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The Effectiveness of a Signature Strengths Intervention on Maternal Well-Being Among Mothers of Children with Autism

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A thesis submitted to the faculty of
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Master of Science

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ABSTRACT

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Mothers of children with autism face unique challenges that can negatively impact their well-being. Frequently, these challenges require elevated amounts of time, energy, and money to address. In an effort to investigate a low-demand approach to improving well-being, this study employed a signature strengths intervention with mothers of children with autism. Thus far, research on signature strengths with this specific population is very limited.

Five mothers of children with autism participated in the study. All were married and highly educated. Four identified themselves as white, one as Hispanic. They ranged in age from 25-44. Each mother had between one and three children with autism. The participants attended an online meeting with the researcher after identifying their strengths. During the meeting, they discussed ways they already used their strengths, as well as more ways they might use them in the future. The participants then entered a four-week practice period. Each week they focused on one strength, aiming to use each strength in three new ways over the allotted seven days. The participants completed surveys to measure parental distress and life satisfaction at three points: baseline, immediately after a four-week intervention phase, and one month after the end of the intervention phase. Additionally, they answered a daily question that queried life satisfaction on a Likert-scale throughout the baseline and intervention phases.

Overall, the group reported a decrease in parental distress and an increase in their level of life satisfaction and daily satisfaction. These results add to other research that has found beneficial outcomes for mothers of children with autism who are taught to use their strengths more often. The use of signature strengths interventions could help to address a critical need among this group of mothers: mental health support that does not require excessive effort or time.

Keywords: autism spectrum disorders, parent training, positive psychology, signature strengths, maternal distress, maternal life satisfaction

ACKNOWLEDGMENTS

I am glad for the opportunity to express gratitude for the many individuals who have supported me as I muddled my way through this process. In an early interview with the BYU CPSE department, I was asked what I anticipated would be a challenge for me if I were accepted into a graduate program. I responded that I was worried about completing a thesis. I knew the stopping and starting and long-term work of a project like this might be my undoing. It very nearly was.

While I did a lot more stopping than starting (and effectively dragged up the average number of years it takes a student to graduate from the special education master's program), I experienced kindness and patience from my committee chair, Blake Hansen. This was a balm during a long bout of illness that prevented me from accomplishing much more than the bare minimum. When I was, finally, prepared to defend my prospectus and "get a move on," my committee members, Blake Hansen, Cade Charlton, and Terisa Gabrielsen, provided thoughtful feedback and encouragement. I am very grateful.

While I am grateful my children exist, I do not think they were particularly helpful in speeding up this process. However, I am very glad I was able to show them how much I care about continuing to stretch and learn. I am also motivated by the thought that they just might see me graduate. To Cyrus, Esther, and Bruin: Learning is a gift.

Beyond my committee, there is only one other poor sap who has read this document in its entirety: my brother Talon. Thank you for your time and for lending a critical eye.

Lastly, thank you to my husband Jeff. Even though you told me to quit I still love you. You picked up a lot of the plates I dropped while trying to accomplish this task, and you did so with love and enthusiasm. Thank you.

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DESCRIPTION OF THESIS STRUCTURE AND CONTENT

This thesis, The Effectiveness of a Signature Strengths Intervention on Maternal Well-Being Among Mothers of Children with Autism, is organized in a hybrid format to better integrate traditional thesis requirements with formats commonly used in journal publication. The preliminary pages of the thesis reflect requirements for submission to the university. The thesis report is presented as a journal article. Thus, it conforms to length and style requirements for submitting research reports to education journals.

The literature review is included in Appendix A. Appendix B contains the IRB letter of approval and participant consent forms. Appendix C is made up of a collection of the study's instruments. Two reference lists are present in this document. The first is made up of references for the journal-ready article. The second list contains all references in the full literature review present in Appendix A.

Introduction

In recent years, both well-being and human flourishing have moved into a spotlight in research and clinical practice (Ryff, 2014). Many are interested in how we can help ourselves and others find and use the tools available to flourish. While the rise in depression, anxiety, stress, and other emotional disorders is of great concern among the general population (Santomauro, 2021), there is a group of mothers facing unusually acute difficulty in achieving healthy psychological well-being. These are mothers of children with autism spectrum disorders (ASD; Hayes & Watson, 2012). With autism prevalence now at 1 in 36 (Maenner et al., 2023), these mothers make up a large and growing percentage of our population.

Stress in Mothers of Children with Autism

While some mothers of children with autism report experiencing healthy positive emotion and experiences (Bayat, 2007; Hastings & Taunt, 2002), trends in the literature shine a spotlight on concerning data regarding the average levels of stress and well-being among mothers in this group (Hayes & Watson, 2012). Research repeatedly reports evidence that mothers of children with ASD are exceptionally stressed (Baker-Ericzen et al., 2005; Blacher & McIntyre, 2006; Bromley et al., 2004; Cohrs & Leslie, 2017; Dabrowska & Pisula, 2010; Dykens & Lambert, 2013; Eisenhower et al., 2005; Estes et al., 2009; Griffith et al., 2010; Hayes & Watson, 2012; Pisula, 2007; Totsika et al., 2011; Zablotsky et al., 2013).

The stressors that can be common in raising a child with autism include maladaptive behavior, restricted interests, cognitive impairment, communication deficits, functional dependence, difficulty with eating, sleeping, and toileting, etc. (Baker-Ericzen et al., 2005; Bromley et al., 2004; Griffith et al., 2010). Stress is shown to have negative outcomes including

development of maternal emotional disorders (Totsika et al., 2011), lowered well-being and physical health (Miodrag & Hodapp, 2010), and increased depression (Benson & Karloff, 2008). A study by Robinson and Weiss (2020) found child behaviors to be significantly related to parenting stress. This finding is supported by the research of others in the field (Enea & Rusu, 2020; Estes et al., 2009).

Reciprocity of Maternal Stress and Child Behavior

Several recent studies have begun to investigate the reciprocity of the relationship between challenging behaviors in children and the stress level of their mothers. High parenting stress appears to contribute to an increase in both internalizing and externalizing behaviors in children with ASD over time (Lecavalier et al., 2006; McGregor et al., 2020; Rodriguez et al., 2019). In a study investigating reciprocity, Neece et al. (2012) came to a similar conclusion and posit that parenting stress serves as both a consequence and an antecedent to child behavior problems, and vice versa (Neece et al., 2012).

Several variables may be at work in the relationship between parenting stress and child behavior. One variable that appears in the research is related to parents seeking out treatment. In several studies, impaired well-being and heightened stress levels decreased the likelihood of a parent seeking out and participating in treatment for their child (Kazdin & Mazurick, 1994; Kazdin & Wassell, 2000; Packard et al., 2021). If a parent is able to gain access to available resources, increased stress appears to make it difficult for the parent to elicit the positive effects expected from the intervention (Osborne et al., 2008). Furthermore, when parent well-being is low, challenging behavior may increase (Rodriguez et al., 2019) and parents may have difficulty implementing interventions (Osborne et al., 2008; Robbins et al., 1991).

While improvement in challenging behaviors can improve well-being in parents (Herring et al., 2006), it is important to note that strong mental health is needed to implement behavior plans and adhere to them with fidelity, a critical component for lasting behavior change. It is crucial that clear, brief, and actionable mental health support is given to mothers of children with autism (Dykens & Lambert, 2013). Their ability to manage their stress could have a significant impact on their own well-being as well as the flourishing and development of their child with ASD (McIntyre, 2008). The dyad is strengthened when the mother is strengthened.

Positive Psychology and Signature Character Strengths Interventions

Positive psychology interventions (PPIs) are interventions aimed at improving well-being through positive practices. Their significant effect has been discussed in two meta-analyses (Bolier et al., 2013; Sin & Lyubomirsky, 2009). One notable PPI that has been found to be effective at improving well-being and decreasing depressive emotions is identifying character strengths and then using them regularly (multiple times per week in the study) (Peterson & Seligman, 2004; Seligman et al., 2005). This intervention is often referred to in the literature as "using character strengths" or "using signature strengths."

Signature Character Strengths

Signature character strengths are identified using a questionnaire called the Values in Action (VIA) Inventory of Strengths (Peterson & Seligman, 2004). The questionnaire measures the possession and relative strength of 24 character dimensions in adults (e.g., love, prudence, zest, and love of learning), placing them in ascending order according to how central each dimension is for the individual assessed. The top four dimensions are identified as "signature strengths." Frequent use of four or more signature strengths has been associated with more positive outcomes than using three or less (Harzer & Ruch, 2012).

Signature Strengths Interventions in Research

Signature strengths interventions have been used in myriad studies with a wide range of participants, including children, adolescents, the elderly, university students, employees in the workplace, the neurodiverse, etc. (Allan & Duffy, 2014; Andrewes et al., 2014; Bridges et al., 2012; Duan et al., 2019; Forest et al., 2012; Harzer & Ruch, 2012, 2013, 2016; Hausler et al., 2017; Hoge et al., 2020; Huber et al., 2020; Kachel et al., 2020; Kannangara, 2015; Khanna & Singh, 2019; Kirchner, 2016; Linley et al., 2010; Littman-Ovadia et al., 2017; Lounsbury et al., 2009; Madden et al., 2011; Merritt et al., 2019; Peisah, 2016; Proyer et al., 2014; Quinlan et al., 2015; Suldo et al., 2015).

Intentional use of signature strengths has been shown to improve human flourishing in several categories including well-being, happiness, and life satisfaction. Studies have also found a reduction in depressive symptoms (Duan et al., 2019; Forest et al., 2012; Harzer & Ruch, 2016; Hausler et al., 2017; Khanna & Singh, 2019; Linley et al., 2010; Proyer et al., 2015; Woodworth et al., 2017). When investigated, this has been found to have continued positive impact when follow up measures are completed at both three and six months after the intervention (Gander et al., 2013; Wood et al., 2011). Most studies on signature strengths involve only a brief initial training and still report significant positive results (Duan et al., 2019; Harzer & Ruch, 2016; Seligman et al., 2005). Others give merit to providing the initial training online, reporting positive results even though their study did not provide live presentation of the information. (Harzer & Ruch, 2016; Proyer et al., 2015).

A 2019 meta-analysis by Schutte and Malouff evaluated 29 effect sizes in 14 studies. They found a weighted Hedges *g* score of 0.42 when calculating for the effect of signature strength use on life satisfaction, indicating significant effect. This is consistent with findings in a

smaller 2012 meta-analysis that found small to moderate effects from character strength interventions (Quinlan et al., 2012) and a 2013 meta-analysis that addressed positive psychology more generally and found the interventions to be effective in enhancing subjective and psychological well-being (Bolier et al., 2013). Signature strength interventions appear to be an effective tool for improving mental health while requiring relatively little initial training and ongoing support (Duan et al., 2019; Gander et al, 2013).

This approach for improving well-being and life satisfaction could be especially beneficial for mothers of children with autism, who may have limited time and energy to address their mental health needs. One study by Dykens et al. (2014) used a signature strengths intervention with mothers of children with autism that yielded positive results. In the randomized trial, one group of mothers participated in a mindfulness-based stress reduction (MBSR) training while the other group completed a positive adult development (PAD) training. The PAD training involved gratitude journaling and use of signature strengths. Significant improvements were measured for mothers of children with autism in the PAD group in several mental wellness areas, including life satisfaction, depression, anxiety, and insomnia (Dykens et al., 2014).

An Argument for Signature Strengths Training

While research that applies signature strengths interventions to mothers of children with autism is rather limited, several factors support its exploration for this population. First, we know that it works to improve well-being in many other settings where individuals face challenges and stressors. Second, we know that positive outcomes are possible with minimal amounts of initial training. Third, ongoing use of signatures strengths is not a burden on resources or time. Fourth, it is free. This intervention has the potential to be cost- and time-effective, beneficial to the

mental health of the participants, and easy to maintain, as the skill learned involves accessing what is *already* strong in the mother and using those strengths more regularly.

Conclusion

Resilient families make meaning out of adversity. Despite the grim conclusions of many studies on stress and well-being among parents of children with autism, it is valuable to note that positive outcomes are possible. When asked to share positive aspects of having a child with autism, parents have described changes such as gaining new perspectives on life, increased sensitivity, stronger appreciation for the small things, more support for one other, opportunities to learn, improved family dynamics, finding positive meaning in disability, increased confidence and assertiveness, and increased faith (Bayat, 2007; Hastings and Taunt, 2002). While meaning can be found amidst the challenges of raising a child with autism, it is important to support the mother of a child with autism in improving their well-being so they are well enough to discover that meaning. Because their challenges are particularly difficult, their emotional needs should be addressed early and effectively as a crucial part of the package of responses employed to support the development of a child with ASD.

Statement of the Problem

The aim of this study is to investigate an approach for targeting well-being that would require relatively little effort and no expense from the participant (a mother of a child with ASD). While signature-strengths interventions are growing in their use in research and practice, there is very limited published research on the impact such interventions have on the well-being of mothers of children with autism. The available research pairs signature strengths interventions with other elements of positive psychology, like gratitude journaling (Dykens et al., 2014).

Further research is needed to build the case for or against signature-strengths interventions for this population.

Statement of the Purpose

The purpose of this study is to examine the effects of using signature strengths more often and in new ways on the well-being of mothers of children with autism.

Research Questions

This study will address the following research questions:

1. What are the effects of a signature-strengths intervention on maternal well-being among mothers of children with autism?
2. What are the effects of a signature-strengths intervention on maternal distress among mothers of children with autism?

Method

The following section describes the methods used in this study. It details, in order, the participants, setting, measures, procedures, research design, and data analysis procedures. Approval was granted by the International Review Board to complete this study as outlined. Subsequently, participants provided their written consent to engage in the study.

Participants

Five mothers of children with autism participated in this study. They were eligible to participate if they reported that their child had an educational classification of autism, community diagnosis, or other documentation of autism, and were between the ages of 3 and 12. They needed to be willing and able to complete measures sent daily through text message as well as surveys sent through email during each stage of the study. They also needed access to a computer or phone and the internet for the online meeting. Psychiatric problems were not

evaluated to determine eligibility. Recruitment was done through postings of a flier on online support groups for mothers of children with autism such as Facebook and Instagram.

Those interested in participating completed a brief initial survey to determine eligibility for participation. Completed surveys were reviewed in order. If the mother met the requirements for participation they were admitted. Five mothers met the requirements and were sent a consent form to review and sign if they chose to pursue participation in the study. All five offered their consent, and all five completed the study. 100% of the participants were married and highly educated. They were all between the ages of 25 and 44. Four identified themselves as white, one as Hispanic. All five mothers identified themselves as female. Further demographic information is presented in Table 1.

Table 1

Participant Demographics

Name	Gender	Age	Race/ Ethnicity	Education	Household Income	Marital Status	Total # of children	Age(s) of Child(ren) with ASD	Gender of Child(ren) with ASD
Erica	Female	25–34	White	Bachelor's degree	$50,000–$100,000	Married	4	12, 8, 6	Male, Male, Female
Sara	Female	35–44	White	Bachelor's degree	$50,000–$100,000	Married	6	7	Male
Anna	Female	35–44	Hispanic	Bachelor's degree	>$200,000	Married	2	8, 8	Male, Male
Lily	Female	35–44	White	Master's degree or above	$50,000–$100,000	Married	2	5	Male
Grace	Female	35–44	White	Master's degree or above	$50,000–$100,000	Married	2	5, 3	Male, Male

Settings

Baseline, intervention, and follow-up measures took place through emailed surveys and daily text messages. Two online meetings were scheduled with each participant. The first took place at the onset of the intervention phase. The second occurred at the conclusion of the study, after follow-up measures were completed. The meetings were conducted through Zoom™. Meetings were one-on-one, between the researcher and the participant. They were recorded for the purpose of assessing treatment fidelity. Recordings were stored in an encrypted folder and then deleted after treatment fidelity data were collected.

Measures

Participants completed four different measures during this study. The measures were selected to identify signature strengths, measure life satisfaction, and measure distress over the course of their time in the study. One limitation of this approach was that all research data were based on self-report. However, the point could be made that self-perception of well-being was the very problem this study was designed to address. One of the measures required daily response to a question on life satisfaction. This question was not validated and has not been used in previous research. Even so, the remaining three measures were well-validated. This allowed the daily satisfaction question to be evaluated in comparison to pertinent data from the other surveys to assess its accuracy and validity.

The Values in Action Inventory of Strengths

The VIA Inventory of Strengths (VIA-IS-P; McGrath, 2019) was given at the onset of the intervention. The VIA questionnaire measures the possession and relative strength of 24 character dimensions in adults (e.g., love, prudence, zest, and love of learning), placing them in ascending order according to how central each dimension is for the individual assessed. It is a

96-item questionnaire that asks the respondent to rank statements on a Likert-like scale (1= *very much unlike me*, 5= *very much like me*). Some examples include "I always treat people fairly whether I like them or not" and "I can always find the positive in what seems negative to others."

After completing the survey, a respondent's top four dimensions are identified as "signature strengths." Reliability has been shown to be greater than or equal to 0.77 with an average of 0.85 (McGrath, 2019). In the original research regarding the validity and reliability of the scales of the VIA it was reported that all scales have satisfactory alphas (greater than 0.7), test-retest correlations over a four-month period are substantial (greater than 0.7), and all scales approach internal consistency (Seligman et al., 2004).

The Parenting Stress Index-4 Short Form

The Parenting Stress Index™, Fourth Edition Short Form (PSI-4-SF; Abidin, 1995) was completed before the intervention began, immediately after the intervention (at the end of week four), and at a follow-up one month later. The PSI-4-SF is a 36-item index scored by the parent on a 1 (*strongly agree*) to 5 (*strongly disagree*) Likert scale. There are 3 subdomains: parental distress (PD), parent-child dysfunctional interaction (PCDI), and difficult child (DC). Internal consistency ranging from very good to excellent was found in a study published by Reitman et al. (2002).

A study evaluating the psychometric properties of the PSI-4-SF when used with parents of children with autism found poor functioning in several items in the PCDI and DC subdomains (Zaidman-Zait et al., 2010). Dardas and Ahmad (2014) found the items in the parental stress domain were strong, but also found that the other subdomains demonstrated structural instability. With this information and for the purpose of this study, we will present and evaluate only the parental distress subdomain.

The Satisfaction with Life Scale

The Satisfaction with Life Scale, (SWLS; Diener et al., 1985) was completed three times over the course of the study. Once before beginning the intervention phase, once at the conclusion of the intervention, and once at follow up. It is a 5-item measure with questions such as: "In most ways my life is close to my ideal." Participants respond on a Likert scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*). Responses are summed to measure global life satisfaction. The SLWS has been shown to have strong psychometric properties (Diener et al., 1985; Diener et al., 2013; Pavot & Diener 1993; Shevlin et al., 1998). It has excellent internal consistency (Neece, 2014; Pavot & Diener, 1993), a single factor structure, and temporal stability (r=0.54 over four years) (Pavot & Diener, 1993). The Satisfaction with Life Scale also demonstrated acceptable internal consistency reliability (a = 0.88) (Kobau et al., 2010).

Daily Satisfaction Measure

A brief survey was sent to each participant daily throughout baseline and intervention. They responded to the statement "I am satisfied with the conditions of my life" on a sliding scale from 1 (*strongly disagree*) to 7 (*strongly agree*). During the intervention phase they also indicated whether or not they used a signature strength in a new way the previous day by responding to a yes or no question: "Did you use a signature strength in a new way yesterday?" The daily measure was completed in Google Forms by clicking a link sent through text messaging. This was a novel approach to gathering satisfaction data. It was unique in that it used a repeated measure on a daily basis to track changes in life satisfaction.

Treatment Fidelity

To qualify as participating with fidelity, the mothers needed to respond to at least 57% of the daily measures; four out of seven sent each week. They needed to complete the VIA once and

the PSI-4-SF and SWLS three times. They needed to attend both meetings with the researcher. If a participant was not able to meet these requirements, another participant would be enrolled in the study.

A tracking calendar was kept to ensure measures were sent out as planned. At the end of each week, the response rate was reviewed to determine if the goal of four out of seven days had been met. All five participants maintained a response rate that allowed them to continue participating in the study. The response rate ranged from 81% to 96%, exceeding the minimum expectation of 57%.

The online meetings were recorded and then evaluated to measure treatment fidelity. Treatment fidelity was achieved if all of the required elements occurred during the meeting (see Table 2). A research assistant viewed all recorded sessions to evaluate completion of each item on the list. All five sessions were identified as adequately including 100% of the meeting elements.

Table 2

Meeting Elements

Step	Task
Step 1	VIA results were discussed.
Step 2	The participant identified 4 of their top 7 strengths as "signature."
Step 3	A discussion occurred regarding how strengths are currently used.
Step 4	A discussion occurred regarding how strengths might be used in new ways.
Step 5	A document was created listing ideas under each of the four signature strengths.
Step 6	The goal of focusing on one strength per week and using it in at least three ways was outlined.
Step 7	The document was shared with the participant.

Procedures

Both the meeting time and the measures for this study were selected and designed to be brief and flexible in order to better serve mothers of children with autism. Participants began participation the study in the order they were admitted. The study had three main stages: baseline, intervention, and follow-up. Each participant completed all three stages at different times. The timeline was staggered to align with the multiple-baseline research design.

Baseline

The SWLS, PSI-4-SF, and a demographic survey were given to participants during the baseline phase. Participants also completed the daily progress monitoring measure throughout baseline. They received a single question survey each day through text messaging during this phase. The amount of time each participant spent in this phase varied in length according to each mother's placement in the study, ranging from seven to twenty-five days. Due to the multiple-

baseline research design, the participants progressed as stable trends developed in their own data as well as the data of the participants ahead of them in the arrangement of the study.

Intervention

At the onset of the intervention phase, each participant was sent a link navigating them to the website where they could complete the VIA assessment. They were then scheduled for a 45-minute meeting with the researcher. In the meeting, the participant and the researcher discussed the results of the VIA Inventory of Strengths (VIA-IS-P; McGrath, 2019). After identifying which four strengths (of the top seven) they felt were signature strengths, they discussed how they already used those strengths. Their strengths were then explored further using resources from Ryan Niemiec's book, "Character Strengths Interventions: A Field Guide for Practitioners" (2018). A slideshow presentation that provided roughly five ideas per strength was used to guide the discussion. Together, the participant and the researcher created a four-week plan, assigning one signature strength per week and listing ideas for how to use that strength in new ways.

After the meeting, the participant continued to receive the brief daily progress monitoring measure throughout intervention (informally assessing their general well-being), with an added question that allowed them to indicate whether or not they used a signature strength in a new way the day before. At the close of the final week of the intervention, the participant was asked to complete both the SWLS and PSI-4-SF. The intervention phase was then complete and they were informed that they should expect to be contacted in four weeks.

Follow-up

Four weeks after completing the intervention phase, participants were asked to once more complete the SLWS, PSI-4-SF, and submit a response to the brief progress monitoring measure. They then attended the final zoom meeting with the researcher. The purpose of this meeting was

to discuss results and conduct a social validity interview. After the meeting they were sent the final survey, containing further questions regarding social validity. After completing this survey, they were sent a $30 gift card. This concluded their participation in the study.

Research Design

A concurrent multiple-baseline-across-participants design was used for this study. Pre- and post-intervention surveys were embedded in the design. This approach was selected because the effect of the intervention appears to have strong traits of maintenance (and even positive effect) well after the initial training period (Dykens et al., 2014). Thus, it appears the effect of the intervention could not be adequately reversed. For our purpose of evaluating the general effect of signature strengths training on well-being, a multiple-baseline design was deemed most appropriate.

Data Analysis

Visual analysis was used on an ongoing basis to make decisions about participation in the study. Participant A completed baseline measures for a minimum of two weeks before beginning intervention. When a stable trend developed in Participants A and B, Participant B entered the intervention phase. This pattern continued with each participant. Once they entered the intervention stage, the weekly schedule was fixed. They completed four weeks in the intervention phase, followed by a four-week window before follow-up measures took place.

Parental Distress and Satisfaction with Life Scale

Cohen's *d* effect size (Cohen, 2013) was calculated for short-term effects (between baseline and intervention) and long-term effects (between baseline and follow up) on the Parental Distress Scale and the Satisfaction with Life Scale. In line with Cohen's (2013)

recommendations, an effect size of $d = 0.2$ was considered small, $d = 0.5$ was considered medium, and $d = 0.8$ was considered large.

Daily Satisfaction Measure

To obtain an effect size estimate for each participant's daily satisfaction data, Simulation Modeling Analysis (SMA; Borckhardt et al., 2008) was used. SMA is a bootstrapping method that calculates an effect size (Pearson's *r*), and simulates 5,000 datasets of the same length with similar autocorrelation as the original dataset. Simulated data was then used to calculate a *p* value. These datasets were combined using the average of weighted Fisher's *z* coefficients. Weighting was determined by the number of days monitored. For combining correlations, averaging Fisher's *z* is less biased than averaging Pearson's *r* correlations (Corey et al., 1998). The average Fisher's *z* was then converted to a Pearson's *r* yielding the average effect size for the daily satisfaction data.

Results

The resulting data on parental distress, satisfaction with life, and daily satisfaction will now be presented. Strengths-usage and social validity data will also be reported in this section. An evaluation of the results will then be discussed in the following section.

Parental Distress

Parental distress was measured using the PSI-4-SF. The results are presented in percentiles (see Figure 1). Overall, the group moved from the 84th percentile at baseline to the 58th percentile at follow-up, demonstrating improvement in reported symptoms of parental distress. Erica and Sara reported an improvement in parental distress after the four-week intervention period. Lily maintained her parental distress level between baseline and intervention. Anna and Grace both reported slightly more distress after the four-week

intervention period. At the follow-up, all five mothers reported a significant drop in distress in comparison to their baseline.

The effect size for parental distress, as measured by Cohen's *d*, yielded a small–medium short-term effect (d = -0.35) and a large long-term effect (d = -1.29). Reductions in parental distress were the aim of the study, therefore a negative effect size indicates that parental distress data moved in the intended therapeutic direction.

Life Satisfaction

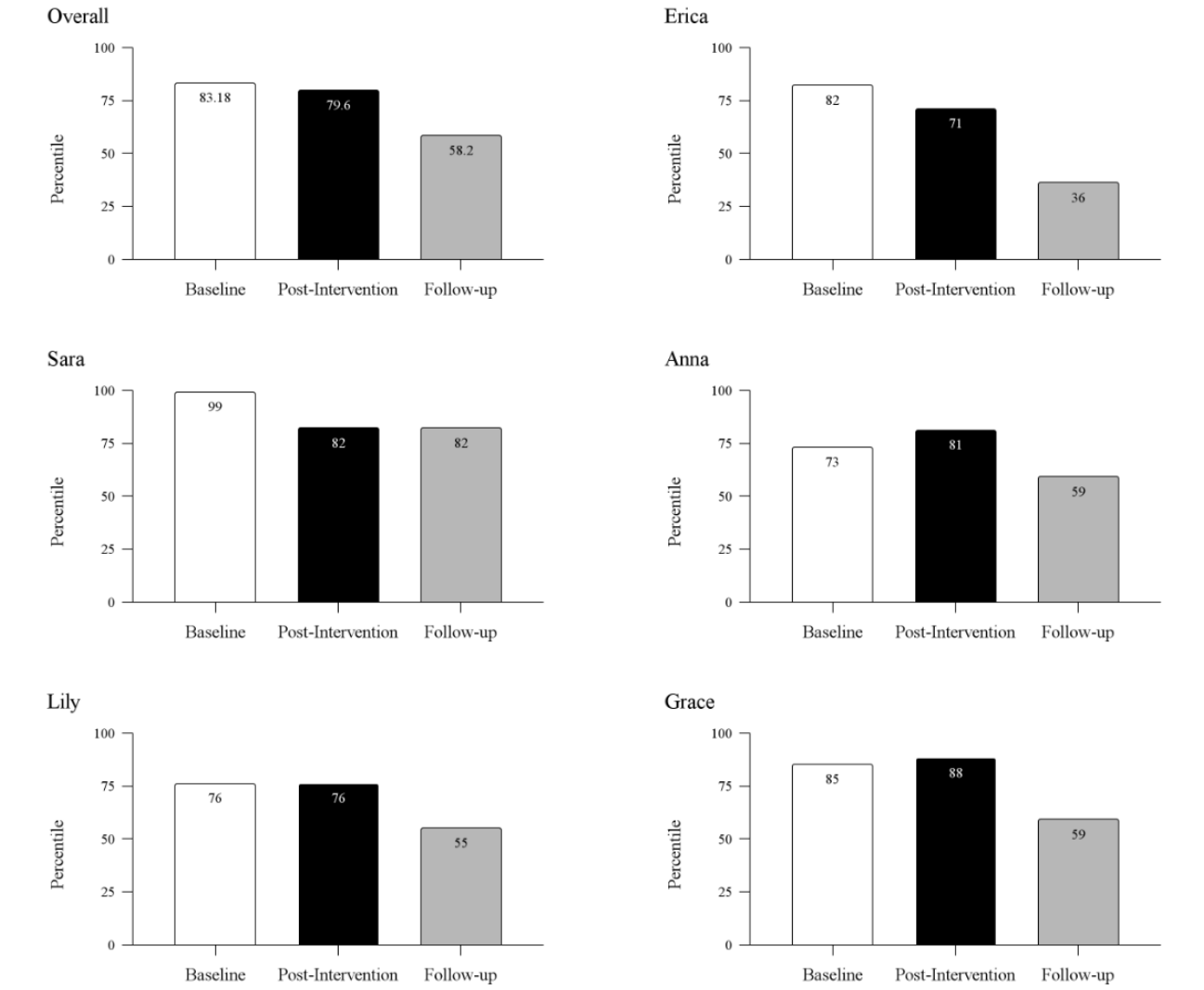
Life satisfaction was measured using the SWLS. Mothers responded on a Likert-scale. The results are detailed in Figure 2 below. Overall, the group moved from an average rating of 24 (*slightly satisfied*) at baseline to an average score of 29 (*satisfied*) at follow-up.

When comparing to baseline data, Erica, Sara, Lily, and Grace had higher life satisfaction scores after the four-week intervention phase. Anna's life satisfaction dropped slightly. At follow-up, all five mothers reported higher life satisfaction than was reported during the baseline phase.

The effect size for life satisfaction, as measured by Cohen's *d*, indicated that the short-term effect was medium–large (d = 0.78) and the long-term effect was large (d = 1.06). Increases in satisfaction were considered the aim of the study, therefore, a positive effect size indicates that life satisfaction data moved in the intended therapeutic direction.

Figure 1

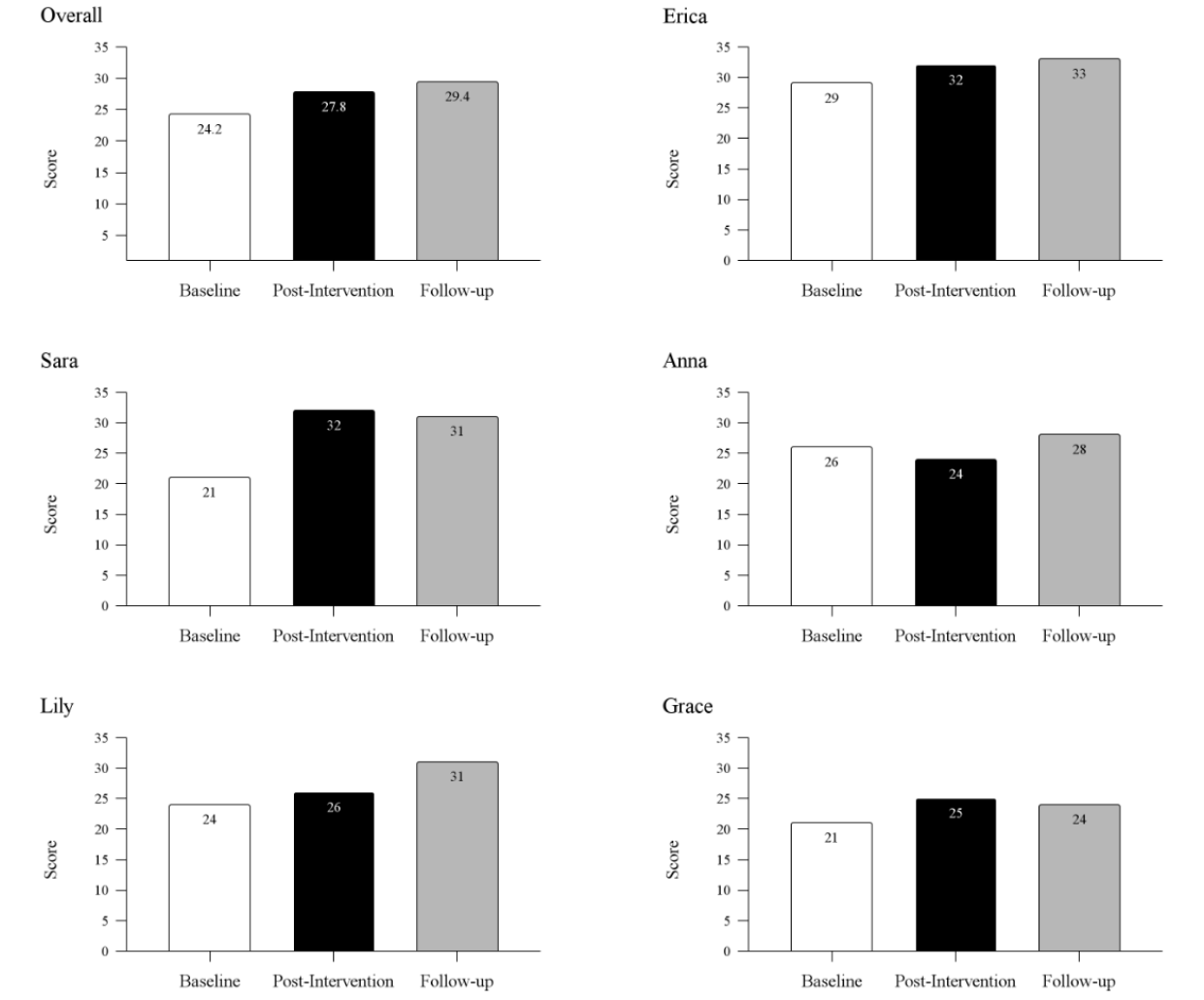
Parental Distress



Note. Reported level of parental distress in percentiles (16^{th}–84^{th} = *Normal*, 85^{th}–89^{th} = *high*, 90^{th}+ = *clinically significant*).

Figure 2

Life Satisfaction



Note. Reported levels of life satisfaction (31–35 = *Extremely Satisfied*, 26–30 = *Satisfied*, 21–25 = *Slightly Satisfied*, 20 = *Neutral*, 15–19 = *Slightly Dissatisfied*, 10–14 = *Dissatisfied*, 5–9 = *Extremely Dissatisfied*).

Daily Satisfaction

Throughout their time in the study, participants responded daily to a query about their satisfaction with life. They responded on a 7-point Likert Scale ranging from one (*very*

dissatisfied) to seven (*very satisfied*). Each participant demonstrated slight, but positive change between the baseline and intervention stages. Response changes ranged from a 0.08-point improvement (Erica) to a 1.62-point improvement (Sara). The average positive change among all five participants was 0.5. The results of this daily question are presented in Figure 3. Gray lines represent the average in each stage.

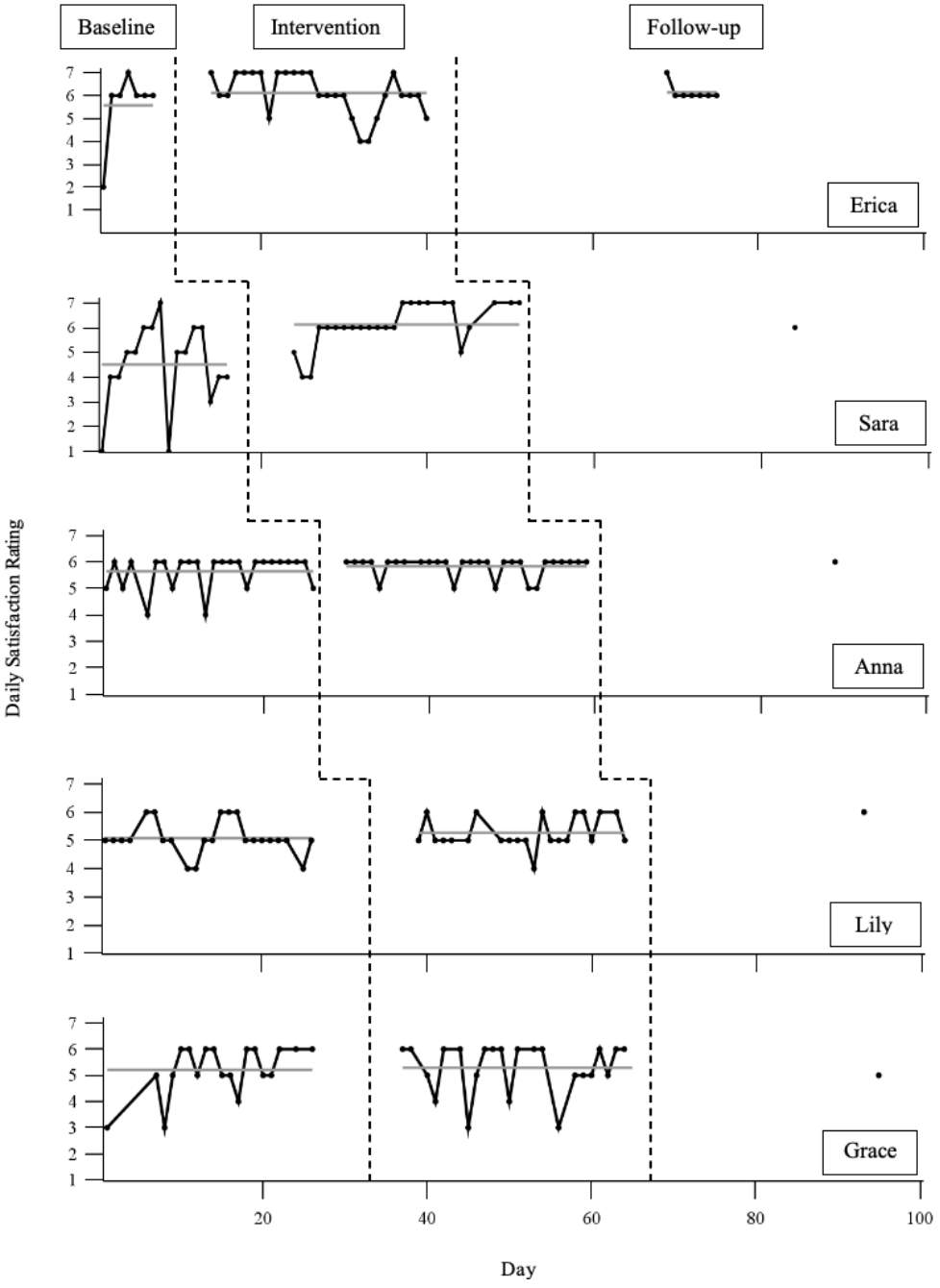
When researchers sent the SWLS and PSI-4-SF surveys one month after completion of the intervention phase, each mother was also asked to respond once more to the daily satisfaction question. The first participant, Erica, continued to respond to the daily question for six days beyond the final request at follow-up. That data is included on the graph in Figure 3.

Table 3 displays individual effect size estimates, p values, confidence intervals, and combined effect sizes for daily satisfaction. Overall, one participant yielded a large effect size at the $p < 0.01$ level. One participant yielded a small effect size at the $p < 0.10$ level. Three of the five participants yielded small, insignificant effect sizes. The combined effect size for daily satisfaction data was small ($r = 0.23$).

Further visual analysis of the data reveals a positive trend in life satisfaction for all participants ranging from 0.001 (Erica) to 0.046 (Sara). This is in line with the aim of improving life satisfaction. Variability in the response ratings reduced between the baseline and intervention phases for each participant. The standard deviation of Erica's response data moved from 1.618 in baseline to 0.8444 in intervention, a 0.774 reduction in variability. Sara reported a reduction of 0.831. Anna's response variability reduced by 0.258. Lily and Grace demonstrated the smallest change in variability between phases with changes of 0.038 and 0.002, respectively.

Figure 3

Daily Satisfaction



Note. The results of a daily query on satisfaction: "I am satisfied with the conditions of my life" (1 = *strongly disagree*, 7 = *strongly agree*). Gray lines indicate the average rating in each stage.

Table 3

Daily Satisfaction Effect Sizes

Participant	Effect Size (*r*)	*p* value	95% CI
Erica	0.201	0.400	0.169–0.233
Sara	0.537	0.010*	0.442–0.632
Anna	0.188	0.100*	0.165–0.211
Lily	0.189	0.300	0.164–0.214
Grace	0.049	0.770	0.045–0.053
Overall	0.236		0.221–0.251

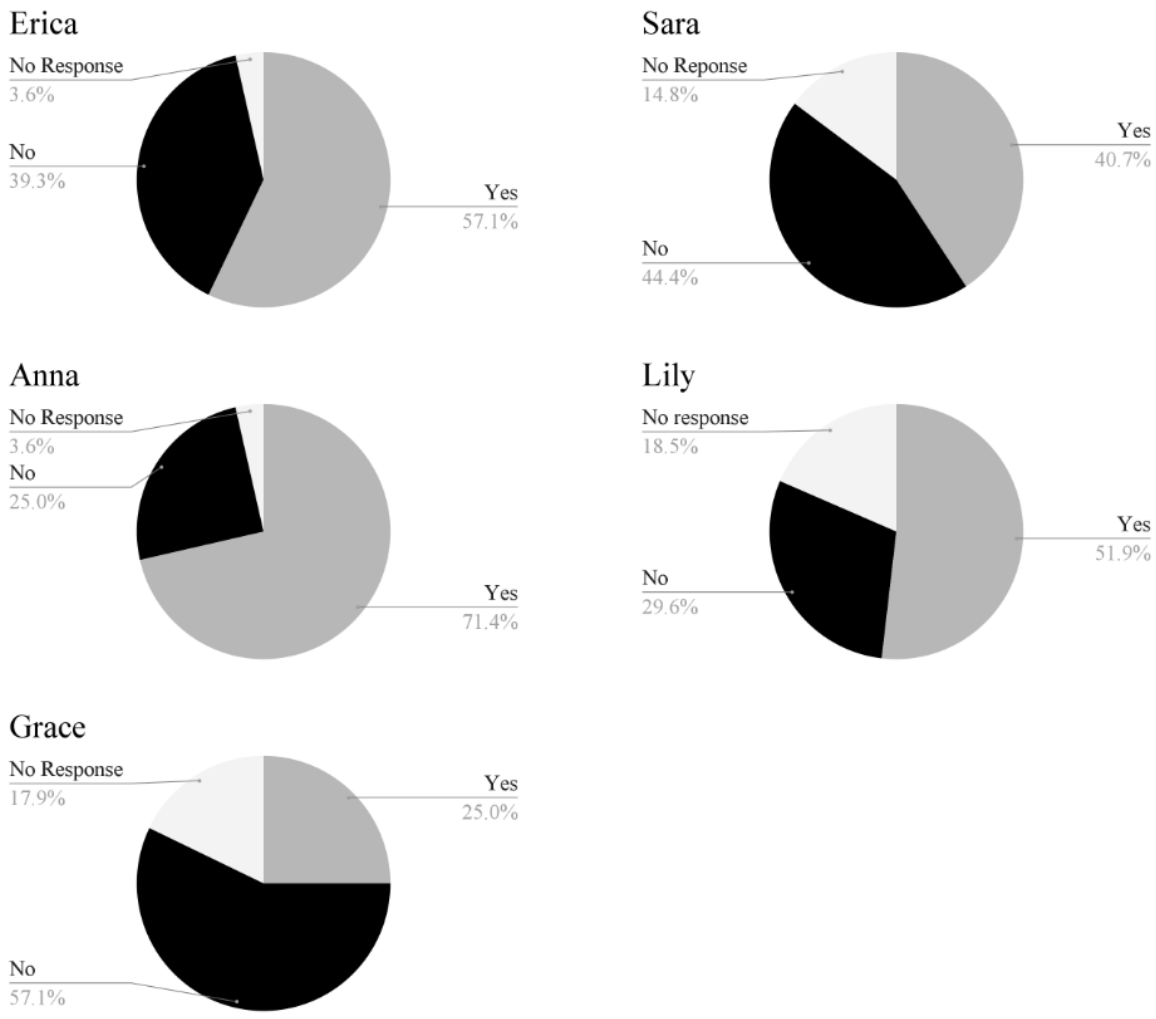
Note. This table shows the Pearson *r, p* value, and confidence intervals for each participant. Asterisks indicate significance (.10 = *small effect size*, .01 = *large effect size*).

Signature Strengths Use

During their time in the intervention phase of the study, a question was added to the daily query on life satisfaction. It asked participants if they had used their strength in a new way the previous day. This provided information on the extent to which each participant was engaging in the intervention. The goal set in the meeting was to use a signature strength in a new way three times per week. This would come out to be 43%. The affirmative response rate ranged from 25% to 71% among the participants. Erica, Anna, and Lily all exceeded this benchmark. Sara came in slightly below at 41%. Grace reported “Yes” 25% of the time. The results are presented in Figure 4.

Figure 4

Response Frequency and Strengths Usage



Note. This figure displays response data for the daily question sent only during the intervention phase: “Did you use of your strengths in a new way yesterday?”

Social Validity

Each participant completed a social validity questionnaire and survey at the conclusion of the study. The results of the online survey are presented in Table 4. The participants indicated that the intervention provided benefit for themselves and their child(ren). They all reported they would use the approach again and recommend it to others. When asked if they experienced discomfort during their time in the study, four responded that they did not. One participant said they experienced discomfort. They reported that the discomfort came from feeling the need to do all the planned ideas for each individual signature strength. Some were a challenge to prepare for and implement. While completing all the ideas on the brainstormed list was not the expectation, it is valuable to know that this phenomenon occurred.

In a free response portion of the online survey, mothers were asked to describe ways they or their child(ren) benefited from their participation in the study. The responses included statements such as, “I became more patient and less irritated,” “I was a happier person when I could focus on simple things that made me happy, that helped me be more patient,” and “I was able to create more moments of magic, joy, and connection, in areas that were more natural to me.”

When asked how a study of this kind could better support others in the future, several mothers mentioned having daily reminders of the strength and its associated list of ideas to pull from, rather than a weekly reminder. Two participants addressed the length of the study, with one suggesting more time to explore more strengths and another suggesting two weeks focused on each strength instead of one.

Table 4

Social Validity Questionnaire

Question	Erica	Sara	Anna	Lily	Grace
Did you benefit from identifying your signature strengths and using them more?	Yes	Yes	Yes	Yes	Yes
Do you believe your child benefited from your participation in this study?	Yes	Yes	Yes	Yes	Yes
Would you use this approach to improve your well-being again?	Yes	Yes	Yes	Yes	Yes
Did you like the procedures used in this study?	Yes	Yes	Yes	Yes	Yes
Did you experience discomfort during this study?	No	No	No	Yes	No
Would you recommend this intervention to other mothers of children with autism?	Yes	Yes	Yes	Yes	Yes

Conclusion

The data presented in this section show an overall reduction in parental distress and an overall improvement in life satisfaction between baseline and follow-up. The immediate post-intervention survey results varied in their impact, with some reporting more distress or less satisfaction than before they began. These results will be discussed further in the following section.

Discussion

The purpose of this study was to evaluate the impact of signature strengths use on maternal well-being. This study specifically examined parental distress and life satisfaction before, immediately after, and one month after a four-week intervention phase during which mothers were encouraged to use their unique signature strengths in new ways.

Findings

The discussion of findings will be organized into four sections. The first topic to be discussed will be the effect of this intervention on parental distress, followed by the effect on life satisfaction and daily satisfaction. Finally, results of a social validity interview and survey will be discussed.

Parental Distress

Overall, all five mothers reported reduced levels of distress on the PSI-SF between baseline and follow-up. A follow-up measure was included in the study due to the data results of the Dykens et al. (2014) study that showed more significant outcomes long term. That phenomenon occurred in this study as well. Analysis of the baseline and post-intervention data alone do not yield results that are as significant as analyzing the change between baseline and follow-up data. One mother, Lily, presented a stable level of distress before and immediately after the intervention. Anna and Grace presented slightly higher levels of distress between baseline and intervention.

There may be several variables contributing to this outcome. First, learning a new skill, however easy, adds to daily tasks and expectations. In final interviews, two of the participants reported feeling slightly burdened by some (but not all) of the brainstormed strategies for using their strengths. They reported that some of the planned tasks and their associated strengths were easy to implement more often and some were not. Perhaps after completing the four-week intervention stage where the mother learned the skill, they entered a stage where they were wired to use their strengths more often without as much initial effort. It is also possible that they had learned what practices were most rewarding and pursued those activities.

Another contributing factor (again, reported by mothers) was that for Anna, Lily, and Grace, the intervention data (collected immediately after completion of the four-week practice period) was collected during the last weeks of August and first week of September. They reported that the transition to school was very difficult for their children with autism, and very stressful for themselves. Perhaps this contributed to the higher levels of distress they reported after completing the intervention stage.

The possibility that the intervention itself increased distress should also be considered. Maybe the large decrease in distress reported in the follow-up measure was a result of the removal of an added stressor. One result from the social validity survey would oppose this theory, as 100% of the mothers reported positive outcomes for themselves and their children and said they would complete this exercise again and recommend it to others. They also discussed how they continued to practice the skills taught. If the increased use of strengths had caused the rise in distress, maintenance of the distress level would be expected among those that continued to engage in the intervention.

Notably, Erica and Sara reported the most significant change between baseline and intervention. For those two, both data points were collected during the summer months. At follow-up, they still reported another significant drop in distress levels. As a group, the participants moved from a baseline placement in the 83rd percentile (*high–normal*) to the 58th percentile (*mid–normal*) on average at the follow-up.

Life Satisfaction

All of the participants reported improved life satisfaction between baseline and follow-up. On this measure, only Anna reported less satisfaction immediately after the intervention. All others reported improvement. At follow-up, all five reported improved satisfaction over baseline,

but only three demonstrated an improvement over the post-intervention measure. Two of the mothers dropped one point on the 35-point scale of life satisfaction. Overall, the group average indicated improved satisfaction at each point of measurement.

The factors discussed under parental distress may also apply here. The start of school or the effort required to implement signatures strengths may have negatively impacted well-being. In this case, the impact is not seen as clearly. As a group, the average score moved from 24 (*slightly satisfied*) to 29 (*satisfied*) by the end of their time in the study.

Daily Satisfaction

The results of the daily satisfaction question produce less significant data. While all five mothers reported improvement in their satisfaction according to their average response between baseline and intervention, some of those improvements were very small, as low as 0.08 in change. The average change among all participants came out to be a reported 0.5-point improvement in life satisfaction. While this is an acceptable rate of change for a 7-point scale, further analysis of the results presents some challenges.

First, the largest average change comes from the first two participants who moved forward in the study. The first averaging a 0.54-point change and the second averaging a 1.62-point change. The next three participants reported far less change (0.19, 0.19, and 0.08).

During a social validity interview at the end of the study, the last three participants reported exceptional levels of stress during the time that they were responding to intervention measures due to the advent of the school year. Two mothers reported that they believed their data was not a good reflection of the impact of the intervention due to this variable. All reported that they benefitted from using their signature strengths more. The timing of the surveys could be a

reason for the less significant average improvement between baseline and intervention for these three mothers.

It is helpful to reference the Satisfaction with Life Scale (SWLS) to when evaluating this daily measure. The results overall are positive on both, but the SWLS appears to be more sensitive to change than the daily query about satisfaction.

Social Validity

An evaluation of the data collected through the social validity questionnaire and interview indicate that this approach is socially valid. The goal of improving maternal well-being addressed a significant problem, the well-being of mothers of children with autism. The procedures were socially appropriate, as they were designed to lead to the desired outcome of reduced distress and greater satisfaction with life. Lastly, the effect of the intervention was valuable to the participant and their child. All of the participants reported that there was a benefit for both themselves and their child(ren) as a result of participating in this study.

Contributions to the Literature

In the Dykens et al. (2014) study on the effects of positive psychology interventions with mothers of children with autism, the use of signature strengths was paired with a gratitude practice. My study differs from the work of Dykens et al. in that it contributes to the limited existing literature by evaluating signature strengths use on its own. The results of this study add support to the hypothesis that signature strengths use can improve well-being factors in mothers of children with autism.

The results of this study also add further support to the hypothesis that there appears to be a long-term benefit to this approach, with well-being not only remaining stable, but continuing to improve after initial instruction and practice of the skill. Other studies outside the population of

mothers of children with autism have also reported this effect (Gander et al., 2013; Harzer & Ruch, 2016). The research study presented here suggests these outcomes may also be possible with mothers of children with autism.

Limitations

This study is limited in its scope due to the small sample size and narrow range of diversity represented in the group of participants. This study investigated only five mothers. All participants were U.S. citizens. All reported income levels above the poverty line. All were married. Only two ethnicities were represented, white and Hispanic. It is also limited due to the use of a daily question that had not been used in research of this kind previously. The data resulting from that daily question was not reflective of the change represented on other validated measures used in the study. Additionally, due to the voluntary nature of the sampling, the group may have been more prone to respond positively.

It is also important to acknowledge that caution should be used when making assumptions based on self-reported information. This approach to data collection prevents researchers from being able to collect interobserver agreement data to better verify results. However, self-perception of well-being was a variable we were aiming to evaluate, so for this purpose, self-reported data proved valuable.

Another limitation of this study was that it involved a social connection with the researcher. In connecting and discussing the signature strengths of each participant, it is possible that the connection impacted the level of well-being in the participant. The benefit of social connection for this population has been presented in the research (Barker et al., 2011, Cetinbakis et al., 2020). However, it is likely that this type of brief connection would not have the lasting positive effect as seen in the follow-up data.

Implications for Future Research

Based on participant feedback and visual analysis of the data, future research may benefit from aiming to complete all stages of a study like this within a school year or within a school break. This would avoid the possibility of data being impacted by the extra stressors of those transitions. Alternatively, systems could be in place to avoid completion of well-being surveys within two weeks of a major life transition. Future research on the effects of this intervention with mothers of children of autism may also use a study timeline that allows for surveys at 3-, 6-, or 12-months post-intervention to evaluate long-term impact and lend support to other research that measured longevity with positive results.

In regards to the participant report of discomfort, future research may strive to avoid this by emphasizing that brainstormed ideas do not have to be completed, especially if they cause distress or discomfort. Other possible ways to improve the experience of the participants might include providing more than five ideas for each strength during the meeting. Perhaps a more exhaustive list would be more helpful. Researchers may also choose to send the list of ideas each day with the daily measure. This was specifically mentioned by two participants. During this study the list was sent only one time per week.

Future research may also benefit from using a different daily question, or finding a different way to gather frequent data on well-being. The daily question used in this study did not show the same sensitivity as did the validated measures used for pre- and post-intervention assessment of well-being. It may also be beneficial to explore training through pre-recorded online courses. This could improve the reach and flexibility of an intervention of this kind. It could also open doors to a variety of translations, expanding the reach beyond English-speaking populations. Additionally, research could be conducted to evaluate the impact of signature-

strengths-use on fathers or other caregivers of children with autism. Perhaps this approach could also aid in addressing teacher burnout in the special education field.

Implications for Practitioners

The results presented here, along with the results in the Dykens et al. (2014) study, suggest that learning about and using signature strengths could boost well-being among mothers of children with autism, and maintain its benefit beyond the immediate future. Perhaps practitioners could recommend this approach to mothers as they navigate their journey parenting a child with autism. Being encouraged to identify and use their individual strengths as they face the challenges of their unique experience could provide a strengthening effect for their mental health. This approach requires limited time, money, and energy. The hope is that it will be energizing to do things that come naturally to them as they face their unique challenges.

Conclusion

A focus on signature strengths provides an opportunity to emphasize what is strong rather than what is wrong. Research suggests that this approach provides long-term benefits for the well-being of individuals engaged in using their strengths more often and in new ways. The results of this study lend support to that hypothesis, demonstrating improvement in measures of life satisfaction and parental distress after five mothers of children with autism completed a signature strengths intervention. This intervention required relatively little training, time, or effort on the part of the mother. The positive results presented in the available research are encouraging and will hopefully inspire more investigation so that this approach, if validated, can be used to aid mothers who are in so much need of support.

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APPENDIX A

Review of the Literature

In recent years, both well-being and human flourishing have moved into a spotlight in research and clinical practice (Ryff, 2014). Many are interested in how we can help ourselves and others find and use the tools available to flourish. While the rise in depression, anxiety, stress, and other emotional disorders is of great concern among the general population (Santomauro, 2021), there is a group of mothers facing unusually acute difficulty in achieving healthy psychological well-being. These are mothers of children with autism spectrum disorders (Hayes & Watson, 2012). With autism prevalence now at 1 in 36 (Maenner et al., 2023), these mothers make up a large and growing percentage of our population.

While some mothers of children with autism report experiencing healthy positive emotion and experiences (Bayat, 2007; Hastings & Taunt, 2002), trends in the literature shine a spotlight on concerning data regarding the average levels of stress and well-being among mothers in this group (Hayes & Watson, 2012). The stressors that are common in raising a child with autism can be abundant and incredibly impactful for the well-being of the mother. These stressors include maladaptive behavior, restricted interests, cognitive impairment, communication deficits, functional dependence, difficulty with eating, sleeping, and toileting, etc. Studies show that mothers who report higher levels of well-being appear to have many factors working in their favor, including strong social support, various positive coping strategies, access to professional support and resources, adequate finances, and training in stress reduction skills. What occurs when a mother has a child with autism but is not afforded all of these strengthening factors? Research shows us they are struggling to cope and thrive (Bromley et al.,

2004; Cox et al., 2015; Dabrowska & Pisula, 2010; Duarte et al., 2005; Enea et al., 2020; Pisula et al., 2007; Shieve et al., 2007; Totsika et al., 2011; Zablotsky et al., 2013).

While there are many labs researching strategies that can enable positive life outcomes for individuals with autism, there is not a substantial amount of research focused on improving positive life outcomes for the caregivers of these individuals (Dykens, 2015; Karst & Van Hecke, 2012). Emerging research is highlighting the crucial role the well-being of these caregivers plays in the development of their children. The relationship appears to be reciprocal (Neece et al., 2012; Rodriguez et al., 2019). The better a mother is doing emotionally, the better the child appears to do socially, emotionally, academically, and behaviorally. The difficulty is that the potential stressors inherent in having and raising a child with autism are immense and challenging to navigate. This is why it is absolutely crucial that clear, brief, and actionable support is given to mothers of children with autism. The dyad is strengthened when the mother is strengthened.

Stress in Mothers of Children with Autism

Having a child with autism poses a unique and substantive risk to the overall psychological well-being of a mother (Ekas et al., 2010). The negative effects on family members of children with autism appear to be present no matter the intensity of their symptoms (Pottie & Ingram, 2008). Mothers of these children with ASD are exceptionally stressed (Bromley et al., 2004; Dykens & Lambert, 2013; Zablotsky et al., 2013) and more prone to depression (Cohrs & Leslie, 2017). They are more stressed than mothers of typically developing children (Baker-Ericzen et al., 2005; Hayes & Watson, 2012; Totsika et al., 2011), and more stressed than mothers of children with myriad other disabilities, including intellectual disabilities, and cerebral palsy (Blacher & McIntyre, 2006; Dabrowska & Pisula, 2010;

Eisenhower et al., 2005; Estes et al., 2009; Griffith et al., 2010; Hayes & Watson, 2012; Pisula, 2007).

Stress is shown to have negative outcomes including development of maternal emotional disorders (Totsika et al., 2011), lowered well-being and physical health (Miodrag & Hodapp, 2010), and increased depression (Benson & Karloff, 2008). Stress studies in parents of children with autism have found the stress in mothers higher than in fathers (Davis & Carter, 2008; Herring et al., 2006; McStay et al., 2014; Olsson & Hwang, 2001). Mothers of children with autism are at risk for significantly low quality-of-life outcomes.

Traits that can be common among individuals with autism contribute to the psychological burden placed on their mothers (Baker-Ericzcn et al., 2005; Bromley et al., 2004; Griffith et al., 2010). These include high levels of problem behaviors, sensory problems, and delayed social skill acquisition. A 2010 study evaluated mothers of children with down syndrome, intellectual disabilities, and autism. Each group of mothers was assessed to gather data on their child's social competence and problem behaviors as well as their own positive perceptions of their child and their parenting stress. Mothers of children with autism reported significantly higher levels of problem behaviors as well as lower levels of social competence in their child compared to the other two groups. They also reported lower maternal well-being and lower levels of positive perceptions (Griffith et al., 2010).

Another study by Robinson and Weiss (2020) found child behaviors to be significantly related to parenting stress. This finding is supported by the research of others in the field (Enea & Rusu, 2020; Estes et al., 2009). In a systematic literature review, Rusu and Enea found that sensory problems also served as a predictor of maternal distress (2020).

Additionally, delayed social skills appear to be linked to maternal distress as presented in a 2005 study of mothers of 37 toddlers with autism and 23 mothers of typically developing children (Baker-Ericzen et al., 2005). The authors of this study present data indicating that mothers of children with ASD demonstrated significantly higher levels of stress compared to mothers of typically developing children. Strongly associated with this increase in stress was the level of the child's social skills, with social skill level serving as a predictor of maternal stress.

Reciprocity of Maternal Stress and Child Behavior

Several recent studies have begun to investigate the reciprocity of the relationship between challenging behaviors in children and the stress level of their mothers. High parenting stress appears to contribute to an increase in externalizing behaviors over time in children with ASD (Lecavalier et al., 2006). For example, one longitudinal study of 188 families of children with autism aimed to examine bidirectional associations between parenting stress and child functioning over the course of three years. ASD behaviors in children were found to cause increases in maternal and paternal stress. The authors also discovered a link between heightened parenting stress and later development of internalizing behavior problems like social withdrawal and depressed mood in their child with autism (Rodriguez et al., 2019). High parenting stress appears to serve as a trigger for later development of problematic internalizing behaviors in children with ASD. In regards to externalizing behaviors (for example, aggression and impulsivity), it was found that heightened parent stress also led to higher levels of these behaviors (Rodriguez et al., 2019). These findings are supported by another study aimed at reducing parenting stress through mindfulness-based stress reduction (MBSR). The authors found that a reduction in child internalizing behavior problems was associated with a reduction in parental stress (McGregor et al., 2020).

Additionally, Neece et al. (2012) found a transactional effect between parenting stress and child behavior problems in a study done with 237 children: 93 with developmental delays and the remaining typically developing children. They posit that parenting stress serves as both a consequence and an antecedent to child behavior problems, and vice versa. This transactional relationship was present in both families of children with developmental delays and families of typically developing children (Neece et al., 2012).

Several variables may be at play in the link between parenting stress and child behavior. One variable that appears in the research is related to parents seeking out treatment. In several studies, impaired well-being and heightened stress levels decreased the likelihood of a parent seeking out and participating in treatment for their child (Kazdin & Mazurick, 1994; Kazdin & Wassell, 2000; Packard et al., 2021). Even if a parent gains access to available resources, increased stress appears to make it difficult for the parent to elicit the positive effects expected from the intervention (Osborne et al., 2008). When parent well-being is low, challenging behavior may increase (Rodriguez et al., 2019) and parents may have difficulty implementing interventions (Osborne et al., 2008; Robbins et al., 1991).

While improvement in challenging behaviors can improve well-being in parents (Herring et al., 2006), it is important to note that strong mental health is needed to implement behavior plans and adhere to them with fidelity, allowing for lasting impact and improvement. In fact, adherence to behavior intervention programs was found to be a moderator in stress levels of parents and caregivers of individuals with autism in a recent study (Rovane et al., 2020). Stress reduced as adherence increased. With low levels of mental health at odds with implementation of behavioral interventions, there may be merit in targeting mental health levels in mothers in order to benefit the dyad.

This information supports the need for interventions that address parental distress early in the process of raising a child with autism. The mother's ability to manage her stress could have a significant impact on her own well-being as well as the flourishing and development of her child with ASD (McIntyre, 2008). There is a great need to target maternal well-being and stress through interventions to improve outcomes for both the mother and the child (Dykens & Lambert, 2013).

Variables Related to Higher Well-Being Outcomes

Research on maternal distress among mothers of children with autism points to several promising areas that could be addressed in order to improve maternal well-being outcomes. These include increasing social support (Benson & Karlof, 2009; Bromley et al., 2004; Dunn et al., 2001; Lu et al., 2018; Tobing & Glenwick, 2007), using positive coping skills (Hastings et al., 2005; Lyons et al., 2010; Pottie & Ingram, 2008; Zaidman-Zait et al., 2018), strengthening resilience (Bitsika et al., 2013), accessing respite care (Harper et al., 2013), practicing mindfulness (Cachia et al., 2016; Dykens et al., 2014; Jones et al., 2018; Neece, 2014; Singh et al., 2019), practicing acceptance (Blackledge & Hayes, 2006; Fung et al., 2018), and employing positive psychology practices (Dykens et al., 2014; Timmons and Ekas, 2018).

Social Support & Coping Skills

Several studies have concluded through surveys and interviews that strong social support and use of positive coping skills are correlated with higher levels of well-being in parents of children with autism (Ang & Loh, 2019; Barker et al., 2011; Benson, 2014; Cetinbakis et al., 2020; Ekas et al., 2015; Lin et al., 2011; Pozo et al., 2014; Willis et al., 2016; Zablotsky et al., 2013). For example, in a national survey of mothers of children with ASD, Zablostky et al. (2013) found that emotional support, neighborhood social support, and positive coping skills

greatly reduced the risk of poor mental health and heightened stress levels. While the information from this study and others like it are useful for identifying those at greater risk for distress in parenting, it does not provide us with actionable information, as there is currently little research on the effect of interventions aimed at strengthening informal social connections or coping skills and the subsequent impact on maternal well-being.

Coping Skills

Many studies present data that indicate that parents who use positive coping skills or employ a resilience mindset demonstrate higher levels of well-being (Abbeduto et al., 2004; Benson, 2010; Benson, 2014; Dunn et al., 2001; Lyons et al., 2010; Pottie & Ingram, 2008; Shepherd et al., 2018). There is some limited data on the positive impact of intervening to improve specific coping skills and the subsequent effect (Al-Khalaf et al., 2014; Dunn et al., 2001; Samadi et al., 2013). Studies presenting results of surveys on coping skills are important and useful in that they provide us with information about how those who are thriving are coping with their circumstances (Benson, 2014). For example, several of these studies clarify which coping strategies appear to be harmful and which are helpful.

Lyons et al. (2010), found emotion-oriented coping to be associated with higher stress levels, while task-oriented coping was associated with the lowest levels of stress among 77 primary caregivers of children with autism. Emotion-oriented coping levels were determined by measuring negative thinking and rumination. This mode of coping has repeatedly been found to predict psychological distress (Abbeduto et al., 2004; Ang & Loh, 2019; Dunn et al., 2001; Smith et al., 2007). Task-oriented coping was defined as a parent "engaging in active attempts, both behavioral and cognitive, to alleviate stress" (Lyons et al., 2010). They might do this by employing strategies that attempt to solve the problem, reconceptualizing the problem, or

minimizing the effects of the problem. These conclusions align with other research regarding emotion-focused coping and task-oriented (or problem-focused) coping (Abbeduto et al., 2004; Ang & Loh, 2019; Dunn et al., 2001; Dabrowska & Pisula, 2010; Smith et al., 2007; 2008). Emotion-oriented coping broadly aligns with other forms of harmful coping present in the literature, like avoidant coping (Benson, 2010; Hastings et al., 2005).

In another study on coping, Pottie and Ingram (2008) found four coping strategies to be harmful: escape, blaming, withdrawal, and helplessness. They found five coping strategies that were helpful for improving stress levels: problem-focused coping, social support, positive reframing, emotional regulation, and compromise coping. An additional study on coping styles found active avoidance coping to be harmful to levels of stress in parents of children with autism. In the same study, lower levels of depression were associated with positive coping, which involves using positive perceptions (Hastings et al., 2005).

In a seven-year study on coping skills in mothers of children with autism, engagement, disengagement, distraction, and cognitive reframing were analyzed. Maternal maladjustment was found to be associated with use of disengagement and distraction. Cognitive reframing was found to be linked to higher maternal well-being outcomes (Benson, 2014).

Another set of terminology was used to address coping in a study by Zaidman-Zait et al. (2018) examining engaged and disengaged coping along with social networks. Engaged coping was tied to problem-focused coping in this study. Parents who use engaged coping use "active efforts to solve a problem, get help, or construct positive meaning." Engaged problem-focused coping predicted higher well-being outcomes in parents with both average social resources and elevated social resources. Those who reported using more disengaged coping strategies (strategies used to distance themselves from, minimize, or avoid a problem) than engaged coping

strategies displayed higher distress on measures given during and at two years after the initial study. Of note, their fourth group (comprised of those using elevated amounts of disengaged coping who had limited social resources) also demonstrated the poorest outcomes for the child with autism in regards to problem behavior and adaptive functioning.

Many of the interventions aimed at improving mental health outcomes in parents of children with autism target the positive coping techniques that have emerged as helpful in the literature. For example, engaged problem or task-oriented coping (i.e., solving a problem, reconceptualizing a problem, getting help, minimizing the effects of a problem, or constructing meaning) in its variety of forms, plays an important role in mindfulness, acceptance, and positive adult development. Positive impact on parenting stress has resulted from interventions that employ these strategies (Blackledge & Hayes, 2006; Dykens et al., 2014).

Acceptance Interventions

Acceptance interventions seek to teach important cognitive processes that correlate with higher mental well-being (Lloyd & Hastings, 2008). Acceptance is a component of Acceptance and Commitment Therapy (ACT). ACT has been found to be successful in groups of mothers of children with autism (Blackledge & Hayes et al., 2006; Fung et al., 2018). Blackledge and Hayes (2006) completed a within-subject repeated measures design with 20 parents or caregivers with autism. The ACT intervention aimed to teach the caregiver to use acceptance to cope with the challenges of caring for an individual with ASD.

In the training, parents were first assisted in identifying core values. Cognitive fusion was then addressed and the group participated in exercises employing defusion, the concept of separating oneself from one's thoughts. They then spent time on exercises that supported the use of acceptance in the face of difficult emotions or cognitions, making room for negative

experiences in their mind without pushing them out. They practiced self-as-context and self-as-content concepts, which emphasize the observing self, or the part of the mind that can step back and observe what one is thinking. They were then taught to make behavioral commitments (aligned with their values) while in the midst of discomfort and discouraging thoughts. The training took place over two days, with 14 hours required of the parents in total. The intervention led to improved psychological outcomes (distress and depression) that were sustained over a three-month period (Blackledge & Hayes, 2006).

Mindfulness Interventions

Mindfulness interventions have also been successful with parents of children with autism (Dykens et al., 2014; Neece, 2014; Jones et al., 2018). Neece et al. (2014) completed a mindfulness-based stress reduction (MBSR) intervention with 46 parents of children with autism in which they trained the parents for two hours weekly over the span of eight weeks. They also held a six-hour mindfulness retreat during the program after week six. The parents reported significant reductions in distress and improvement in global life satisfaction. The data also showed that parents reported less behavior problems in their children at the end of the study, supporting the hypothesis that parenting distress and child behavior have a transactional relationship. Another study provided a mindfulness-based parenting program over eight weeks to 21 parents and also found significant improvement in mindfulness and self-compassion as well as a reduction in stress among the participants (Jones et al., 2018). However, this study did not find significant improvement in child behavior.

A larger study involving 243 parents of children with autism provided a six-week program, 90 minutes per week, on MBSR. During the interventions, parents were taught movement techniques, breathing exercises, and meditation. They were encouraged to pay

attention to their breath, practice deep-belly breathing, and utilize their relaxation response. They were also taught three kinds of meditation, including loving-kindness, sitting, and body-scan meditation. This intervention led to significant reductions in stress, depression, and anxiety, as well as improvement in life satisfaction and sleep (Dykens et al., 2014). A systematic review evaluating MBSR interventions for parents of children with autism concluded that MBSR interventions have potential to have long-term positive impacts on the stress levels and well-being of these parents. They conclude that finding or creating a time- and cost-effective approach should be pursued in future research (Cachia et al., 2016).

Positive Psychology Interventions

One possible avenue for addressing the need for time and cost-effective intervention lies in the use of Positive Adult Development (PAD), from the field of positive psychology. Research on the impact of positive psychology is growing and has been done with individuals of varied age and circumstance (Bolier et al., 2013). In the randomized trial discussed previously (Dykens et al., 2014) on meditation and mindfulness, one group participated in MBSR training while the other group completed PAD training. The PAD training involved gratitude journaling and use of signature strengths with the goal of tempering guilt, conflict, worry, and pessimism. Participants were encouraged to practice specific exercises at home and share with others in the group meetings.

There were significant improvements for mothers of children with autism in several mental wellness areas, including life satisfaction, depression, anxiety, and insomnia after participating in the PAD training (Dykens et al., 2014). Variations of these positive psychology interventions can be found throughout the research literature and with a wide variety of study groups. A thorough review of this research demonstrates that these interventions manage to be

time- and cost-effective while also having a strong positive impact on the well-being of the participants.

Positive Psychology and Signature Character Strengths Interventions

Positive psychology is a field focused on the scientific study of human flourishing. The practice of positive psychology is "about good lives, or about enabling people to be at their best." (Lopez & Snyder, 2009, p. 35). Positive psychology interventions (PPIs) are interventions aimed at improving well-being through positive practices. Their significant effect has been discussed in two meta-analyses (Bolier et al., 2013; Sin & Lyubomirsky, 2009). One notable PPI that has been found to be effective is identifying character strengths and then using them regularly (multiple times per week in the study) (Peterson & Seligman, 2004). It appears to be effective at both improving well-being and decreasing depressive emotions. This intervention is often referred to in the literature as "using character strengths" or "using signature strengths."

Signature Character Strengths

Signature character strengths are identified using a questionnaire called the Values in Action (VIA) Inventory of Strengths (Peterson & Seligman, 2004). The questionnaire measures the possession and relative strength of 24 character dimensions in adults (e.g. love, prudence, zest, and love of learning), placing them in ascending order according to how central each dimension is for the individual assessed. It is a 96-item questionnaire that asks the respondent to rank statements on a Likert-like scale (1 = *very much unlike me*, 5 = *very much like me*). Some examples include "I always treat people fairly whether I like them or not", and "I can always find the positive in what seems negative to others." The top four dimensions are identified as "signature strengths."

Early research on identifying and using signature strengths proved promising for improvement of well-being and reduction of depressive symptoms among participants (Seligman et al., 2005). Since then, this realm of positive psychology has been used in many settings in an effort to evaluate its effectiveness and improve the well-being of many diverse groups.

Signature Strengths Interventions in Research

Signature strengths interventions have been used with children and adolescents, the elderly, employees in the workplace, individuals with dyslexia, those with traumatic brain injury, people with autism, university students, health professionals, homeless youth, and even class clowns (Allan & Duffy, 2014; Andrewes et al., 2014; Bridges et al., 2012; Duan et al., 2019; Forest et al., 2012; Harzer & Ruch, 2012, 2013, 2016; Hausler et al., 2017; Höge et al., 2020; Huber et al., 2020; Kachel et al., 2020; Kannangara, 2015; Khanna & Singh, 2019; Kirchner, 2016; Linley et al., 2010; Littman-Ovadia et al., 2017; Lounsbury et al., 2009; Merritt et al., 2019; Peisah, 2016; Proyer et al., 2014; Quinlan et al., 2015; Madden et al., 2011; Suldo et al., 2015).

While simply learning about one's signature strengths may be beneficial, research demonstrates that the greatest benefit is derived through *using* signature strengths (Duan et al., 2019; Forest et al., 2012; Harzer & Ruch, 2013; Hausler et al., 2017; Seligman et al., 2005; Wood et al., 2011), particularly when individuals devise novel ways to use their signature strengths. Use of signature strengths has been shown to improve human flourishing in several categories including well-being, happiness, and life satisfaction. Studies have also found a reduction in depressive symptoms (Duan et al., 2019; Forest et al., 2012; Harzer & Ruch, 2016; Hausler et al., 2017; Khanna & Singh, 2019; Linley et al., 2010; Proyer et al., 2015; Woodworth et al., 2017). This intervention has been found to have continued positive impact when follow-up

measures are completed at three months (Wood et al., 2011) and six months after training (Gander et al., 2013; Wood et al., 2011).

When Seligman first began investigating positive psychology interventions, a large randomized control trial was completed that evaluated five positive psychology intervention (PPI) exercises. The first group identified their signature strengths through the VIA assessment. The second group completed the same assessment then used one of their signature strengths in a new way for each day over the course of a week. The third group identified three good things that happened each day and wrote them down at the end of the day for a week. The fourth group completed a gratitude visit, writing a letter to someone that had been particularly kind and hand-delivering the letter to them. The fifth group completed a task called "you at your best," where they wrote about a time they had been at their best and then identified their strengths in the story. The placebo group wrote about early memories each day for one week. Two of these interventions lead to gains in happiness and a decrease in depressive symptoms that persisted at the six month follow up; both using signature strengths and the three good things exercise. While simply identifying signature strengths (and not using them in new ways) led to a slight gain in happiness immediately after completing the questionnaire, measures indicated that well-being returned to levels mirroring the placebo group thereafter (Seligman et al., 2005). Long-term benefits were mediated by a continuation in practice of the intervention. A more recent study came to a similar conclusion when it measured well-being for a full year and found that use of signature strengths partially mediated effectiveness of the intervention while signature strengths knowledge had no effect (Duan et al., 2019).

Another longitudinal study of 207 adults in England also found long term effects at a six-month follow up for strengths-use interventions. They found that those who used their strengths

more demonstrated greater gains in well-being. Well-being measures at three months and six months after the intervention found improvements in self-esteem, vitality, and positive affect as well as a decrease in stress. The authors concluded that the use of signatures strengths leads to positive changes in well-being over both three- and six-month time periods (Wood et al., 2011).

Most studies on signature strengths involve only a brief initial training (Duan et al., 2019; Harzer & Ruch, 2016; Seligman et al., 2005). For example, in one randomized controlled intervention with first-year college students, a 90-minute training was given that had four parts. First, the definitions and meanings of each character strength were taught by an instructor. Second, the students participated in an activity called a "strengths 360," in which they selected what they believed to be their top five strengths with the help of outside observers. Part three was the reception and review of their test results from the VIA assessment (taken before the intervention began, but they did not see their test results immediately). In part four, the instructor talked about how they could use their signatures strengths and then the participants were asked to set goals and plan activities that used their signature strengths (Duan et al., 2019). Gains in well-being were seen after the intervention and at a one-week follow up.

Another study for working professionals aimed to improve life satisfaction and measure changes in a sense of calling at work after a brief online signature strengths intervention. The study included males and females working for diverse employers in different jobs (i.e., teachers, IT technicians, project managers, etc.). At the beginning of the study they completed a brief four-step training. First, they identified their top four signature strengths and learned about them. Next, they thought about their daily activities and tasks. Third, they considered and listed ways they currently use their strengths. Last, they developed plans on how to use their signature strengths in novel ways over the following four weeks. Measures of well-being were given

immediately after the four-week period (of planned strengths use) as well as at three and six months after the study. Notably, global life satisfaction was significantly higher at the four-week measure and continued to rise at the three- and six-month measures (Harzer & Ruch, 2016). This study supports the use of a brief initial training while also supporting the use of online technology to provide the training.

There are other signature strengths studies that have utilized an initial online training with good results. One such study had participants complete the VIA assessment and then sent them a simple prompt: "We have selected five character strengths for you. Use one of these strengths in a new and different way every day for one week. You can apply the strength in a new environment or when interacting with a 'new' person. It is up to you how you want to apply these strengths. Try to apply these strengths, regardless of whether you feel like you are already using this strength frequently or not." They also provided a list of ideas if the individual expressed that they had trouble thinking of novel ways to use their strengths. This study was unique in that it did not inform participants that they were working on their signature strengths, and still found positive effects on happiness and well-being (Proyer et al., 2015).

Another study completed by Harzer and Ruch (2012) found that the number of signature strengths that an individual used in their work had a significant impact on the number of positive experiences they had at work. They gathered data reported by self-raters and peer-raters (from the workplace) to determine how many of each individual's signature strengths were being used at work. Using four or more signature strengths in the workplace was associated with significantly higher positive experiences than using three or less (Harzer & Ruch, 2012). Also of note, only those who applied four or more strengths in their work saw their work as a calling. In

this study, calling was defined as having a sense of meaning as well as finding pleasure and fulfillment in your work.

Although a growing body of research is forming to support the effectiveness of strengths interventions, one partial replication of Seligman's initial 2005 study found less significant results than its predecessor, noting similar improvements among participants in the strength-intervention group and the positive-intervention placebo group (writing about positive early memories) (Mongrain & Anselmo-Matthews, 2012). The authors suggested that the benefit comes not from the strength intervention itself, but from its focus on self-relevant and positive information. A replication with differing results was published one year later by Gander et al. (2013). In an effort to replicate and extend Seligman's initial 2005 study with over 2,000 participants, it was demonstrated that the positive placebo and other positive interventions demonstrated similar *initial* gains in happiness, but differences were found over time, with the positive interventions leading to gains in happiness at both three- and six-months post intervention while the placebo returned to baseline by the three-month follow up. The authors suggest that Mongrain and Anselmo's (2012) results may differ from theirs because their average depressive level was higher than the cutoff reported in Gander et al. (2013). Gander et al. (2013) also point out that differing results among different positive interventions serve to disprove Mongrain and Anselmo's theory that any positive intervention that involves self-relevant and positive information would have the same effect.

A meta-analysis by Schutte and Malouff (2019) evaluated 29 effect sizes in 14 articles. They found a weighted Hedges *g* score of .42 when calculating for the effect of signature strength use on life satisfaction, indicating significant effect. This is consistent with findings in a smaller 2012 meta-analysis that found small to moderate effects from character strength

interventions (Quinlan et al., 2012) and a 2013 meta-analysis that addressed positive psychology more generally and found the interventions to be effective in enhancing subjective and psychological well-being (Bolier et al., 2013). Signature strength interventions appear to be an effective tool for improving mental health while requiring relatively little initial training and ongoing support (Duan et al., 2019).

This approach for improving well-being and life satisfaction could be especially beneficial for mothers of children with autism, who may have limited time and energy to address their mental health needs. When it comes to using signature strength interventions with mothers of children with autism spectrum disorder (ASD), research is limited. Published literature gives us only the randomized trial by Dykens et al. (2014) comparing mindfulness-based stress reduction (MBSR) to positive adult development (PAD).

Additional Forms of Strengths-Focused Parenting Interventions

We can look to other areas of parenting intervention to find further support for strengths-focused interventions. One example comes from a program designed to provide integrated care by pairing parenting interventions with well-child visits with a family's primary care provider. This evidence-based program, called the Incredible Years Well-Baby (IYWB) was designed to help parents better meet the social and emotional needs of their children while dealing with compound stressors (Webster-Stratton & Reid, 2010). In a study aimed at evaluating engagement in these parents it was found that parents were more likely to complete a task when it was linked with their individual strengths or concerns (Woods-Jaeger et al., 2020). Based on the study outcomes, the authors recommended that parenting interventions could incorporate building from parent strengths to improve engagement. This strategy may be helpful in supporting parents of children with autism as they begin interventions aimed at improving their own parenting

behavior in addition to interventions targeting the social, academic, behavioral, and emotional development of their child.

Another example is illustrated in a study evaluating stress in mothers of children with intellectual disabilities. A statistical analysis was done on measures completed by 135 mothers. They completed surveys evaluating parental self-efficacy, satisfaction with life, family satisfaction, positive affect, and positive contributions. They found that maternal positivity was negatively associated with maternal distress to a significant degree. Based on the results, the authors recommend targeting parental positivity to improve their well-being. They specifically recommend finding ways to improve their feeling of self-efficacy in the parenting role (Jess et al., 2017).

Another form of strengths-based parenting involves identifying and celebrating the strengths of the child. For example, one study measured parent affect, quality of parent-child interactions, and parent statements about their child's behavior throughout an alternating treatment intervention. In the sessions, the therapist made either strength-focused or deficit-focused statements about the child over different periods. During the strength-focused periods, parents would show their child more physical affection, make more positive statements about their child, and display more positive affect (Steiner, 2011). The author suggests a focus on strengths could contribute to improving parental well-being among parents of children with autism. Taking a strengths-focused rather than deficits-focused approach in parent education and training appears to be an important consideration for therapists leading these interventions.

An Argument for Signature Strengths Training

While research that applies signature strengths interventions to mothers of children with autism is rather limited, several factors support its exploration for this population. First, we know

that it works to improve well-being in many other settings where individuals face challenges and stressors. Second, we know that positive outcomes can be seen with minimal amounts of initial training. Third, ongoing use of signature strengths is not a burden on resources or time. Fourth, it is free. Fifth, the tenets of signature strengths training and usage align with the coping strategies that have emerged in the literature as helpful for parents of children with autism. For example, rather than avoiding a problem at hand, a parent can consider how they might use their strengths to solve the problem, minimize the effects of the problem, or get the help needed. Signature strengths use involves action, which is in direct contrast with harmful coping mechanisms like avoidance and emotion-focused coping.

Signature strengths use also shares some commonalities with ACT in that it focuses on accessing and using individual values and implementing the practice of accepting what is. The VIA institute on character strengths has also embraced mindfulness and integrated it with signature strengths use, creating a mindfulness-based strengths practice (MBSP) (Bretherton & Niemiec, 2019). In the 2014 study that compared mindfulness and positive psychology interventions, results were positive for both groups of participants (Dykens et al., 2014). This intervention has the potential to be cost- and time-effective, beneficial to the mental health of the participants, and easy to maintain, as the skill learned is accessing what is *already* strong in the mother and using those strengths more regularly.

Conclusion

Resilient families make meaning out of adversity. Despite the grim conclusions of many studies on stress and well-being among parents of children with autism, it is valuable to note that positive outcomes are possible. New perspectives on life, increased sensitivity, support for each other, opportunities to learn, improved family dynamics, increased confidence and assertiveness,

and increased faith were all responses given by parents of children with autism when they were asked to report positive aspects of having a child with autism (Hastings and Taunt, 2002). Bayat (2007) presented more positive themes reported by 175 families of children with autism. They include becoming closer and more united as a family, appreciating the small things, being spiritually awakened or strengthened, adjusting beliefs about the meaning of life, and finding positive meaning in disability. There appears to be a paradox in the responses of caregivers of children with autism, in that they can express deep and poignant despair and joy in the same breath.

In a qualitative study by Myers et al. (2009), 493 mothers of children with autism submitted an answer online to the question "How has your child on the autism spectrum impacted your life and your family's life?" The written responses were coded for themes. 50% of responses were coded as fully negative. The 46 responses that were coded for deepest distress were categorized under a theme called "center of our lives." They spoke of their lives being turned upside down by their child. 30% of responses were a mix of positive and negative, and 10% were fully positive. Finding meaning amidst the challenges of raising a child with autism appeared to be important in responses containing positive themes (Myers et at., 2009).

While meaning can be found amidst the challenges of raising a child with autism, it is important to support the mother of a child with autism in improving their well-being so they are well enough to discover that meaning. Because their challenges are particularly difficult, their emotional needs should be addressed early and effectively as a crucial part of the package of responses employed to support the development of a child with ASD.

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APPENDIX B

Consent & Institutional Review Board Approval Letter

Memorandum

To: Blake Hansen
Department: BYU - EDUC - Counseling, Psychology, & Special Education
From: Sandee Aina, MPA, HRPP Associate Director
Wayne Larsen, MAcc, IRB Administrator
Bob Ridge, Ph.D., IRB Chair
Date: April 13, 2023
IRB#: IRB2023-092
Title: The Effectiveness of a Signature Strengths Intervention on Maternal Well-Being Among Mothers of Children with Autism

Brigham Young University's IRB has approved the research study referenced in the subject heading as expedited level, categories 6 and 7. This study does not require an annual continuing review. Each year near the anniversary of the approval date, you will receive an email reminding you of your obligations as a researcher. The email will also request the status of the study. You will receive this email each year until you close the study.

The IRB may re-evaluate its continuing review decision for this decision depending on the type of change(s) proposed in an amendment (e.g., protocol change that increases subject risk), or as an outcome of the IRB's review of adverse events or problems.

The study is approved as of 04/13/2023. Please reference your assigned IRB identification number in any correspondence with the IRB.

Continued approval is conditional upon your compliance with the following requirements:

1. A copy of the approved informed consent statement and associated recruiting documents (if applicable) can be accessed in iRIS. No other consent statement should be used. Each research subject must be provided with a copy or a way to access the consent statement.
2. Any modifications to the approved protocol must be submitted, reviewed, and approved by the IRB before modifications are incorporated into the study.
3. All recruiting tools must be submitted and approved by the IRB prior to use.
4. All data, as well as the investigator's copies of the signed consent forms, must be retained for a period of at least three years following the termination of the study.
5. In addition, serious adverse events must be reported to the IRB immediately, with a written report by the PI within 24 hours of the PI's becoming aware of the event. Serious adverse events are (1) the death of a research participant; or (2) serious injury to a research participant.
6. All other non-serious unanticipated problems should be reported to the IRB within 2 weeks of the first awareness of the problem by the PI. Prompt reporting is important, as unanticipated problems often require some modification of study procedures, protocols, and/or informed consent processes. Such modifications require the review and approval of the IRB.

Consent to be a Research Subject

Title of the Research Study: The Effectiveness of a Signature Strengths Intervention on Maternal Well-Being Among Mothers of Children with Autism
Principal Investigator: Blake Hansen

Introduction

This research study is being conducted by Associate Professor, Blake D. Hansen, PhD, BCBA-D, LBA, at Brigham Young University to determine the effectiveness of the purposeful use of signatures strengths on the well-being of mothers of children with autism. You were invited to participate because you met the criteria for recruitment (e.g., you are the mother of a child who has been diagnosed with autism spectrum disorder (ASD) and you have expressed willingness to participate in the study and complete the research requirements.

Procedures

If you agree to participate in this research study, the following will occur:

- You will be asked to complete 2 brief surveys online at three separate times over the duration of the study. Due to the organization of the study, the time spent in the study will vary. You could be enrolled for as little as six weeks and up to 10 weeks.
- You will be sent a text each day asking you to answer a single question on a sliding scale (1: I strongly disagree to 7: I strongly agree). The question will be the same each day and is meant to only require only a few seconds to answer. During a four-week window in the study an additional yes or no question will be added to this text.
- You will participate in a 4-week practice period 2-4 weeks after enrolling in the study. At the beginning of the 4-week practice period you will be asked to complete a 25-minute survey identifying your strengths and then you will meet with the researcher on Zoom™ to discuss the results and make actionable goals to be completed in a 4-week period. The online meeting is not expected to exceed 45 minutes. It will be scheduled at a time that is convenient for you.
- Over the following 4 weeks you will be asked to complete 3 tasks or goals per week. You will plan what these are to be with the researcher during your online meeting. They are not expected to be time consuming.
- After completing that period there will be a 6 week wait before we send the last surveys. Nothing will be expected from you during this time.
- After the 6-week wait is completed, a final meeting will be scheduled to take place on Zoom™. In this meeting we will discuss your experience and results. This meeting will be scheduled at your convenience and is expected to take 20 minutes. You will then be sent a final 8-question survey asking for information on your experience with the study. This should take 5 minutes to complete.
- After completing the final survey, you will be sent an email with a link to a $30 gift card.
- Total time commitment will be approximately **176** minutes for surveys and meetings, in addition to the variable time required to complete planned tasks and goals during the 4-week practice period.

Risks/Discomforts

Risks to participants may occur, but are not anticipated. Risks might occur during completion of surveys, meetings with researchers, or task completion. These might be negative affective states like boredom or thoughts of inadequacy. These are anticipated to be minimal and transient if they occur. There is also a slight risk of loss of privacy. Researchers will mitigate this risk by password protecting all recorded video and stored survey results.

Benefits
There are no direct benefits for participants in this study.

Confidentiality

We will keep the information we collect about you during this research study for analysis and for potential use in future research projects. Your name and other information that can directly identify you will be stored securely and separately from the rest of the research information we collect from you. The research data will be kept on password protected computer and only the researcher will have access to the data. At the conclusion of the study, all identifying information will be removed and the data will be kept in the University Box with restricted access.

The researchers may contact you again as part of this research study.

De-identified data from this study may be shared with the research community, with journals in which study results are published, and with databases and data repositories used for research. We will remove or code any personal information that could directly identify you before the study data are shared. Despite these measures, we cannot guarantee anonymity of your personal data.

The results of this study could be shared in articles and presentations but will not include any information that identifies you unless you give permission for use of information that identifies you in articles and presentations.

Compensation

You will receive a $30 gift card for your participation in this study.

Participation
Participation in this research study is voluntary. You have the right to withdraw at any time.

Questions about the Research
If you have questions, concerns, or complaints, you can contact the Principal Investigator Blake Hansen (blake_hansen@byu.edu) or CPSE graduate student Tawni Poole (tawni.joy@gmail.com).

Questions about Your Rights as Research Participants
If you have questions regarding your rights as a research participant contact Human Research Protections Program by phone at (801) 422-1461; or by email: BYU.HRPP@byu.edu.

Statement of Consent
I have read, understood, and received a copy of the above consent and desire of my own free will to participate in this study.

Name (Printed): _____ Signature _____ Date: _____

Consent to Use Audio Recording & Video Recording

The Effectiveness of a Signature Strengths Intervention on Maternal Well-Being Among Mothers of Children with Autism

Thank you for your willingness to participate as a research subject for a signature strengths study conducted by Blake Hansen and Brigham Young University.

During the Study, researchers will audio & video record (through Zoom) you. The recordings will only be viewed by research team members in order to collect data on how the team member presented the information. They will be deleted after the data is collected. Your consent below allows BYU to use these recordings for purposes associated with the Study.

Participant Consent

I understand that researchers will take audio recording & video recordings of me as part of this Study. I give permission for BYU to use the Media in scientific publications, scientific conferences or meetings, educational presentations, public presentations to non-scientific groups, and other uses related to the Study so long as my name is not used. I agree that all Media will become the property of BYU, and I waive my right to inspect, approve, or be compensated for BYU's use of the Media.

By signing below, I certify that I have read this Consent to Use Audio Recording & Video Recording and agree to its terms.

Name of Participant: _____
(Please Print)

_____
Signature of Participant *Date*

APPENDIX C

Instruments

Brief Daily Measure A

* Required

1. To what degree do you agree with the following statement: *
"I am satisfied with the conditions of my life"

Mark only one oval.

	Strongly Disagree
1	
2	
3	
4	
5	
6	
7	
	Strongly Agree

BYU Research Recruiting: Mothers of Children with ASD

Thank you for your interest in our study! We are recruiting mothers of children with autism between the ages of 3-12 to participate in a study on maternal well-being. If you are interested in participating, please complete this form. For questions and inquiries please reach out to Tawni Poole at tawni.joy@gmail.com or Blake Hansen at blake_hansen@byu.edu.

1. Your Name:

_____

2. Your Email:

_____

3. Are you a mother of a child who has been diagnosed with autism?

Mark only one oval.

- ◯ Yes
- ◯ No

4. Is your child between the ages of 3 and 12?

Mark only one oval.

- ◯ Yes
- ◯ No

5. Do you have access to the internet and Zoom?

Mark only one oval.

- ◯ Yes
- ◯ No

6. Are you willing to meet twice (online over Zoom) with the researcher to discuss survey results? (45 minutes for the first meeting and 20 minutes for the second meeting)

Mark only one oval.

- ◯ Yes
- ◯ No

7. Are you willing and able to answer a single question that will be sent via text each day for 6-10 weeks?

Mark only one oval.

- ◯ Yes
- ◯ No

8. Are you willing to complete several online surveys that would require roughly 73 minutes (total) of your time? This would take place over the course of several months.

Mark only one oval.

- ◯ Yes
- ◯ No

9. Are you willing to be contacted through email and text during the study?

Mark only one oval.

- ◯ Yes
- ◯ No

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Google Forms

Demographics

* Required

1. First name: *

2. Last name: *

3. What is your age? *

Mark only one oval.

- Under 15
- 16-24
- 25-34
- 35-44
- Over 50

4. What is your gender? *

Mark only one oval.

- Male
- Female
- Nonbinary
- Prefer not to say
- Other:

5. What is your ethnic background? *

Mark only one oval.

- White / Caucasian
- Asian - Eastern
- Asian - Indian
- Hispanic
- African-American
- Mixed race
- Other:

6. In what state do you live? *

7. In what city do you live? *

8. What is the highest level of education you have achieved? *

Mark only one oval.

- Master's degree or above
- Bachelor's degree
- High school
- Other:

9. What is your marital status? *

Mark only one oval.

- ◯ Married
- ◯ Single
- ◯ Separated
- ◯ Divorced

10. What is the level of your annual household income? *

Mark only one oval.

- ◯ Less than $25,000
- ◯ $25,000 - $50,000
- ◯ $50,000 - $100,000
- ◯ $100,000 - $200,000
- ◯ More than $200,000

11. How many children do you have? *

Mark only one oval.

- ◯ 1 *Skip to question 12*
- ◯ 2 *Skip to question 15*
- ◯ 3 *Skip to question 17*
- ◯ 4 *Skip to question 19*
- ◯ 5+ *Skip to question 21*

One child

12. Does your child have autism? *

Mark only one oval.

- ◯ Yes
- ◯ No

13. What is your child's gender? *

Mark only one oval.

- ◯ Male
- ◯ Female
- ◯ Nonbinary
- ◯ Prefer not to say
- ◯ Other: _____

14. What is your child's age? *

_____

Two Children

15. Please indicate the gender of each of your children below:

Check all that apply.

	Male	Female	Nonbinary	Prefer not to say
Child 1	☐	☐	☐	☐
Child 2	☐	☐	☐	☐

16. Please mark the ages of your children:

Mark only one oval per row.

	< 1	1	2	3	4	5	6	7	8
Child 1	◯	◯	◯	◯	◯	◯	◯	◯	◯
Child 2	◯	◯	◯	◯	◯	◯	◯	◯	◯

Skip to question 22

Three Children

17. Please indicate the gender of each of your children below: *

Check all that apply.

	Male	Female	Nonbinary	Prefer not to say
Child 1	☐	☐	☐	☐
Child 2	☐	☐	☐	☐
Child 3	☐	☐	☐	☐

18. Please mark the ages of your children: *

Mark only one oval per row.

	< 1	1	2	3	4	5	6	7	8
Child 1	◯	◯	◯	◯	◯	◯	◯	◯	◯
Child 2	◯	◯	◯	◯	◯	◯	◯	◯	◯
Child 3	◯	◯	◯	◯	◯	◯	◯	◯	◯

Skip to question 22

Four Children

19. Please indicate the gender of each of your children below: *

Check all that apply.

	Male	Female	Nonbinary	Prefer not to say
Child 1	☐	☐	☐	☐
Child 2	☐	☐	☐	☐
Child 3	☐	☐	☐	☐
Child 4	☐	☐	☐	☐

20. Please mark the ages of your children: *

Mark only one oval per row.

	< 1	1	2	3	4	5	6	7	8
Child 1	◯	◯	◯	◯	◯	◯	◯	◯	◯
Child 2	◯	◯	◯	◯	◯	◯	◯	◯	◯
Child 3	◯	◯	◯	◯	◯	◯	◯	◯	◯
Child 4	◯	◯	◯	◯	◯	◯	◯	◯	◯

Skip to question 22

5 or more children

21. What is the gender and age of each of your children? *

_____

_____

_____

_____

_____

Skip to question 22

Autism

22. Do you have more than one child with autism? *

Mark only one oval.

- ( ) Yes *Skip to question 24*
- ( ) No *Skip to question 23*

One child with Autism

23. What is the age of your child with autism? *

Mark only one oval.

- ( ) 1
- ( ) 2
- ( ) 3
- ( ) 4
- ( ) 5
- ( ) 6
- ( ) 7
- ( ) 8
- ( ) 9
- ( ) 10
- ( ) 11
- ( ) 12
- ( ) 13
- ( ) 14
- ( ) 15
- ( ) 16
- ( ) 17
- ( ) 18 +

Other Children with Autism

24. What is the age and gender of each of your children with autism? *

____

Brief Daily Measure B

* Required

1. To what degree do you agree with the following statement: *
"I am satisfied with the conditions of my life"

Mark only one oval.

Strongly Disagree

1 ◯
2 ◯
3 ◯
4 ◯
5 ◯
6 ◯
7 ◯

Strongly Agree

2. Did you use one of your signature strengths in a new way yesterday? *

Mark only one oval.

◯ Yes
◯ No
◯ Other: ____________

8. Would you recommend this intervention to other mothers of children with autism? *

Mark only one oval.

- Yes
- No
- Other: ______

Untitled Section

9. Please describe a few ways you or your child benefitted when you used your strengths in a new way: *

10. Do you have any thoughts on how we could improve the experiences of others who participate in this study?

11. Is there anything else we should know about your experience while participating in this study?

BYU Research: Final Feedback Survey

Thank you so much for your participation in our study! We appreciate your willingness to give your time and energy to further our study of well-being among mothers like you! We hope you found the content of our study to be helpful and informative. We have a few questions for you as we wrap up your time in the study. We are seeking your feedback so we can continually improve. We appreciate you for taking the time to complete this final questionnaire, of many! After you complete this survey, we will send a $30 gift card to you within one week. Don't hesitate to reach out if you do not receive the gift card or if you have any further questions.

* Indicates required question

1. Your Name: *

_____

2. Your mailing address (for the gift card): *

_____

_____

_____

_____

_____

3. Did you benefit from identifying your signature strengths and using them more? *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Other: _____

4. Do you believe your child benefited from your participation in this study? *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Other: _____

5. Would you use this approach to improve your well-being again? *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Other: _____

6. Did you like the procedures used in this study? *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Other: _____

7. Did you experience discomfort during this study? *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Other: _____

8. Would you recommend this intervention to other mothers of children with autism? *

Mark only one oval.

- Yes
- No
- Other: ____________

Untitled Section

9. Please describe a few ways you or your child benefitted when you used your strengths in a new way: *

10. Do you have any thoughts on how we could improve the experiences of others who participate in this study?

10/6/23, 12:51 PM BYU Research: Final Feedback Survey

11. Is there anything else we should know about your experience while participating in this study?

Treatment Fidelity Checklist (Zoom Meeting)

* Indicates required question

1. Title of the recording you are reviewing: *

2. Your Name: *

3. Date of Review: *

Example: January 7, 2019

4. Please mark all that occurred in the Zoom session. Thank you! *

Check all that apply.

- [ ] VIA test results were discussed
- [ ] The participant identified 4 of their top 7 strengths to identify as "signature"
- [ ] Discussion of how strengths are currently used occurred
- [ ] Discussion of how strengths might be used in new ways occurred
- [ ] Graduate student created a Google document listing ideas under each strength, organized into the 4-week plan, then shared the Google doc with the participant.
- [ ] Graduate student explained that the goal is to focus on one strength per week and use it in at least 3 new ways on at least 3 days of that week.