UNIVERSITY OF CALIFORNIA

Santa Barbara

Associations between Adverse Childhood Experiences, Parenting Stress, and Early Childhood Behavior Problems

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

Doctor of Philosophy in Counseling, Clinical, and School Psychology

by

Althea P. Wroblewski

Committee in charge:

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September 2019

The dissertation of Althea P. Wroblewski is approved.

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September 2019

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This dissertation is a reflection of the dedication, commitment, and encouragement from my family, faculty mentors/advisors, friends and colleagues. I would like to thank my mentor and advisor, Dr. Jill Sharkey, for her endless support throughout my doctoral milestones. Jill, your tenacity and passion for what you do inspire all who work with you. I will be forever grateful for your willingness to take a chance on me when I started my graduate journey in 2014. I would also like to thank my other committee members for their thoughtful reviews and willingness to guide me throughout the dissertation process. Thank you also to Dr. Ryan Smith, who believed in my work and allowed me to pursue this study at CALM. Without you, this study truly would not have been possible! A big thank you to my wonderful friends and colleagues at UCSB who provided the support I needed to push through during difficult times. I would also like to thank my family including my mom, Dr. Haydee Jabines-Stewart, and in-laws, Pete, Sandi, and sister-in-law Kaye, who have all supported me since day one. Finally, I would like to thank my husband Peter who has truly been my rock and allowed me to pursue my dream of obtaining a doctorate and working with children from vulnerable backgrounds. Peter, there are not enough words to express my gratitude for your patience, unconditional support, and love throughout this journey. This dissertation is also dedicated to all of the children and families who demonstrate tremendous resilience on a daily basis in the face of adversity.

VITA OF ALTHEA P. WROBLEWSKI
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EDUCATION

***University of California – Santa Barbara* (*UCSB*)** **2014-2019 (*Anticipated*)**
Ph.D., Counseling, Clinical, and School Psychology (*CCSP*)
Advisor: Jill D. Sharkey, Ph.D.
Dissertation: "Examining Adverse Childhood Experiences and Parenting Stress on Early Childhood Behaviors"

Loyola University of Chicago **2012-2014**
M.Ed., School Psychology
Advisor: Pamela Fenning, Ph.D.

The University of Iowa **2005-2010**
B.S. Psychology
Minor: Art History

GRANT & FELLOWSHIP AWARDS

Siff Educational Foundation Fellowship	**2017-2018**
UCSB Block Grant	**2017-2018**
Graduate Opportunity Fellowship Nominee	**2016-2017**
UCSB Travel Grant	**2016-2017**
CCSP Alumni Fellowship	**2016-2017**
UCSB Travel Grant	**2015-2016**
UCSB Block Grant Recipient	**2014-2015**

CLINICAL EXPERIENCE

Insight Neuropsychology, Camarillo, CA **2016-Present**
Psychological Testing Assistant
Supervisor: Erik Lande, Ph.D.
Hours: 10 hours/week
Setting: Private practice clinic specializing in neuropsychological assessment
Population: Geriatric and adult population
Common Presenting Problems: Parkinson's related dementia, traumatic-brain injury, and capacity evaluations
Primary Responsibilities:

- Conduct neuropsychological assessments targeting dementia and traumatic-brain injury symptoms
- Assist Adult Protective Services on Rapid Response Expert Team (RRET) capacity evaluations
- On-going consultation with neuropsychologist regarding clinical diagnoses and treatment recommendations

Child Abuse Listening and Mediation (CALM), Santa Barbara, CA **2015-2016**
Psychological Assistant
Supervisors: Ryan Smith, Psy.D. and Jessica Adams, Ph.D.
Hours: 20 hours/week

Setting: Nonprofit Community-based Mental Health Center
Population: Children (between the ages of birth through 21 years) and their families
Common Presenting Problems: Treatment for trauma-related symptoms; Trauma prevention
Primary Responsibilities:

- Co-led domestic violence (DV) and dialectical behavioral therapy (DBT) groups
- Assisted preschool teachers with trauma-focused school-based supports for individual clients
- Obtained experience with MediCal billing and clinical documentation

Psychological Assessment Center (PAC), Santa Barbara, CA **2015-2016**
Senior Clinician
Supervisors: Jordan Witt, Ph.D. and Erik Lande, Ph.D.
Hours: 5-10 hours/week
Setting: Hosford Counseling and Psychological Services Clinic, UCSB (university-based community clinic)
Population: Child and adolescent population
Common Presenting Problems: Evaluation for attention deficit hyperactivity disorder and learning disabilities
Primary Responsibilities:

- Administered academic achievement and neuropsychological assessments
- Produced psychological and psychoeducational assessment reports with DSM-V and IDEA diagnoses
- Provided feedback and recommendations to families regarding assessment findings

San Marcos High School, Santa Barbara, CA **2014-2015**
School Psychology Advanced Practicum Student
Supervisor: Sally Stonefelt, M.S., NCSP
Hours: 20 hours/week
Setting: Mainstream High School
Population: Adolescent youth receiving special education services
Common Presenting Problems: Initial referrals for psychoeducational assessment; triennial assessment evaluations; counseling for emotional and behavioral difficulties
Primary Responsibilities:

- Administered psychological and academic assessments in accordance with state and federal IDEA requirements
- Assisted in the collection and analyzing of school-wide social emotional screening data
- Provided individual and group counseling for high school students with social emotional difficulties

Academy South Therapeutic Day School, Streamwood, IL **2013-2014**
School Psychology Practicum Student
Supervisor: Dr. Brian Lazzaro, Ph.D.
Hours: 20 hours/week
Setting: Therapeutic Day School (High School)
Population: High school youth diagnosed with emotional disturbance, anxiety, and/or severe depression
Common Presenting Problems: Counseling for anxiety, depression, and behavioral regulation difficulties within the classroom
Primary Responsibilities:

- Provided individual counseling and psychological services for students with severe emotional needs
- Observed and participated in threat and suicide assessments
- Collaborated with school staff to implement individual and class-wide positive behavior interventions

St. Agatha Catholic School, Chicago, IL **2012-2013**
Classroom Intervention Support Staff
Supervisor: Ruth Schumacher, Ph.D.
Hours: 10 hours/week (approximately)
Setting: Elementary (private) Catholic school
Population: Elementary school youth
Common Presenting Problems: Reading and math difficulties; academic and behavioral intervention support

Primary Responsibilities:

- Assisted lead teacher in 1st and 2nd grade classroom with reading and math instruction
- Administered DIBELS screening measure to students for classroom benchmarking
- Provided individual classroom support for students determined to be at-risk in reading/math

Erie Elementary Charter School, Chicago, IL **2010-2011**
Social Emotional Intervention Support
Supervisor: Melanie Madigan, LCSW
Hours: 20 hours/week (approximately)
Setting: Elementary (charter) school
Population: Elementary school youth
Common Presenting Problems: Classroom assistance and one-on-one support for youths with behavioral difficulties
Primary Responsibilities:

- Worked as a one-on-one aid for child diagnosed with ODD and ADHD,
- Identified students with emotional and behavioral issues in need of intervention support
- Collaborated with general and special education teachers to establish positive behavioral intervention techniques/support in the classroom

PUBLICATIONS

Nopoulos, P., Boes, A. D., **Jabines, A**., Conrad, A., Canady, J., Richman, L., Dawson, J. D. (2010). Hyperactivity and inattention in boys with cleft lip and palate: Relationship to ventral frontal cortex morphology, *Journal of Neurodevelopmental Disorders*, 2(4), 235-242. doi: 10.1007/s11689-010-9060-5

Submitted for Publication:
Wroblewski, A., Dowdy, E., Sharkey, J.D., & Kyung Kim, E. (2016). Social-emotional screening to predict truancy severity: Recommendations for educators. Manuscript under review

Lenzi, M., Sharkey, J., **Wroblewski, A**., Furlong, M. J., & Santinello, M. (2014). Protecting youth from gang membership: Individual and school–level emotional competence. Manuscript under review

TECHNICAL & RESEARCH REPORTS

Jabines, A. (2013). Improving school safety through a juvenile justice lens. *Illinois School Psychologists Association.*

Mayworm, A., **Wroblewski, A**., Igaz, T., Janes, L., Carnazzo, K., Eusterbrock, M., & Sharkey, J.D. (2016). California gang reduction, intervention, and prevention project. City of Lompoc Evaluation Report.

Reed, L., **Wroblewski, A**., Goldstein, A., Eusterbrock, M., Ramos, X., Damiani, T., Parker, R., & Sharkey, J.D. (2016). Evaluation of female specific-services: Transforming the juvenile justice approach to girls. Year 2 Systemic Probation Analysis & Girls Group Evaluation.

Reed, L., **Wroblewski, A**., Eusterbrock, M., & Sharkey, J.D. (2017). Evaluation of SB678 in Santa Barbara County.

Sharkey, J.D., **Wroblewski, A**., Aoun, M., & Ramos, X. (2015). Santa Barbara county alcohol, drug, and mental health services, alcohol and drug prevention programs: Youth survey technical report.

Sharkey, J.D., Lenzi, M., Parker, R., & **Wroblewski, A**. (2014). Evaluation of female-specific services: Transforming the juvenile justice approach to girls. December 2014 Outcome Evaluation Report.

Wroblewski, A., Moore, S., Eusterbrock, M., Mayworm, A., & Sharkey, J.D. (2016). Evaluation of the community
corrections performance incentive act (SB678) in Santa Barbara County. Year 4 Evaluation.

Wroblewski, A., Reed, L., Sharkey, J.D., Leon, B., & Jimenez, S. (2017). Evaluation of female-specific services:
Transforming the juvenile justice approach to girls. Year 3 Systemic Evaluation.

PRESENTATIONS

Sander, J.B., Fenning, P., Sharkey, J.D., **Wroblewski, A**., Rye, L., White, T., Miller, L., Raines, T.C., Biehl, A., & Price, L. (2017). School psychology and juvenile justice: Assessment tools, interventions, and disparities. Symposium presentation at the National Association of School Psychologists (NASP) Annual Convention, February, 2017, San Antonio, TX.

Sharkey, J.D., **Wroblewski, A.,** & Janes, L. (2017). School psychologists and trauma: identifying and treating sexual exploitation. Paper presentation at the National Association of School Psychologists (NASP) Annual Convention, February, 2017, San Antonio, TX.

Wroblewski, A., Dowdy, E., Sharkey, J.D., & Kyung Kim, E. (2017). Using a social-emotional screening measure to predict truancy. Poster presentation at the National Association of School Psychologists (NASP) Annual Convention. February, 2017, San Antonio, TX.

Wroblewski, A., Fullchange, A., & Sharkey, J.D. (2016). Trauma in schools: Ethical considerations and evidenced-based interventions. Practitioner conversation presented at the National Association of School Psychologists Annual Convention (NASP). February, 2016, New Orleans, LA.

Parker, R., **Wroblewski, A**., & Sharkey, J.D. (2016). Social-emotional assets and educational experiences among incarcerated females. Paper presentation at the National Association of School Psychologists (NASP) Annual Convention. February, 2016, New Orleans, LA.

Mayworm, A., Dougherty, D., Parker, R., & **Wroblewski, A.** (2016). School psychologists' involvement in school discipline. Poster presented at the National Association of School Psychologists (NASP) Annual Convention. February, 2016, New Orleans, LA.

Buchanan, C., **Jabines, A**., Montes de Oca, J., Gabbidon, N., & Fenning, P. (2015). Predictors of high risk behavior among adolescent females. Paper presentation at the National Association of School Psychologists (NASP) Annual Convention. February, 2015, Orlando, FL.

Parker, R., **Wroblewski, A**., Dougherty, D., & McFarland, A. (2015). School psychologists role with trauma and court-involved adolescents. Symposium presentation at the National Association of School Psychologists Annual Convention (NASP). February, 2015, Orlando, FL.

Ausikaitis, A., **Jabines, A**., Fenning, P., & Escobar, G. (2014). Female students and the school to prison pipeline: A literature review. Poster presented at the National Association of School Psychologists (NASP) Annual Convention. February, 2014, Washington, DC.

Rappaport, M., Engler, E., Hernandez, C., **Jabines, A**., Fenning, P. (2014). Alternatives to suspension program evaluation. Poster presented at the National Association of School Psychologists (NASP) Annual Convention . February, 2014, Washington, DC.

Jabines, A. & Poole, L. (2013). *Tips for professional development in graduate school*. Presented to

school psychology program as part of an on-going Student Orientation Session series at Loyola University of Chicago. Chicago, IL.

Einfeldt, A., **Jabines, A**., Miller, J. (2010). *Is a picture worth a thousand words? Elements of Target Preview Advantage in Visual Search*. Presented at The University of Iowa for an in-class senior research project, Iowa City, IA.

Nopolous, P., Boes, A., **Jabines, A**., Conrad, A., Canady, J., Lynn, R., Dawson, J. (2008). *Hyperactivity and Inattention in Boys with Cleft Lip and Palate: Relationship to Ventral Frontal Cortex Morphology*. Oral session presented at the 65th Annual Cleft Palate/Craniofacial Association National Meeting, Philadelphia, PA.

Jabines, A. (2006). *MRI Tracing Guidelines for the Amygdala*. Poster session presented at The University of Iowa through the Iowa Biosciences Advantage (IBA) program, Iowa City, IA.

GUEST LECTURES

Wroblewski, A. (October 2017). *An introduction to the NASP & APA ethical codes.* CNCSP 274 School Psychology Fieldwork. University of California, Santa Barbara.

Wroblewski, A. (September 2017). *Pillars of IDEA: FAPE, LRE, and procedural safeguards.* CNCSP 274 School
Psychology Fieldwork. University of California, Santa Barbara.

Hunnicutt, K., Dougherty, D., Mayworm, A., **Wroblewski, A**., Igaz, T., & Sharkey, J. D. (March 2015).
The reality of program evaluation: Using data to inform practice. Education 220: Introduction to Program Evaluation: Theory and Practice. University of California, Santa Barbara.

RESEARCH EXPERIENCE

Dissertation Research **2017-Present**
Examining Adverse Childhood Experiences and Parenting Stress on Early Childhood Behaviors
Dissertation Committee: Jill D. Sharkey, Ph.D., Erika Felix, Ph.D., & Erin Dowdy, Ph.D.
Timeline: Dissertation Proposal successfully approved on 7/26/2017; Dissertation defense tentatively scheduled for Spring 2018 (prior to leave for internship)

- Using existing data-set from CALM
- Structural equation modeling (SEM) techniques will be used to test whether parenting stress moderates the association between young children's exposure to cumulative trauma and their behavioral symptoms
- Measures include the Adverse Childhood Experiences (ACEs) survey, the preschool version of the Child Behavior Checklist (CBCL/1.5-5), and the Parent Stress Inventory (PSI)

Department of Counseling, Clinical, and School Psychology (UCSB) **2014-Present**
Graduate Student Researcher
Primary Investigator: Jill D. Sharkey, Ph.D.
Female Specific Project (Project Lead)
California Gang Reduction and Intervention Programs (CalGRIP) Evaluation
SB678 Research Project
UCSB Alcohol and Drug Prevention (ADP) Evaluation Research

- Collaborate with probation, school and mental health systems to evaluate gender-specific and trauma informed programming for females in a juvenile detention facility
- Analyze probation data on high risk felony probationers in Santa Barbara County to assist Probation in reducing recidivism

- Assist in evaluating Lompoc's California Gang Reduction Initiative Program (CalGRIP) program

School of Education, Loyola University of Chicago **2012-2014**
Graduate Research Assistant
Primary Investigator: Pamela A. Fenning, Ph.D. and Gipsy Escobar, Ph.D.
Discipline Policy Evaluation
School to Prison Pipeline Research Project

- Co-created high risk behavior survey to examine risk taking behaviors of high school students
- Conducted qualitative coding using catholic school discipline policies in the surrounding Chicago-land area
- Examined school factors related to the school-to-prison pipeline and methods for intervention through systems and policy change

Iowa Mental Health Clinical Research Center,
University of Iowa Hospitals and Clinics **2006-2008**
Undergraduate Psychiatry Research Assistant
Primary Investigator: Peggy Nopolous, MD
Cleft Lip and Palate Research Project

- Worked with BRAINS2 neuroimaging software and SPSS statistical software
- Analyzed MRI volumetric measurements of patients with craniofacial abnormalities
- Collaborated with MD/PhD student to produce data spreadsheets for SPSS statistical analysis

Iowa Mental Health Clinical Research Center **2006-2007**
University of Iowa Hospitals and Clinics
Undergraduate Research Assistant
Primary Investigator: Daniel O'Leary, Ph.D.
Amygdala Brain Tracing Research Project

- Traced the amygdala and hippocampus region of the brain using BRAINS2 neuroimaging software
- Attempted to identify a "gold standard" method for tracing the amygdala
- Prepared guidelines for delineating the neuroanatomical boundaries of the amygdala from the hippocampal border

TEACHING & SUPERVISION EXPERIENCE

UCSB **Teaching Assistant** **2017**
Advanced Fieldwork

- Primary Responsibilities: Supervision of third-year doctoral practicum students in case conceptualizations and school-based intervention techniques; on-site observation and feedback of students' therapy sessions; co-lead group supervision discussions

UCSB **Teaching Assistant** **2017**
Assessment and Data-based Decision-Making in the Schools

- Primary Responsibilities: Supervision of first and second-year doctoral practicum students; on-site observation and feedback of students' therapy sessions; prepare and deliver lecture content

UCSB **Teaching Assistant** **2016**
Psychoeducational Assessment Course

- Primary Responsibilities: Assistance in preparing lecture content and assignments, grading psychoeducational assessment reports, and co-lead discussions

SERVICE TO THE PROFESSION

Santa Barbara County Psychological Association (SBCPA) **2017-Present**

Student Representative (Board Member)

- Communicate professional development interests and needs of graduate students to SBCPA board members
- Organize graduate student events in the community for networking opportunities with licensed psychologists
- Collaborate with board members on developing student-centered professional development seminars and speaking engagements

Department of Counseling, Clinical, and School Psychology **2017-Present**
Blend Committee

- Support graduate students in their training pursuits across all areas of clinical, counseling, and school psychology
- Attend faculty and Associated Student Committee (ASC) meetings
- Advocate for training opportunities that provide a breadth of experiences in the combined areas of

Loyola Association of School Psychologists (LASP) **2013-2014**
Professional Development Chair

- Advocated for graduate students on professional development interests
- Created panel discussion for members of the Illinois School Psychology Association
- Coordinated professional development opportunities for students during bi-weekly meetings

Student Orientation Student Development Team **2013-2014**

- Met monthly to plan and review student orientation topics for school psychology program
- Presented to entire program on "Tips for Professional Development While in Graduate School"
- Co-developed a resume workshop for graduate students with faculty and peer colleagues

VOLUNTEER EXPERIENCE

Madonna House Homeless Shelter **2013-2014**
Tutor with Chicago Hopes for Kids
Supervisor: Patricia Rivera, LCSW

- Tutored individual children living in a homeless shelter
- Assisted program director with development of enrichment activities and program-specific needs
- Directed a spring gardening event to beautify the homeless shelter by collaborating with and initiating external sources of financial and volunteer support in Chicago

Cicero Youth Task Force **2012-2013**
Volunteer at Corazon Community Services
Supervisor: Erika Zacarias, M.Ed.

- Reviewed student health-related data to evaluate the risk-taking behavior of high school students
- Co-presented a sexual education class to high school students as an alternative to serving Saturday in-school suspension
- Helped to develop an HIV survey that was administered and distributed at a local health fair for the community

CERTIFICATES

Cognitive Processing Therapy On-line Training Course [**March, 2016**]
Trauma Focused- Cognitive-Behavioral Therapy Certificate [**January, 2014**]
Non-violent Crisis Prevention Intervention Certified [**CPI; Renewed 2013**]

ASSESSMENT EXPERIENCE

Beck Depression Inventory (BDI)

Beery Test of Visual Motor Integration (VMI)
Behavior Assessment System for Children (BASC)
Behavior Rating Inventory of Executive Functioning (BRIEF)
Children's Depression Inventory (CDI)
Comprehensive Test of Non-verbal Intelligence (CTONI)
Comprehensive Trail Making Test (CTMT)
Conner's Continuous Performance Test (CCPT)
Conner's Rating Scales (Teacher, Parent, Child)
DKEFS- Verbal Fluency
Effort Test
Grooved Pegboard
Kaufman Brief Intelligence Test (K-BIT)
Kaufman Assessment Battery for Children (KABC)
Multi-dimensional Anxiety Scale for Children (MASC)
NEPSY (Developmental Neuropsychological Assessment)
Neurological Assessment Battery (NAB)
Parent Stress Index (PSI)
Repeatable Battery for Assessment of Neuropsychological Status
Reynolds Intellectual Assessment Scales (RIAS)
Reynolds Intellectual Screening Test (RIST)
Stroop Color Naming
Test of Premorbid Functioning (TOPF)
Visual Motor Integration (VMI)
Wechsler Adult Intelligence Scales (WAIS)
Wechsler Intelligence Scale for Children (WISC)
Wechsler Preschool and Primary Scale of Intelligence (WPPSI)
Woodcock Johnson Psychoeducational Battery

ABSTRACT

Associations between Adverse Childhood Experiences, Parenting Stress, and Early Childhood Behavior Problems

by

Althea P. Wroblewski

Children exposed to adverse experiences early in life have an increased risk for developing a range of behavioral problems (Repetti, Taylor, & Seeman, 2002). However, studies focusing on the immediate impact of adverse experiences in early childhood are limited despite high rates of abuse and neglect in young children (U.S. Department of Health and Human Services, 2015). Rates of exposure to violence are also particularly high (63%-94%) for children from Latinx backgrounds living in disadvantaged communities (Gudino, Nadeem, Kataoka, & Lau, 2011). The current study uses parent reported screening and assessment data from a sample of clinically referred youth, ages 1.5 to 5 years, to examine children's exposure to a range of adverse childhood experiences, levels of internalizing and externalizing problems, and self reports of parenting stress. The sample was comprised of youth from predominantly Latinx (70%) and low-income backrounds. Multivariate analysis was used to test parenting stress as a moderator between the child's cumulative trauma and child behavior outcomes. Gender and ethnicity differences for cumulative adverse childhood experiences were also analyzed using a two-way analysis of variance (ANOVA). Although results did not support evidence of moderation, parenting stress was found to be a significant predictor for both internalizing and externalizing behaviors. Cumulative trauma significantly

predicted internalizing, but not externalizing behaviors. Results from the ANOVA indicated a significant two-way interaction between gender and ethnicity, with non-Latinx children reportedly experiencing an increased number of cumulative traumas compared to Latinx children. Findings from this study are intended to inform screening and treatment approaches for trauma in early childhood populations. Cultural sensitivity concerns related to ACEs screening are also discussed, as well as implications for addressing parenting stress and its relation to young children's behavioral symptoms following trauma exposure.

Table of Contents

LIST OF FIGURES

Introduction

Early childhood, which typically refers to the years from birth through age five years, is a time of rapid developmental growth that ultimately sets the foundation for a child's overall well being later in life (Jimenez, Wade, Lin, Morrow, & Reichman, 2016; Shonkoff, 2010). During this critical period of early development, a child's vulnerability is highlighted by their inability to care for themselves and reliance on caregivers to meet most, if not all, of their basic needs. This reliance, coupled with a young child's limited verbal expression skills, makes young children highly susceptible to abuse and neglect (Lieberman & Van Horn, 2009). These findings are reflected in national prevalence statistics on child maltreatment, which indicate that 47% of reported child abuse cases were for children between the ages of birth and five years (U.S. Department of Health and Human Services, 2015). The report also documents that in 2015, one or both parents were identified as the perpetrators of abuse for 91% of all reported cases of child abuse in that year.

Despite these alarming statistics, research on the concurrent impact of cumulative adverse childhood experiences (ACEs) remains limited (Freeman, 2014). In fact, much of the early knowledge about ACEs is based on research involving adults and their retrospective reports. In the late 1990's, groundbreaking research conducted by Felitti et al. (1998) was the first study to demonstrate a link between ACEs and poor health outcomes later in adulthood. The ACEs study included more than 18,000 adults from Kaiser Permanente's San Diego Health Appraisal Clinic and was comprised of mostly White, middle-class individuals. Results from this seminal study demonstrated a significant association between early exposure to ACEs and a range of negative physical health outcomes, as well as poor behavioral outcomes.

Prior to the ACEs study, the dose-response relation between adversity exposure and poor health outcomes was not well understood in the medical literature. The dose-response relation refers to the notion that as the number of ACEs increases so does the likelihood of experiencing poor physical or behavioral health outcomes. Researchers now understand the biological basis for the dose-response relation in adults and its link to the hormone cortisol (Lehman, Taylor, Kiefe, & Seeman, 2009; Murphy et al., 2016). However, research on the dose-response association in young children suggests that the overall health of a child, at age four or six for example, may not yet reflect the effects of a dose-response relation as seen in adults (Flaherty et al., 2006). Instead, Flaherty et al. (2006) report that the cumulative effects of exposure to adverse experiences in young children are more likely to be represented as psychosocial or behavioral problems rather than physical health problems.

Despite growing recognition of ACEs, there continues to be a lack of available research-supported methods for measuring ACEs among childhood populations (Burke, Hellman, Scott, Weems, & Carrion, 2011). In addition, research studies that have examined ACEs in childhood populations often use inconsistent methods prompting difficulty in reliably assessing and screening for ACEs. There are also no set standard of ACEs and a number of adversities have been added to screening measures over the past few years (Finkelhor, Shattuck, Turner, & Hamby, 2013; Purewal et al., 2016). These factors have contributed to the gap in research on determining reliable prevalence rates of ACEs, particularly for early childhood and ethnically diverse populations (Mersky, Topitzes, & Reynolds, 2013).

The current study contributes to the literature by examining the prevalence of cumulative ACEs in a clinical sample of young children, as well as exploring the role of

parenting stress as a potential moderator in the association between ACEs and children's behavioral health. Previous studies have established the significant role that parenting stress plays in the association between high-risk environments and children's behavioral adjustment following exposure to significant adversity and trauma (Conger et al., 1992; Conger et al., 1993; Levendosky & Graham-Bermann, 1998). In fact, the link between childhood trauma exposure and parenting stress has been well established in the literature and provides strong evidence for targeted attention on reducing parenting stress as part of evidenced-based trauma treatment approaches (Ammerman et al., 2013; Pereira et al., 2012). In order for prevention and early intervention efforts to be successful in early childhood, more research is needed on the cumulative impact of ACEs on behavioral health and how factors such as parenting stress exacerbate behavioral problems (Audet & Le Mare, 2010; Colonnesia et al., 2012; Kriebel & Wentzel, 2011; McGoron et al., 2012; Purvis et al., 2015).

Literature Review

Over the past two decades, the majority of research on child trauma has focused on specific types of trauma or single incidents of trauma with limited focus and attention on their cumulative effects that include a much wider range of potentially traumatic experiences (PTEs). ACEs refer to a range of traumatic and potentially traumatic experiences. For instance, ACEs includes such events as witnessing domestic violence in the home, divorce or separation of a parent, incarceration of a family member, and having a family member with mental illness. Research on the effects of cumulative ACEs in young children is extremely limited (Hagan et al., 2016; Evans, Li, & Whipple, 2013; Finkelhor, Ormrod, & Turner, 2007; Lieberman, Chu, Van Horn, & Harris, 2011), particularly for children from underrepresented and low-income backgrounds (Mersky et al., 2013). Despite the growing

recognition of ACEs, steps towards early identification and measurement of ACEs among children is in its infancy, compared to the strides made in adult medical care (Oral et al., 2016). Furthermore, relatively few ACEs studies involving children include an emphasis on broader influences, such as family-related factors, which may contribute to the association and interplay between ACEs and developmental outcomes (Bruner, 2017).

Concerns by healthcare professionals related to the significant, positive association between cumulative ACEs exposure and psychosocial problems in children have helped to place ACEs at the forefront of pediatric primary care (Oral et al., 2016). In particular, cumulative exposure to ACEs can lead to behavioral and emotional regulation problems in children and adolescents (Burke, Hellman, Scott, Weems, & Carrion, 2010; Felitti & Anda, 2010; Finkelhor et al., 2007) leading to the possibility of misdiagnosing trauma symptoms (Powers, Cross, Fani, & Bradley, 2015) as disruptive behavior disorders (Godinet, Li, & Berg, 2013; Kotch et al., 2008). Researchers and policy makers have declared child trauma a major public health concern with approximately 3.5 million referrals of child abuse, involving 6.4 million children, each year to child welfare systems (Bartlett et al., 2016; U.S. Department of Health and Human Services, 2015). As a result, it is imperative to examine not only the prevalence of ACEs in young children, but also the influence of potential exacerbating factors such as parenting stress and the impact of these factors on behavioral problems.

Prevalance of Trauma and Abuse in Early Childhood

Studies suggest that maltreatment and exposure to adverse experiences begins early in childhood and children under the age of seven have the highest rates of maltreatment victimization (Crusto et al., 2010; Fantuzzo & Fusco, 2007; U.S. Department of Health and

Human Services, 2007). The Diagnostic and Statistical Manual, Fifth Edition (DSM-V) defines a traumatic event for children under the age of six as the direct, indirect, or witnessing exposure to actual or threatened death, serious injury, or sexual violence including exposure to pornographic material (American Psychiatric Association, 2013). Some studies estimate that nearly one in four infants and toddlers are at risk for exposure to ACEs and that these estimates may be even higher in high-risk samples, such as young children enrolled at Head Start (Grasso, Ford, Briggs-Gowan, 2012; Farver, Xu, Eppe, Fernandez, & Schwartz, 2005). These findings are highlighted in a study conducted by Briggs-Gowan, Ford, Fraleigh, McCarthy, and Carter (2010). The authors examined the lifetime prevalence and correlates of ACEs in a cohort of 1,152 young children between the ages of one and three years from an urban-suburban region of the United States. Parents completed two follow-up surveys, from birth through age three, approximately one year apart. Results found that children living in poverty were two to five times more likely to be exposed to violence compared to children from non-poverty level backgrounds (Christoffel, 1990; Cunradi et al., 2000; Margolin & Gordis, 2000). Exposure to ACEs was significantly associated with risk factors such as living in a single-parent household and having a parent that reported high levels of stress and/or clinical levels of depression and anxiety (Briggs-Gowan et al., 2010).

Research suggests that exposure to ACEs is high for both clinically and non-clinically referred childhood populations. Grasso et al. (2012) examined ACEs exposure in a non-clinically referred sample of 213 toddlers and preschoolers between the ages of two to four-years old. Results showed that the majority of the sample (65.4%) had been exposed to at least one ACE, followed by two events (23.1%), three events (9%), and four or more events (2.6%). The most common ACEs reported by parents of non-clinically referred children

included hospitalization (17.8%), witnessing interpersonal partner violence (IPV; 11.7%), being burned (6.1%), and experiencing the sudden death of a loved one (5.6%). Research by Lamers-Winkelman, Willemen, and Visser (2012) indicates that children who are clinically referred to treatment for trauma exposure may have an increased exposure to ACEs. ACEs exposure was examined in a study including a clinically referred sample of 208 children between the ages of two and twelve years referred to treatment following exposure to domestic violence in the home (Lamers-Winkelman et al., 2012). Findings showed that approximately 20% of children had been exposed to seven or more ACEs and that the sample had a mean number of $M = 5.08$ ACEs exposure overall. Similarly high rates of ACEs exposure among clinically referred samples have been replicated in other studies as well, with reports showing ranges from 26% in non-clinically referred populations to between 60% and 69% in clinically referred (i.e., treatment seeking) populations of domestic violence exposure in children (Levendosky, Huth-Bocks, Semel, & Shapiro, 2002; Scheeringa, Zeanah, Myers, & Putnam, 2003; Scheeringa et al., 2001; Scheeringa et al., 1995).

In terms of exposure to specific ACEs, some of the most commonly reported ACE categories for childhood populations include witnessing (either directly or indirectly) family violence and being separated from a primary caregiver (Burke et al., 2010; Hagan, Sulik, & Lieberman, 2016). Lesser-reported ACEs include exposure to natural disasters and narrow escape from danger (Crusto et al., 2010; Hagan et al., 2016). The empirically identified risk factors that have been shown to increase the likelihood of trauma exposure in children include child-related factors, such as younger age, and contextual factors related to the child's caregiver, such as perceived levels of psychological distress (Brown, Cohen, Johnson,

& Salzinger, 1998; Cicchetti & Toth, 1995; Costello, Erkanli, Fairbank, & Angold, 2002; Fergusson, Lynskey, & Horwood, 1996; Fleming, Mullen, & Bammer, 1997).

Trauma, Adversity, and Early Childhood Behavior Symptoms

The severity of behavioral responses to trauma can be conceptualized within a cumulative risk framework, as highlighted by McCrae and Barth (2007). The authors used a cumulative risk model to examine the association between a range of risk factors and severity (i.e., meeting borderline or clinically significant range of severity) of behavioral problems in children. They define cumulative risk as the amalgamation and integration of total risk scores gathered from a variety of child assessment measures. The study included a sample of children between the ages of 2 and 6 years (n = 1,194) and 7 to 14 years (n = 1,828) from the National Survey of Child and Adolescent Well-Being (NSCAW). A total of 21 risks were measured using data obtained from child welfare workers. Examples of risk factors included history of abuse, primary caregiver substance abuse, low social support, and poor parenting skills. Child behaviors were measured using the Child Behavior Checklist (CBCL; Achenbach, 1991) and older children (ages 8 and older) completed the Trauma Symptom Checklist for Children (TSCC; Briere, 2005) to assess for trauma symptoms. McCrae and Barth (2007) found developmentally specific associations between risk factors and severity of behavioral symptoms. For young children, risk factors such as poor parenting skills ($p <$ .01) and low social support ($p < .05$) were significantly and positively related to scores in the borderline or clinical-level range of impairment for behavior problems. In terms of cumulative risks, results showed that young children who scored in the borderline or clinical-level range of impairment for behavioral symptoms had a significantly higher total number of

risks (*M* = 13.56) compared to children who did not exhibit impairment in behavioral symptoms (*M*= 12.26; McCrae & Barth, 2007). As the number of risk factors increases, so does the likelihood of exposure to trauma and adversity.

Behavioral symptoms associated with ACEs in young children. Although some children and adults who experienced trauma will exhibit posttraumatic stress symptoms, very few (less than 30%) will continue to exhibit symptoms a month or more after the threat has been removed (Cohen & Scheeringa, 2009; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Behavioral responses to trauma varies based on a variety of risk factors, age of the child, whether the child directly (e.g., physical or sexual abuse) or indirectly (e.g., witnessing DV in the home) experienced the traumatic event(s), and proximity of the trauma to the child's primary caregiver (Osofsky, 2011). In general, trauma symptoms are categorized into four domains of symptom clusters, including affective, behavioral, cognitive, and physical posttraumatic symptoms (Cohen, Mannarino, & Deblinger, 2006). Affective symptoms involve the development of new fears (e.g., depression, anger, irritability, or emotional numbing). Behavioral symptoms include active avoidance of trauma reminders and/or loss of interest in previously enjoyed activities. Cognitive symptoms may include cognitive distortions about themselves, others, the event, or the world (e.g., "the event is my fault" or "I can't trust others"). Physical symptoms related to trauma can result in elevated heart rates and blood pressure, increased muscle tension, and hypertension.

For infants and toddlers (birth through age three), responses to trauma can include exhibiting developmentally regressed behavior and displaying aggressive behavior towards caregivers and peers. For instance, a child who was fully potty trained may begin to wet their

bed more frequently, become increasingly clingy towards their caregiver, or use fewer words to communicate than previously demonstrated. Children between the ages of three through six years of age can exhibit an even wider range of behavioral symptoms in response to trauma, which can include symptoms that are similar to infants and toddlers indicating developmental regression. Examples of behavioral symptoms of preschool age children (ages three to six) include displaying aggressive behavior (e.g., hitting or throwing), acting out the traumatic incident during play, becoming easily startled or demonstrating a fear of adults who remind them of the traumatic incident (Cerezo-Jimenez & Frias, 1994; Ethier, Lemelin, & Lacharite, 2004; Manly, Kim, Rogosch, & Cicchetti, 2001; Toth, Manly, & Cicchetti, 1992).

Table 1

Behavioral symptoms in response to trauma for children birth through age five.

Age Range	Internalizing Symptoms	Externalizing Symptoms
Infants & Toddlers (Birth – 3 Years)	Difficulty eating or sleeping (change in habits) Clingy behavior and/or separation anxiety Helpless or passive behavior Limited range of expression or depressed mood Exhibits developmentally regressed behaviors Easily startled or frightened Fearful of strangers or caregiver(s) Developing new fears related to trauma Language delays Avoids trauma reminders	Hitting, punching or biting Easily upset or angered Screaming or excessive tantrum-like behavior Demands frequent attention from caregiver
Preschoolers (3 – 5 Years)	Excessive crying or sadness Clingy behavior and/or separation anxiety Nightmares Frequent bedwetting Appears sad or withdrawn Exhibits developmentally regressed behaviors Avoids trauma reminders Repetitive play related to trauma	Hitting, punching or biting Overly controlling behavior Outbursts of anger Extreme temper tantrums

Internalizing and externalizing behavioral symptoms. As shown in Table 1, children's behavioral responses to trauma often fall into the category of internalizing or externalizing behaviors (Zero to Six Collaborative Group, 2010). Children who have been exposed to early adversity are at an increased risk for exhibiting either externalizing or internalizing behaviors, or both. Externalizing problems include such symptoms as impulsivity, hyperactivity, and oppositional behavior (Bernard, Zwerling, & Dozier, 2015; Repetti et al., 2002; Teisl & Cicchetti, 2008). In particular, children from low-income or poverty backgrounds (Ackerman, Brown, & Izard, 2004; Slopen, Fizmaurice, Williams, & Gilman, 2010) and those who have experienced abuse and/or neglect demonstrate significantly elevated levels of externalizing behaviors (Godinet et al., 2013; Kotch et al., 2008). Additionally, externalizing behaviors in preschool age children have been linked to individual factors such as problems with emotion regulation, impulse control and cognitive processing (Andersson & Sommerfelt, 2001; Eisenberg et al., 2001).

Internalizing problems include symptoms such as avoidance or withdrawal, and are associated with early violence exposure (Briggs-Gowan et al., 2010), neglect, and maltreatment (Milot, Ethier, St-Laurent, & Provost, 2010). Dissociative symptoms (e.g., appearing dazed or in a trance-like state) in young children is another example of internalizing problems and is often associated with neglect (Hulette, Fisher, Kim, Ganger, & Landsverk, 2008). Grasso and colleagues (2012) found preliminary evidence that suggests the possibility of gender differences in internalizing and externalizing behaviors in young children between the ages of two and four exposed to early adversity. The authors found that boys had significantly greater number of externalizing symptoms ($p < .05$), but not internalizing symptoms ($p > .10$), compared to girls. Additionally, a significant interaction

between type of trauma exposure and gender was found for internalizing ($p < .001$), but not externalizing ($p > .10$) symptoms, such that girls exposed to ACEs had significantly greater internalizing symptoms compared to girls without exposure to ACEs (Grasso et al., 2012). Internalizing symptoms were unrelated to exposure to PTEs or recent stressors in the home for boys. The authors report that although gender differences in internalizing and externalizing behaviors have been documented in the literature for older children (i.e., five years of age and older), research is more limited with early childhood populations (Grasso et al., 2012). Although the current study does not focus on gender differences, due to limited sample size, these findings indicate a need for additional research on gender differences in ACEs exposure among early childhood populations.

Behavioral symptoms related to acute versus chronic exposure to trauma.

Finally, a child's behavioral response to trauma may present differently based on the type of trauma and frequency of exposure to the traumatic event (De Young, Kenardy, & Cobham, 2011). Acute trauma refers to the exposure of a single incident trauma, such as a serious accident, natural disaster, or sudden loss of a loved one, and can be categorized as a Type I trauma (Terr, 1991). In contrast, Type II trauma refers to the tendency for children or adults to have experienced multiple or repeated exposure to trauma and is sometimes referred to as *complex trauma* due to the complex symptom presentations of children and adults (Herman, 1992; Terr, 1991). Type II traumas are operationalized in the literature as the "total number of different types of traumatic or PTEs experienced by a given individual" (Hodges et al., 2013, p. 892). Crossover-type traumas describe experiences in which a child was exposed to a single traumatic incident (e.g., serious injury or accident) and there is the possibility for on-going complications resulting from the trauma (e.g., surgeries or scars).

Children who have experienced trauma with on-going consequences (Crossover-Type traumas) may present with symptoms that are congruent with Type I or Type II traumas (De Young et al., 2011). Young children exposed to single-incident, or Type I, traumatic incidents are often diagnosed with acute stress reactions, with reported prevalence rates ranging from 6.5% to 29% (Meiser-Stedman, Smith, Gluckman, Yule, & Dalgeish, 2008; Stoddard et al., 2006). Whereas behavioral symptoms from Type I trauma exposure are more often attributed to posttraumatic stress reactions, behavioral symptoms that arise from chronic exposure to ACEs or trauma (Type II traumas) are more likely to be attributed to behavioral disorders (De Young et al., 2011; van der Kolk, 2005). The complex symptomology of children exposed to multiple traumas has led some researchers to propose a that a new diagnosis be added to the diagnostic and statistical manual that captures the impact of trauma on a child's development. The diagnostic classification called *Developmental Trauma Disorder* (DTD) was first coined by Bessel van der Kolk (2005) to capture the developmental changes in children as a result of on-going (Type II) trauma and disrupted attachment, findings that are supported by biological and neurological research (Denton, Frogley, Jackson, John, & Querstret, 2016; van der Kolk, 2009; Glaser, 2000). The diagnostic term DTD is similar to the term *complex trauma* (Cook et al., 2005), though some researchers prefer the term DTD since it captures the interactional nature of trauma on development (Denton et al., 2016). One advantage of creating this new diagnostic term is that it allows clinicians and researchers to contextually integrate a child's symptoms, relate them to cumulative trauma in a developmental framework, and develop appropriate trauma-focused interventions (Denton et al., 2016).

Arguments about the current diagnostic criteria of children's trauma symptoms in the

DSM-V (American Psychiatric Association, 2013) stem from its inability to capture the cumulative effects of trauma and tendency for clinicians to give co-morbid diagnoses (Copeland, Keeler, Angold, & Costello, 2007; Denton et al., 2016; Spinazzola et al., 2005). For example, children with histories of cumulative trauma often meet the diagnostic criteria for internalizing (e.g., depression or anxiety) and externalizing (e.g., disruptive behavior or oppositional defiance) behavior disorders (Copeland, Keeler, Angold, & Costello, 2007). These concerns are amplified by the fact that growing research indicates that children exposed to Type II cumulative or *complex trauma* also exhibit complex symptomatology involving a high number of symptoms in different areas of functioning (Hodges et al., 2013; Cook et al., 2005). For example, Cloitre et al. (2009) examined the effects of exposure to multiple traumas in a sample of ($N = 152$) children and adolescents, between the ages of 7 and 17. Children in the sample were referred to a child trauma clinic for evaluation and treatment of symptoms. Logistic regression results found that cumulative trauma was significantly associated with symptom complexity ($p < .05$) and that for every one-unit increase in cumulative child trauma, the odds of higher symptom complexity (i.e., exceeding clinically significant levels of symptom impairment) increased by 17%. In their discussion of findings, the authors suggest that findings from the study highlight the tendency for cumulative trauma to impact multiple domains of functioning from levels of depression to a child's ability to regulate their behavior (Cloitre et al., 2009).

ACEs and Childhood Behavior: Conceptual Framework

Exposure to ACEs has long-term consequences on a child's physical, behavioral and emotional health (Toth & Manly, 2011). Various theories exist to explain the complexity of behavioral symptoms exhibited by children exposed to ACEs. Two frequently cited

frameworks for understanding the impact of trauma on a child's overall development and behaviors include attachment theory (Bowlby, 1969) and bioecological theory (Bronfenbrenner & Morris, 2006).

Bowlby's early research on attachment focused on the caregiving responses provided to children by their caregivers and the importance of these responses in helping children to feel safe and secure in their environment. For young children, the importance of parent-child relationships is especially salient given their dependence on caregivers. Research studies suggest that a young child's psychological and behavioral adjustment following trauma exposure depends partly on the responses of their caregivers (Herbers, Cutuli, Monn, Narayan, & Masten, 2014; Kiser & Black, 2005; Lieberman & Knorr, 2007; Scheeringa & Zeanah, 2001). Attachment theory provides the basis for many of the early intervention and prevention strategies that focus on parent-child relationships following a traumatic incident (Howe, 2005). It is well documented that consistent and positive responses from caregivers can help young children develop a sense of self-efficacy and trust that can last into adulthood (Calkins & Hill, 2007; Herbers et al., 2014; Sroufe, Egeland, Carlson, & Collins, 2005).

Attachment relationships between children and their caregivers were originally described as either secure or insecure (Bowlby, 1969). In secure attachment relationships, a child builds a strong bond with their caregiver and develops a sense of trust that allows them to feel safe when exploring environments away from their caregiver. In insecure attachment relationships, a child may become easily anxious and cry without their caregiver close by. Children who exhibit insecure attachments with their caregivers can even avoid their caregiver altogether in instances where their caregiver has demonstrated inconsistent responses, abuse, or neglect. When a young child experiences trauma or is exposed to ACEs

they rely on their caregivers to discern the level of danger posed by these experiences and respond in different ways. A traumatic event can also alter a child's relationship with their caregiver and affect their ability to trust other individuals in the future and/or their sense of perceived safety. Research studies involving children who have been adopted indicate that secure caregiver-child relationships with their adopted parents can serve as a buffer against behavioral problems that result from early exposure to ACEs (Audet & Le Mare, 2010; Colonnesia et al., 2012; Kriebel & Wentzel, 2011; McGoron et al., 2012; Purvis et al., 2015).

In addition to attachment relationships, a child's ecological environment also plays an important role in the emergence of behavioral symptoms following trauma exposure. Bronfenbrenner's (1977) early theories on ecological development proposed that the ecological environment of a child could be conceived as a nested arrangement of systems in which each system successively impacts the next. These systems include the *microsystem*, *mesosystem*, *exosystem*, and *macrosystem* and were adapted from Brim's (1975) work on the macro-structural influences of child development. The *microsystem* includes the child's immediate environment, such as parent child interactions and situations that occur within the child's home. The *mesosystem* refers to the interactions that occur between the multitude of *microsystems* in a child's environment, such as interactions between family members, with peers, and teachers. The *exosystem* includes systems that are more distal to the child, but ultimately affects the child's direct environment. For example, the *exosystem* can refer to parent training classes that are available to families or professional development opportunities for teachers in the child's school. The *macrosystem* influences the larger overall systems and is usually comprised of contextual and cultural factors, such as a child's gender, ethnicity, familial traditions, and socioeconomic background (Crosby, 2015). A

child's behavior is perceived to be a "function of the interaction of the person's traits and abilities with the environment" (White & Klein, 2008, p. 258).

Bronfenbrenner's later contributions to bioecological theory (2005) included a focus on the biological or genetic factors that contribute to development and interact with the various systems in a child's environment. Integration of the genetic and ecological factors that contribute to development is important for conceptualizing the behavioral symptoms exhibited by children following exposure to trauma. In fact, an increasing number of research studies have focused on the biological factors associated with the development of externalizing behavior problems in children (Alink et al., 2008). Research in this area indicates that chronic exposure to stress and adversity can disrupt and affect a child's neurobiological system leading to the development of psychosocial and psychological problems (Cicchetti, 2002; Susman, 2006; De Kloet, Joels, & Holsboer, 2005). Some studies have suggested that the association between cortisol and externalizing problems is especially pronounced for young children (Alink et al., 2008) due to the neurobiological impact that stress has on a child's early development (Gunnar & Fisher, 2006; McBurnett, King, & Scarpa, 2003). In general, a child's stress responses exist along a continuum and can range depending on the length of time stress is experienced and proximity of the child to the stressor or traumatic event(s).

Given the dependence of young children on their caregivers it is also important to consider the impact of parent factors, such as parenting stress, and the influence of these factors on a child's response to adversity or trauma. Ecological theory suggests that levels of parenting stress are reciprocally determined by individual characteristics related to the child and parent, as well as external and environmental demands on resources (Abidin, 1990; Crnic

& Acevedo, 1995). Theoretical frameworks that take into account the interconnectedness of both parent and child related factors provide a broader manner in which to understand internalizing and externalizing problems in children who have experienced varying levels of adversity.

Assessment of Trauma and ACEs in Early Childhood

Assessing the impact of trauma in young children is challenging due to the limited verbal capacities of toddlers and preschoolers and differences in the manifestation of symptoms (Scheeringa, Zeanah, Drell, & Larrieu, 1995). For example, a child of preschool age with a history of witnessing chronic DV or IPV in the home might present with problems in language development and in the absence of contextual factors be misattributed as a developmental delay. Although early intervention services that target language development could be beneficial for the preschooler, they do not address the root of the problem or the possibility of the child being exposed to on-going trauma. Moreover, differences in the manifestation of trauma symptoms in early childhood, compared to older children and adults, have prompted changes in the DSM-V (American Psychiatric Association, 2013) and the manner in which children under the age of six years meet diagnostic criteria for post-traumatic stress disorder (PTSD). The DSM-V now includes a preschool subtype of PTSD, which reflects the manifestation of trauma symptoms in young children in a developmentally appropriate manner as well as altering symptom thresholds. For instance, the preschool PTSD subtype requires only one or more avoidance symptom(s) as opposed to three or more avoidance symptoms in adults. Numerous empirical studies support the validation of a preschool subtype of PTSD (Scheeringa, Zeanah, & Cohen, 2011) and have documented the long-term stability of the diagnosis (Meiser-Stedman et al., 2008; Scheeringa, Zeanah,

Myers, & Putnam, 2005). Previous iterations of the DSM-V failed to include symptom criteria for children under the age of 15 years making it difficult to determine prevalence rates of PTSD in young children (Scheeringa et al., 2011).

Behavioral symptoms following exposure to a traumatic event that meet or exceed clinically significant thresholds increases the risk for developing emotional and behavioral difficulties (De Young et al., 2011; Lieberman, van Horn, & Ozer, 2005; Zerk, Mertin, & Proeve, 2009). The Child Behavior Checklist (CBCL/1.5-5; Achenbach & Rescorla, 2000) and the Trauma Symptom Checklist for Young Children (TSCYC; Briere, 2005) are two of the most commonly used parent report measures for assessing trauma symptoms in young children under the age of six. Most assessment tools for measuring trauma symptoms in children are developed for children over the age of five and are not suitable for very young children (Buss, Warren, & Horton, 2015). The American Psychological Association (APA) Presidential Task Force on PTSD and Trauma in Children and Adolescents (2008) assert that the lack of appropriate assessment measures and diagnostic criteria for trauma in young children raises considerable concerns in being able to accurately identify those in need of clinical treatment services.

Screening for trauma exposure in early childhood. The ACEs study (Felitti et al., 1998) has created tremendous momentum over the past few decades to assess for adverse childhood experiences (Whiteside-Mansell, Conners-Burrow, Swindle, & Fitzgerald, 2016). However, screening adverse experiences in samples of young children can be an uncomfortable experience for parents when ACEs measures are administered in treatment settings where parents are the primary reason for their child receiving intervention support (McKelvey et al., 2016). The original ACEs measure used by Felitti et al. (1998) was not

developed for use with children and is not yet valid for use with child and adolescent populations either as self-report or parent-report for very young children.

Although a variety of traumatic inventory measures are available for use and function much in the same way as the original ACEs measure, most have been developed for older children and adults. The Center for Youth Wellness (CYW) is currently working to validate and provide an adapted version of the original ACEs measure (Felitti et al., 1998) free to practitioners and available for use through their website. The CYW has created screening measures (ACE-Q) for parents of children and parents of teenagers (CYW, 2017). The Traumatic Events Screening Inventory for Children (TESI-C; Ribbe, 1996) is a widely used measure that has been undergone rigorous research validation and was revised to include a parent report version (TESI-PRR) children from birth through six years of age. The TESI-PRR has been shown to have high test-retest reliability estimates ranging from .91 to .93 (Berent et al., 2008) and is also highly correlated with other trauma events screening measures (Basharpoor, Narimani, Gamarigive, Abolgasemi, & Molavi, 2011). However, a criticism of the measure by Ford, Hartman, Hawke, and Chapman (2008) includes concern about the possibility of cross-cultural differences in endorsement of traumatic experiences on the TESI though no further specific information about these differences is offered by the authors.

Clearly, more research is needed to develop measurement tools that are valid for assessing not only trauma symptoms but also trauma exposure in young children. McKelvey et al. (2016) highlights the potential for ethical considerations when implementing ACEs (or similar) screening measures, such as the possibility of identifying children where abuse or neglect is suspected within families. The authors suggest providing adequate training and

support to staff administering screening measures related to trauma exposure in discerning whether to report cases of suspected child abuse when they are endorsed on a trauma screening measure.

Parenting Stress and Adverse Childhood Experiences

Factors such as availability of caregiver support and family functioning can mediate or moderate how children under the age of six respond to trauma (Lieberman & Knorr, 2007; Scheeringa & Zeanah, 2001). Children who grow up in family environments that are characterized as having high levels of parenting stress, instability, or unresponsive caregivers are also more likely to exhibit emotional and behavioral problems (Repetti, Taylor, & Seeman, 2002). Past studies have defined parenting stress as an "aversive psychological reaction to the demands of being a parent" (Deater-Deckard, 1998, p. 315) and as a complex combination of factors related to the child, the parent, and child-parent interactions (Abidin, 1995). Trauma interventions for young children often include some focus on building healthy parent-child relationships (Roberts, Campbell, Ferguson, & Crusto, 2013). However, studies have found an increased risk for negative behavioral outcomes following trauma exposure in young children when caregivers' are unable to provide consistent, stable support (English, Marshall, & Stewart, 2003).

The link between parenting stress and children's behavioral symptoms following trauma exposure has been well established in the literature. In a study conducted by Zerk et al. (2009), researchers used regression analyses to determine whether parenting stress and maternal functioning significantly predicted behavioral trauma responses of sixty preschool-age children exposed to DV. Children's symptoms of behavioral trauma were measured using the CBCL (CBCL/1.5-5; Achenbach & Rescorla, 2000) and levels of parenting stress

were measured using the Parenting Stress Short Index Form (PSI-SF-4; Abiden, 2012). Maternal symptoms of depression and anxiety were measured using the Symptom Checklist (SCL-90-R) and reflected maternal reports of functioning (Zerk et al., 2009). Total Parenting Stress was the only significant predictor of children's internalizing and externalizing trauma symptoms was (Zerk et al., 2009). Each of the three individual subscales that make up the Total Parenting Stress scores (Parental Distress, Difficult Child, and Parent-Child Dysfunction) were also examined and found to significantly contribute to the variance in CBCL scores. The Parental Distress subscale explained 6.2% of the variance, whereas the Difficult Child and Parent-Child Dysfunctional subscales explained 37.2% and 8.8% of the variances in CBCL scores respectively (Zerk et al., 2009). Together, the three subscales explained 52.2% of the variance in children's internalizing and externalizing behavioral symptoms on the CBCL following exposure to DV (Zerk et al., 2009). The authors suggest that children's post-trauma symptoms are substantially influenced by their caregiver's own level of distress and that their distress may alter the way their perceive their children's behavior.

In another study conducted by Roberts et al., (2013), early exposure to family violence, parenting stress, and children's mental health functioning were examined in a sample of (N = 188) children between the ages of three and five years from Head Start. Exposure to trauma was measured using the Traumatic Events Screening Inventory-Parent Report Revised Long Version (TESI-PRR; Ghosh-Ippen, 2002) and levels of parenting stress were measured using the Parenting Stress Short Index Form (PSI-SF-4; Abiden, 2012). Structural equation modeling techniques were used to assess for associations, with child mental health functioning measured as a latent variable comprised of data related to their

psychosocial health, temperament and self-regulation, and behavioral concerns. Results showed that children's mental health functioning did not significantly differ according to gender or race/ethnicity (Roberts et al., 2013). However, structural equation modeling results found that after controlling for prior trauma history, child's age, and gender, higher levels of exposure to family violence was associated with worse child mental health functioning ($\beta = 0.14$, $p < .05$) and that child exposure to family violence was significantly associated with higher levels of parenting stress ($\beta = 0.20$, $p < .01$). High levels of parenting stress were also significantly associated with worse child mental health functioning overall ($\beta = 0.59$, $p < .001$).

In addition to poor child mental health outcomes, high levels of parenting stress have also been found to exacerbate child behavior problems as demonstrated in a study conducted by Neece, Green, and Baker (2012). The authors conceptualized parenting stress as an environmental risk factor that has reciprocal effects on child behavior outcomes. Neece et al. (2012) analyzed the transactional relation between parenting stress using the Family Impact Questionnaire (FIQ; Donenberg & Baker, 1993) and child behavior outcomes using two versions of the CBCL (CBCL/1.5-5 and CBCL/6-18; Achenbach & Rescorla, 2000). The study included a sample of 237 families and spanned over the course of six years. All questionnaires were completed annually by parents for their children from approximately 3 to 9 years of age (Neece et al., 2012). Results from the study showed that parenting stress and child behavior outcomes covaried significantly across development, however, parents tended to report the highest levels of parenting distress and behavior problems at younger ages (Neece et al., 2012). The authors conclude that their findings provide support for using stress management interventions for parents of children with behavior problems.

Despite the robust literature linking parenting stress and poor child behavior and mental health outcomes, few if any research studies have directly examined the moderating role of parenting stress in the association between ACEs exposure and child behavior problems. As Neece et al. (2012) points out, there are important intervention implications related to the addressing the exacerbating effects of parenting stress in response child behavioral problems and early exposure to childhood trauma and adversity.

Summary

This study provides an important contribution to the literature through comprehensive findings related to the associations between ACEs, parenting stress, and child behavior problems among underrepresented, early childhood populations. Exposure to trauma and adversity in early childhood can have long-term effects on a child's ability to self-regulate and potentially lead to conduct and substance abuse problems in adolescence and young adulthood (Porche et al., 2011; van der Kolk and McFarlane, 1996). Despite these findings, studies examining the cumulative impact of ACEs on young children and their behavioral health have received limited attention in the literature (Freeman, 2014; Stahmer et al., 2005) and much of the current knowledge related to the impact of (ACEs) is based on adults' retrospective reports of adversity. In order for prevention and early intervention efforts to be successful in early childhood, more research is needed to further understand the impact of cumulative ACEs on young children's behavioral health, such as their internalizing and externalizing symptoms, and how factors related to the child's environment exacerbate these symptoms. Factors such as high levels of parenting stress have been shown to have a significant impact on a child's mental health functioning (Roberts et al., 2013) and behavioral response to trauma (Zerk et al., 2009) following trauma exposure (Schechter &

Willheim, 2009). As such, it is imperative that future research efforts incorporate a broader ecological focus by including parenting stress in their examination of ACEs and young children's behavioral problems. The implications for these findings extend beyond recognition of a problem and inform practical solutions for practitioners when working with children and their families following trauma exposure.

The Current Study

The current study examines the prevalence of trauma exposure and associations between cumulative trauma (ACEs), behavioral health, and parenting stress levels in a sample of clinically referred young children between the ages of 1.5 and 5 years of age. Specifically, this study will examine the following research questions:

Research question 1. *What are the specific adverse childhood experiences of young children ages 1.5 to 5 years as reported by their parents?*

To assess for prevalence of adverse childhood experiences within a clinically referred population, descriptive statistics were used to examine frequencies and means for the specific types of adverse experiences as reported by parents for children between the ages of 1.5 and five years of age. Since there is limited research on cumulative adverse experiences in early childhood underrepresented populations, there were no specific hypotheses for the types of frequencies or patterns that will emerge based on gender or ethnicity. Although the current study includes a sample of clinically referred children, referrals were largely for early intervention and prevention services making it difficult to hypothesize expectations surrounding ACEs exposure. Descriptive results were provided and are discussed within a screening context for adverse childhood experiences. Frequencies of ACEs, per parent report, were grouped according to age groups, including toddler (1.5 to 2 years) and preschool (3 to

5 years) populations. ACEs were also broken down by gender and ethnicity.

Research Question 2. *Are there differences in the cumulative number of parent reported adverse childhood experiences of these young children according to gender and ethnicity?*

A two-way ANOVA was conducted to investigate whether there are significant differences in the total number of ACEs reported across gender and ethnicity. Two-way ANOVAs can be used to compare mean differences between groups on a single dependent variable. The independent variables for the two-way ANOVA included gender and ethnicity with cumulative ACEs score as the single dependent variable. Gender, ethnicity, and age group were dichotomized. There were no specific hypotheses for the second research question given the limited research available about cumulative ACEs in young children and studies reporting gender and ethnicity differences.

Research Question 3. *Using parent report measures, does parenting stress moderate the association between their children's exposure to cumulative trauma, such that higher levels of parenting stress relates to increased problems in internalizing and externalizing symptoms?*

To investigate the effects of parent stress (composite and subscales) as a moderator in the relation between ACEs and child behavior outcomes, path analysis using structural equation modeling techniques was the preferred method to test moderation effects. A benefit of using path analysis to examine moderation effects is that it allows for simultaneous comparisons unlike regression techniques, which require step-wise comparisons to compare models. The parsimony of path analysis is also beneficial in decreasing the likelihood of making a Type I error. It was hypothesized that an increase in adverse childhood experiences

would predict higher levels of internalizing and externalizing behaviors and that this association would vary according to levels of parenting stress.

Method

This study was conducted in collaboration with Child Abuse and Listening Mediation (CALM), a non-profit, community-based organization that has provided evidenced-based trauma treatment and early prevention services to children and their families for the past 45 years. The organization has three offices, seven family resource center locations, and is embedded in eight preschools across Santa Barbara County. According to information obtained from CALM's 2015-2016 Annual Report (CALM, 2016), the organization includes 86 practitioners and served approximately 1,800 children and families during the 2015-2016 fiscal year. Historically, over half of all clients referred to CALM are from Latinx or Hispanic backgrounds and most are reportedly from low-income households (CALM, 2016).

The dataset provided by CALM was created by CALM's manager of psychology and outcome evaluations. The dataset includes child assessment data from June 1, 2016 through January 10, 2018 on *N*= 217 young children via parent report as part of the initial intake process at CALM. Inclusion criteria included data for children between the ages of 1.5 and 5 years who were first time clients at CALM referred for early intervention and prevention services. The dataset includes parent-reported variables on specific types and cumulative number of trauma exposure(s), levels of parenting stress, and child behavioral symptoms. Demographic variables such as age, gender, ethnicity, and disability status are also provided in the dataset. For a complete list of the dataset variables and their descriptions, please refer to Appendix A.

Participants

A total of *N*= 217 clinically referred young children participated in this study. There were *n* = 63 (29.0%) toddlers (1.5 to 2 years of age) and *n* = 154 (71.0%) preschoolers (3 to 5

years of age). Their mean age was 3.31 years (*SD* = 1.23), and had a larger percentage (*n* = 137; 63.1%) of males compared to females (*n* = 80; 36.9%). The majority of participants were classified as Latinx (*n* = 153; 70.5%), followed by Caucasian (*n* = 44; 20.3%), Other including mixed or multiple ethnicities (*n* = 16; 7.4%), and African American (*n* = 4; 1.8%). Close to half of all referrals for treatment came from professionals (*n* = 106; 48.8%), which includes case managers, Child Welfare System (CWS) workers, teachers, physicians, or nurses. The remaining referrals came from family members or relatives (*n* = 89; 41.0%) or directly from parents (*n* = 22; 10.1.6%). A small percentage (*n* = 49; 22.6%) of children in the sample were reported to have a known disability. Poverty level was also included in the dataset, which indicated that more than half of the sample (58.7%) was either at or below the poverty level. Demographic information related to the parents of children in the sample, other than poverty level, was not available in the data provided by CALM.

Measures

All participant data represent parent/caregiver reported information for their child. As such, internal consistency for subscales used with the current sample was not available.

Adverse childhood experiences (ACEs). Information on the specific types and number of adverse experiences for each child was measured using the parent reported ACEs survey. CALM's adapted version of the ACEs survey was based on the Center for Youth Wellness Adverse Childhood Experiences Questionnaire (CYW ACE-Q; Burke Harris & Renschler, 2015). According to CYW (2017), the CYW ACE-Q is intended solely for informational and/or educational purposes and is not a diagnostic tool that has undergone validation to be used in the diagnosis, cure, or treatment of a medical condition.

For children under the age of 12 years, parents are asked to complete the ACEs

survey for their child. The ACEs survey asks parents and caregivers to report on exposure to a number of adverse and PTEs including, bullying, abuse, parental incarceration or loss, divorce, and community and domestic violence. A complete list of question items contained on the ACEs is provided in Appendix A. More information about the CYW ACE-Q can be obtained from the user manual (Bucci et al., 2015).

The ACEs survey adapted by CALM contains all 17 items on the original CYW ACE-Q measure and includes two additional items for a total of 19 items. The two additional question items added by CALM include an emotional neglect item: "Your child *often* felt unsupported, unloved, and/or unprotected" and an item that refers to continuity of care between the child and their caregiver: "Check if your child has not been continually in your care since they were born, and you are concerned that they may have had difficult experiences that you are not aware of." Parents complete and respond to all items on the ACEs survey by checking the box next to the question item if their child has experienced the item, indicating a response of "true" for that item. Items that are not checked or endorsed by a parent have a response of "false" for that item. A composite ACE score is calculated by counting the number of "true" responses for each of the 19 question items, reflecting the total number of ACEs reported by parents for their child on a scale of 0 (no ACEs) to 19 (maximum number of ACEs). The ACEs survey used by CALM is provided in Appendix B.

Child behavior symptoms. Both internalizing and externalizing behavior symptoms were measured using the Child Behavior Checklist, as completed by their parents/caregivers, for children between the ages of one and a half to five years (CBCL/1.5-5; Achenbach & Rescorla, 2000). The CBCL/1.5-5 is a measure of child emotional and behavioral symptoms and is administered to parents and caregivers of young children. Previous studies have found

the CBCL/1.5-5 to have good reliability (r = .68 - .92) and validity estimates across multiple ethnic groups (Konold, Hamre, & Pianta, 2003; Koot, Van den Oord, Verhulst, & Boomsma, 1997; Tan, Dedrick, & Marfo, 2007). Parents respond to question items on a three-point Likert scale with response options of "Not True", "Somewhat or Sometimes True", and "Very True or Often True." The CBCL/1.5-5 is a relatively new, combined version of the CBCL/2-3 (Achenbach, 1992) and the CBCL/4-18 (Achenbach, 1991) that specifically focuses on the early childhood years.

The 99-item measure is cited widely in major national studies, such as the NICHD Study of Early Child Care and Youth Development in the United States (NICHD Early Child Care Research Network, 2005). The CBCL/1.5-5 consists of seven correlated factors represented by each of the following subscales: reactive (9 items), anxious/depressed (8 items), somatic complaints (11 items), withdrawn (8 items), sleep problems (7 items), attention problems (5 items), and aggressive behavior (19 items). The Internalizing scale is comprised of the emotionally reactive, anxious/depressed, somatic complaints, and withdrawn subscales to yield a total Internalizing score. The Externalizing scale is formed by combining the attention problems and aggressive subscales to yield a total Externalizing behaviors score. Both the Internalizing and Externalizing scales on the CBCL/1.5-5 have been shown to have good internal consistency (α= .82 and α= .89, respectively; Xing Tan et al., 2007). *T* scores are calculated for the Internalizing and Externalizing scales to produce standardized, gender and age normed-referenced measures of children's behavioral symptoms. Scores that fall below 60 indicate average behavioral symptoms, *T* Scores from 60 to 63 reflect borderline behavioral symptoms, and *T* Scores above 64 suggest clinically significant levels of behavioral impairment. *T* Scores normed for both gender and age were

used in the study. Since item-level responses were not provided by CALM, internal consistency cannot be calculated for individual response items on the CBCL/1.5-5. However, internal consistencies were calculated for each of the subscale scores that comprise the Internalizing and Externalizing Scales on the CBCL/1.5-5 using SPSS 24.

Parenting stress. Levels of parenting stress were measured using the Parent Stress Index-Short Form, fourth edition (PSI-SF-4; Abidin, 2012). The PSI-SF-4 measures levels of parenting stress for parents of children between the ages of two and twelve years. Parents are asked to respond to items on a five-point Likert scale, with response options of "Strongly Agree", "Agree", "Not Sure", "Disagree", and "Strongly Disagree." The PSI-SF-4 yields three subscales (Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child) and an overall composite score for Total stress. A defensive responding validity score is also provided which reflects overly cautious or defensive responses towards their child's adjustment and behavior. Defensive responding scores are considered not valid for interpretation and were excluded from data analysis.

Each of the three subscale scores of the PSI-SF-4 consists of 12 questions for a total of 36 items. The Parental Distress (PD) subscale examines levels of personal distress and factors related to the role of being a parent (e.g., feeling trapped by parenting responsibilities). The Parent-Child Dysfunctional Interaction (P-CDI) subscale focuses on parent perceptions and expectations related to interactions with their child and role as a parent (e.g., expecting child to make parent feel good or not feeling appreciated by their child). The Difficult Child (DC) subscale examines characteristics of the child that can make parenting roles and expectations difficult to manage (e.g., child is very emotional or gets upset easily). The Total stress scale consists of the two parent (PD and P-CDI) subscales and

one child (DC) subscale and reflects the overall level of parenting stress reported by parents. Research indicates that the full PSI and PSI-SF are highly correlated to the PSI-SF-4 Total stress (α= .94), Parental Distress (α= .92), Parent-Child Dysfunctional Interaction (α= .92), and Difficult Child domains (α= .87; Abidin, 2012).

The PSI-SF-4 (Abiden, 2012) was developed based on EFAs from the full-length version of the PSI (Abiden, 1995). Recently, the PSI-SF-4 was shown to be a valid, reliable tool for measuring parenting stress in a sample of 58 mothers from a pediatric primary care clinic that served predominantly low-income, Hispanic children and their families (Barroso, Hungerford, Garcia, Graziano, & Bagner, 2016). Internal consistency estimates were computed for the total sample, as well as separately for English and Spanish versions of the measure. The PD subscale was found to have adequate internal consistency for the full sample (α= .75), English sample (α= .71), and Spanish-speaking sample (α= .79). Internal consistency estimates were good for the P-CDI subscale (α= .85, .87, .83) and for the DC subscale (α= .82, .81, .84), for the full, English, and Spanish versions of the measure, respectively. The PSI Total stress scale was found to have excellent internal consistency (α= .91, .92, .90) for the full, English, and Spanish versions of the measure, respectively (Barroso et al., 2016). In terms of convergent validity, the mothers' PD subscale scores on the PSI-SF-4 were moderately correlated with their scores on the CES-D $r(58) = .53$, $p < .001$ (CES-D; Radloff & Locke, 1986). Mothers' scores on the P-CDI subscale were also moderately correlated with their scores on the Parental Locus of Control-Short Form $r(58) = .44$, $p = .001$ (PLOC-SF; Rayfield, Eyberg, Bogg, & Roberts, 1995). DC subscale scores were moderately correlated with infants' Internalizing $r(58) = .38$, $p = .01$, Externalizing $r(58) = .50$, $p = .01$, and Dysregulation $r(58) = .44$, $p = .01$ scores on the Infant-Toddler Social and

Emotional Assessment (ITSEA; Carter & Briggs-Gowan, 2006). Studies examining gender differences between mother and father reports on the PSI have found no significant differences in responses (Deater-Deckard & Scarr, 1996; Baker et al., 2003).

According to the PSI-SF-4 manual (Abidin, 2012), scoring for the measurement tool is interpreted based on percentiles. Percentile scores that fall within the 16th to 84th range indicate normal levels of parent stress. Percentile scores that fall within the 85th to 89th range are considered borderline to high, while scores that meet or exceed the 90th percentile indicate clinically significant levels of parenting stress. The PSI-SF-4 also produces *T* Scores, however, established percentiles are reported for interpretation (Abidin, 2012). In the CALM dataset, scores for the Total stress variable and each of its subscales (Parental Distress, Difficult Child, and Parent-Child Dysfunctional Interactions) are represented as percentile composite scores. Internal consistencies were calculated for each of the subscale scores that comprise the Total Parenting Stress scale and each of the individual subscales (Parental Distress, Difficult Child, and Parent-Child Dysfunctional Interactions) using SPSS 24.

Demographic information. Demographic information for each child was reported by the child's parent/caregiver to CALM intake staff. Specific parent-related demographics were not made available in the dataset. Child demographic information included the child's gender, age, and ethnicity.

Procedure

On June 1, 2016, CALM implemented a policy that required all therapists to administer the Adverse Childhood Experiences (ACEs) survey to parents and children to upon intake. The adapted version of the ACEs survey was administered to all new and returning clients during the intake process in conjunction with a standard assessment battery

of measures. The standard battery of assessment measures for children between the ages of birth through five years includes the ACEs survey, CBCL/1.5-5, PSI-SF-4 and other measures related to parent-child dynamics. Intake assessment data were used to create the dataset provided by CALM and reflect first-time client information obtained at intake. All participant data reflect parent-reported child data from each of CALM's treatment center locations across Santa Barbara County, including Carpentaria, Santa Barbara, Lompoc, and Santa Maria.

Consent procedures. The intake process at CALM typically involves gathering baseline assessment data and reviewing consent and confidentiality procedures. CALM's consent procedure includes informing parents and children about their rights to privacy and consent for any assessment data collected by the organization for research purposes. If a parent refuses to allow their child's assessment information to be used for research purposes, the assessment data are used only for treatment purposes and reviewed solely by the therapist providing services to the client or family. CALM does not provide any incentives to clients for use of their assessment data. However, therapists at CALM are encouraged to have all clients complete the standard battery of intake assessments in a timely fashion (i.e., prior to providing any treatment or even before the clinical interview takes place). For children between the ages of birth through five years, parents are asked to complete assessments for their child. Both English and Spanish versions are typically available for all assessments. The University of California, Santa Barbara's Institutional Review Board (IRB) granted an exemption for the secondary analysis of this anonymous data.

Data Analytic Plan

The three research questions in this study were answered using different types of

analyses. To assess the prevalence of adverse childhood experiences reported by parents, frequencies were conducted for each of the 19 items on the ACEs survey. Differences in the number of cumulative ACEs across gender, ethnicity, and age groups were analyzed using a three-way analysis of variance (ANOVA). Finally, path analysis using structural equation modeling and multivariate analyses were conducted to examine the association between cumulative adverse experiences and child behavior outcomes and how varying levels of parenting stress moderate their relation. In addition to testing total levels of Parenting Stress as a moderator, each of the individual subscales that comprise the Parenting Press index (PD, DC, and P-CDI) were tested separately to determine if specific contributors of Parenting Stress also moderate the association between cumulative trauma and behavioral symptoms. All analyses were conducted using SPSS 24 and M*plus* version 7.4 (Muthen & Muthen, 1998-2015). Table 2, below, provides a detailed summary of the research questions, hypotheses, and data analysis plan for the current study.

Table 2

Summary of Research Questions, Hypotheses, Variables, and Analysis Methods

Research Questions	Hypotheses	DVs	IVs	Analytic Method
Q1: What are the specific adverse childhood experiences (ACEs) of young children ages 1.5 to 5 years as reported by their parents?	The majority of children in the sample will have been exposed to at least one ACE.	ACEs (prevalence of specific ACEs reported)		Descriptive Statistics
Q2: Are there differences in the cumulative number of parent-reported adverse childhood experiences (ACEs) of these young children according to gender and ethnicity?	For gender, ethnicity, and age group no specific hypotheses were predicted for differences ACE scores.	ACEs (total number of ACEs reported)	Gender, ethnicity	Two-way Analysis of Variance (ANOVA)
Q3: Using parent report measures, does parenting stress moderate the association between their children's exposure to cumulative trauma, such that higher levels of parenting stress relates to increased problems in internalizing and externalizing symptoms?	There will be a positive association between children's ACE scores and their behavioral symptoms, which will be moderated by levels of parenting stress (Total scores as well as all subscale scores, tested separately). More specifically, high levels of parenting stress will be associated with more internalizing/externalizing symptoms. Low levels of parenting stress will be associated with fewer internalizing/externalizing symptoms.	ACEs; Total Parenting Stress composite scores as the moderator. Each of the individual subscales (Parental Distress, Difficult Child, and Parent-Child Dysfunctional Interaction) will also be tested separately as moderators.	CBCL Internalizing/Externalizing composite scores	Path analysis using structural equation modeling (SEM); Regression Analyses

Power to conduct proposed analyses. The path analyses conducted in this study are somewhat power intensive. Established guidelines for determining sample size for structural equation modeling includes using a minimum sample size of 100 (Boomsma, 1982), five or ten observations per estimated parameter (Bentler & Chou, 1987), and ten cases per variable (Nunnally, 1967). According to Kline (1998), an adequate sample size of 10 times the number of parameters is sufficient for path analysis. An a priori power analysis was conducted using an on-line sample size calculator for structural equation models (Soper, 2006-2017). For a conservative anticipated medium effect size of 0.5, a desired power level of 0.8, and a probability level specified at $p < .05$, a minimum sample size of 100 was estimated using five observed variables. Thus, the current sample size of $N = 217$ appears adequately sufficient for conducting a path analysis using structural equating modeling techniques.

Handling missing data. Univariate and descriptive analyses were conducted in SPSS 24 to assess for general trends in observed variables and discern whether there are any patterns of missing data, including data missing at random (MAR) or missing completely at random (MCAR). Missing Value Analysis (MVA) was conducted using SPSS 24 and revealed that missing data was MCAR ($p = 0.085$) as determined by Little's (1988) MCAR test. Listwise deletion techniques were the default method used for handling missing data in SPSS 24. For analyses conducted in *Mplus* (i.e., the path analysis), Full Information Maximum Likelihood (FIML) estimation with robust standard errors were used to handle missing data. The FIML estimation technique assumes that data are missing at random (MAR) and is the preferred method for handing missing data (Enders & Bandaloos, 2001).

Applying FIML estimation techniques uses observed responses within a dataset to supplement missing response information (Little, Jorgensen, Lang, & Moore, 2014). In doing so, FIML is able to yield unbiased estimates of parameters and their standard errors (Enders, 2010; Schafer & Graham, 2002).

Data screening and descriptive statistics. Prior to conducting the three-way ANOVA, data were screened for violations of assumptions related to the dependent variable (i.e., number of ACEs) and independent variables (i.e., gender, ethnicity, and age group). Specifically, outliers and homogeneity of variance were examined prior to testing for main-effects. Levene's test for homogeneity of variances was reviewed in SPSS 24 to assess for violations of the assumption. Normal distributions for the dependent variable were also reviewed in SPSS 24 using the Shapiro-Wilk test of normality. Prior to conducting the path analysis, descriptive statistics for skewness and kurtosis were assessed for each of the observed variables.

Path analysis. The fit statistics produced by the path analysis model were examined to assess for goodness of fit. Fit statistics that were examined, as suggested by Kline (2016), include the chi-square (χ^2) statistic, Tucker-Lewis Index (TLI), comparative fit index (CFI) values, root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). A representation of the proposed model is shown in Figure 1, below.

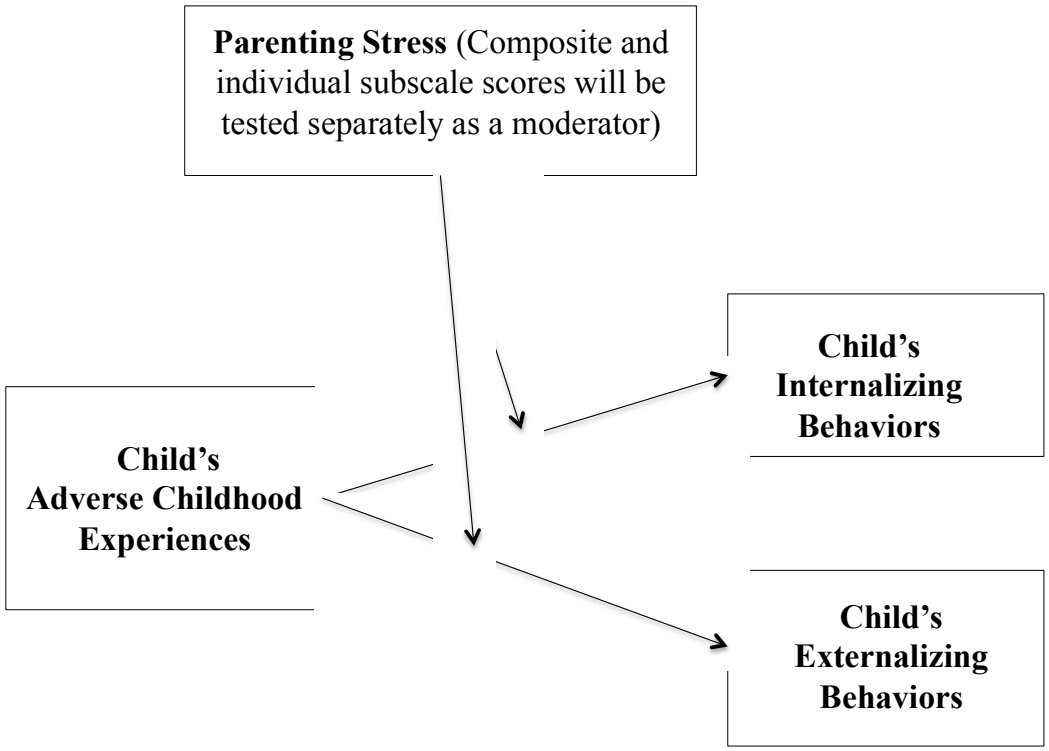

Figure 1. Path analysis model examining the association between ACEs and behavioral symptoms with levels of parenting stress as a moderator.

In this model, all variables are observed and there are no latent variables. The model depicted in Figure 1 provides a conceptual framework for depicting the association between parenting stress, adverse childhood experiences, and children's internalizing and externalizing behaviors.

Kline (2016) provides six basic steps to conducting a path analysis using structural equation modeling. Steps one through three involve specifying a model (see Figure 1), evaluating the model identification, and selecting the measures and operationalizing the

constructs. As previously described, examination of multiple fit statistics as recommended by Kline (2016) was examined to evaluate model identification. TLI and CFI values > .90 were considered adequate fit and values > .95 indicated good fit (Hu & Bentler, 1999). Cut-off values of < .06 indicate good fit for RMSEA (Fabrigar, Wegener, MacCullum & Strahan, 1999) and values <. 08 suggest good fit for SRMR (Hu & Bentler, 1999). Finally, non-significant *p* values for the chi-square test statistic were used to indicate good fit and (Hu & Bentler, 1999). Steps four through six require a more iterative process involving evaluation of model fit, model re-specification based on theory, and decisions related to retaining the model or creating near-equivalent models (Kline, 2016). The six steps for conducting a path analysis provided by Kline (2016) are useful for conceptualizing the basic steps for conducting a path analysis since it is impossible to know if a model will be identified prior to conducting analyses. Models that are found to be under-identified, just-identified, or over-identified will be analyzed using linear regression techniques in SPSS to estimate separate regression equations. In order to assume causal inference in path analysis, temporal precedence and random assignment are required. In this study, because data are cross-sectional data the assumption of temporal precedence is not met, nor does the study design allow random assignment. Therefore no causal inferences will be made.

Results

Overall Descriptive Statistics

ACE scores. Prior to conducting analyses, assumptions of normal distribution for cumulative ACEs were examined by visually assessing histograms and Q-Q plots, as well as results from the Shapiro-Wilks tests. Skewness and kurtosis values were also examined. The histogram findings showed a positively right skewed distribution for cumulative ACE scores

and Q-Q plots indicated data points loosely following the diagonal line. The Shapiro-Wilks ($S\text{-}W = 0.924$, $df = 217$, $p < .001$) test revealed violations of the assumption for normality. The cumulative ACEs variable had a skewness value of |.84| and a kurtosis value of |.65|, values that suggested no serious violations of normality (Chou & Bentler, 1995; Curran et al., 1996). Levene's test showed equal variance in cumulative ACEs across age groups, $F(1,215) = .212$, $p = .714$, gender, $F(1,215) = .311$, $p = .578$, and ethnicity, $F(1,215) = 2.379$, $p = .124$.

Children's behavioral symptoms. Descriptive statistics and distributional characteristics were conducted with variables measuring children's behavioral symptoms, as rated by their parents using the CBCL/1.5-5 (Achenbach & Rescorla, 2000). Since item-level responses were not available for analysis, histograms and descriptive statistics for the Internalizing and Externalizing symptoms subscale scores and the Total Problems score were examined. Normality of Internalizing and Externalizing subscales were tested using the Shapiro-Wilk test of normality and by analyzing skewness and kurtosis values. The Shapiro-Wilks test was used in place of the Kolmogorov-Smirnov (K-S) test since the K-S test has been found to have lower power compared to Shapiro-Wilks and is not recommended for testing normality (Ghasemi & Zahediasl, 2012; Thode, 2002). Results from the Shaprio-Wilk test of normality indicated violations of this assumption for both the Internalizing ($S\text{-}W = 0.981$, $df = 217$, $p = .005$) and Externalizing ($S\text{-}W = 0.985$, $df = 217$, $p = .024$) subscales.

Table 3

Means, Standard Deviations, Skewness, and Kurtosis for Behavioral Symptoms

Variable Name	*T-score Range*	*% Reaching Clinical Significance*	*M*	*SD*	Skewness	Kurtosis
CBCL_Externalizing	28-92	25.80%	56.18	12.63	-0.01	0.24
CBCL_Internalizing	29-78	24.00%	53.69	12.18	-0.14	-0.68
CBCL_Total	8-88	24.90%	55.08	12.54	-0.22	0.52

However, skewness and kurtosis values did not exceed critical limits (|2.0| for skewness and |7.0| for kurtosis; Chou & Bentler, 1995; Curran et al., 1996), suggesting no major violations to normality for all variables related to children's behavioral symptoms. Examining the histograms and Q-Q plots for each of the subscales visually supported this assumption, which showed close to normal distributions and data points adhering closely to the diagonal line. Means, standard deviations, *T*-score ranges, skewness and kurtosis values are presented in Table 3. Table 3 also includes information on the percent of *T*-scores reaching clinical significant (*T*-Score > 63) within the current sample. No outliers were found for either the Externalizing or Internalizing variables used in the path analysis. An outlier *T*-score of 8 was found for the Total Problems scale; however, this variable was not included in the path analysis and did not affect analyses. Next, reliability analysis was conducted for the Internalizing, Externalizing, and Total Problems scales on the CBCL/1.5-5 (Achenbach & Rescorla, 2000). Cronbach's alpha showed good reliability with an alpha of .90 between Internalizing, Externalizing, and Total Problems scales.

Parenting stress. Finally, preliminary data screening was conducted for parenting stress variables from the PSI-SF-4 (Abiden, 2012). Item level responses were also not available for parenting stress variables and data screening was conducted at the scale level of analysis. Preliminary data screening was conducted for the Total Parenting Stress scale, as well as each of the three subscales that comprise this scale (PD, P-CDI, and DC). Table 4 presents means, standard deviations, percentile ranges, percent reaching clinical significance (percentiles > 90), and skewness and kurtosis values for each of the scales on the PSI-SF-4 (Abiden, 2012).

Table 4

Means, Standard Deviations, Skewness, and Kurtosis for Parenting Stress

Variable Name	*Percentile Range*	*% Reaching Clinical Significance*	*M*	*SD*	Skewness	Kurtosis
PSI_total	4-99	8.30%	55.18	26.74	-0.15	-1.04
PSI_DifficultChild	3-99	17.10%	59.79	27.81	-0.34	-0.99
PSI_ParChildDys	8-99	8.80%	50.51	26.93	0.12	-1.13
PSI_ParDistress	5-99	14.70%	51.18	28.48	0.04	-1.08

Skewness and kurtosis values for all variables on the PSI-SF-4 (Abiden, 2012) did not exceed critical limits (|2.0| for skewness and |7.0| for kurtosis; Chou & Bentler, 1995; Curran et al., 1996), suggesting no major violations to normality for all variables related to parenting stress. The Shaprio-Wilk test did not support assumptions of normality for the composite (*S-W* = 0.959, *df* = 217, $p < .001$) score and all subscale scores, including Difficult Child (*S-W* = 0.942, *df* = 217, $p < .001$), Parent Child Dysfunctional Interaction (*S-W* = 0.950, *df* = 217, $p < .001$), and Parental Distress (*S-W* = 0.950, *df* = 217, $p < .001$). Visual examination of the histograms and Q-Q plots indicated some deviance from normality for the composite PSI Total score and subscale scores. In general, data values appeared to be distributed equally from low to high instead of following the expected bell shape curve which centrals around the mean. Data values most closely adhered to the diagonal line on the Q-Q plot for the composite PSI Total score. However, given that the skewness and kurtosis values for the parenting stress variables did not exceed critical limits (Chou & Bentler, 1995; Curran et al., 1996), assumptions of normality were considered adequately met. Reliability analysis was also conducted for the composite and subscale scores on the PSI-SF-4 (Abiden, 2012). Cronbach's alpha showed good reliability with an alpha of .91 between Total Problems and each of the three subscales (PD, P-CDI, DC).

Bivariate correlations were examined for cumulative Total ACEs and variables related to child behavioral symptoms and parenting stress (see Table 5). As expected, the Internalizing and Externalizing subscales on the CBCL/1.5-5 (Achenbach & Rescorla, 2000) were strongly positively correlated ($r = .69$, $p < .001$). Strong, positive correlations were also seen between Total Parenting Stress and each of the three subscales on the PSI-SF-4 (Abiden, 2012). Moderate positive correlations were found between Total Parenting Stress and children's Internalizing ($r = .40$, $p < .001$) and Externalizing ($r = .46$, $p < .001$) behavioral symptoms.

Table 5

Bivariate Correlations for ACEs, Child Behavioral Symptoms, and Parenting Stress Variables

	1	2	3	4	5	6	7
1. ACEs	-						
2. CBCL_Externalizing	0.047	-					
3. CBCL_Internalizing	.163*	.685**	-				
4. PSI_DifficultChild	0.017	.536**	.415**	-			
5. PSI_ParChildDys	-0.035	.365**	.310**	.678**	-		
6. PSI_ParDistress	-0.003	.259**	.239**	.474**	.584**	-	
7. PSI_Total	-0.009	.460**	.396**	.836**	.876**	.815**	-

Note. * = $p < .05$; ** = $p < .01$.

Weak correlations were found between cumulative Total ACEs and all other variables, presumably due to the fact that the population was clinically referred (as opposed to a true community-based sample), limiting variability in ACE scores.

Parent Reported Exposure to Specific ACEs

Parents were asked to report on their child's exposure to specific ACEs and results were organized in Table 6 according to their gender, age group (toddler or preschooler), and ethnicity (Latinx and non-Latinx). The range of ACEs reported was 0 to 12 ($M = 3.00$, $SD = 2.44$) for the total sample. The range of ACEs for males was 0 to 12 with a mean cumulative

ACE score of *M* = 2.99 (*SD* = 2.51). Females had an ACE score range of 0 to 9 with mean cumulative ACE score of *M* = 3.03 (*SD* = 2.34). For toddlers, the range of ACEs reported was 0 to 9 and a mean of *M* = 3.08 (*SD* = 2.24). Preschoolers had an ACE score range of 0 to 12 and a mean of *M* = 3.01 (*SD* = 2.53).

Certain items on the ACEs survey were endorsed with greater frequency compared to others. For instance, over half of parents (*n* = 121; 56.8%) indicated that their child had experienced divorce while no parents endorsed the question item indicating that their child had ever been discriminated against due to race or cultural background. There were also very few parents (*n* = 3; 1.4%) who indicated that their child had been separated from a parents or caregiver due to immigration status. In general, males and females had similar rates of exposure to specific ACE as reported by their parents. The most commonly reported ACEs for toddlers were experiencing divorce (59.7%), having a family member(s) with a substance abuse problem (51.6%), having a family member who is mentally ill (38.1%), or having a family member who had been to prison (29.0%). In the preschool age group, the most commonly reported ACEs included divorce (55.6%), having a family member with a substance abuse problem (39.6%), experiencing emotional abuse (32.7%), and witnessing DV (30.1%). Other frequently reported ACEs for preschoolers included having a family member who is mentally ill (29.5%) or who had been to prison (26.4%). Compared to toddlers, fewer preschoolers (10.8% compared to 27.9%) had experienced being placed in foster care as reported by their parent or guardian. For ethnicity, non-Latinx children were observed to have higher rates of exposure to ACEs on all items with the exception of being separated from their caregiver due to immigration status.

Table 6

Parent Reported Adverse Childhood Experiences by Child's Gender, Age Group, and Ethnicity

ACEs Exposure	Total (%)	Male (%)	Female (%)	Toddler (%)	Preschooler (%)	Latinx (%)	non-Latinx (%)
Bullying	4.3	3.8	5.1	0.0	6.1	4.1	4.8
Community Violence	6.7	6.1	7.7	6.6	6.8	4.8	11.3
Discrimination	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Divorce	56.8	56.0	58.2	59.7	55.6	53.3	65.1
Domestic Violence	30.2	28.6	32.9	29.0	30.7	30.2	30.2
Emotional Abuse	30.2	31.3	28.2	24.2	32.7	26.8	38.1
Emotional Neglect	12.0	13.0	10.3	9.8	12.8	10.2	16.1
Family Member Mentally Ill	32.1	30.6	34.6	38.1	29.5	29.5	38.1
Family Member in Prison	27.1	27.3	26.9	29.0	26.4	21.8	39.7
Family Member with Substance Abuse Problems	43.1	43.2	43.0	51.6	39.6	37.2	57.1
Foster Care	15.8	14.5	17.9	27.9	10.8	13.6	21.0
Parent/Guardian Died	4.3	6.1	1.3	1.6	5.4	4.1	4.8
Medical Illness	7.2	6.9	7.7	6.6	7.4	5.4	11.3
Physical Abuse	11.0	12.1	9.0	8.2	12.1	8.8	16.1
Physical Neglect	10.5	10.7	10.3	9.8	10.8	7.5	17.7
Prenatal Exposure	10.5	11.4	9.0	11.5	10.1	8.1	16.1
Separated due to Immigration Status	1.4	1.5	1.3	1.6	1.4	2.0	0.0
Sexual Abuse	4.8	4.6	5.1	0.0	6.8	4.1	6.5
Not in Continuous Care of Guardian/Parent/Caregiver	12.9	12.2	14.1	18.0	10.8	9.5	21.0

Note. Toddlers represent children between the ages of 1.5 and 2 years of age, while preschooler represents children between the ages of 3 and 5 years of age.

Cumulative ACEs, Gender, and Ethnicity Differences

In addition to looking at specific ACEs in this clinically referred sample of young children, cumulative ACEs were also examined. Overall, 18.0% of the sample had a Total ACEs score of 0, 13.8% had a Total ACEs score of 1, and over a third of the sample (68.2%) had a Total ACEs score of 2 or more out of 19 possible ACEs. The mean scores of cumulative ACEs were compared for gender and ethnicity and across age groups. A two-way ANOVA was conducted to determine whether a two-way interaction existed between gender and ethnicity on cumulative ACE exposure. The 2x2 ANOVA with gender (male and female) and ethnicity (Latinx and non-Latinx) as between-subjects factors revealed a significant main effect for ethnicity, $F(1,213) = 7.399$, $p = 0.007$, $\eta_p^2 = .034$, but not gender, $F(1,213) = 0.863$, $p = 0.354$; $\eta_p^2 = .004$. Interaction results indicated a statistically significant two-way interaction between gender and ethnicity, $F(1,213) = 6.203$, $p = 0.014$, $\eta_p^2 = .028$, with Bonferroni correction critical p value of $< .025$ ($\alpha = .05/2$). Figure 2 shows the interaction between gender and ethnicity across cumulative ACE scores. There was a main effect for ethnicity, no main effect for gender, and an interaction between cumulative ACE score and ethnicity. Overall, non-Latinx participants had higher mean ACE scores compared to Latinx participants and differences varied according to gender. Although non-Latinx males had higher ACE scores than non-Latinx females, the reverse trend was true for males and females from Latinx backgrounds. Follow-up independent-samples *t*-test supported these results. Cumulative ACE scores were significantly higher for non-Latinx participants, $t(215) = 3.439$, $p = .001$, but were not significantly different between gender, $t(215) = .115$, $p = .908$. Within gender, results showed non-significant differences for Latinx $t(151) = -1.504$, $p = .702$ and non-Latinx $t(62) = 1.842$, $p = .070$ participants.

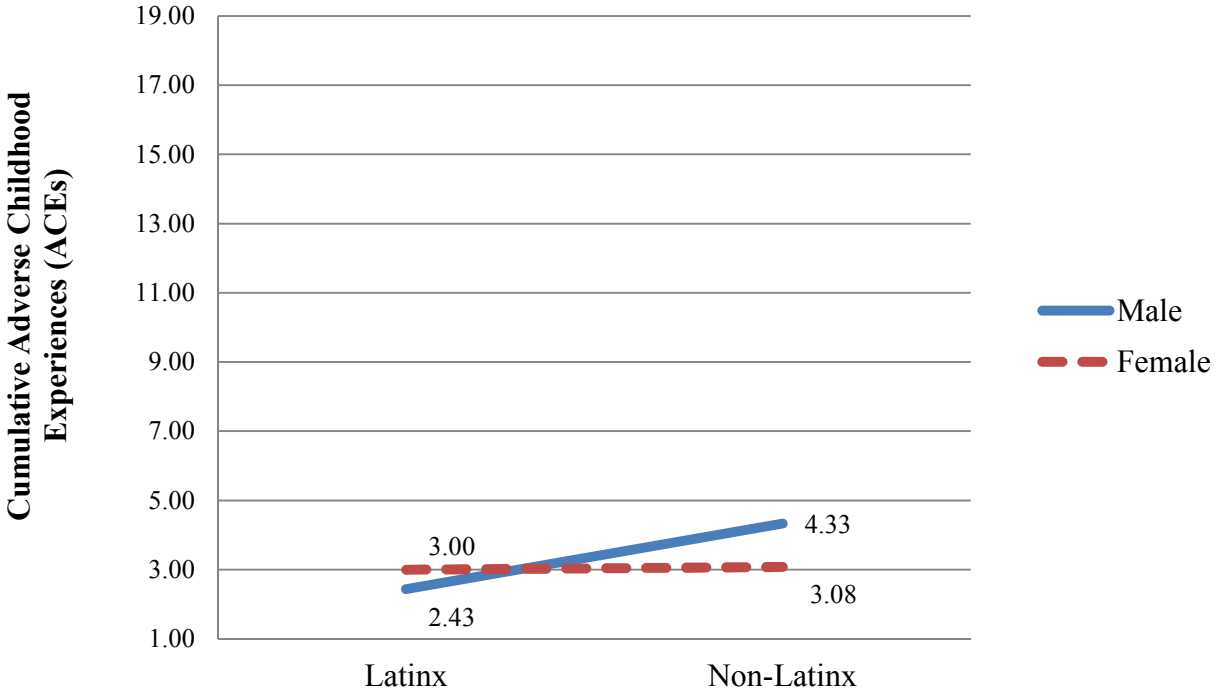

Figure 2. Mean ACE scores by gender and ethnicity.

Cumulative ACEs, Parenting Stress, and Children's Behavioral Symptoms

The association between cumulative Total ACEs and children's behavioral symptoms, and the potential moderating effect of parenting stress, was examined. The initial hypothesis was that an increase in adverse childhood experiences would predict higher levels of internalizing and externalizing behaviors and that this association would vary according to levels of parenting stress. Furthermore, it was also hypothesized that high levels of parenting stress would exacerbate behavioral symptoms in children with high cumulative Total ACEs scores.

Although a moderated path analysis with observed variables was the preferred data analytic method, fit statistics for the model revealed a just-identified or fully saturated model with 0 degrees of freedom: χ^2 (0) = .000, p < .001; CFI = 1.000; TLI = 1.000; and RMSEA = .000 [.000, .000]; SRMR = .000. A just-identified model indicates an identified model in which the number of free parameters equals the exact number of known values with zero degrees of freedom (Kenny, 2011; Kline, 2016). When models are determined to be just-identified, parameters can be estimated but it is not possible to assess goodness of fit or test a particular hypothesis (Kline, 2016). Path coefficients from the just-identified model indicated a significant indirect effect of cumulative total ACEs scores on externalizing behaviors (p < .001) and a significant direct effect of parenting stress totals on internalizing behaviors (p < .001).

Given that the path analysis resulted in a just-identified model with no interpretation for hypothesis testing, two separate moderation analyses were conducted using SPSS to estimate separate regression equations for both internalizing and externalizing behavioral symptoms with ACEs as the predictor variable. Linear regression in SPSS was used to conduct moderation analyses, using an interaction term to interpret moderation effects between parenting stress and cumulative Total ACEs scores. To increase the interpretability of these interactions and avoid multicollinearity with interaction terms, the predictor variable (Total ACEs) and moderator variables (Total Parenting Stress and each of the three subscales), were centered around their means (Aiken & West, 1991; McClelland & Judd, 1993). All terms were entered into the model together. Bonferroni adjustments were made to reduce the likelihood of making a Type I error when testing multiple regression hypotheses. After applying Bonferroni's calculation, α =.05 was divided by the number of regression

hypotheses tested for each outcome variable (4) and the new threshold of significance was adjusted to $p < .013$. The total number of hypotheses included testing Parenting Stress Totals and each of its three subscales (PD, P-CDI, DC) for both internalizing and externalizing behavioral symptoms.

Overall, the regression model for Model 1 (without interaction term) accounted for ($R^2 = .19$) of the total variance in predicting internalizing behavioral symptoms and was statistically significant, $F(2, 214) = 24.288$, $p < .001$, $\Delta R^2 = .185$. In the model for internalizing behaviors, both cumulative Total ACEs ($\beta = .167$, $p = .007$) and Parenting Stress Total ($\beta = .400$, $p < .001$) were significant even after applying Bonferroni adjustments with an adjusted p value of .013. A positive association was found in that as Total ACEs and PSI Totals increased, levels of internalizing behaviors also increased. When the interaction term (Total ACEs and Parenting Stress) was added to the model in Model 2 (see Table 7), the predictors accounted for ($R^2 = .19$) of the variance and remained statistically significant, $F(3, 213) = 17.134$, $p < .001$, $\Delta R^2 = .194$. Both predictors, Total ACEs ($\beta = .166$, $p < .008$) and Parenting Stress Total remained statistically significant, ($\beta = .399$, $p < .001$). The interaction term was not statistically significant.

Table 7

Final Model of Predictors of Internalizing Behaviors with Interaction Term

Model 2: Internalizing behaviors	*B*	*SE B*	β	*t*	*p*
Constant	53.68	0.75		71.84	< .001
Total ACEs (c)	0.82	0.31	0.17	2.68	0.008*
PSI Total (c)	0.18	0.03	0.40	6.50	< .001**
Total ACEs x PSI Total	-0.02	0.01	-0.10	-1.58	0.116

Note. *$p < .01$; **$p < .001$.

Next, a linear regression model was analyzed using externalizing behaviors as the outcome variable, with Total ACEs and Parenting Stress as the predictor variables. The regression model for Model 1 (without interaction term) accounted for ($R^2 = .21$) of the total variance in predicting externalizing behavioral symptoms and was statistically significant, $F(2, 214) = 29.210$, $p < .001$, $\Delta R^2 = .214$. In the model for externalizing behaviors, the only predictor variable that was significant included Parenting Stress ($\beta = .461$, $p < .001$). The interaction term (Total ACEs and Parenting Stress) was added to the model in Model 2 (see Table 8), which showed that the predictor accounted for ($R^2 = .22$) of the total variance and was statistically significant, $F(3, 213) = 20.174$, $p < .001$, $\Delta R^2 = .221$. Similar to Model 1 for externalizing behaviors, the only significant predictor in the model included Parenting Stress Totals ($\beta = .462$, $p < .001$). The predictor Total ACEs and the moderator Parenting Stress were not statistically significant.

Table 8

Final Model of Predictors of Externalizing Behaviors with Interaction Term

Model 2: Externalizing Behaviors	*B*	*SE B*	β	*t*	*p*
Constant	56.18	0.76		73.73	< .001
Total ACEs (c)	0.26	0.31	0.05	0.82	0.414
PSI Total (c)	0.22	0.03	0.46	7.64	< .001**
Total ACEs x PSI Total	-0.02	0.01	-0.08	-1.37	0.173

Note. *$p < .01$; **$p < .001$.

To further explore parenting stress as a moderator, each of the subscales that contribute to Total Parenting stress (PD, P-CDI, and DC) were tested separately for both Internalizing and Externalizing behavioral symptoms. First, each of the three Parenting Stress subscales and

Total ACEs were tested for internalizing behavioral symptoms. The final regression models are shown in Table 9 for internalizing behaviors.

Table 9

Final Model of Predictors of Internalizing Behaviors for each of the Parenting Stress Subscales

	Model 3 Parental Distress					Model 4 Parent-Child Dysfunctional Interaction					Model 5 Difficult Child				
	B	*SE B*	β	*t*	*p*	*B*	*SE B*	β	*t*	*p*	*B*	*SE B*	β	*t*	*p*
Constant	53.69	0.80		67.42	< .001	53.67	0.78		69.02	< .001	53.72	0.74		72.98	< .001
Total ACEs (c)	0.81	0.33	0.16	2.46	0.015	0.88	0.32	0.18	2.76	0.006*	0.72	0.30	0.14	2.37	0.019
Subscale (c)	0.10	0.03	0.24	3.67	< .001**	0.14	0.03	0.32	4.98	< .001**	0.18	0.03	0.40	6.55	< .001**
Interaction	-0.01	0.01	-0.03	-.47	0.638	-0.01	0.01	-0.04	-.63	0.529	-0.03	0.01	-0.15	-2.42	0.016

Note. *p < .01; **p < .001.

For internalizing behaviors, the regression models showed that each of the subscale predictors (PD, P-CDI, and DC) and Total ACEs significantly predicted internalizing behavioral outcomes. Each of the subscales showed a positive association for the outcome variable, meaning that as levels of Parental Distress, Parent-Child-Dysfunctional Interaction, and Difficult Child increased, parent-reported levels of internalizing behaviors also increased. However, none of the subscales that comprise the Parenting Stress Index significantly moderated the association between Total ACEs and internalizing behavioral symptoms. Model 3, which included Parental Distress and Total ACEs as predictors, accounted for a very small percent of the total variance ($R^2 = .08$) and was statistically significant, $F(2, 214) = 9.828$, $p < .001$, $\Delta R^2 = .084$. In this model, the only predictor of internalizing behaviors was Parental Distress ($\beta = .240$, $p < .001$). In Model 4, Parent-Child Dysfunctional Interaction ($\beta = .316$, $p < .001$) and Total ACEs ($\beta = .007$, $p = .084$) were significant predictors of internalizing behaviors. Model 4 accounted for ($R^2 = .13$) and was statistically significant, $F(2, 214) = 15.520$, $p < .001$, $\Delta R^2 = .027$. Model 5 showed that both predictors Difficult Child ($\beta = .412$, $p < .001$) and Total ACEs ($\beta = .156$, $p = .011$) were significant. This model accounted for ($R^2 = .20$) of the total variance in internalizing behaviors and was statistically significant, $F(2, 214) = 26.218$, $p < .001$, $\Delta R^2 = .197$. Although the moderator Difficult Child approached significance in Model 5 ($\beta = -.148$, $p = .016$), alpha levels did not fall below the adjusted $p = .013$ significance threshold.

The same regression analyses were conducted for externalizing behavioral symptoms and final model results are presented in Table 10 (below).

Table 10

Final Model of Predictors of Externalizing Behaviors for each of the Parenting Stress Subscales

	Model 3 Parental Distress					Model 4 Parent-Child Dysfunctional Interaction					Model 5 Difficult Child				
	B	*SE B*	β	*t*	*p*	*B*	*SE B*	β	*t*	*p*	*B*	*SE B*	β	*t*	*p*
Constant	56.18	0.83		67.51	< .001	56.17	0.80		70.05	< .001	56.20	0.73		77.42	< .001
Total ACEs (c)	0.24	0.34	0.05	.68	0.494	0.32	0.33	0.06	.98	0.327	0.17	0.30	0.03	.56	0.575
Subscale (c)	0.12	0.03	0.26	3.94	< .001**	0.17	0.03	0.37	5.80	< .001**	0.24	0.03	0.53	9.14	< .001**
Interaction	-0.01	0.01	-0.04	-0.53	0.598	-0.01	0.01	-0.04	-.64	0.524	-0.01	0.01	-0.07	-1.17	0.237

Note. *p < .01; **p < .001

Similar to results for internalizing behavioral symptom, none of the subscales that comprise the Parenting Stress Index significantly moderated the association between Total ACEs and externalizing behavioral symptoms. Total ACEs were also not significantly predictive of externalizing behaviors in any of the models. Model 3, which included Parental Distress and Total ACEs as predictors, accounted ($R^2 = .07$) of the variance and was statistically significant, $F(2, 214) = 8.003$, $p < .001$, $\Delta R^2 = .070$. In this model, the only predictor of externalizing behaviors was Parental Distress ($\beta = .260$, $p < .001$). In Model 4, Parent-Child Dysfunctional Interaction ($\beta = .367$, $p < .001$) was the only significant predictor of externalizing behaviors. Model 4 accounted for ($R^2 = .14$) and was statistically significant, $F(2, 214) = 16.959$, $p < .001$, $\Delta R^2 = .137$. Similar results were found in Model 5, which showed that the only significant predictor of externalizing behavioral symptoms was the subscale Difficult Child ($\beta = .535$, $p < .001$). This model accounted for ($R^2 = .29$) of the total variance in externalizing behavioral symptoms and was statistically significant, $F(2, 214) = 43.407$, $p < .001$, $\Delta R^2 = .289$. Positive associations were also found for each of the subscales, such that as levels of Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child increased, levels of parent-reported externalizing behaviors also increased.

Discussion

The current study examined exposure to and associations between ACEs and children's behavioral symptoms, as well as the potential direct and moderating effect of parenting stress among a clinically referred early child population. Information about ACEs, behavioral symptoms, and levels of parenting stress were all gathered from parent/guardian report for children between the ages of 1.5 and 5 years of age. Frequencies of specific ACEs were explored according to gender, age group (toddlers and preschoolers), and ethnicity

(Latinx and non-Latinx). In addition, gender and ethnicity differences were examined in terms of cumulative ACE scores. Parent reports indicated that young children from non-Latinx backgrounds have significantly higher exposure to ACEs compared to young children from Latinx backgrounds. A significant two-way interaction was found and showed that non-Latinx male participants had higher mean ACE scores compared to non-Latinx female participants, though Latinx female participants had higher mean ACE scores compared to Latinx male participants. Though no evidence for moderation was found between parenting stress and cumulative ACEs on children's behavioral symptoms, parenting stress was a significant predictor of both internalizing and externalizing behaviors. These findings contribute to the literature gap on specific and cumulative exposure to ACEs among young children and pose important cultural implications related to screening of ACEs in diverse, clinically referred samples.

Early Childhood Exposure to ACEs

The first two research questions focused exclusively on exposure to both specific and cumulative ACEs among young children. In the first research question, frequencies of specific ACEs were explored according to gender, age group, and ethnicity. In comparison to a national report on the prevalence rates of ACEs in children 0 to 5 (Bethell, Davis, Gombojav, Stumbo, & Powers, 2017), the sample in the current study showed higher rates of exposure in almost all categories of ACEs. Thus, findings from the current study appear to support prior research suggesting higher rates of trauma exposure in samples of clinically referred children (Lamers-Winkelman et al., 2012).

The most commonly reported ACEs exposure overall included divorce and having a family member with a substance abuse problem. Given that divorce is fairly common among

families, it is possible that parents of young children from both Latinx and Non-Latinx backgrounds and across gender feel more comfortable disclosing information about divorce compared to other items on the ACEs survey. The high rate of exposure to divorce has been documented in other studies examining specific ACEs exposure with children from Hispanic and non-Latinx backgrounds (Cabellero, Johnson, Munoz Buchanan, & DeCamp, 2017; McKelvey, Selig, & Whiteside-Mansell, 2017). In contrast, there were no parents who endorsed the item on the ACEs survey asking about discrimination towards their child – findings that are also similar to other studies examining specific ACEs exposure in national samples (Bethell et al., 2017). These findings warrant additional research related to the endorsement of certain items on the ACEs survey and potential bias in responses based on perceived stigma.

For the second research question, the mean scores of cumulative ACEs were compared for gender and ethnicity. A two-way ANOVA was conducted to determine whether a two-way interaction existed between gender and ethnicity on cumulative ACE exposure. Results showed a significant main effect for ethnicity and a significant two-way interaction between gender and ethnicity across cumulative ACE scores. More specifically, results from the two-way interaction revealed that non-Latinx participants had higher mean ACE scores overall compared to all other participants and varied according to gender. The results parallel recent national data reports on ACEs (Bethell et al., 2017), which indicate that 46.0% of U.S. White or Caucasian children and 27.0% of U.S. Hispanic children birth through age 17 have been exposed to 1 or more ACEs. There are several possible explanations for reports of low ACEs among children from families of Latinx or Hispanic descent. For instance, Cabellero et al. (2017) poses concerns about the cultural relevance of

ACEs questions and cautions that these questions may not capture adverse experiences specific to families from Hispanic or immigrant backgrounds. The authors use the discrimination question on the ACEs survey ("Your child was treated badly because of race, sexual orientation, place of birth, disability or religion") as an example of cultural relevance. Cabellero et al. (2017) explains that Hispanic families may view discrimination as exclusion from resources such as housing or jobs instead of based solely on their race or religion. In addition, Cabellero et al. (2017) states that potential unmeasured buffers unique to immigrant Hispanic families may serve as protective factors in reducing exposure to ACEs. The cultural relevance of the ACEs survey is an important consideration for future studies and holds tremendous implications for assessing ACEs exposure among other ethnic minority groups. Agencies who adopt and implement ACEs screening measures should consider how items on the ACEs survey are perceived and even understood by families from diverse backgrounds. Even supposedly benign questions, such as questions related to divorce, can seem culturally insensitive to children whose parents were never married but separated.

Cultural sensitivity issues related to reporting are already prevalent in the CWS, where Hispanic and Asian children are noticeably underrepresented presumably due to cultural fears and perceptions about maltreatment reporting according to some studies (Cheung & LaChapelle, 2011; Maquire-Jack, Lanier, Johnson-Motoyama, Welch, & Dineen, 2015). Factors such as poverty, lack of trust, negative perceptions of clients' behavior, minority status, and lack of family engagement in community-based services have all been found to contribute to the racial disproportionality in CWS (Miller, Cahn, & Orellana, 2012). These factors highlight various reasons why families from certain ethnic minority groups, such as those from Latinx backgrounds, fail to disclose traumatic incidents that occur. For

example, families from Latinx backgrounds may fear additional legal repercussions or consequences if they choose to report being separated from a family member due to immigration status. Parents from non-Latinx backgrounds who do not have these same fears are more likely to feel comfortable disclosing sensitive information regarding their child's past trauma exposure. The findings from the current study highlight a need for cultural sensitivity regarding questions on the ACEs survey and how they are posed to vulnerable populations. Reminding families that they do not have to disclose immigration status when pursuing treatment options is imperative for enhancing a sense of trust and safety.

ACEs, Parenting Stress, and Behavioral Symptoms

The third research question assessed the association between cumulative Total ACEs, children's behavioral symptoms, and the potential moderating effect of parenting stress. It was hypothesized that an increase in adverse childhood experiences would predict higher levels of internalizing and externalizing behaviors and that this association would vary according to levels of parenting stress. Furthermore, it was also hypothesized that high levels of parenting stress may exacerbate behavioral symptoms in children with high cumulative Total ACEs scores. Although a path analysis was initially proposed as the preferred data analytic method, fit statistics revealed a just-identified or fully saturated model and moderation analyses were instead conducted using multivariate linear regression analysis in SPSS.

The hypothesis that Total Parenting Stress scores would significantly moderate the association between Total ACEs exposure and both internalizing and externalizing behavioral symptoms was not supported. In addition, none of the three subscales that comprise Total Parenting Stress (Parental Distress, Parent-Child Dysfunctional Interaction,

and Difficult Child) were found to significantly moderate the association between Total ACEs exposure and internalizing or externalizing behavioral symptoms. Although the subscale Difficult Child approached significance levels as a moderator between Total ACEs and internalizing behaviors, results were not statistically significant after accounting for Bonferroni adjustments. Despite the lack of evidence for moderation, each of the three subscales that comprise Total Parenting Stress had a positive association and significantly predicted both internalizing and externalizing behavioral symptoms.

There are several possible explanations for the lack of moderation found in the current study. First, it is possible that the lack of evidence for moderation is in fact true and that levels of parenting stress do not exacerbate internalizing or externalizing behavioral symptoms in young children following exposure to trauma. However, given that parenting stress was found to be a significant predictor of both internalizing and externalizing behavioral symptoms, the lack of moderation more likely reflects complexity in the emergence of behavioral symptoms after exposure to trauma. The convoluted presentation of internalizing and externalizing behavioral symptoms following repeated trauma exposure, particularly in early childhood, was in fact the impetus for coining the term *complex trauma* due to the complex presentation of symptoms observed in children (Cook et al., 2005; Denton, Frogley, Jackson, John, & Querstret, 2016; van der Kolk, 2009; Glaser, 2000). It is also possible that the children in the current study's sample, who were referred for early prevention and intervention services, have yet to develop significant behavioral symptoms that would warrant treatment to the same degree as a true clinically referred sample. In other words, the sample of young children in the current study exhibits traits of both clinically referred and community-based populations. Future research is needed to discern whether

parenting stress moderates the association between cumulative trauma exposure and behavioral symptoms in older children.

In addition, these results highlight the importance of examining parenting stress when working with young children referred for behavioral problems. Despite the lack of moderation, parenting stress was found to be a significant predictor of both internalizing and externalizing symptoms and suggests a need for increased focus on parenting stress reduction in early intervention/prevention services. Early intervention and prevention services that attempt to reduce parenting stress through behavioral management strategies and teaching of positive parenting practices may miss a critical opportunity to comprehensively address and explore parents' self-perceived levels of parenting stress. High levels of parenting stress have been found to counteract the effectiveness of early intervention approaches for young children with developmental disorders (Osborne, McHugh, Saunders, & Reed, 2007) and can impede treatment success. Prior research has also shown that the stability of parenting stress is dependent upon young children's externalizing behavior problems and that factors such as single parenthood, maternal psychopathology, and child anger proneness, and child emotion dysregulation can predict parenting stress up to two years in advance (Williford, Calkins, Keane, 2006). These studies underscore the necessity of addressing parenting stress for children exhibiting behavioral problems.

Finally, whereas cumulative Total ACEs did not predict externalizing behaviors, findings showed a significant positive association between parenting stress and externalizing behavioral problems. In contrast to the current study's findings, prior research has shown that consistently high exposure to ACEs in infancy and toddlerhood is associated with significant aggressive behavior problems (McKelvey et al., 2017). Thus, it appears that the risk factors

for increasing externalizing behavioral problems are complex due to a number of factors such as developmental timing, proximity, and consistency of ACEs exposure as suggested by McKelvey et al. (2017). It is also possible that the current study's sample reflects a limited range of variance in ACEs exposure to detect statistical significance for externalizing behaviors. Confounding variables such as socioeconomic status, parent/child demographic factors, and resilience factors not measured or included in the current study may also buffer against the association of ACEs and the emergence of young children's externalizing symptoms. Implications for early intervention and treatment, including the importance of screening for ACEs in early childhood populations, are discussed below.

Implications for Treatment of Early Childhood Trauma

Findings from the current study demonstrate that exposure to ACEs begins as early as infancy and toddlerhood, and that early intervention efforts that include screening for ACEs greatly aids agencies in their ability to comprehensively address behavioral symptoms. In particular, results showed that both cumulative ACEs exposure and levels of parenting stress were significantly predictive of children's internalizing symptoms. Though current trauma treatment approaches for children, such as Trauma-Focused Cognitive Behavioral Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2006), include a parent component, these sessions are limited and mostly target parenting skills and psychoeducation related to trauma exposure. Teaching parents and caregivers parenting skills on setting limits and responding appropriately to their child's behaviors may alter, but not sufficiently address high levels of parenting stress.

According to Cohen and Mannarino (2015), the purpose of parenting sessions within a TF-CBT model is to enable parents to provide ongoing opportunities to their children to

regain trust and a sense of safety. However, parents that report high levels of parenting stress may struggle to implement positive parenting skills. In the current study, the subscale Difficult Child contributed to a greater extent in the positive association between parenting stress and young children's behavioral symptoms than overall levels of parenting stress. In a previous study conducted by Lai, Tiwari, Self-Brown, Cronholm, and Kinnish (2017, caregiver factors such as levels of parenting stress, parental trauma history, and caregivers' attitudes towards therapy were all found to significantly predict treatment completion for TF-CBT. Lai et al. (2017) suggest that screening for and addressing caregiver factors, including levels of parenting stress, prior to or in conjunction with their child's treatment may lead to increased engagement in trauma treatment services. In another study conducted by Koverla, Murtaugh, Connors, Reeves, and Papas (2007), high levels of parenting stress were also found to significantly predict lower levels of engagement in their child's trauma treatment. These findings warrant additional research that examines how levels of parent reported parenting stress impact their child's level of treatment engagement.

The results from this study also highlight important screening implications for assessing trauma exposure in young children. In the current study's clinically-referred sample of young children, 18.0% had a Total ACEs score of 0, 13.8% had a Total ACEs score of 1, and over a third of the sample (68.2%) had a Total ACEs score of 2 or more out of a possible 19 items. The frequency of ACEs exposure in the current study is alarming when the exceptionally young ages of participants are considered. It is fitting then that agencies and institutions that regularly work with children, such as daycares, schools, and primary care sites, support and adopt policies that utilize ACEs. Some studies have even shown that measuring ACEs during childhood, as opposed to retrospectively, offers more opportunities

for intervention thereby improving short-term behavioral and emotional symptoms and possibly even long-term health problems (Finkelhor et al., 2013; Marie-Mitchell & O'Connor, 2013). Oral et al. (2016) asserts that the future of pediatric health care involves tiered screening for ACEs and varying levels of prevention and intervention efforts. At the primary prevention level, intervention efforts such as psychoeducation to parents are used to reduce exposure to adversity beginning in early childhood and beyond. Secondary intervention efforts involve immediately referring children for interventions to minimize the immediate and long-term consequences associated with exposure to ACEs. This might include referring the child and his/her family to programs or services such as homeless shelters or food pantries. At the tertiary level, treatment for the child and their family is recommended to begin the healing process. According to Oral et al. (2016), interventions that are strength-based and foster a sense of resiliency within families and communities are likely to have the greatest individual and societal impact at preventing or reducing exposure to ACEs.

It is also important to underscore the ability of parents to serve as both risk *and* protective factors in their child's life. Environmental factors such as exposure to adversity and parenting stress can be prevented to some extent or, at the very least, are amenable to early intervention efforts. Professionals such as early childhood educators, pediatricians, psychologists, and social workers who work with young children and their families are in a unique position to foster resiliency within families. As the findings from the current study demonstrate, caregiver factors such as parenting stress are important to consider in the treatment planning process for young children. For this reason, working collaboratively to

support parents and reduce parenting stress can add an additional layer of protection for children who experience adversity (Sciaraffa, Zeanah, & Zeanah, 2018).

Strengths and Limitations of Current Study

Few studies have examined the cumulative impact of ACEs on young children's behavioral health (Freeman, 2014; Stahmer et al., 2005) or how varying levels of parenting stress can serve as a risk factor or moderator for this association. In addition, limited information is available in the literature that specifically focuses on the prevalence of ACEs in Latinx samples from low-income backgrounds. Findings from the study assert a need for ACEs screening and targeted reduction in parenting stress in order to aid in prevention and intervention strategies for trauma exposure in diverse, low-income early childhood samples.

Despite the contributions of this study to early childhood research, there are a few limitations that must be considered. First, causal effects cannot be determined for the predictor variables since cross-sectional data does not address the temporal ordering of associations in the current study. For instance, it is not possible to discern whether children displayed high levels of internalizing or externalizing behaviors prior to experiencing adverse childhood experiences or if behavioral symptoms emerged as a result of parenting stress. To more definitively understand these relations, longitudinal studies are needed. In addition, the assessment tools used in this study do not allow for interpretation of whether parenting stress precedes any increase or decrease in behavioral symptoms, or if the child's behavioral problems cause an increase or decrease in parent's self-reported levels of parenting stress. Additionally, it is difficult to know the extent that parent's reports of their child's ACE scores are reportedly accurately. This is especially true for abuse items on the ACEs survey that would require parents to report potentially illegal behaviors. Another concern related to

parents' report of ACEs is the lack of clarity by CALM about the endorsement of "false" items. Items that are coded "false" do not allow practitioners or researchers the ability to interpret whether the item is truly false (i.e., the child was never exposed to the traumatic event) or was simply left blank. Admittedly, the lack of interpretability between false and missing items is a major limitation of the current study. Finally, due to the small sample size, it was difficult to look at multiple covariates such as age, income status, or prior treatment, which limited interpretability of findings for clinically referred populations of young children.

Despite these limitations, the current study poses important treatment and early intervention implications when working with clinically referred populations of young children. Screening and assessment of variables such as ACEs exposure and levels of parenting stress are crucial for understanding the emergence and presentation of early childhood behavioral symptoms. Early intervention and treatment that include a comprehensive and ecological approach are more likely to be successful in addressing behavioral problems in young children. Results from the current study show the importance of assessing a child's cumulative exposure to adversity as well as caregivers or guardians levels of parenting stress. Trauma treatment approaches that include ongoing support to parents and caregivers to reduce their own levels of parenting stress may help to reduce young children's behavioral symptoms.

References

Abidin, R. R. (2012). *Parenting stress index.* Odessa, FL: Psychological Assessment Resources, Inc.

Abidin, R. R. (1995). *Parenting stress index, third edition: Professional manual.* Odessa, FL: Psychological Assessment Resources, Inc.

Abidin, R. R. (1990). Introduction to the special issue: The stresses of parenting. *Journal of Clinical Child Psychology, 19,* 298-301.

Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA preschool forms & profiles: an integrated system of multi-informant assessment*. Burlington: University of Vermont, Research Center for Children, Youth & Families.

Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist/4-18 and 1991 profile.* Burlington, VT: University of Vermont, Department of Psychiatry.

Achenbach, T. M. (1992). *Manual for the Child Behavior Checklist/2-3 and 1992 profile.* Burlington, VT: University of Vermont, Department of Psychiatry.

Ackerman, B. P., Brown, E. D., & Izard, C. E. (2004). The relations between persistent poverty and contextual risk and children's behavior in elementary school. *Developmental Psychology, 40,* 367–377. doi: 10.1037/0012- 1649.40.3.367.

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage Publications, Inc.

Alink, L. R. A., van Ijzendoorn, M. H., Bakermans-Kranenburg, M. J., Mesman, J., Juffer, F., & Koot, H. M. (2008). Cortisol and externalizing behavior in children and adolescents: Mixed meta-analytic evidence for the inverse relation of basal cortisol and cortisol reactivity with externalizing behavior. *Developmental Psychobiology*,

50(5), 427-450.

American Psychiatric Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatric Association. American Psychological Association Presidential Task Force on Posttraumatic Stress Disorder and Trauma in Children and Adolescents. (2008). *Children and trauma: Update for mental health professionals*. American Psychological Association (APA). Retrieved from: http://www.apa.org/pi/families/resources/update.pdf

Ammerman, R. T., Shenk, C. E., Teeters, A. R., Noll, J. G., Putnam, F. W., & van Ginkel, J. B. (2013). Multiple mediation of trauma and parenting stress in mothers in home visiting. *Infant Mental Health Journal, 34,* 234-241. doi: http://dx.doi.org/10.1002/imhj.21383,

Andersson, H.W., & Sommerfelt, K. (2001). The relationship between cognitive abilities and maternal ratings of externalizing behaviors in preschool children. *Scandinavian Journal of Psychology, 42*, 437-444.

Audet, A. & Le Mare, L. (2010). Mitigating effects of the adoptive caregiving environment on inattention/overactivity in children adopted from Romanian orphanages. *International Journal of Behavioral Development, 35*(2), 107-115.

Baker, B., McIntyre, L., Blacher, J., Crnic, K., Edelbrock, C., & Low, C. (2003). Preschool children with and without developmental delay: Behavior problems and parenting stress over time. *Journal of Intellectual Disability Research, 47,* 217-230.

Barroso, N. E., Hungerford, G. M., Garcia, D., Graziano, P. A., & Bagner, M. (2016). Psychometric properties of the parenting stress index-short form (psi-sf) in a high-risk sample of mothers and their infants. *Psychological Assessment, 28*(10), 1331-1335.

doi: 10.1037/pas0000257.

Bartlett, J. D., Barto, B., Griffin, J. L., Fraser, J. G., Hodgdon, H., & Bodian, R. (2016). Trauma-informed care in the Massachusetts child trauma project. *Child Maltreatment*, *21*(2), 101-112. doi: 10.1177/1077559515615700.

Basharpoor, S., Narimani, M., Gamarigive, H., Abolgasemi, A., & Molavi, P. (2011). Effect of cognitive processing therapy and holographic reprocessing on reduction of posttraumatic cognitions instudents exposed to trauma. *Iranian Journal of Psychology, 6*(4), 138-144.

Bentler, P. M., & Chou, C. H. (1987). Practical issues in structural modeling. *Sociological Methods & Research, 17,* 78-117.

Berent, R., Crusto, C. A., Lotyczewki, B. S., Greenberg, S. R., Hightower, A., & Kaufman, J. S. (2008). Developmental and psychometric refinement of a measure assessing young children's exposure to violence: Parent report of children's experiences. *Best Practices in Mental Health: An International Journal, 4*(1), 19-30.

Bernard, K., Zwerling, J., & Dozier, M. (2015). Effects of early adversity on young children's diurnal cortisol rhythms and externalizing behavior. *Developmental Psychobiology, 57*(8), 935-947. doi: 10.1002/dev.21324.

Bethell, C. D., Davis, M. B., Gombojav, N., Stumbo, S., & Powers, K. (2017). *Issue brief: A national and across state profile on adverse childhood experiences among children and possibilities to heal and thrive.* Retrieved from: http://www.cahmi.org/wp-content/uploads/2017/10/aces_brief_final.pdf

Boomsma, A. (1982). Robustness of LISREL against small sample sizes in factor analysis models. In K. G. Joreskog & H. Wold (Eds.), Systems under indirection observation: Causality, structure, prediction (pp. 149-173). Amsterdam, Netherlands: North Holland;

Bowlby, J. (1969). *Attachment and loss*: *Volume 1: Attachment*. New York, NY: Basic Books.

Briere, J., Kaltman, S., & Green, B. L. (2008). Accumulated childhood trauma and symptom Complexity. *Journal of Traumatic Stress, 21,* 223-226.

Briere, J. (2005) *Trauma Symptom Checklist for Young Children: Professional manual.* Florida: Psychological Assessment Resources Inc.

Briggs-Gowan, M. J., Ford, J. D., Fraleigh, L., McCarthy, K., & Carter, A. S. (2010). Prevalance of exposure to potentially traumatic events in a healthy birth cohort of very young children in the northeastern United States. *Journal of Traumatic Stress, 23*(6), 725-733. doi: 10.1002/jts.20593.

Brim, O. G. (1975). Macro-structural influences on child development and the need for childhood social indicators. *American Journal of Orthopsychiatry*, 45, 516-524.

Bronfenbrenner, U., & Morris, P. (2006). The bioecological model of human development. In W. Damon & R. M. Lerner (Eds.), *Handbook of child development, volume 1, theoretical models of human development* (6th ed., pp. 793-828). Hoboken, NJ: Wiley.

Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development.* Thousand Oaks, CA: Sage.

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, *32,* 513-531. doi: 10.1037/0003-066X.32.7.513.

Brown, J., Cohen, P., Johnson, J. G., & Salzinger, S. (1998). A longitudinal analysis of risk factors for child maltreatment: Findings of a 17-year prospective study of officially recorded and self-reported child abuse and neglect. *Child Abuse and Neglect*, *22*, 1065–1078.

Bruner, C. (2017). ACE, place, race and poverty: Building hope for children. *Academic Pediatrics, 17*(7S), S123-S129.

Bucci, M., Gutierrez Wang, L., Koita, K., Purewal, S., Silverio Marques, S., & Burke Harris, N. (2015). *Center for youth wellness ACE-questionnaire user guide*. San Francisco, CA: Center for Youth Wellness. Retrieved: http://centerforyouthwellness.org/CYW-ACE-Q-and-User-Guide

Burke Harris, N., & Renschler, T. (2015). *Center for youth wellness ACE-questionnaire (CYW ACE-Q child, teen, teen sr)*. San Francisco, CA: Center for Youth Wellness.

Burke, N. J., Hellman, J. L., Scott, B. G., Weems, C.F., & Carrion, V. G. (2010). The impact of adverse childhood experiences on an urban pediatric population. *Child Abuse & Neglect*,
35, 408-413. doi: 10.1016/j.chiabu.2011.02.006.

Buss, K. E., Warren, J. M., & Horton, E. (2015). Trauma and treatment in early childhood: A review of the historical and emerging literature for counselors. *The Professional Counselor, 5*(2), 225-237. doi: 10.15241/keb.5.2.225.

Cabellero, T. M., Johnson, S. B., Munoz Buchanan, C. R., & DeCamp, L. R. (2017). Adverse Childhood experiences among hispanic children in immigrant families versus US-native families. *Pediatrics, 140*(5), 1-10. doi: 10.1542/peds.2017-0297.

Calkins, S. D., & Hill, A. (2007). Caregiver influences on emerging emotion regulation: Biological and environmental transactions in early development. In J. J. Gross (Ed.),

Handbook of emotion regulation (pp. 229-248). New York: Guildford Press.

Carter, A. S., & Briggs-Gowan, M. J. (2006). *Infant-toddler social and emotional assessment.* San Antonio, TX: Hartcourt. Center for Youth Wellness (CYW). (2017). *Why and how we screen for ACES*. Retrieved from: http://www.centerforyouthwellness.org/healthcare-professionals/how-we-screen-for-aces/

Cerezo-Jimenez, M. A., & Frias, D. (1994). Emotional and cognitive adjustment in abused children. *Child Abuse & Neglect, 18*, 923-932.

Cheung, M., & LaChapelle, A. (2011). Disproportionality from the other side: The underrepresentation of asian american children. In D. K. Green, K. Belanger, R. G. McRoy, & L. Bullard (Eds.), *Challenging racial disproportionality in child welfare: Research, policy, and practice* (pp. 131-139). Washington, DC: CWLA Press.

Child Abuse and Listening Mediation (CALM). (2016). *Annual report*. Retrieved from: http://calm4kids.org/wp-content/uploads/CALM_AR15-16_9.75x8.5-LOW.pdf

Chou, C. P., & Bentler, P. M. (1995). Estimates and tests in structural equation modeling. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 37–54). Thousand Oaks, CA: Sage.

Christoffel, K. K. (1990). Violent death and injury in US children and adolescents. *American Journal of Diseases of Children, 144*, 697–706.

Cicchetti, D. (2002). The impact of social experience on neurobiological systems: Illustration from the constructivist view of child maltreatment. *Cognitive Development, 17,* 1407-1428.

Cicchetti, D., & Toth, S. L. (1995). A developmental psychopathology perspective on child

abuse and neglect. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 541–565.

Cloitre, M., Stolbach, B. C., Herman, J. L., van der Kolk, B., Pynoos, R., Wang, J., & Petkova, E. (2009). A developmental approach to complex PTSD: Childhood and adult cumulative trauma as predictors of symptom complexity. *Journal of Traumatic Stress, 22,* 399-408.

Cohen, J. A. & Scheeringa, M. (2009). Post-traumatic stress disorder diagnosis in children: Challenges and promises. *Dialogues in Clinical Neuroscience, 11*(1), 91-99.

Cohen, J. A., & Mannarino, A. P. (2015). Trauma-focused cognitive behavioral therapy for traumatized children and families. *Child and Adolescent Psychiatric Clinics of North America, 24*(3), 557-570. doi: 10.1016/j.chc.2015.02.005.

Cohen, J. A., Mannarino, A. P., & Deblinger, E. (2006). *Treating trauma and traumatic grief in children and adolescents*. New York, NY: Guilford Press.

Colonnesia, C., Wissink, I., Noom, M., Asscher, J., Hoeve, M., Stams, G. M., & Kellaert-Knol, M. G., (2012). Basic trust: An attachment oriented intervention based on mind-mindedness in adoptive families. *Research on Social Work Practice, 23*(2), 179-188.

Conger, R. D., Conger, K. J., Elder, G. H., Lorenz, F. O., Simons, R. L., & Whitbeck, L. B. (1992). A family process model of economic hardship and adjustment of early adolescent boys. *Child Development, 63*, 526-541.

Conger, R. D., Conger, K. J., Elder, G. H., Lorenz, F. O., Simons, R. L., & Whitbeck, L. B. (1993). Family economic stress and adjustment of girls. *Developmental Psychology*, 29, 206-219.

Cook, A., Spinazzola, J., Ford, J., Lanktree, C., Blaustein, M., Cloitre, M., DeRosa, R., Hubbard, R., Kagan, R., Liautaud, J., Mallah, K., Olafson, E., & van der Kolk, B. (2005). Complex trauma in children and adolescents. *Psychiatric Annals, 35*, 390-398.

Copeland, W. E., Keeler, G., Angold, A., & Costello, E. J. (2007). Traumatic events and posttraumatic stress in childhood. *Archives of General Psychiatry, 64*, 577-584.

Costello, E. J., Erkanli, A., Fairbank, J. A., & Angold, A. (2002). The prevalence of potentially traumatic events in childhood and adolescents. *Journal of Traumatic Stress, 15*(2), 99-112.

Crnic, K., & Acevedo, M. (1995). Everyday stress and parenting. In M. H. Bornstein (Ed.), *Handbook of parenting* (pp. 277-297). Hillside, NJ: Erlbaum.

Crosby, S. D. (2015). An ecological perspective on emerging trauma-informed teaching practices. *Children & Schools, 37*(4), 223-230.

Crusto, C. A., Whitson, M. L., Walling, S. M., Feinn, R., Friedman, S. R., Reynolds, J., Amer, M., & Kaufman, J. S. (2010). Posttraumtic stress among young urban children expose to family violence and other potentially traumatic events. *Journal of Traumatic Stress, 23*(6), 716-724. doi: 10.1002/jts.20590.

Cunradi, C. B., Caetano, R., Clark, C., & Schafer, J. (2000). Neighborhood poverty as a predictor of intimate partner violence among White, Black, and Hispanic couples in the United States: A multilevel analysis. *Annals of Epidemiology, 10*, 297–308.

Curran, P. J., West, S. G., & Finch, G. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods, 1*, 16 –29. doi: 10.1037/1082-989X.1.1.16

Deater-Deckard, K. (1998). Parenting stress and child adjustment: Some old hypotheses and

new questions. *Clinical Psychology: Science and Practice, 5,* 314-332.

Deater-Deckard, K., & Scarr, S. (1996). Parent stress among dual-earner mother and fathers: Are there gender differences? *Journal of Family Psychology, 10*(1), 45-59.

De Kloet, E. R., Joels, M., & Holsboer, F. (2005). Stress and the brain: From adaptation to disease. *Nature Reviews Neuroscience, 6,* 463-475.

Denton, R., Frogley, C., Jackson, S., John, M., & Querstret, D. (2016). The assessment of developmental trauma in children and adolescents: A systematic review. *Clinical Child Psychology and Psychiatry, 22*(2), 260-287. doi: 10.1177/1359104516631607

DeVoe, E. R., Bannon, W. M., Jr., & Klein, T. P. (2006). Post-9/11 helpseeking by New York City parents on behalf of highly exposed young children. *American Journal of Orthopsychiatry, 76*(2), 167-175.

De Young, A. C., Kenardy, J. A., & Cobham, V. E. (2011). Trauma in early childhood: A neglected population. *Clinical Child and Family Psychology Review, 14*, 231-250. doi:10.1007/s10567-011-0094-3

Donenberg, G., & Baker, B. L. (1993). The impact of young children with externalizing behaviors on their families. *Journal of Abnormal Child Psychology, 21, 179-198.*

Eisenberg, N., Cumberland, A., Spinrad, T.L., Fabes, R.A., Shepard, S.A., Reiser, M., Murphy, B.C., Losoya, S.H., & Guthrie, I.K. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development, 72*, 1112-1134.

Enders, C. K. (2010). *Applied missing data analysis.* New York, NY: Guilford.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models.

Structural Equation Modeling: A Multidisciplinary Journal, 8, 430–457. doi:10.1207/S15328007SEM0803_5.

English, D. J., Marshall, D. B., & Stewart, A. J. (2003). Effects of family violence on child behavior and health during early childhood. *Journal of Family Violence, 18,* 43-57.

Ethier, L. S., Lemelin, J. -P., & Lacharite, C. (2004). A longitudinal study on the effects of chronic maltreatment on children's behavioral and emotional problems. *Child Abuse & Neglect, 28*, 1265-1278.

Evans, G. W., Li, D., & Whipple, S. S. (2013). Cumulative risk and child development. *Psychological Bulletin, 139*, 1342-1396.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272-299.

Fanti, K. A., Henrich, C. C., Brookmeyer, K. A., & Kupermine, G. P. (2008). Toward a Transactional model of adolescent relationship quality and adolescent psychological adjustment. *Journal of Early Adolescence, 28*, 252-276.

Fantuzzo, J., & Fusco, R. L. (2007). Children's direct sensory exposure to substantiated domestic violence crimes. *Violence and Victims*, *22*, 158–171.

Farver, J. A., Xu, Y., Eppe, S., Fernandez, A., & Schwartz, D. (2005). Community violence, family conflict, and preschoolers' socioemotional functioning. *Developmental Psychology, 41*(1)*,* 160–170. doi: 10.1037/0012-1649.41.1.160.

Felitti,V. J. (2002). The relationship between adverse childhood experiences and adult health: Turning gold into lead. *Permanente Journal, 6*(1), 44–47.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V.,

Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventative Medicine*, *14*(4), 245-258.

Fergusson, D. M., Lynskey, M. T., & Horwood, J. L. (1996). Childhood sexual abuse and psychiatric disorder in young adulthood: I. Prevalence of sexual abuse and factors associated with sexual abuse. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*, 1355–1364.

Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2007). Polyvictimization and trauma in a national longitudinal cohort. *Development and Psychopathology, 19,* 149-166.

Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2013). Improving the adverse childhood experiences study scale. *JAMA Pediatrics, 167*, 70-75.

Flaherty, E. G., Thompson, R., Litrownik, A. J., Theodore, A., English, D. J., Black, M. M., Wike, T., Whimper, L., Runyan, D. K., & Dubowitz, H. (2006). Effects of early childhood adversity on child health. *Archives of Pediatrics and Adolescent Medicine, 160(*12), 1232-1238. doi: 10. 10.1001/archpedi.160.12.1232.

Fleming, J., Mullen, P., & Bammer, G. (1997). A study of potential risk factors for sexual abuse in childhood. *Child Abuse and Neglect, 21*, 49–58.

Ford, J. D., Hartman, J. K., Hawke, J., & Chapman, J. (2008). Traumatic victimization, posttraumatic stress disorder, suicidal ideation, and substance abuse risk among juvenile justice-involved youths. *Journal of Child and Adolescent Trauma, 1*, 75-92. doi: 10.1080/19361520801934456.

Freeman, P. A. C. (2014). Prevalence and relationship between adverse childhood

experiences and child behavior among young children. *Infant Mental Health Journal, 35*, 544-554. doi: 10.1002/imhj.21460.

Ghasemi, A., & Zahediasl, S. (2012). Normality tests for statistical analysis: A guide for non-statisticians. *International Journal of Endocrinology and Metabolism, 10*(2), 486-489. doi: 10.5812/ijem.3505.

Ghosh-Ippen, C., Ford, J., Racusin, R., Acker, M., Bosquet, K., Rogers, C., Edwards, J. (2002).

Traumatic events screening inventory-parent report revised. San Francisco, CA: The Child Trauma Research Project of the Early Trauma Network and The National Center for PTSD Dartmouth Child Trauma Research Group.

Glaser, D. (2000). Child abuse and neglect and the brain: A review. *Journal of Child Psychology and Psychiatry, 41*, 97-116.

Godinet, M. T., Li, F., & Berg, T. (2013). Early childhood maltreatment and trajectories of behavioral problems: Exploring gender and racial differences. *Child Abuse & Neglect, 38*, 544–556. doi: 10.1016/j.chiabu.2013.07.018.

Grasso, D. J., Ford, J. D., & Briggs-Brown, M. J. (2012). Early life trauma exposure and stress sensitivity in young children. *Journal of Pediatric Psychology*, *38*(1), 94-103. doi: 10.1093/jpepsy/jss101

Gross, H. E., Shaw, D. S., & Moilanen, K. L. (2008). Reciprocal association between boys' externalizing problems and mothers' depressive symptoms. *Journal of Abnormal Child Psychology, 36*, 693-709.

Gudiño, O. G. (2013). Behavioral inhibition and risk for posttraumatic stress symptoms in Latinx children exposed to violence. *Journal of Abnormal Child Psychology, 41*(6),

983–992. doi:10.1007/s10802- 013-9731-2.

Gudino, O. G., Nadeem, E., Kataoka, S. H., & Lau, A. S. (2011). Relative impact of violence exposure and immigrant stressors on Latinx youth psychopathology. *Journal of Community Psychology*, *39*, 316–335. doi:10.1002/jcop.20435.

Gunnar, M. R., & Fisher, P. A. (2006). Bringing basic research on early experience and stress neurobiology to bear on preventive interventions for neglected and maltreated children. *Development and Psychopathology, 18,* 651-677.

Hagan, M. J., Sulik, M. J., & Lieberman, A. F. (2016). Traumatic life events and psychopathology in a high risk, ethnically diverse sample of young children: a person-centered approach. *Journal of Abnormal Child Psychology, 44,* 833-844. doi:10.1007/s10802-015-0078-8.

Herbers, J. E., Cutuli, J. J., Monn, A. R., Narayan, A. J., & Masten, A. S. (2014). Trauma, Adversity, and parent-child relationships among young children experiencing Homelessness. *Journal of Abnormal Child Psychology, 42,* 1167-1174. doi: 10.1007/s10802-014-9868-7.

Herman, J. L. (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of Traumatic Stress, 5*(3), 377-391. doi: 10.1002/jts.2490050305

Hodges, M., Godbout, N., Briere, J., Lanktree, C., Gilbert, A., & Kletzka, N. T. (2013). Cumulative trauma and symptom complexity in children: A path analysis. *Child Abuse & Neglect, 37,* 891-898.

Hu, L. & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternative. *Structural Equation*

Modeling: A Multidisciplinary Journal, 6(1), 1-55. doi: 10.1080/10705519909540118.

Hulette, A. C., Fisher, P. A., Kim, H. K., Ganger, W., & Landsverk, J. L. (2008). Dissociation in foster preschoolers: A replication and assessment study. *Journal of Trauma & Dissociation, 9*, 173-190.

Howe, D. (2005). *Child abuse and neglect: Attachment, development, and intervention.* Basingstoke: Palgrave Macmillan.

Jimenez, M. E., Wade, R., Lin, Y., Morrow, L. M., & Reichman, N. E. (2016). Adverse childhood experiences in early childhood and kindergarten outcomes. *Pediatrics, 137*(2), 1-9. doi: 10.1542/peds.2015-1839.

Johnson, S. B., Riley, A. W., Granger, D. A., & Riis, J. (2013). The science of early life toxic stress for pediatric practice and advocacy. *Pediatrics, 131*(2), 319-327.

Kenny, D. A. (2011). Terminology and basics of SEM. Retrieved from http://davidakenny.net/cm/iv.htm

Kessler R., Sonnega, A., Bromet, E., Hughes, M., Nelson, C. (1995) Posttraumatic stress disorder in the national comorbidity survey. *Archives of General Psychiatry*, *52*, 1048-1060.

Kiser, L. J., & Black, M. M. (2005). Family processes in the midst of urban poverty: What does the trauma literature tell us? *Aggression and Violent Behavior, 10,* 715-750. doi: 10.1016/j.avb.2005.02.003.

Kitzmann, K. M., Gaylord, N. K., Holt, A. R., & Kenny, E. D. (2003). Child witnesses to domestic violence: A meta-analytic review. *Journal of Counseling and Clinical Psychology, 71(*2), 339-352. doi: 10.1037/0022-006X.71.2.339.

Kline, R. B. (2016). Principles and practice of structural equation modeling (4th ed.). New York, NY: Guilford Press

Kline, R. B. (1998). *Principles and Practice of Structural Equation Modeling*. New York: The Guilford Press.

Konold, T. R., Hamre, B. K., & Pianta, R. (2003). Measuring problem behaviors in young children. *Behavioral Disorders, 28*, 111-123.

Koot, H. M., Van den Oord, E. J. C. G., Verhulst, F. C., & Boomsma, D. L. (1997). Behavioral and emotional problems in young preschoolers: Cross-cultural testing of the validity of the child behavior checklist/2-3. *Journal of Abnormal Child Psychology, 25,* 183-196.

Kotch, J. B., Lewis, T., Hussey, J. M., English, D., Thompson, R., Litrownik, A. J., Runyan, D. K., Bangdiwala, S. I., Margolis, B., & Dubowitz, H. (2008). Importance of early neglect for childhood aggression. *Pediatrics, 121*(4), 725-731. doi: 10.1542/peds.2006-3622.

Koverola, C., Murtaugh, C. A., Connors, K. M., Reeves, G. & Papas, M. A. (2007). Children exposed to intra-familial violence: Predictors of attrition and retention in treatment. *Journal of Aggression, Maltreatment, and Trauma, 14*(4), 19-42.

Kriebel, D. K. & Wentzel, K. (2011). Parenting as a moderator of cumulative risk for behavioral competence in adopted children. *Adoption Quarterly, 14,* 37-60.

Lai, B. S., Tiwari, A., Self-Brown, S., Cronholm, P., & Kinnish, K. (2017). Patterns of caregiver factors predicting participation in trauma-focused cognitive behavioral therapy. *Journal of Child & Adolescent Trauma*, 1-10. doi: 10.1007/s40653-017-

0177-5.

Lamers-Winkelman, F., Willemen, A. M., & Visser, M. (2012). Adverse childhood experiences of referred children exposed to intimate partner violence: Consequences for their wellbeing. *Child Abuse & Neglect*, *36*(2), 166-179. doi: 10.1016/j.chiabu.2011.07.006.

Lehman, B. J., Taylor, S. E., Kiefe, C. I., & Seeman, T. E. (2009). Relationship of early life Stress and psychological functioning to blood pressure in the CARDIA study. *Health Psychology, 28*(3), 338-346.

Levendosky, A. A., Huth-Bocks, A. C., Semel, M. A., & Shapiro, D. L. (2002). Trauma symptoms in preschool-age children exposed to domestic violence. *Journal of Interpersonal Violence, 17*(2), 150-164.

Levendosky, A. A., & Graham-Bermann, S. A. (1998). The moderating effects of parenting stress on children's adjustment in woman-abusing families. *Journal of Interpersonal Violence, 13*(3), 383-397.

Lieberman, A. F., Chu, A., Van Horn, P., & Harris, W.W. (2011). Trauma in early childhood: Empirical evidence and clinical implications. *Development and Psychopathology, 23,* 397-410.

Lieberman, A. F., & Van Horn, P. (2009). Giving voice to the unsayable: Repairing the effects of trauma in infancy and early childhood. *Child and Adolescent Psychiatric Clinics of North America, 18*(3), 707-720. doi:10.1016/j.chc.2009.02.007.

Lieberman, A. F. & Knorr, K. (2007). The impact of trauma: A developmental framework for infancy and early childhood. *Pediatric Annals, 36*(4)*,* 209-215.

Lieberman, A. F., Van Horn, P., & Ozer, E. J. (2005). Preschooler witnesses of marital violence: Predictors and mediators of child behavior problems. *Development and Psychopathology, 17*(2), 385-396.

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198-1202.

Little, T. D., Jorgensen, T. D., Lang, K. M., & Moore, E. W. (2014). On the joys of missing data. *Journal of Pediatric Psychology*, *39*(2), 151-162. doi: 10.1093/jpepsy/jst048.

Maguire-Jack, K., Lanier, P., Johnson-Motoyama, M., Welch, H., & Dineen, M. (2015). Geographic variation in racial disparities in child maltreatment: The influence of county poverty and population density. *Child Abuse & Neglect, 47*, 1-13.

Manly, J. T., Kim, J. E., Rogosch, F. A., & Cicchetti, D. (2001). Dimensions of child maltreatment and children's adjustment: Contributions of developmental timing and subtype. *Development and Psychopathology, 13*, 759-782.

Margolin, G., & Gordis, E. B. (2000). The effects of family and community violence on children. *Annual Review of Psychology, 51*, 445–479.

Marie-Mitchell, A., & O'Connor, T. G. (2013). Adverse childhood experiences: Translating knowledge into identification of children at risk for poor outcomes. *Academic Pediatrics, 13*, 14-19.

Marshall, L. (1992). Development of the severity of violence against women scales. *Journal of Family Violence*, *7*, 103– 121.

McBurnett, K., King, J., & Scarpa, A. (2003). The hypothalamic-pituitary-adrenal (HPA) system and the development of aggressive, antisocial, and substance abuse disorders. In D. Cicchetti & E. F. Walker (Eds.), *Neurodevelopmental mechanisms in*

psychopathology, (pp. 324-344). New York: Cambridge University Press.

McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin, 114*(2), 376-390.

McGoron, L., Gleason, M., Smyke, A., Drury, S., Nelson, C., Gregas, M. C., et al. (2012). Recovering from early deprivation: Attachment mediates effects of caregiving on psychopathology. *Journal of the American Academy of Child and Adolescent Psychiatry, 51*(7), 683-693.

McKelvey, L. M., Selig, J. P., & Whiteside-Mansell, L. (2017). Foundations for screening adverse childhood experiences: Exploring patterns of exposure through infancy and toddlerhood. *Child Abuse & Neglect, 70,* 112-121. doi: 10.1016/j.chiabu.2017.06.002.

McKelvey, L. M., Whiteside-Mansell, L., Conners-Burrow, N. A., Swindle, T., & Fitzgerald, S. (2016). Assessing adverse childhood experiences from infancy through early childhood in home visiting programs. *Child Abuse & Neglect, 51*, 295-302. doi: 10.1016/j.chiabu.2015.09.008.

Meiser-Stedman, R., Smith, P., Glucksman, E., Yule, W., & Dalegleish, T. (2008). The posttraumatic stress disorder diagnosis in preschool- and elementary school-age children exposed to motor vehicle accidents. *The American Journal of Psychiatry, 165*(10), 1326-1337.

Mersky, J. P., Topitzes, J., & Reynolds, A. J. (2013). Impacts of adverse childhood experiences on health, mental health, and substance use in early adulthood: A cohort study of an urban, minority sample in the U.S. *Child Abuse and Neglect, 37*(11), 917-925. doi: 10.1016/j.chiabu.2013.07.011.

Miller, K. M., Cahn, K., & Orellana, E. R. (2012). Dynamics that contribute to racial disproportionality and disparity: Perspectives from child welfare professionals,

community partners, and families. *Children and Youth Services Review*, *34*(11), 2201-2207. doi: 10.1016/j.childyouth.2012.07.022.

Milot, T., St-Laurent, D., Ethier, L. S., & Provost, M. A. (2010). Trauma-related symptoms in neglected preschoolers and affective quality of mother-child communication. *Child Maltreatment, 15*(4), 293-304. doi: 0.1177/1077559510379153.

Murphy, A., Steele, H., Steele, M., Allman, B., Kastner, T., & Dube, S. R. (2016). The clinical Adverse childhood experiences (ACEs) questionnaire: Implications for trauma-informed behavioral healthcare. In Briggs, R. D. (Ed.), *Integrated Early Childhood Behavioral Health in Primary Care* (pp. 7-16). Switzerland: Springer International Publishing.

Muthén, L. K., & Muthén, B. O. (1998-2015). M*plus* User's Guide (7th ed.). Los Angeles, CA: Muthén & Muthén.

Neece, C. L., Green, S. A., & Baker, B. L. (2012). Parenting stress and child behavior problems: A transactional relationship across time. *American Journal on Intellectual and Developmental Disabilities, 117*(1), 48-66. doi: 10.1352/1944-7558-117.1.48.

Newcomb, M. D., Munoz, D. T., & Carmona, J. V. (2009). Child sexual abuse consequences in community samples of Latinx and european american adolescents. *Child Abuse and Neglect*, 33, 533-544. doi: 10.1016/j.chiabu.2008.09.014

NICHD Early Child Care Research Network. (2005). Childcare and child development: Results from the NICHD study of child care and youth development. New York: Guilford Press.

Nunnally, J. C. (1967). *Psychometric theory*. New York, NY: McGraw-Hill.

Oral, R., Ramirez, M., Coohey, C., Nakada, S., Walz, A., Kuntz, A., Benoit, J., & Peek-Asa,

C., (2016). Adverse childhood experiences and trauma informed care: The future of healthcare. *Pediatric Research, 79*(1), 227-233. doi: 10.1038/pr.2015.197.

Osborne, L. A., McHugh, L., Saunders, J., & Reed, P. (2007). Parenting stress reduces the effectiveness of early teaching interventions for autistic spectrum disorders. *Journal of Autism and Developmental Disorders*, *38*, 1092. doi: 10.1007/s10803-007-0497-7.

Pereira, J., Vickers, K., Atkinson, L., Gonzalez, A., Wekerle, C., & Levitan, R. (2012). Parenting Stress mediates between maternal maltreatment history and maternal sensitivity in a community sample. *Child Abuse & Neglect, 36,* 433-437. doi: http://dx.doi.org/10.1016/j.chiabu.2012 .01.006.

Porche, M. V., Fortuna, L.R., Lin, J., & Alegria, M. (2011). Childhood trauma and psychiatric disorders as correlates of school dropout in a national sample of young adults. *Child Development*, 82(3), 982-998. doi: 10.1111/j.1467-8624.2010.01534.x

Powers, A., Cross, D., Fani, N., & Bradley, B. (2015). PTSD, emotion dysregulation, and dissociative symptoms in a highly traumatized sample. *Journal of Psychiatric Research, 61,* 174-179. doi:: 10.1016/j.jpsychires.2014.12.011.

Purewal, S. K., Bucci, M., Gutierrez Wang, L., Koita, K., Silverio Marques, S., Oh, D., & Burke Harris, N. (2016). Screening for adverse childhood experiences (aces) in an integrated pediatric care model. *Zero to Three, 37*(1), 10-17.

Radloff, L. S., & Locke, B. Z. (1986). The community mental health assessment survey and the CES-D scale. *Community Surveys of Psychiatric Disorders, 4*, 177–88.

Rayfield, A., Eyberg, S. M., Boggs, S., Roberts, M. (1995). *Development and validation of the parenting locus of control-short form*. Washington, D.C.

Repetti, R. L., Taylor, S. E., & Seeman, T. E. (2002). Risky families: Family social environments and the mental and physical health of offspring. *Psychological Bulletin, 128*, 230–266.

Ribbe, D. (1996). Psychometric review of Traumatic Event Screening Instrument for Children (TESI-C). In B. H. Stamm (Ed.), *Measurement of stress, trauma, and adaptation* (pp. 386-387). Lutherville, MD: Sidran Press.

Roberts, Y. H., Campbell, C. A., Ferguson, M., & Crusto, C. A. (2013). The role of parenting stress in young children's mental health functioning after exposure to family violence. *Journal of Traumatic Stress, 26*(5), 605-612. doi: 10.1002/jts.21842

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*, 147-177.

Schechter, DS., & Willheim, E. (2009). Disturbances of attachment and parental psychopathology in early childhood. *Child and Adolescent Psychiatry Clinics of North America, 18*(3), 665-686. doi: 10.1016/j.chc.2009.03.001

Scheeringa, M. S., Zeanah, C. H., & Cohen, J. A. (2011). PTSD in children and adolescents: Towards an empirically based algorithm. *Depression and Anxiety*, *28*, 770–782. doi:10.1002/da.20736.

Scheeringa, M. S., & Zeanah, C. H. (2008). Reconsideration of harm's way: Onsets and comorbidity patterns of disorders in preschool children and their caregivers following Hurricane Katrina. *Journal of Clinical Child and Adolescent Psychology, 37*(3), 508-518.

Scheeringa, M. S., Zeanah, C., Myers, L., & Putnam, F. (2005). Predictive validity in a prospective follow-up of PTSD in preschool children. *Journal of the American Academy of Child and Adolescent Psychiatry, 44* (9), 899-906. doi: 10.1097/01.chi.0000169013.81536.71.

Scheeringa, M. S., Zeanah, C. H., Myers, L., & Putnam, F. W. (2003). New findings on alternative criteria for PTSD in preschool children. *Journal of the American Academy of Child & Adolescent Psychiatry, 42*(5), 561-570.

Scheeringa, M. S., & Zeanah, C. H. (2001). A relational perspective on PTSD in early childhood. *Journal of Traumatic Stress, 14,* 799-815.

Scheeringa, M. S., Zeanah, C. H., Drell, M. J., & Larrieu, J. A. (1995). Two approaches to the diagnosis of posttraumatic stress disorder in infancy and early childhood. *Journal of the American Academy of Child and Adolescent Psychiatry*, *34*, 191–200. doi:10.1097/00004583-199502000- 00014.

Sciaraffa, M. A., Zeanah, P. D., & Zeanah, C. H. (2018). Understanding and promoting resilience in the context of adverse childhood experiences. *Early Childhood Education Journal, 46*, 343-353. doi: 10.1007/s10643-017-0869-3.

Shonkoff, J. P. (2010). Building a new biodevelopmental framework to guide the future of early childhood policy. *Child Development, 81*(1), 357-367.

Shonkoff, J. P., Garner, A. S., Siegel, B. S., Dobbins, M. I., Earls, M. F., Garner, A. S.,Wood, D. L. (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics, 129*(1), e232-e246. doi: 10.1542/peds.2011-2663.

Slopen, N., Fitzmaurice, G., Williams, D. R., & Gilman, S. E. (2010). Poverty, food insecurity, and the behavior for childhood internalizing and externalizing disorders. *Journal of the American Academy of Child Psychiatry, 49,* 444–452.

Soper, D. (2006-2017). *A-priori sample size calculator for structural equation models.* Retrieved: http://www.danielsoper.com/statcalc/calculator.aspx?id=89

Spinazzola, J., Ford, J. D., Zucker, M., van der Kolk, B. A., Silva, S., Smith, S. F., & Blaustein, M. (2005). Survey evaluates complex trauma exposure, outcome, and intervention among children and adolescents. *Psychiatric Annals, 35*, 433-439.

Sroufe, L. A., Egeland, B., Carlson, E. A., & Collins, W. A. (2005). *The development of the person: The Minnesota study of risk and adaptation from birth to adulthood.* New York: Guilford Press.

Stahmer, A. C., Leslie, L. K., Hurlburt, M., Barth, R. P., Webb, M. B., Landsverk, J., & Zhang, J. (2005). Developmental and behavioral needs and service use for young children in child welfare. *Pediatrics, 116*(4), 891-900.

Steele, H., Bate, J., Steele, M., Dube, S. R., Danskin, K., Knafo, H., Nikitiades, A., Bonuck, K., Meissner, P., & Murphy, A. (2016). Adverse childhood experiences, poverty, and parenting stress. *Canadian Journal of Behavioural Science, 48*(1), 32-38. doi: http://dx.doi.org/10.1037/cbs0000034.

Stoddard, F. J., Saxe, G., Ronfeldt, H., Drake, J. E., Burns, J., & Edgren, C. (2006). Acute stress Symptoms in young children with burns. *Journal of the American Academy of Child & Adolescent Psychiatry, 45*(1), 87-93.

Susman, E. J. (2006). Psychobiology of persistent antisocial behavior: Stress, early vulnerabilities, and the attenuation hypothesis. *Neuroscience and Biobehavioral Reviews, 30,* 376-389.

Tan, T. X., Dedrick, R. F., & Marfo, K. (2007). Factor structure and clinical implications of child behavior checklist/1.5-5 ratings in a sample of girls adopted from china. *Journal of Pediatric Psychology, 32*, 807-818.

Teisl, M., & Cicchetti, D. (2008). Physical abuse, cognitive and emotional processes, and aggressive/disruptive behavior problems. *Social Development, 17*, 1–23. doi: 10.1111/ j.1467-9507.2007.00412.x.

Terr, L. C. (1991). Childhood traumas: An outline and overview. *The American Journal of Psychiatry, 148*(1), 10-20.

Thode, H. J. (2002). *Testing for normality*. New York, NY: Marcel Dekker.

Toth, S. L., Manly, J. T., & Cicchetti, D. (1992). Child maltreatment and vulnerability to depression. *Development & Psychopathology, 4*, 97-112.

Toth, S. L., & Manly, J. T. (2011). Bridging research and practice: Challenges and successes implementing evidenced-based preventive intervention strategies for child maltreatment. *Child Abuse and Neglect, 35*, 633-636.

U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau. (2015). *Child maltreatment 2015.* Retrieved from https://www.acf.hhs.gov/sites/default/files/cb/cm2015.pdf

U.S. Department of Health and Human Services, Administration on Children, Youth and Families, Children's Bureau. (2007). *Child maltreatment 2005*. Washington, DC: Government Printing Office.

van der Kolk, B. A., Pynoos, R. S., Cicchetti, D., Cloitre, M., D'andrea, W., Ford, J., & Teicher, M. (2009). Proposal to include a developmental trauma disorder diagnosis

for children and adolescents in DSM-V. Retrieved from: http://www.traumacenter.org/announcements/dtd_papers_oct_09.pdf

van der Kolk, B. A. (2005). Developmental trauma disorder: Toward a rational diagnosis for children with complex trauma histories. *Psychiatric Annals, 35*(5), 401-408.

van der Kolk, B. A., & McFarlane, A. C. (1996). The black hole of trauma. In B. A. van der Kolk, A. C. McFarlane, & L. Weisaeth (Eds.), *Traumatic stress: The effects of overwhelming experience on mind, body, and society* (pp. 3–23). New York: Guilford.

White, J. M. & Klein, D. M. (2008). *Family theories* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Williford, A. P., Calkins, S. D., Keane, S. P. (2006). Predicting change in parenting stress across early childhood: Child and maternal factors. *Journal of Abnormal Child Psychology, 35*(2), 251-263.

Xing Tan, T., Dedrick, R. F., Marfo, K. (2007). Factor structure and clinical implications of child behavior checklist/1.5-5 ratings in a sample of girls adopted from China. *Journal of Pediatric Psychology, 32*(7), 807-818. doi: doi:10.1093/jpepsy/jsm025.

Zerk, D. M., Mertin, P. G., & Proeve, M. (2009). Domestic violence and maternal reports of young children's functioning. *Journal of Family Violence, 24*(7), 423-432.

Zero to Six Collaborative Group, National Child Traumatic Stress Network. (2010). *Early childhood trauma.* Los Angeles, CA & Durham, NC: National Center for Child Traumatic Stress. Retrieved from: http://www.nctsn.org/sites/default/files/assets/pdfs/nctsn_earlychildhoodtrauma_08-2010final.pdf

Zhang, X., Chen, H., Zhang, G., Zhou, B., & Wu, W. (2008). A longitudinal study of parent-

child relationships and problem behaviors in early childhood: Transactional model. *Acta Psychologica Sinica, 40*, 571-582.

Appendix A

Table A1

List and Description of Variables Included in the Current Study from CALM's Dataset

	Variable Name	Variable Description	Response Options	Recoded for Current Study
Adverse Childhood Experiences (ACEs)	ACES_Bullying	Your child experienced harassment or bullying at school	True False	Dichotomized: True = 1 False = 0
	ACES_CommViolence	Your child saw or heard violence in the neighborhood or in her/his school	True False	Dichotomized: True = 1 False = 0
	ACES_Discrim	Your child was treated badly because of race, sexual orientation, place of birth, disability or religion	True False	Dichotomized: True = 1 False = 0
	ACES_Divorced	Your child's parents or guardians were separated or divorced	True False	Dichotomized: True = 1 False = 0

	ACES_DV	Your child saw or heard household members hurt or threaten to hurt each other	True False	Dichotomized: True = 1 False = 0
	ACES_EmotAbuse	A household member swore at, insulted, humiliated, or put down your child in a way that scared your child OR a household member acted in a way that made your child afraid that s/he might be physically hurt	True False	Dichotomized: True = 1 False = 0
	ACES_EmotNeglect	Your child *often* felt unsupported, unloved and/or unprotected	True False	Dichotomized: True = 1 False = 0
	ACES_FamMemMentIll	Your child lived with a household member who was depressed, mentally ill or attempted suicide	True False	Dichotomized: True = 1 False = 0
	ACES_FamMemPrison	Your child lived with a household member who served time in jail or prison	True False	Dichotomized: True = 1 False = 0
	ACES_FamMemSubAb	Your child lived with someone who had a problem with drinking or drugs	True False	Dichotomized: True = 1 False = 0
	ACES_FosterCare	Your child was in foster care	True False	Dichotomized: True = 1 False = 0

ACES_GuardianDied	Your child lived with a parent or guardian who died	True False	Dichotomized: True = 1 False = 0
ACES_MedicalIllness	Your child had a serious medical procedure or life threatening illness	True False	Dichotomized: True = 1 False = 0
ACES_PhysAbuse	Someone pushed, grabbed, slapped or threw something at your child OR your child was hit so hard that your child was injured or had marks	True False	Dichotomized: True = 1 False = 0
ACES_PhysNeglect	More than once, your child went without food, clothing, a place to live, or had no one to protect her/him	True False	Dichotomized: True = 1 False = 0
ACES_PrenatalExp	Your child was exposed to illegal drugs or alcohol before they were born	True False	Dichotomized: True = 1 False = 0
ACES_SepImmigration	Your child was separated from her/his primary caregiver through deportation or immigration	True False	Dichotomized: True = 1 False = 0
ACES_SexAB	Someone touched your child's private parts, or asked your child to touch their private parts in a sexual way	True False	Dichotomized: True = 1 False = 0

	ACES_NotContCare	Check if your child has not been continually in your care since they were born, and if you are concerned that they may have had difficult experiences that you are not aware of.	True False	Dichotomized: True = 1 False = 0
	ACES	Total number of ACEs reported	Range = 0-19	Numeric response
Gender	Gender	Child composite gender	Male Female	Male = 1 Female = 0
Ethnicity	Ethnicity	Child composite ethnicity	(1) Caucasian (2) Latinx (3) African American (4) Other	Dichotomized: Latinx= 1 non-Latinx = 0
Age Group	Age group	Age group of child	(1) Toddler (0-2) (2) Preschool (3-5)	
Referral Type	RefRelType	Reference relationship type	(1) Family (Extended) (2) Immediate Family (3) Other (4) Personal (5) Professional (6) Self	
Child Behavior Checklist (CBCL) composite scores	CBCL_Externalizing	CBCL Externalizing composite T-score *Comprised of the following sub-scales:* (1) Attention Problems (5 items) (2) Aggressive (19 items)	T-Score Range = 28-92	

	CBCL_Internalizing	CBCL Internalizing problems composite T-score *Comprised of the following sub-scales:* (1) Emotionally Reactive (9 items) (2) Anxious/Depressed (8 items) (3) Somatic Complaints (11 items) (4) Withdrawn (8 items)	T-Score Range = 29-78	
Parent Stress Index (PSI) composite scores	PSI_total	PSI Total Stress composite score *Comprised of the following sub-scales:* (1) Parental distress (12 items) (2) Parent-child dysfunctional interaction (12 items) (3) Difficult child (12 items)	Percentile Range = 4-99	All PSI composite and subscale scores were reported as percentiles
	PSI_DifficultChild	PSI Difficult Child subscale score	Percentile Range = 3-99	
	PSI_ParChildDysfunction	PSI Parent Child Dysfunctional Interaction subscale score	Percentile Range = 8-99	
	PSI_ParDistress	PSI Parental Distress subscale score	Percentile Range = 5-99	

Appendix B

Birth – 12

Adverse Childhood Experiences Survey

Many children experience stressful life events that can affect their health and wellbeing. The results from this questionnaire will assist your provider in assessing their health and determining guidance. Please read the statements below, and **check if your child has experienced any of the following at** *any point since your child was born…*

Separation from caregivers

- ☐ Your child's parents or guardians were separated or divorced
- ☐ Your child lived with a parent or guardian who died
- ☐ Your child was in foster care
- ☐ Your child was separated from her/his primary caregiver through deportation or immigration

Family Problems

- ☐ Your child lived with someone who had a problem with drinking or using drugs
- ☐ Your child lived with a household member who served time in jail or prison
- ☐ Your child lived with a household member who was depressed, mentally ill or attempted suicide

Trauma exposure

- ☐ A household member swore at, insulted, humiliated, or put down your child in a way that scared your child OR a household member acted in a way that made your child afraid that s/he might be physically hurt
- ☐ Someone pushed, grabbed, slapped or threw something at your child OR your child was hit so hard that your child was injured or had marks
- ☐ Your child saw or heard household members hurt or threaten to hurt each other
- ☐ Someone touched your child's private parts, or asked your child to touch their private parts in a sexual way
- ☐ Your child often saw or heard violence in the neighborhood or in her/his school
- ☐ Your child was often treated badly because of race, sexual orientation, place of birth, disability or religion
- ☐ Your child experienced harassment or bullying at school

Other

- ☐ Your child had a serious medical procedure or life threatening illness
- ☐ Your child was exposed to illegal drugs or alcohol before they were born
- ☐ More than once, your child went without food, clothing, a place to live, or had no one to protect her/him
- ☐ Your child *often* felt unsupported, unloved and/or unprotected

- ☐ Check if your child has not been continually in your care since they were born, and you are concerned that they may have had difficult experiences that you are not aware of.

*Adapted from the **CYW Adverse Childhood Experiences Questionnaire (ACE-Q), 2015***