	20-100
	Caregiver Behavior Scale (average)	137 (4.28)	139 (4.34)	32-160
	Skills Encouragement	36 (4)	39 (4.33)	9-45
	Positive Involvement	26 (4.33)	25 (4.17)	6-30
	Communication	28 (4.67)	24 (4)	6-30
	Problem Solving	17 (3.4)	21 (4.2)	5-25
	Discipline	30 (5)	30 (5)	6-30
Castillo	Child Behavior Scale	77 (3.85)	80 (4)	20-100
	Caregiver Behavior Scale	127 (3.97)	145 (4.53)	32-160
	Skills Encouragement	33 (3.67)	36 (4)	9-45
	Positive Involvement	23 (3.83)	30 (5)	6-30
	Communication	23 (3.83)	28 (4.67)	6-30
	Problem Solving	18 (3.6)	23 (4.6)	5-25
	Discipline	30 (5)	28 (4.67)	6-30
Domínguez	Child Behavior Scale	62 (3.1)	78 (3.9)	20-100
	Caregiver Behavior Scale	95 (2.97)	111 (3.47)	32-160
	Skills Encouragement	30 (3.33)	30 (3.33)	9-45
	Positive Involvement	16 (2.67)	17 (2.83)	6-30
	Communication	19 (3.17)	17 (2.83)	6-30
	Problem Solving	8 (1.6)	18 (3.6)	5-25
	Discipline	22 (3.67)	29 (4.83)	6-30

Table 4

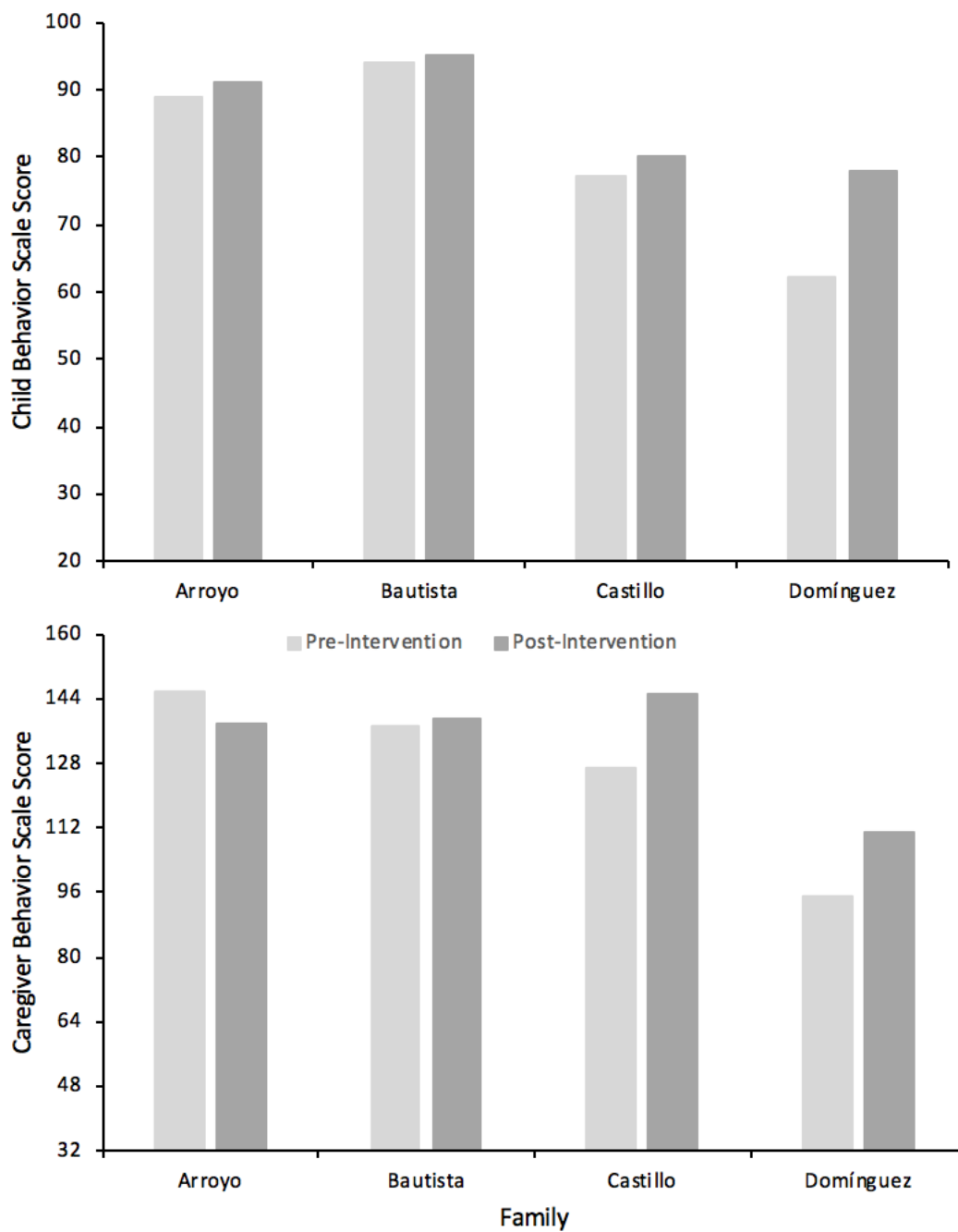
*Parent Goals and Self-Rated Progress*

Family	Meta	Progress Rating (0-10)	Reflection
Arroyo	Help [my son] to control his anger when he does not understand what is asked of him.	7	I still have a lot to practice and learn but I think I am on the right path.
	Help my son to know the difference between play and duty.	5	My son now understands the difference between play and duty, but still sometimes does not want to fulfill his duties on his own.
	Have a united front with my husband.	3	We have the same goals but I feel like his work schedule does not allow me to teach him everything that I have learned and he is almost always very stressed.
Bautista	Learn new ways or techniques to educate my kids.	10	I feel that having practiced, the different techniques, has helped me, thanks to that I have been able to achieve my goal.
	Realize if we are, within the average parents in terms of raising our children, and how to improve.	9	Completing this program has showed me that we were moderately prepared to parent our children, and we obtained more tools to continue improving.
Castillo	Work on household chores together in a team.	4	We have not yet been able to have her help us in the house. I haven't applied the teachings in this area yet.
	That she do something the first time that I ask her to do it.	6	The class helped me to know how to ask the children so that they do things the first time.
	That she pick up her toys.	6	They clean up better when I ask them how the class says to.
	That she is more understanding with her younger brother.	5	They should still try to be more understanding with their brother.
Domínguez	How to better control my son.	8	I understand better now that I praise him more.
	How we could, as a family, help [my son] to be a better child.	7	We now know how to get [our son's] attention.
	How we can better respond in the situations when our son does not behave.	8	We are more patient with him, and if we get his attention he listens better and understands.

*Note.* Responses were originally in Spanish and translated to English for this table.



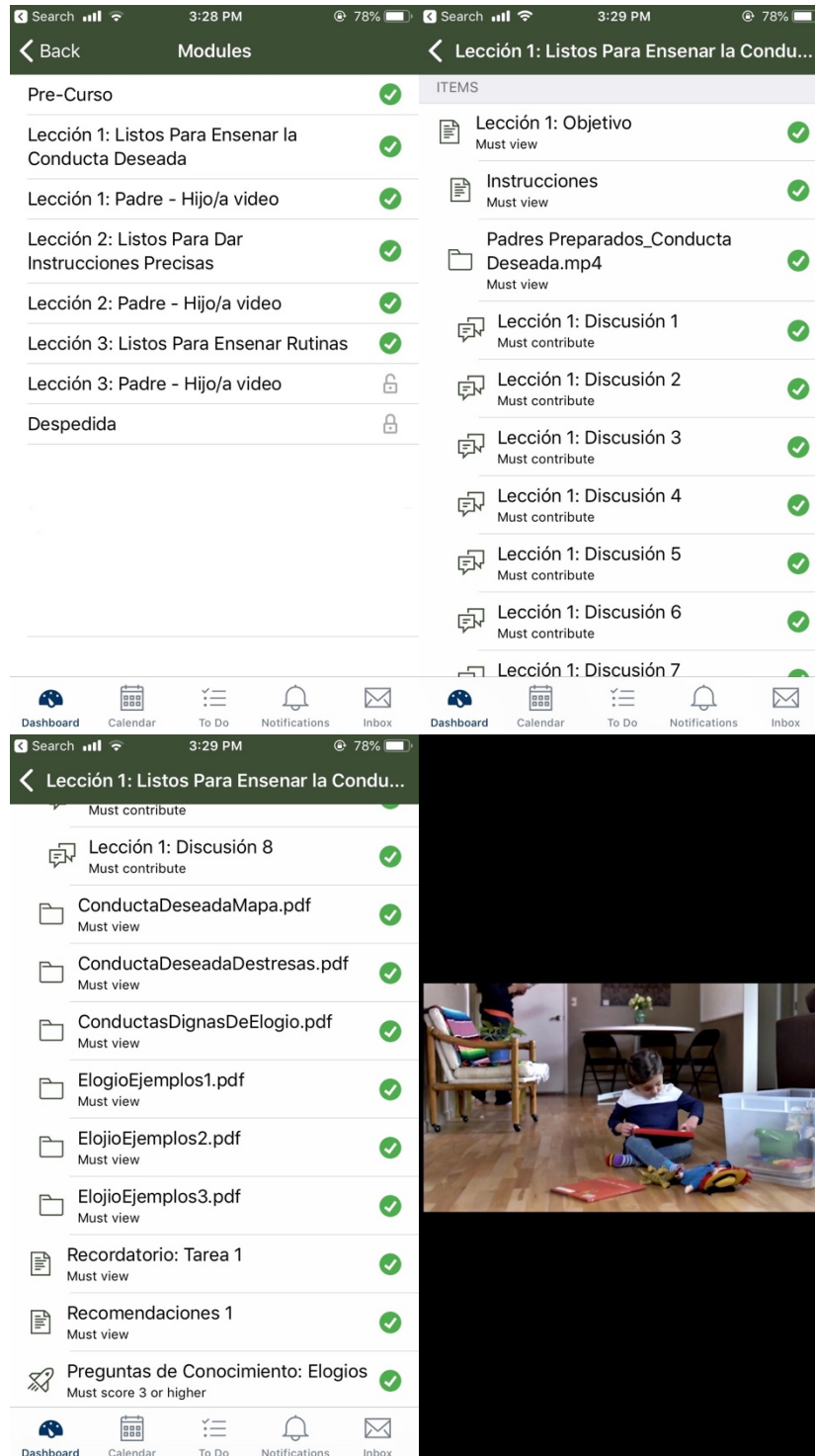
*Figure 1.* Parent Daily Report scores for each family during baseline, intervention, and follow-up. Higher scores indicate more problem behaviors reported. The start of each lesson is marked with the lesson number.



*Figure 2.* Child and caregiver behavior coded from semi-structured parent-child interactions using the FIBRS. Higher scores represent more positive behavior.

## Appendix

### Canvas App View of Program Overview and Lesson 1



## CHAPTER IV

### GENERAL SUMMARY AND CONCLUSIONS

A detailed systematic review and a pilot study of a technology-based intervention provide strong evidence for the utility and efficacy of technology as a delivery tool for evidence-based parenting practices. The systematic review revealed several studies with small to large effect sizes for parent and child variables pointing to the promise of technology-based programs in addressing gaps in mental health services provision. We also learned about common approaches, barriers, and gaps in the literature.

One of the most glaring topics in need of research was technology-based interventions developed specifically for traditionally underserved ethnic groups. In our experimental pilot study, we addressed this gap by assessing the effect of an intervention developed specifically for Spanish-speaking Latinx families: *Padres Preparados Online*. *Padres Preparados Online* is an app and website-based intervention created by transforming the material from a GenerationPMTO group-format manual (*Padres Preparados*; Domenech Rodríguez & Iris Educational Media, 2016). We maintained a common element of traditional and technology-based parenting interventions, therapist coaching, using parent-uploaded videos and asynchronous text, audio, and video feedback.

In this pilot study, we learned that *Padres Preparados Online* had a generally positive impact on child behavior as well as caregiver knowledge, stress, self-efficacy, and behavior. The amount of treatment impact varied by family and variable, providing important questions for future research to address. Semi-structured behavioral observations detected no change for all but one child, who had some improvement, and



modest improvement for two caregivers. Importantly, participants rated the intervention and systems used as acceptable, although parents and researchers alike identified areas for improvement. Overall, there is strong evidence to support technology-based parenting interventions, and we anticipate that this is only the beginning for technology and psychological interventions. These interventions have great potential to reduce barriers to treatment and ultimately health disparities, making continued assessment of culturally sensitive and adapted treatments critical.

### **The Impact of Technology**

Technology is clearly trending in psychological science at the moment. From special issues like “Technology and Mental Health (Comer, 2015) to conference themes on “Cognitive Behavioral Science, Treatment, and Technology”

(<http://www.abct.org/conv2018/>), technology is a major focus. Not surprisingly, many other fields have begun to integrate technology into their interventions and study its effects. A Google Scholar search of “technology based interventions review” yields at least 10 systematic reviews in fields varying from primary care (Ramsey, Satterfield, Gerke, & Proctor, 2019) to nutrition and physiotherapy (Kiss, Baguley, Ball, Daly, Fraser, Granger, & Ugalde, 2019; Law, Neihart, & Dutt, 2018).

Although research in this area is growing, many questions remain regarding the promise and impact of technology based interventions. Are technology-based interventions cost-effective when considering the costs of system usage and maintenance? Will insurance companies approve the use of technology-based interventions, and what will they require in order to grant approval? What formats (e.g.,

group, individual, self-guided, coached) are most effective and preferred? Who is most likely to benefit from these types of interventions?

Moreover, as technology evolves, so will the interventions and services delivery. Our systematic review conducted just three years ago provides a perfect example of this. At the time of the review, none of the included studies used app-based interfaces. Three years later, we tested an intervention that was flexibly available both via an app or website, and others have started to do the same (Breitenstein, Fogg, Ocampo, Acosta, & Gross, 2016). Interestingly, the future of app-based parent training interventions was predicted in 2010 by Jones and colleagues in an article titled “Behavioral Parent Training: Is There an “App” for That?” (Jones, Forehand, McKee, Cuellar, & Kincaid, 2010).

### **The Impact of Cultural Adaptation**

The United States continues to diversify and be a place where immigrants seek refuge and better lives (Lin, Stamm, & Christidis, 2018; Radford, 2019). We have evidence of mental health disparities for people belong to a variety of ethnic groups (American Psychiatric Association, 2017), *and* we have evidence for the efficacy of culturally adapted interventions (Soto, Smith, Griner, Domenech Rodríguez, & Bernal, 2018). There is evidence that some groups, such as Asians and Blacks, underutilize mental health services (Hines, Cooper, & Shi, 2017), while other groups may not find traditional Western treatments acceptable (Calzada et al., 2012). *Padres Preparados* and *Padres Preparados Online* are examples of interventions that marry traditional, Western behavioral principles with surface level adaptations (e.g., language, actors and images)

with deep adaptations (e.g., values systems and cultural norms; Bernal & Domenech Rodríguez, 2012).

### **The Future is Technology and Cultural Adaptation**

The field of psychology is uniquely positioned in this moment, with research demonstrating both evident need for services and innovative new tools for treatment delivery. Effective treatments exist for a vast number of presenting problems (David, Lynn, & Montgomery, 2018), culturally adapted treatments exist and have research support (Soto et al., 2018), and technology-based interventions have quickly accumulating evidence for a wide variety of applications (Corralejo & Domenech Rodríguez, 2018; Kiss et al., 2019; Law et al., 2018). Sourander and colleagues (2016) have already had success merging culturally adapted parenting interventions and technology in Finland. The potential is great, and the research front is wide open. In addition, technology use among Americans has never been higher. In 2019, 90% of Americans reported using the internet and 81% of Americans reported owning a smartphone (Pew Research Center, 2019a, 2019b). With only 12% of licensed psychologists working in health service identifying as racial or ethnic minorities and over a third of the U.S. population identifying as such (Lin et al., 2018), technology-based interventions provide a way to widen the impact of diverse psychologists, especially those that are multilingual. Of course, the structure and community knowledge exist such that any culturally competent psychologist could pursue this work.

### **Where Do We Fit In?**

As clinicians and researchers, allowing technology to do the work that we have done for years introduces some interesting theoretical and perhaps existential questions.

Is it possible that traditional in-person therapeutic exchanges will be all but non-existent? We doubt that this will be the case, especially for more severe presenting problems (Newman, Szkodny, Llera, Przeworski, 2011). Furthermore, as social beings we generally look for ways to connect with others. The use of technology in some element of all clinical practice and research, however, is extremely likely. Technology has already been integrated into practice in auxiliary ways such as treatment notes and outcome monitoring, and has the potential to be an outside aid for tasks such as self-monitoring, homework tracking, and check-ins (Berrouiguet, Gravey, Le Galudec, Alavi, & Walter, 2014; Clough & Casey, 2011; Reger et al., 2013; Yager, 2001). But what about the interventions that do eliminate or all-but-eliminate the therapist? The contextual model of common factors theory describes “The Real Relationship” as one of the key pathways to benefitting from psychotherapy (Wampold, 2015). Other important therapist contributions include alliance and empathy. Can a technology-based intervention replace or compensate for the absence of a therapist? Several systematic reviews might suggest that they can. Perhaps the form of social connection is simply shifting to a technology platform, rather than being eliminated. For now, the field of psychology is tasked with learning more about how and when technology-based interventions are effective and how to use them in conjunction with cultural adaptation to produce lasting change.

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- depression: Is human contact necessary for therapeutic efficacy? *Clinical Psychology Review*, 31, 89-103. <https://doi.org/10.1016/j.cpr.2010.09.008>
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disruptive behavior in 4-year-old children: A randomized clinical trial. *JAMA Psychiatry*, 73, 378-387. <https://doi.org/10.1001/jamapsychiatry.2015.3411>

Wampold, B. E. (2015). How important are the common factors in psychotherapy? An update. *World Psychiatry*, 14, 270-277. <https://doi.org/10.1002/wps.20238>

Yager, J. (2001). E-mail as a therapeutic adjunct in the outpatient treatment of anorexia nervosa: Illustrative case material and discussion of the issues. *International Journal of Eating Disorders*, 29, 125-138. [https://doi.org/10.1002/1098-108X\(200103\)29:2<125::AID-EAT1002>3.0.CO;2-S](https://doi.org/10.1002/1098-108X(200103)29:2<125::AID-EAT1002>3.0.CO;2-S)



## CURRICULUM VITAE

SAMANTHA CORRALEJO

**Education**

*Utah State University* *Logan, UT* *2015 - present*

Ph.D. in Combined Clinical/Counseling/School Psychology

Advisor: Melanie M. Domenech Rodríguez, Ph.D.

Dissertation: Technology in Parenting Programs: A Systematic Review and Pilot Study of an App-based intervention for Latinx Families

*University of the Pacific* *Stockton, CA* *2013 - 2015*

M.A. in Psychology

Advisor: Scott Jensen, Ph.D.

Thesis: Time-out for Sibling Aggression: An Analysis of Effective Durations for Typically Developing Children in a Natural setting

*Westmont College* *Santa Barbara, CA* *2007 - 2011*

Bachelor of Arts in Psychology

Advisor: Brenda Smith, Ph.D.

Senior thesis: Can You Repeat That? Factors That Affect Recall in a Fast-paced Lecture

*University of Barcelona* *Barcelona, Spain* *Spring 2010*

Semester Abroad – Spanish Immersion

**Research Experience****Positions**

*Institutional Review Board* *2017 - Present*

Utah State University, Graduate Assistant

Improve the quality and efficiency of IRB processes, policies, and procedures for researchers and reviewers.

Review protocols as an alternate Institutional Review Board member.

## **Grants / Fellowships**

### **Funded**

<i>Presidential Doctoral Research Fellow</i>	2015-
<i>Present</i>	
Utah State University, \$20,000 annually	
<i>Borg Scholarship and Research Productivity Award</i>	2018 -
2019	
Utah State University, \$3,500	
<i>Lawson Fellow</i>	2017-
2018	
Utah State University, \$5,000	
<i>Kranz Professional Development Funds</i>	2015-
<i>Present</i>	
Utah State University, \$350 annually	
<i>Psychology Department Travel Award</i>	2015,
2016	
Utah State University, \$300	
<i>School of Graduate Studies Travel Award</i>	2015,
2018	
Utah State University, \$300	

## **Peer Reviewed Publications**

- Call, A., Domenech Rodríguez, M. M., Vazquez, A., & **Corralejo, S. M.** (2018). Predicting participation in Dual Language Immersion using theory of planned behavior. *Bilingual Research Journal*.  
<http://dx.doi.org/10.1080/15235882.2018.1425935>
- Corralejo, S. M.**, & Domenech Rodríguez, M. M. (2018). Technology in parenting programs: A systematic review of existing interventions. *Journal of Child and Family Studies*. <http://dx.doi.org/dist.lib.usu.edu/10.1007/s10826-018-1117-1>
- Corralejo, S. M.**, Jensen, S. A., & Mitchell, A. D. (2018). Time-out for sibling aggression: An analysis of effective durations in a natural setting. *Child and Family Behavior Therapy*. <http://dx.doi.org/10.1080/07317107.2018.1487701>
- Domenech Rodríguez, M. M., Caraway, N., Marquez, J., Concepción, R., Pennefeather, J., Vincent, C., **Corralejo, S. M.**, & Rosario Colón, J. (under review). *Padres Preparados: A tech-savvy culturally adapted parenting program for parents of preschool children*.
- Corralejo, S. M.**, Jensen, S. A., Mitchell, A. D., & Ward, L. E. (2018). Parameters of time-out: Research update and comparison to parenting programs, books, and online recommendations. *Behavior Therapy*, 49, 99-112.  
<https://doi.org/10.1016/j.beth.2017.09.005>

- Domenech Rodríguez, M. M., **Corralejo, S. M.**, Vouvalis, N., & Mirly, A. K. (2017). Institutional Review Board: Ally not adversary. *Psi Chi Journal of Psychological Research*, 22, 76-84. <https://doi.org/10.24839/2325-7342.JN22.2.76>
- Jensen, S. A., & **Corralejo, S. M.** (2016). Large effect sizes do not mean most people get better: Clinical significance and the importance of individual results. *Child and Adolescent Mental Health*, 22, 163-166. doi:10.1111/camh.12203

### **Non-Peer Reviewed Publications**

- Domenech Rodríguez, M. M., Papa, L. A., Reveles, A. K., & **Corralejo, S. M.** (2017). *Advancing civility in middle schools*. Utah State University: Logan, UT. Retrieved from [osf.io/mcn89](https://osf.io/mcn89)
- Domenech Rodríguez, M. M., Papa, L. A., Reveles, A. K., & **Corralejo, S. M.** (2016). *Advancing civility in elementary schools*. Utah State University: Logan, UT. Retrieved from [osf.io/z7ua8](https://osf.io/z7ua8)
- Corralejo, S. M. (2017, May 31). Understanding your child's problem behavior [Invited blog post from Help Me Grow Utah]. Retrieved from <http://helpmegrowutah.blogspot.com/2017/05/guest-post-understanding-your-childs.html#more>

### **Conference Presentations**

- Corralejo, S. M.**, González Vera, J., & Domenech Rodríguez, M. M. (2019, October). *The feasibility of Padres Preparados Online: Teaching positive parenting skills with technology*. Poster session submitted for the annual conference of the National Latinx Psychological Association, Miami, FL.
- Corralejo, S. M.**, Domenech Rodríguez, M. M. (2018, November). *The Parent (Tr)APP: Engaging Latinx Parents Through App-based Skills Training and Online Video Coaching*. Paper presented at the meeting of the Association for Behavioral and Cognitive Therapies, Washington, D.C.
- Corralejo, S. M.**, Domenech Rodríguez, M. M., Papa, L. A., & Vazquez, A. L. (2018, October). *A new look at discipline in Puerto Rican families*. Poster session presented at the biennial conference of the National Latina/o Psychological Association, La Jolla, CA.
- Greathouse, A. D., Vo, J., **Corralejo, S. M.**, & Jensen, S. A. (2016, October). Suggestibility of preference in children. Poster session presented at the meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.
- Corralejo, S. M.**, & Domenech Rodríguez, M. M. (2016, October). *Technology in parenting programs: A meta-analysis of existing interventions*. Poster session presented at the meeting of the National Latina/o Psychological Association, Orlando, FL.
- Corralejo, S. M.** (2016, October). The impact of researcher presence during direct observation. In S. A. Jensen (Chair), *Obstacles and Opportunities in Observations*

- of Parenting Skills (OOPS!)*. Symposium conducted at the meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.
- Shea, K. A., **Corralejo, S. M.**, Lee, J. T., & Sellers, T. P. (2016, April). *Role of home language when conducting a functional analysis of problem behavior*. Poster session presented at the Utah State University Student Research Symposium, Logan, UT.
- Corralejo, S. M.**, Jensen, S. A., & Mitchell, A. D. (2016, February). *Time-out for sibling aggression: An analysis of effective durations in a natural setting*. Poster session presented at the meeting of the California Association for Applied Behavior Analysis, Santa Clara, CA.
- Ward, L. E., Mitchell, A. D., **Corralejo, S. M.**, & Jensen, S. A. (2015, November). *Evaluating structured feedback and didactic instruction methods for behavioral parent training*. Poster session presented at the meeting of the Association for Behavioral and Cognitive Therapies, Chicago, IL.
- Mitchell, A. D., **Corralejo, S. M.**, & Jensen, S. A. (2015, November). *Evaluation of popular book's time-out procedures related to previous research*. Poster session presented at the meeting of the Association for Behavioral and Cognitive Therapies, Chicago, IL.
- Corralejo, S. M.**, Mitchell, A. D., Ward, L. E., & Jensen, S. A. (2015, May). *Comparing teaching approaches: Evaluating role-play and didactic instruction methods for behavioral parent training*. Poster session presented at the meeting of the Western Psychological Association, Las Vegas, NV.
- Corralejo, S. M.**, Meyer, K., & Jensen, S. A. (2015, May). *Are you an expert on timeout? What the research says versus what parents say*. Poster session presented at the meeting of the Western Psychological Association, Las Vegas, NV.
- Ward, L. E., **Corralejo, S. M.**, & Jensen, S. A. (2014, November). *Investigation of the eight parameters of time out in popular parent training websites*. Poster session presented at the meeting of the Association for Behavioral and Cognitive Therapies, Philadelphia, PA.
- Nighbor, T., **Corralejo, S. M.**, & Myers, M. (2014, April). *Assessment of parental report of differentially attending to child's behavior following an instructional-based parent training class*. Poster session presented at the meeting of the Western Psychological Association, Portland, OR.
- Mitchell, A. D., **Corralejo, S. M.**, & Jensen, S. A. (2014, April). *Evaluation of popular books and their time-out procedures as they relate to time-out research*. Poster session presented at the meeting of the Association for Behavioral and Cognitive Therapies, Philadelphia, PA.
- Jensen, S. A., **Corralejo, S. M.**, & Meyer, K. (2014, April). *Variability of individual outcomes in BPT masked by group analysis*. Poster session presented at the meeting of the Western Psychological Association, Portland, OR.
- Corralejo, S. M.**, Skafi, L., Martin, E., Attal, S. C., & Jensen, S. A. (2014, April). *Comparing group and individual improvement: Statistical group differences mask divergent individual outcomes in ECBI scores among parents*. Poster session presented at the meeting of the Western Psychological Association, Portland, OR.

- Corralejo, S. M.,** Herrera, E., & Jensen, S. A. (2014, April). *The importance of individual analysis in assessing treatment outcomes: The case of group behavioral parent training*. Poster session presented at the meeting of the Association for Behavioral and Cognitive Therapies, Philadelphia, PA.
- Corralejo, S. M.** (2011, April). *Can you repeat that? Factors that affect recall in a fast-paced lecture*. Poster session presented at the Westmont College Student Research Symposium, Santa Barbara, CA.

### Clinical Experience

Student Therapist 2019 <i>Bear River Charter School</i> Provide counseling and clinical service to students, behavioral interventions for individual students, and classrooms behavior management intervention. Clinical Supervisor: Marietta Veeder, Ph.D. Hours: 99 direct, 49 indirect	<i>Logan, UT</i>	<i>2018 -</i>
Student Therapist <i>Developmental Behavioral Health Clinic</i> <i>Utah State University</i> Conducted various psychological assessment activities for child and adult clients requesting autism spectrum disorder (ASD) evaluation. Clinical Supervisor: Martin Toohill, Ph.D. Hours: 30 direct, 11 supervision, 80 indirect Integrated reports: 2	<i>Logan, UT</i>	<i>2018</i>
Student Therapist 2018 <i>Counseling and Psychological Services</i> <i>Utah State University</i> Provide counseling and clinical service to students. Clinical Supervisor: Eri Bentley, Ph.D. and Amy Kleiner, Ph.D. Hours: 112 direct, 95 indirect	<i>Logan, UT</i>	<i>2017 -</i>
Student Therapist 2017 <i>Psychology Community Clinic</i> <i>Utah State University</i> Provide counseling and clinical service to students and community members. Complete and report on psychological and cognitive assessments. Clinical Supervisors: Susan Crowley, Ph.D. and Sara Boghosian, Ph.D. Hours: 119.75 direct, 159.5 indirect	<i>Logan, UT</i>	<i>2016 -</i>
Behavior Specialist 2017 <i>Up to 3</i>	<i>Logan, UT</i>	<i>2016 -</i>

*Utah State University*

Deliver parent training and related psychological services for families with children with developmental delays.

Clinical Supervisor: Gretchen Peacock, Ph.D.

Hours: 210 direct, 37 indirect

Facilitator/Training Supervisor  
2015

*Stockton, CA*

2013 -

*Pacific Child and Family Parenting Program*  
*University of the Pacific*

Led 8-10 week behavioral parent training groups that were free to community members.

Train incoming graduate students and oversee their instruction of classes.

Clinical Supervisor: Scott Jensen, Ph.D.

Hours: 76 direct, 37 indirect

### **Clinically Relevant Experience**

Therapist  
2015

*Tarzana, CA*

2011 -

*Center for Autism and Related Disorders*

Provided one-on-one therapy to special needs individuals in home, school, and clinic settings.

Maintained accurate and timely records of intervention programs and reports.

Collaborated with clinical supervisors regarding client progress and treatment.

Supervised by Board Certified Behavior Analysts

Graduate Student Intern

*Stockton, CA*

2014

*Community Re-Entry Program*

*University of the Pacific*

Taught social and independent living skills to individuals with various mental illnesses at a drop-in socialization center.

### **Teaching**

*Guest Lecture – Child Disruptive Behaviors*

*Logan, UT*

2018

*Utah State University*

Evidence Based Practice I: Children and Adolescents (PSYC6150)

*Guest Lecture – Graduate Student Panel*

*Logan, UT*

2015,

2017

*Utah State University*

Introduction to the Psychology Major (PSYC2010)

*Guest Lecture – Ethics*

*Logan, UT*

2016 -

2019

*Utah State University*

Introduction to the Psychology Major (PSYC2010)

*Guest Lecture – Cultural Adaptations  
2015*

*Logan, UT*

*Fall*

*Utah State University*

Cultural and Linguistic Diversity and Disability (SPED7400)

*Graduate Teaching Assistant  
2015*

*Stockton, CA*

*2013 -*

*University of the Pacific*

Experimental Psychology (PSYC105)  
2013,

*Fall*

*2014,  
Spring  
2015*

Research Methods and Statistics (PSYC193a)  
2015

*Spring*

Cognitive Psychology (PSYC115)  
2014

*Spring*

## **Professional**

### **Skills**

Intensive training and evaluation in Applied Behavior Analysis Therapy  
Trained and experienced in The Incredible Years and Parent Management Training – Oregon Model parent training programs  
Group and independent research experience, involving experimental design and implementation,  
data entry, statistical analysis, and presentation (written, visual, and oral)  
SPSS, Prism, Microsoft Excel (manipulation and graphing)  
Proficient reading and conversational skills in Spanish

### **Affiliations/Memberships**

American Psychological Association Division 45  
*Present*

*2017 -*

National Latina/o Psychological Association  
*Present*

*2016 -*

American Association of University Women (AAUW)  
2018

*2014 -*

Association for Behavioral and Cognitive Therapies <i>Present</i>	2013 -
Psi Chi, the International Honor Society in Psychology <i>Life</i>	2009 -
Western Psychological Association 2015	2013 -
California Association for Applied Behavior Analysis	2015

### **Honors/Awards**

Graduated cum laude, Westmont College	2011
Dean's List 2011	2008 -

### **Community Involvement**

USU Diversity Dinner Facilitator	2019
Feria de Salud Health Fair 2018	2017 -
Advancing Civility in Elementary and Middle School Presentations 2017	2016 -
Volunteer at Migrant Head Start	2015
Latino Student Union Member <i>Present</i>	2015 -

### **Professional Development**

Peer reviewer of manuscripts submitted to various journals <i>Present</i>	2017 -
Student President - ABCT Parenting and Family SIG <i>Present</i>	2017 -
Cultural Formulation Interview Webinar	2019
Safe Passages Training	2018
Cultural Humility Webinar	2018
LGBTQ Policy Webinar	2017
Diversity Accreditation Committee Student Representative 2017	2016 -
Grant Writing Workshop 2015	Fall
Allies Training 2015	Fall
Social Media Liaison - ABCT Parenting and Family SIG <i>Present</i>	2015 -
Attended Queer Theory Lecture 2017	Spring