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Pathways from Cumulative Adversity to Self-Regulation and Early Student-Teacher Relationships: Identifying a Need for Trauma-Informed Preschools

Alysse Loomis

University of Connecticut - Storrs, alysse.loomis@uconn.edu

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Alysse M. Loomis, LCSW, PhD

University of Connecticut, 2019

The preschool setting is a natural system of care that can be leveraged to mitigate the effects of childhood adversity, such as maltreatment and violence exposure. However, school-based trauma-informed supports for preschoolers lag behind those for older children, this despite the fact that young children, and particularly low-income children in urban areas, are exposed to disproportionate rates of adversity. This body of work examines the impact of cumulative adversity on children within the preschool context and makes recommendations to aid in the development of trauma-informed preschool models. This is done through one conceptual paper and two empirical papers, derived from a large study with a single sample. The conceptual paper outlines the impact of early childhood adversity and covers current research related to maltreated children's preschool outcomes and existing trauma-informed school models, ultimately making recommendations for key components of trauma-informed preschool models. The first empirical article uses cross-sectional data from a quantitative study of parents, children, and teachers to identify the impact of household and environmental adversity on various components of self-regulation (i.e., children's ability to control their thoughts, feelings, and behaviors). The second data-driven article uses data from teachers throughout the school year to determine whether mid-year self-regulation mediates the relationship between children's cumulative adversity exposure and student-teacher relationships at the end of the school year. This dissertation focuses on understanding the impact of cumulative adversity on children within the preschool context in order to inform the advancement of developmentally appropriate trauma-informed interventions to support the well-being of young children who have been exposed to adversity.

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Relationships: Identifying a Need for Trauma-Informed Preschools

Alysse Melville Loomis, LCSW

B.A., University of Connecticut, 2009

M.S.W., University of Connecticut, 2013

A Dissertation

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APPROVAL PAGE

Doctor of Philosophy Dissertation

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Presented by

Alysse Melville Loomis, LCSW

Major Advisor: _____

Cristina Mogro-Wilson, PhD

Associate Advisor: _____

S. Megan Berthold, PhD

Associate Advisor: _____

Preston Britner, PhD

University of Connecticut

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Chapter One: Introduction/Overview

Rationale

The harmful effects of childhood adversity are common, far-reaching, and now widely understood as a public health crisis (Anda, Butchart, Felitti, & Brown, 2010). Experiences such as child abuse, neglect and exposure to violence, among other experiences typically considered childhood adversities, are costly to the lives of children, adults, communities, and to the healthcare system and economy as a whole (Fang, Brown, Florence, & Mercy, 2012). Childhood adversity has been linked to a number of mental and physical health outcomes, such as depression and obesity, as well as health risk behaviors, such as smoking and non-suicidal self-injury (Baiden, Stewart, & Fallon, 2017; Dube, Felitti, Dong, Giles, & Anda, 2003; Felitti et al., 1998). Childhood adversity has also been linked to other well-being outcomes, including suicide attempts (Dube et al., 2001) and housing instability (Curry, 2017), demonstrating the wide reach of childhood adversity that can persist for generations.

In order to understand the long-term effects of such experiences in childhood, attention more recently has focused on the specific effects of childhood adversity on childhood outcomes, rather than just adult outcomes. This is in an effort to identify the specific mechanisms through which adversity influences health in order to intervene early and mitigate or even reverse long-term effects. Such work has linked childhood adversity to various developmental outcomes for children, including behavioral problems, socio-emotional health, academic success, and school readiness (Clarkson Freeman, 2014; Haskins, 2014; Jimenez, Wade, Lin, Morrow, & Reichman, 2016; Schroeder, Slopen, & Mittal, 2018). These findings suggest that childhood adversity may lay the foundation for outcomes that disrupt the developmental trajectories of young children which may persist into adulthood.

For children of color and children living in poverty, childhood adversity may be even more prevalent and difficult to overcome (Slopen et al., 2016) leading to health and well-being disparities that can continue throughout generations. Social workers are committed to ensuring healthy development for all youth and eliminating health disparities (Barth, Gilmore, Flynn, Fraser, & Brekke, 2014), thus the issue of childhood adversity is of central concern to the social work profession. However, despite widespread understanding of the risks associated with cumulative adversity, there are gaps in knowledge that make it difficult to translate such research into effective policies and interventions. In order to better translate research on childhood adversity into effective practices and policies, it is important to identify mechanisms through which adversity influences child well-being. Further, it is critical to better understand the effects of childhood adversity on children within natural systems of care. This is the first step towards developing interventions to support children within existing systems that are already interacting with children and their families.

Early Childhood Adversity

Adversity in early childhood is highly prevalent (Briggs-Gowan, Ford, Fraleigh, McCarthy, & Carter, 2010; Grasso, Dierkhising, Branson, Ford, & Lee, 2016; Jimenez et al., 2016) and yet the knowledge base on the effects of early childhood adversity lags far behind that for older children and adults. Children are exposed to higher rates of adversity in early childhood, which is considered the time period from birth through age six, compared to children in other developmental epochs (Grasso et al., 2016; U.S. Department of Health & Human Services Administration for Children and Families Administration on Children Youth and Families Children's Bureau, 2018). These rates of adversity are even higher for young children of color and children living in poverty (Jimenez et al., 2016; Slopen et al., 2016).

Despite the heightened prevalence of exposure to adversity in early childhood, very little of the research on adverse childhood experiences has focused specifically on early childhood (Liming & Grube, 2018). The recent research that does exist has found that children who face adversity early in childhood may face increased risk of behavior problems later in childhood (Clarkson Freeman, 2014; Schroeder et al., 2018), poor school readiness (Haskins, 2014; Jimenez et al., 2016), and may be at risk for polyvictimization later in childhood (Grasso et al., 2016). Recent work has also identified that cumulative adversity may be related to alterations in the frontal lobe responsible for impulse control and emotional regulation (Barch, Belden, Tillman, Whalen, & Luby, 2018), which has far reaching implications for long-term brain development and behavioral consequences. As can be seen, outcomes related to adversity in early childhood may set children at a disadvantage academically, behaviorally, and even neurobiologically, which can set a trajectory for future adverse outcomes.

Trauma-Informed Systems

Compared to older children, fewer trauma-informed interventions are available for young children (Melville, 2017) and preschool aged children that need services are less likely to see a mental health provider than older children (U.S. Census Bureau Child and Adolescent Health Measurement Initiative, 2017). Gaps in early childhood trauma-informed research, resources, and interventions place young children at risk for altered developmental trajectories. Interventions that target children within existing early childhood systems, such as preschools, may be particularly helpful for children, as a much higher percentage of young children attend preschool compared to those who receive services from mental health providers (U.S. Census Bureau, 2016). However, research suggests that simple engagement with existing early childhood systems, such as preschools, is not enough to mitigate the effects of early adversity. For example, one study found that when attending high quality preschools, children involved in

the child protective system still had more emotional, social, and academic difficulties than children not involved with child protective services (Kovan, Mishra, Susman-Stillman, Piescher, & LaLiberte, 2014), suggesting that even high quality education may not be enough to mitigate the effects of childhood adversity. However, when children with behavioral challenges receive interventions aimed at improving student-teacher relationships, their biological stress responses may also improve (Hatfield & Williford, 2017), which indicates that appropriately targeted interventions to promote the well-being of young, adversity exposed children may be most effective. Unfortunately, little is known about how childhood adversity may impact children's relationships with teachers, making it difficult to determine what relationship-based interventions may be most appropriate. Additionally, trauma-informed school-based interventions for young children are rare, and those that are responsive to the needs of a range of children, rather than reactive to a specific traumatic event, are even more limited (Zakszeski, Ventresco, & Jaffe, 2017).

Preschool Self-Regulation

The plethora of research on childhood adversity has led researchers to go beyond questioning *if* adversity impacts children's well-being to questioning *how* adversity impacts children's well-being. Understanding the mechanisms through which cumulative adversity influences long-term well-being outcomes can inform the development of targeted efforts to prevent and mitigate the far-reaching effects of childhood adversity, particularly for poor children and children of color. Self-regulation, or children's ability to manage their thoughts, feelings, and behaviors, may be one mechanism through which adversity impacts well-being for children that continues into adulthood. As noted above, recent work has identified links between early adversity and parts of the brain responsible for impulse control and emotional regulation (Barch et al., 2018). The ability to control impulses and regulate emotions is an important

component of school readiness (Reardon & Portilla, 2016), which has long-term implications for educational engagement and success. Additionally, ineffective self-regulation early in childhood has long-term effects that parallels the outcomes associated with adverse childhood experiences, suggesting a link between the two. For example, in a longitudinal study that followed a cohort of children from birth to age 32, self-regulation skills in children as young as preschool-aged predicted adult outcomes including criminal engagement, substance use, health, and socioeconomic status (Moffitt et al., 2011). In this 2011 study, authors looked at children's self-regulation as measured by a composite derived of observations of self-control and teacher and parent reports of several constructs of self-regulation. They found that this composite of self-regulation predicted adult outcomes on a gradient, where small differences in preschool self-regulation predicted small but significant differences in adult outcomes. Moffitt and colleagues (2011) hypothesized based on their findings that interventions that were able to increase self-regulation in early childhood even a small amount may result in noticeably more favorable outcomes in adulthood, supporting the notion that self-regulation may be an important mechanism to explore in relation to children's adversity exposure and long-term well-being.

The focus of the following chapters is on the relationship between children's exposure to cumulative adversity and two potential well-being outcomes, self-regulation and student-teacher relationships. This study will expand the current understanding of self-regulation as it relates to early childhood trauma exposure and highlight the preschool context as an important place of prevention and intervention for at-risk children and families.

Theoretical Foundation

Several theoretical frameworks and models contribute to an understanding of the issue of the effects of childhood adversity on children's well-being in the preschool context, including the ecological theory and the bi-directional model of self-regulation.

Ecological Theory of Human Development

Bronfenbrenner's (1977) ecological theory of human development highlights the interdependence of children's development and various socio-cultural contexts that reciprocally are impacted by and impact children's development. These contexts are considered to be in nested form, including microsystems, mesosystems, exosystems, and macrosystems. Microsystems are characterized by settings that immediately interact with the developing child, such as home and school. Mesosystems are defined by interrelations between microsystems in which a child is developing, such as an interaction between home and school (e.g., the parent-teacher relationship). Exosystems are systems that do not immediately/directly include the developing child but influence the microsystems in which the child develops, such as the community or town in which the child lives. Finally, the macrosystem embodies the cultural setting or society which influences the other systems (Bronfenbrenner, 1977). This body of work focuses on the microsystem of school; Chapter Two conceptually explores the school context as a setting within which to support the development of young children who have experienced trauma or other adversity and the data collected in the study that informs Chapters Three and Four is situated within the school context.

In addition to highlighting the school setting as an important arena within which children develop, Bronfenbrenner's ecological framework helps to frame an understanding of the different systems in which trauma and adversity can occur and how these experiences may influence children's development. Trauma and maltreatment can occur in the microsystem (e.g., child abuse and neglect), in the exosystem (e.g., community violence), and in the macrosystem (e.g., cultural trauma). Chapter Three and Chapter Four utilize an ecological framework when conceptualizing childhood adversity. Chapter Three explores how adversities at the household level (e.g., domestic violence) or the environmental level (e.g., community violence) may

differentially predict children's development (e.g., self-regulation) whereas Chapter Four considers the impact of a broad range of adversities across household and community systems. Chapter Four also discusses the influence of a child's race on a teacher's perceptions of their relationship with the child and the child's behavior, situating this conversation within our current cultural macrosystem in which educational disparities continue to persist for children of color, and in particular for African American children.

Bronfenbrenner's ecological theory is widely used in social work research, including research conducted with diverse early childhood samples (Mollborn, 2016) and research that seeks to understand racial disparities (Alio et al., 2010). However, Bronfenbrenner's ecological theory is not inherently a critical model, thus is limited in the extent to which it supports going beyond *understanding* reciprocal influences to *challenging* systems that disproportionately impact specific populations. For example, the ecological theory highlights the transactional role that culture and society has on a child's development but does not seek to change forces such as racism and discrimination embedded within these macrosystems, forces which have been shown to adversely influence children's development (Kelly, Becares, & Nazroo, 2013; Priest et al., 2013). In fact, racism experienced by individuals within a child's microsystem and mesosystem (e.g., mother, family, and community) have been found to predict children's socioemotional development over time (Bécares, Nazroo, & Kelly, 2015). To attend to this limitation, some authors have expanded the current ecological model to include the historical context to be able to better demonstrate how a history of racism influences all of the other systems within Bronfenbrenner's model (Alio et al., 2010).

As discussed, although the ecological model is a useful tool in this study to understand the influence of different systems on aspects of a child's development, it is important to also critically consider the historical influence of racism on the institutions and systems within which

children in this study are situated. Thus, although Chapter Three and Four do not measure systemic racism, they both employ a critical lens when discussing the implications of study findings. This includes an attention to how teacher's may perceive children differently based on their race as well as situating findings within the current socio-political context, particularly related to disparities in school readiness and school discipline rates for children of color. Additionally, implications of study findings in Chapter Three and Chapter Four related to the ecological environment discuss how early childhood systems and societal contexts can be changed to best support young children's development, rather than considering how children should change or adapt to these contexts.

Bi-Directional Model of Self-Regulation

This body of work is also informed by the bi-directional model of self-regulation, which is a model of the relationship between different indicators of self-regulation (Bridgett, Burt, Edwards, & Deater-Deckard, 2015; Ursache, 2014). In the bi-directional model of self-regulation various constructs of self-regulation are thought to differentially influence each other throughout a child's development. These constructs include bottom-up, or automatic regulatory processes, such as fear, as well as effortful top-down processes, such as emotional regulation (Blair & Ursache, 2011; Ursache, Blair, & Raver, 2012). The bi-directional model posits that these constructs may influence each other in a transactional way, where increases in bottom-up self-regulation may promote increases in top-down self-regulation (and vice versa). This model is particularly relevant for adversity-exposed children, as adversity and violence exposure can activate automatic, physiological survival systems relevant to bottom-up self-regulation (Briggs-Gowan et al., 2015; Delahanty, Nugent, Christopher, & Walsh, 2005; Yehuda, Halligan, & Grossman, 2001).

This body of work explores the hypothesis that poor bottom-up self-regulation due to childhood adversity may disrupt the development of top-down self-regulation skills. Chapter Three and Four both explore measures of self-regulation as dependent and/or mediating variables that may be influenced by a child's cumulative adversity. Chapter Three in particular tests several pathways of a bi-directional model by looking at the relationship between a child's bottom-up self-regulation and their top-down self-regulation.

Review of Articles

This dissertation consists of three articles: one is a conceptual article not based on primary data and two articles are based on data drawn from one large study. Chapter Two is a conceptual article that was written in response to the relative dearth of scholarship related to trauma-informed education for young children. This article fills a needed gap in the field by discussing the research on the prevalence and impact of early childhood trauma exposure to make a case for the need for more trauma-informed interventions with young children. This article also draws from existing research on young child development, traditional preschools, therapeutic preschools, and trauma-informed school models for older children to make several recommendations for practices, research, and policies to support the development and evaluation of trauma-informed preschool models.

Chapters Three and Four are data-driven articles that help to fill gaps in the early childhood trauma literature by exploring the relationship between cumulative adversity and child outcomes within the preschool context. Chapters Three and Four are based on data collected from a multi-phase study that drew triangulated data from parents, teachers, and children at the middle and end of the preschool year. A sample of 126 preschool children, parent, and teacher triads from 21 classrooms were recruited from November through December of 2017, with data drawn from parents during this time (T1), from teachers and children in January and February

2018 (also T1), and repeated measures drawn from parents, teachers, and children in May and June of 2018 (T2). Approval was obtained from the University of Connecticut Institutional Review Board on November 3rd, 2017. The study was funded through the Doris Duke Fellowship for the Promotion of Child Wellbeing.

Chapter Three looks at the cross-sectional relationship between cumulative adversity and self-regulation using data drawn from the children (n=126), caregivers (n=126), and teachers (n=21) at T1. This study sought to identify whether children's cumulative environmental and/or household adversity predicted both their caregiver and teacher-reported self-regulation. Guided by the bi-directional model of self-regulation, Chapter Three explores the hypothesis that bottom-up constructs of self-regulation (bias to threat and fear) would mediate the relationship between both types of cumulative adversity and top-down self-regulation (inhibition and emotional control). Implications for exploring different constructs of self-regulation within early childhood research and integrating environmental adversities into conceptualizations of childhood adversity are discussed within this chapter.

Chapter Four uses data drawn from caregivers at T1 and teachers at T1 and T2 to determine whether mid-year self-regulation mediates the relationship between children's cumulative adversity exposure (at T1) and their relationship with their teacher at the end of the school year. This study makes the link between children's exposure to cumulative adversity and factors within the school environment that have been found to contribute to children's long-term success within school, namely their behaviors and relationships with teachers. Children's race, ethnicity, age, and gender were looked at as predictors in these models to identify whether cumulative adversity differentially impacts certain groups of students. This study is particularly timely because of national concern about the high rates of preschool suspension and expulsion (U.S. Department of Health and Human Services Administration for Children and Families,

2016), racial and gender disparities found in these rates, and the role that children's behaviors and relationships with teachers may play in their risk of suspension and expulsion. Trauma has not been widely explored as a potential contributor to preschool suspension and expulsion, so this study is important in beginning to make some of those links. Implications for trauma-informed school based policies that also seek to address racial disparities in school discipline are discussed.

Conclusion

Intervening early to support young children who have experienced adversity may buffer the effects of adversity early in life and restore children's developmental trajectories to promote positive child development and well-being throughout life. However, understanding how to intervene requires knowledge about the specific ways that adversity impacts children's well-being, particularly within different early childhood contexts. Chapter Five will conclude this body of work with an in-depth examination of the impact of cumulative adversity on children's well-being in preschool. The data-driven findings from Chapter Three and Four will be integrated and discussed within the context of the recommendations and literature reviewed in Chapter One and Two. Recommendations for social work education, policy, practice, and future research will also be discussed.

References

Alio, A. P., Richman, A. R., Clayton, H. B., Jeffers, D. F., Wathington, D. J., & Salihu, H. M.

(2010). An ecological approach to understanding Black-White disparities in perinatal

mortality. *Maternal and Child Health Journal*, *14*(4), 557–566.

https://doi.org/10.1007/s10995-009-0495-9

Anda, R. F., Butchart, A., Felitti, V. J., & Brown, D. W. (2010). Building a framework for global

surveillance of the public health implications of adverse childhood experiences. *American*

Journal of Preventive Medicine, *39*(1), 93–98. https://doi.org/10.1016/j.amepre.2010.03.015

Baiden, P., Stewart, S. L., & Fallon, B. (2017). The role of adverse childhood experiences as

determinants of non-suicidal self-injury among children and adolescents referred to

community and inpatient mental health settings. *Child Abuse and Neglect*, *69*, 163–176.

https://doi.org/10.1016/j.chiabu.2017.04.011

Barch, D. M., Belden, A. C., Tillman, R., Whalen, D., & Luby, J. L. (2018). Early childhood

adverse experiences, inferior frontal gyrus connectivity, and the trajectory of externalizing

psychopathology. *Journal of the American Academy of Child and Adolescent Psychiatry*,

57(3), 183–190. https://doi.org/10.1016/j.jaac.2017.12.011

Barth, R. P., Gilmore, G. C., Flynn, M. S., Fraser, M. W., & Brekke, J. S. (2014). The American

Academy of Social Work and Social Welfare: History and Grand Challenges. *Research on*

Social Work Practice, 24(4), 495–500. https://doi.org/10.1177/1049731514527801

Bécares, L., Nazroo, J., & Kelly, Y. (2015). A longitudinal examination of maternal, family, and

area-level experiences of racism on children's socioemotional development: Patterns and

possible explanations. *Social Science & Medicine*, *142*, 128–135.

https://doi.org/10.1016/j.socscimed.2015.08.025

Blair, C. B., & Ursache, A. (2011). A bidirectional model of executive functions and self-regulation. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of Self-Regulation: Research, Theory, and Applications. 2nd edition.* New York, NY: Guilford Press.

Bridgett, D. J., Burt, N. M., Edwards, E. S., & Deater-Deckard, K. (2015). Intergenerational transmission of self-regulation: A multidisciplinary review and integrative conceptual framework. *Psychological Bulletin*, *141*(3), 602–654. https://doi.org/10.1037/a0038662

Briggs-Gowan, M. J., Ford, J. D., Fraleigh, L., McCarthy, K., & Carter, A. S. (2010). Prevalence 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. https://doi.org/10.1002/jts.20593

Briggs-Gowan, M. J., Pollak, S. D., Grasso, D., Voss, J., Mian, N. D., Zobel, E., … Pine, D. S. (2015). Attention bias and anxiety in young children exposed to family violence. *Journal of Child Psychology and Psychiatry*, *56*(11), 1194–1201. https://doi.org/10.1111/jcpp.12397

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, *32*(7), 513–531. https://doi.org/10.1037/0003-066X.32.7.513

Clarkson Freeman, P. A. (2014). Prevalence and relationship between adverse childhood experiences and child behavior among young children. *Infant Mental Health Journal*, *35*(6), 544–554. https://doi.org/10.1002/imhj.

Curry, S. R. (2017). Childhood experiences and housing insecurity in adulthood: The salience of childhood emotional abuse. *Children & Youth Services Review*, *82*, 301–309. https://doi.org/10.1016/j.childyouth.2017.09.039

Delahanty, D. L., Nugent, N. R., Christopher, N. C., & Walsh, M. (2005). Initial urinary epinephrine and cortisol levels predict acute PTSD symptoms in child trauma victims. *Psychoneuroendocrinology*, *30*(2), 121–8. https://doi.org/10.1016/j.psyneuen.2004.06.004

Dube, S. R., Anda, R. F., Felitti, V. J., Chapman, D. P., Williamson, D. F., & Giles, W. H. (2001). Childhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span: Findings from the Adverse Childhood Experiences study. *JAMA*, *286*(24), 3089–3096. https://doi.org/10.1001/jama.286.24.3089

Dube, S. R., Felitti, V. J., Dong, M., Giles, W. H., & Anda, R. F. (2003). The impact of adverse childhood experiences on health problems: Evidence from four birth cohorts dating back to 1900. *Preventive Medicine*, *37*(3), 268–277. https://doi.org/10.1016/S0091-7435(03)00123-3

Fang, X., Brown, D. S., Florence, C. S., & Mercy, J. A. (2012). The economic burden of child maltreatment in the United States and implications for prevention. *Child Abuse and Neglect*, *36*(2), 156–165. https://doi.org/10.1016/j.chiabu.2011.10.006

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., … Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *American Journal of Preventive Medicine*, *14*(4), 245–258. https://doi.org/10.1016/S0749-3797(98)00017-8

Grasso, D. J., Dierkhising, C. B., Branson, C. E., Ford, J. D., & Lee, R. (2016). Developmental patterns of adverse childhood experiences and current symptoms and impairment in youth referred for trauma-specific services. *Journal of Abnormal Child Psychology*, *44*(5), 871–886. https://doi.org/10.1007/s10802-015-0086-8

Haskins, A. R. (2014). Unintended consequences: Effects of paternal incarceration on child school readiness and later special education placement. *Sociological Science*, *1*(April), 141–158. https://doi.org/10.15195/v1.a11

Hatfield, B. E., & Williford, A. P. (2017). Cortisol patterns for young children displaying disruptive behavior: Links to a teacher-child, relationship-focused intervention. *Prevention Science*, *18*(1), 40–49. https://doi.org/10.1007/s11121-016-0693-9

Jimenez, M. E., Wade, R., Lin, Y., Morrow, L. M., & Reichman, N. E. (2016). Adverse experiences in early childhood and kindergarten outcomes. *Pediatrics*, *137*(2), 1–11. https://doi.org/10.1542/peds.2015-1839

Kelly, Y., Becares, L., & Nazroo, J. (2013). Associations between maternal experiences of racism and early child health and development: Findings from the U.K. millennium cohort study. *Journal of Epidemiology and Community Health*, *67*(1), 35–41. https://doi.org/10.1136/jech-2011-200814

Kovan, N., Mishra, S., Susman-Stillman, A., Piescher, K. N., & LaLiberte, T. (2014). Differences in the early care and education needs of young children involved in child protection. *Children and Youth Services Review*, *46*, 139–145. https://doi.org/10.1016/j.childyouth.2014.07.017

Liming, K. W., & Grube, W. A. (2018). Wellbeing outcomes for children exposed to multiple adverse experiences in early childhood: A systematic review. *Child and Adolescent Social Work Journal*, *35*(4), 317–335. https://doi.org/10.1007/s10560-018-0532-x

Melville, A. (2017). Trauma-exposed infants and toddlers: A review of impacts and evidence-based interventions. *Advances in Social Work*, *18*(1), 53. https://doi.org/10.18060/21287

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., … Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences of the United States of America*, *108*(7), 2693–2698. https://doi.org/10.1073/pnas.1010076108

Mollborn, S. (2016). Young children's developmental ecologies and kindergarten readiness. *Demography*, *53*(6), 1853–1882. https://doi.org/10.1586/14737175.2015.1028369

Priest, N., Paradies, Y., Trenerry, B., Truong, M., Karlsen, S., & Kelly, Y. (2013). A systematic review of studies examining the relationship between reported racism and health and wellbeing for children and young people. *Social Science & Medicine*, *95*, 115–127. https://doi.org/10.1016/j.socscimed.2012.11.031

Reardon, S. F., & Portilla, X. A. (2016). Recent trends in income, racial, and ethnic school readiness gaps at kindergarten entry. *AERA Open*, *2*(3), 1–18. https://doi.org/10.1177/2332858416657343

Schroeder, A., Slopen, N., & Mittal, M. (2018). Accumulation, timing, and duration of early childhood adversity and behavior problems at age 9. *Journal of Clinical Child and Adolescent Psychology*, 1–14. https://doi.org/10.1080/15374416.2018.1496440

Slopen, N., Shonkoff, J. P., Albert, M. A., Yoshikawa, H., Jacobs, A., Stoltz, R., & Williams, D. R. (2016). Racial disparities in child adversity in the U.S.: Interactions with family immigration history and income. *American Journal of Preventive Medicine*, *50*(1), 47–56. https://doi.org/10.1016/j.amepre.2015.06.013

U.S. Census Bureau. (2016). *School enrollment, 2012-2016 American Community Survey 5-Year estimates* S1401. Retrieved from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

Child and Adolescent Health Measurement Initiative. (2016). *2016 National Survey of Children's Health (NSCH) data query*. Available from www.childhealthdata.org.

U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children Youth and Families, Children's Bureau. (2018). *Child maltreatment 2016.* Available from https://www.acf.hhs.gov/cb/research-data-technology/statistics-research/child-maltreatment

U.S. Department of Health and Human Services Administration for Children and Families. (2016). *State and local action to prevent expulsion and suspension in early learning settings*. Retrieved from https://www.acf.hhs.gov/sites/default/files/ecd/state_and_local_profiles_expulsion.pdf

Ursache, A. (2014). *Do bottom-up aspects of self-regulation predict executive functioning?: Testing a bi-directional model of self-regulation and applying it to home and school context*s. Retrieved from ProQuest Dissertations and Theses. (UMI 3624584)

Ursache, A., Blair, C., & Raver, C. C. (2012). The promotion of self-regulation as a means of enhancing school readiness and early achievement in children at risk for school failure. *Child Development Perspectives*, *6*(2), 122–128. https://doi.org/10.1111/j.1750-8606.2011.00209.x

Yehuda, R., Halligan, S. L., & Grossman, R. (2001). Childhood trauma and risk for PTSD: Relationship to intergenerational effects of trauma, parental PTSD, and cortisol excretion. *Development and Psychopathology*, *13*(3), 733–753. https://doi.org/10.1017/S0954579401003170

Zakszeski, B. N., Ventresco, N. E., & Jaffe, A. R. (2017). Promoting resilience through trauma-focused practices: A critical review of school-based implementation. *School Mental Health*, *9*(4), 310–321. https://doi.org/10.1007/s12310-017-9228-1

Chapter Two: The Role of Preschool as a Point of Intervention and Prevention for Trauma-Exposed Children: Recommendations for Practice, Policy, and Research

Abstract

Schools are increasingly being leveraged as intervention points to address childhood trauma due to the well-established links between childhood trauma exposure and poor child well-being outcomes. However, although preschool aged children experience higher rates of trauma, such as maltreatment and violence exposure, than their older counterparts, there is a dearth of information available related to trauma-informed preschool models. This conceptual paper outlines the need for trauma-informed preschool programming and highlights key components of trauma-informed preschool models for young children. This paper does so by discussing the known prevalence and impact of early trauma, exploring evidence related to early childhood trauma interventions and trauma-informed education for older children, and outlining recommendations for practice, policy, and research related to trauma-informed preschools.

Keywords: trauma-informed education, early childhood education, preschool, child maltreatment

The Role of Preschool as a Point of Intervention for Trauma-Exposed Children:

Recommendations for Practice, Policy, and Research

Introduction

Much progress has been made toward determining "what works" to support the well-being of trauma-exposed young children through mental health interventions. However, compared to the number of young children who have access to mental health services, many more young children have access to preschool. Estimates suggest that one in four (Briggs-Gowan, Ford, Fraleigh, McCarthy, & Carter, 2010) to one in two preschool children have experienced a potentially traumatic event (Jimenez, Wade, Lin, Morrow, & Reichman, 2016) and may be in need of trauma-informed supports. However, only 2.5% of preschool aged children received mental health services in the last year (Child and Adolescent Health Measurement Initiative, 2016), indicating a large gap between exposure to trauma and receipt of services for young children. Comparatively, approximately 48% of children ages three and four years old, almost four million children, are enrolled in preschool annually (US Census Bureau, 2016). In some states upward of 80% of children will have spent at least some time in a preschool setting by the time they reach kindergarten (Updegrove, Long, & Ruth, 2017).

Preschools are potential natural systems of care that can be leveraged to support children who have experienced trauma. However, there is little research to suggest best-practices for trauma-informed preschools, this despite the fact that young children are exposed to trauma at disproportionate rates compared to older children (Fantuzzo & Fusco, 2007; Lieberman, Chu, Van Horn, & Harris, 2011), the negative effects of which are well-established. This conceptual paper details the need for and highlights recommendations to guide the development of trauma-informed preschool models for young children. This paper does so by discussing the known prevalence and impact of early trauma, exploring evidence related to early childhood trauma

interventions and trauma-informed education for older children, and outlining recommendations for key components of trauma-informed preschool models. Recommendations for policies to support trauma-informed preschool models and for future research are also discussed.

Early Adversity

Young children experience particularly high rates of adversity and trauma. By age four, 25% (Briggs-Gowan et al., 2010) to 50% of preschool aged children will have experienced a potentially traumatic event, such as abuse, neglect, or witnessing violence (Jimenez et al., 2016), with higher rates of exposure for children living in poverty (Briggs-Gowan et al., 2010). Types of childhood trauma include maltreatment, such as physical, sexual, emotional abuse and neglect, as well as indirect trauma, such as witnessing a caregiver being abused or witnessing community violence. Young children experience higher rates of trauma than older children (Lieberman et al., 2011), including maltreatment (US Department of Health and Human Services, Administration on Children, Youth and Families, & Children's Bureau, 2017) and domestic violence (Fantuzzo & Fusco, 2007). Early adversity also places children at higher risk for continued exposure to trauma across the rest of childhood (Grasso, Dierkhising, Branson, Ford, & Lee, 2016).

Early exposure to trauma (referred to interchangeably here as trauma and adversity) places young children at risk for impacted developmental outcomes, both in the short and long-term. Early adversity affects the developmental trajectory of young children (Lieberman et al., 2011) increasing their risk for mental and physical health problems in adulthood (Dube, Felitti, Dong, Giles, & Anda, 2003; Felitti et al., 1998; Mersky, Topitzes, & Reynolds, 2013). Additionally, early childhood trauma is associated with more psychological distress in adulthood compared to later-onset childhood trauma (Kaplow & Widom, 2007), demonstrating the critical period of exposure in early childhood.

Trauma exposure can specifically affect student's ability to succeed in academic settings. Early adversity is linked to impaired social-emotional development (McKelvey, Whiteside-Mansell, Conners-Burrow, Swindle, & Fitzgerald, 2016), below-average academic literacy skills and behavior problems (Jimenez et al., 2016) and increased rates of PTSD and internalizing symptoms in adulthood (Grasso et al., 2016). Further, exposure to childhood violence in preschool has been found to predict school age internalizing behaviors, externalizing behaviors, and social competence (Briggs-Gowan, Carter, & Ford, 2012), problem behaviors (Milot, Éthier, St-Laurent, & Provost, 2010), as well as executive functioning (DePrince, Weinzierl, & Combs, 2009).

The internalizing and externalizing symptoms and problem behaviors linked to trauma exposure in preschoolers may present challenges for students in the classroom, not only impacting their academic engagement and relationship with peers and teachers, but also increasing their risk of exposure to potentially harmful disciplinary practices. Behaviors such as acting out, daydreaming, and aggressive behavior are often met with disciplinary action in schools and are in fact risk factors for suspension and expulsion (Krezmien, Leone, & Achilles, 2006), which are particularly high for preschool-aged children (Gilliam & Shahar, 2006). Suspension is linked to poor outcomes for children, such as lower academic performance and increased risk of school dropout (Noltemeyer, Ward, & Mcloughlin, 2015). Although trauma has not been specifically identified as a predictor for the high expulsion rates of preschool-aged children, the U.S. Department of Health and Human Services highlight "staff inability to respond to children who have been exposed to traumatic events" as a potential contributor to high suspension and expulsion rates in preschool settings (U.S. Department of Health and Human Services Administration for Children and Families, 2016). Children who have been exposed to early trauma may then not be able to reap the positive benefits that quality preschool programs

have to offer because of increased risk of disciplinary exclusion, pointing to a need for specific trauma-informed settings that may better serve these vulnerable children.

Trauma-Informed Systems for Young Children

Despite the risks associated with early trauma, there are known ways to intervene to buffer or mitigate these outcomes. Mental health interventions to support young children who have experienced trauma have been shown to be effective (Melville, 2017) and are associated with reductions in children's behavior problems, parenting stress, and child welfare involvement (Lowell, Carter, Godoy, Paulicin, & Briggs-Gowan, 2011). Early childhood trauma-informed interventions are also associated with reductions in children's trauma-symptoms as well as parent symptoms (Lieberman, Ghosh Ippen, & Van Horn, 2006) and are linked to positive outcomes for children with high levels of trauma exposure (Ghosh Ippen, Harris, Van Horn, & Lieberman, 2011). However, despite the fact that trauma-informed mental health interventions do work to improve outcomes for children who have experienced trauma, the number of children receiving these falls far behind the number of older children receiving services. Only 2.5% of preschool aged children received mental health services in the last year, compared to approximately 10% of children ages 6 to 11 and 14% of children ages 12 to 17 (Child and Adolescent Health Measurement Initiative, 2016). These numbers show that a significant gap exists in terms of getting young children mental health supports that can prevent future adverse outcomes and promote well-being.

One way to make trauma-informed care more accessible for young children is to incorporate trauma-informed practices into existing systems of care, such as early care and education systems. Trauma-informed practices are increasingly being incorporated into public systems, such as schools, social services, and medical systems, due to increasing awareness as to the potential for current (non-trauma-informed) practices to re-traumatize individuals with

trauma histories (Substance Abuse and Mental Health Services Administration, 2014). In 2014,

SAMHSA developed guidelines for trauma-informed approaches within systems, such as

schools, to acknowledge the impact and symptoms of trauma. According to SAMHSA trauma-

informed systems: realize the effects of trauma, recognize the signs of trauma, respond to

trauma, and resist re-traumatization. Guidelines and blueprints for implementing trauma-

informed approaches within schools emphasize the need for multi-tiered frameworks that include

both prevention and intervention across multiple domains of school systems (Chafouleas,

Johnson, Overstreet, & Santos, 2016; Substance Abuse and Mental Health Services

Administration, 2014). Several conceptual articles are available that highlight the importance of

trauma-informed school systems (Chafouleas et al., 2016; Walkley & Cox, 2013; Wiest-

Stevenson & Lee, 2016). Trauma informed education is also increasingly in the public sphere,

such as in a recent series in the Huffington Post blog on trauma-informed education (Kain, 2015)

and the documentary *Paper Tigers* about a trauma-informed high school in Washington state

(Redford, 2015). However, despite increasing awareness as to the potential benefits of trauma-

informed education, very little of the current focus for trauma-informed systems has touched

upon the need for and best practices of trauma-informed preschools.

Preschools and Trauma-Exposed Children

There are a handful of studies that explore the impact of preschool and other early care

and educations settings (ECE) on children who have experienced maltreatment and other trauma

(Dinehart, Manfra, Katz, & Hartman, 2012; Lipscomb, Pratt, Schmitt, Pears, & Kim, 2013;

Merritt & Klein, 2015). These studies have predominantly focused on child welfare-involved

populations and generally find that quality preschools can have a positive effect on maltreated

children's development. Lipscomb et al. (2013) compared academic and developmental

outcomes for a sample of children living in out-of-home care attending Head Start and a

community comparison sample. Modest effects of Head Start were found on academic skills, student-teacher relationships, and behavior problems for children in out-of-home care. Interestingly, Lipscomb et al. noted that the effects of Head Start on the student-teacher relationship in the out-of-home sample was not mirrored in their national Head Start sample (Lipscomb et al., 2013), suggesting that preschools may have unique effects for particular groups of at-risk, maltreated children.

Another study exploring the effects of quality preschool on child welfare-involved preschoolers (Dinehart et al., 2012) found that quality preschool positively impacted child developmental outcomes for children involved in child welfare at similar rates to children not involved with child welfare. Although both child welfare involved and non-child welfare involved children had positive outcomes associated with quality preschool attendance, children involved in child welfare were less likely to attend quality preschool than their counterparts (Dinehart et al., 2012), indicating that maltreated children involved with child welfare may not have access to the potentially protective supports of quality preschool environments. Mirroring the positive effects found in other studies, Merritt & Klein (2015) found that ECE had a positive influence on language development for maltreated preschoolers. However, Merritt and Klein found that ECE had a particularly strong influence on language development for children who experienced supervisory neglect, compared to relatively minimal differences for children who experienced other sorts of maltreatment. Based on this, Merritt and Klein suggested that preschool teachers may be less prepared to address the needs of children who have experienced maltreatment other than supervisory neglect, such as the behavioral needs typically associated with abuse and violence exposure. This research emphasizes the need for ECE settings to be better prepared to meet the specific needs of maltreated and violence-exposed young children (Merritt & Klein, 2015).

Therapeutic Preschools

Therapeutic preschools are preschool settings that seek to go above and beyond standard preschool curriculum to support the socio-emotional and behavioral needs of young children. Components of therapeutic preschool programs may include: the use of interdisciplinary teams within the school setting (inclusive of mental health staff), a focus on routines, safety and relationship-building in the educational structure, opportunities for group and individual therapy for children, the use of therapeutic play, and parenting support that included psychoeducation and clinical resources for parents. The potentially positive effects of therapeutic preschools for maltreated children has long been documented (Culp, Heide, & Richardson, 1987; Howes & Ritchie, 1998; Oates, Gray, Schweitzer, Kempe, & Harmon, 1995). Therapeutic preschools have been found to be associated with improvements in developmental delays (Culp et al., 1987), more positive changes in the student-teacher relationship (Howes & Ritchie, 1998), and successful re-integration into standard preschool classrooms (Oates et al., 1995). In one study, attendance in a therapeutic preschool program was associated with greater improvements for children whose caregivers also had improvements in insights but was not found to be effective for caregivers whose insights did not improve (Oppenheim, Goldsmith, & Koren-Karie, 2004), demonstrating the importance of the parent support component even in the preschool setting. It should be noted that most studies of therapeutic preschool have used extremely small sample sizes (n<40) to evaluate the effects of the preschool program. Further, there are significantly fewer more recent evaluations of therapeutic preschool programs from which to draw evidence, so more study is needed. As one of the outcomes associated with therapeutic preschools has been reintegration into standard preschool classrooms, one may theorize that integrating some components of therapeutic preschools within trauma-informed preschools may help retain

children who previously may not have been able to be successful within their preschool classrooms due to behavioral or emotional challenges.

Models for Trauma-Informed Education

Similar to therapeutic preschools, models of trauma-informed education seek to meet the needs of children who may be struggling with behavioral and socio-emotional challenges, although more explicitly linked to experiences of trauma. Models for trauma-informed education include both targeted interventions, which are specifically for students who have experienced trauma, as well as whole school models, which include universal, targeted, and select strategies in schools, to both address the school system at large and identify and meet the need of individual trauma-exposed students (Chafouleas et al., 2016). Contrasting the minimal availability of evidence or frameworks surrounding trauma-informed preschools, there is much more information available on trauma-informed education for older children. Following is a review of four models of trauma-informed education: Head Start Trauma Smart (HSTS), Healthy Environments and Responses to Trauma in Schools (HEARTS), Cognitive Behavioral Intervention for Trauma in Schools (CBITS), and RAP club. Of the reviewed models, only HSTS was specifically designed for and evaluated with preschoolers, demonstrating again the dearth of models available for trauma-informed preschools. However, models for trauma-informed education designed for older children can provide information as to potentially important components and lessons learned that are useful for designing trauma-informed preschool programs, thus these models are discussed in addition to HSTS. The reviewed models include targeted and whole school models that integrate strategies of trauma-informed practices, targeted education for teachers and students, and integrated practices for schools and families.

Head Start Trauma Smart (HSTS). The only known study of a specific trauma-informed preschool program is that of Head Start Trauma Smart (HSTS), a trauma-informed,

early intervention program developed in 2008 for preschoolers in Head Start programs. Goals of the HSTS program are to decrease the negative impact of chronic, toxic stress, to support children's social and cognitive development, and to create a trauma-informed network and culture for participating children, families, and school staff (Holmes, Levy, Smith, Pinne, & Neese, 2015). Components of the HSTS program are: (1) trauma-informed training for the child's support network (including all school personnel, family/caregivers, and others in the child's support network) based on a trauma-informed model for service delivery across systems (Kinniburgh, Blaustein, Spinazzola, & van der Kolk, 2005), (2) individual intensive Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) for trauma-exposed children, (3) classroom consultation by Early Childhood Mental Health Consultants (ECMHCs), (4) and peer based mentoring for staff to obtain additional support around the program (Holmes et al., 2015). HSTS also emphasizes the use of parent engagement by providing parents opportunities for trauma-informed training (Project Direct, 2017)

Currently, HSTS is being implemented across Head Start programs and elementary schools in several states, including Missouri, Kansas, Michigan, Wisconsin, and New York (Project Direct, 2017). HSTS is funded by a $2.3 million grant from the Robert Wood Johnson Foundation and is being considered for replication in Head Start programs nation-wide (Holmes et al., 2015). In a recent annual report, HSTS was reported to increase teacher attitudes related to trauma-informed care and caregiver knowledge of concepts related to parenting children who have experienced trauma, such as how to help a child regulate their affect (Project Direct, 2017). Preliminary published findings indicated that the HSTS program had an impact on a number of teacher-rated student behaviors, such as externalizing behavior and opposition defiance (Holmes et al., 2015) for students who received intensive services from the program, however more rigorous studies on this program have not yet been published.

Healthy Environments and Responses to Trauma in Schools (HEARTS). Another whole school model, the University of California San Francisco's Healthy Environments and Responses to Trauma in Schools (HEARTS) program uses tiered responses to support trauma-exposed kindergarteners and elementary schoolers (Dorado, Martinez, McArthur, & Leibovitz, 2016). Consistent with other whole school models, tier 1 supports school-wide changes to the culture and learning environment, tier 2 supports specific training with staff related to resources and disciplinary procedures, and tier 3 addresses specific resources and interventions for trauma-exposed children. Preliminary program evaluation data indicated that the HEARTS program was associated with increased school personnel knowledge about trauma and trauma-informed practices, increased student engagement in school, and decreased behavior problems and trauma-related symptoms among students (Dorado et al., 2016). Additionally, after 5 years of the HEARTS program implementation, office referrals, incidents related to physical aggression, and out-of-school suspensions had decreased by 87%. Limitations of the program evaluation of the HEARTS program based on self-report, retrospective data and high rates of missing data point to a need for cautious replication. However, the HEARTS program highlights the potential structure of a whole school model of trauma-informed schooling for preschool children in which school-wide changes are paired with staff training and specific resources for trauma-exposed children. .

Cognitive Behavioral Intervention for Trauma in Schools (CBITS). Cognitive Behavioral Intervention for Trauma in Schools (CBITS) is a more widely studied targeted intervention that was created to address trauma among students grade 4 and above with a structured curriculum that combines group therapy, individual treatment, parent outreach, and teacher psychoeducation (Jaycox, Kataoka, Stein, Langley, & Wong, 2012). Children are typically screened for trauma-exposure to determine eligibility for the intervention. CBITS has been adapted with positive outcomes to a number of different racial/ethnic groups, including

Latino and American-Indian middle schoolers. CBITS has been associated with reductions in trauma and depression symptoms and high student engagement (Allison & Ferreira, 2017) as well as significant decreases in PTSD symptoms, anxiety, and avoidant strategies (Goodkind, Lanoue, & Milford, 2010).

As recognition of the importance of parent engagement in trauma interventions, CBITS has also been adapted to include a more rigorous and comprehensive parenting engagement component, called CBITS + Family (Santiago, Lennon, Fuller, Brewer, & Kataoka, 2014). A study comparing traditional CBITS with CBITS + Family in a predominantly low-income and Hispanic sample found that the CBITS + Family adaptation was associated with significant improvements on parental attitudes related to mental health and involvement with their child's schooling/teacher, as well as decreases in inconsistent discipline (Santiago et al., 2014). While CBITS is not designed for use with preschoolers, the individual treatment, teacher psychoeducation, and in particular the parent engagement component of CBITS are components that would be developmentally appropriate in a trauma-informed preschool model.

RAP club. Another targeted, trauma-informed intervention is the RAP Club, a 12-session trauma-informed group intervention that takes place in the schools and is facilitated both by a mental health counselor and a young adult from the community (Mendelson, Tandon, O'Brennan, Leaf, & Ialongo, 2015). The RAP Club sessions are comprised of psycho-education around stress and trauma, emotional regulation skills (including mindfulness training), and problem-solving skills. When evaluated in a pilot study in an urban middle school, the RAP program was associated with statistically higher teacher rated student outcomes, such as emotional regulation, authority acceptance, and academic competence, compared to a control group, with moderate to high effect sizes (Mendelson et al., 2015). Also, of note, the RAP Club program was associated with decreases in disciplinary sanctions that approached significance

(*p*=0.06), which has implications for reducing suspension and expulsion through trauma-informed interventions. However, a major limitation of the RAP Club pilot study makes it difficult to draw conclusions from the findings for trauma-exposed youth, as the study did not specifically screen for trauma or enroll trauma-exposed youth (Mendelson et al., 2015). Even so, it may be that universal implementation of targeted trauma-informed interventions are helpful for all students and could be integrated into trauma-informed preschool program models.

Developing, Evaluating, and Sustaining Trauma-Informed Preschools

The review of the early childhood interventions discussed above, including mental health, typical preschool, therapeutic preschool, and HSTS, highlights the importance of considering the developmental needs of young children when designing and evaluating trauma-informed preschools. Mental health interventions targeted at addressing early childhood trauma emphasize the role of the caregiver in several ways, including through psychoeducation regarding child development and effects of trauma on development, through support for parent's own potential trauma experiences, as well as support for the parent-child relationship. The emphasis on relationships is carried through in the therapeutic preschool models and HSTS, which focus both on supporting the parent-child relationship as well as the student-teacher relationship. Early childhood mental health interventions and therapeutic preschools also highlight the use of developmentally appropriate methods, such as play, to process trauma and support children's relationship.

The trauma-informed education models and interventions discussed above highlight the need for universal and targeted interventions that support the needs of individual students impacted by trauma as well as the whole school environment. Lessons learned from the targeted models reviewed are the importance of targeted interventions to specifically address trauma symptoms in students, the need to include a parent engagement piece, the importance of gaining

buy-in from schools and in appropriately educating teachers and school staff who will either implement interventions or support students who are receiving interventions. Teaching strategies, classroom environment, administrative responsibilities, professional development, and multi-agency collaborations are among some of the important areas highlighted by conceptual frameworks and whole school models of trauma-informed schools (Chafouleas et al., 2016; Walkley & Cox, 2013; Wiest-Stevenson & Lee, 2016).

Following are specific recommendations for components of trauma-informed preschool models, drawn from the aforementioned review. These recommendations are made to contribute to a whole school, comprehensive model of a trauma-informed preschool, which can address multiple tiers of student needs, acknowledge the importance of parent engagement, and emphasize the need for teacher, staff, and school development to support such models of care (see Table 1).

Recommendations for Components of Trauma-Informed Preschools

A trauma-informed school climate. A universal trauma-informed school climate and community is one that can recognize and respond to trauma without re-traumatizing individuals (Chafouleas et al., 2016; National Child Traumatic Stress Network & Schools Committee, 2017). SAMHSA recommends that trauma-informed systems are implemented across a number of domains, including but not limited to leadership, physical environment, collaboration across sectors, and policies (Substance Abuse and Mental Health Services Administration, 2014). Findings that implementation of trauma-informed school models are associated with reductions in school discipline (Dorado et al., 2016; Mendelson et al., 2015) suggests that trauma-informed preschools can proactively evaluate and modify their own policies related to discipline. This is particularly important in light of high rates of suspension and expulsion in preschools. Creating a school discipline policy that acknowledged the link between trauma and challenging or

potentially disruptive behaviors and embedding tiered supports for students who are struggling within such discipline policies would reflect a move towards a trauma-informed school climate. A trauma-informed preschool climate would also be structured to respond to local, state, and national events that may adversely affect children and families. For example, in the current socio-political climate, young children of undocumented parents may experience the trauma of separation due to a caregiver's deportation or forced removal. Many preschools and ECE settings are not prepared to support families around issues related to immigration and immigration policies (Cervantes, Ullrich, & Matthews, 2018) and thus may not be able to adequately respond to children and families with this experience. A trauma-informed preschool climate would integrate trauma-informed learning and responsiveness at all stages of the system and ensures that even children who are not targeted for targeted trauma-informed interventions can receive the positive benefits of a trauma-informed system.

Ongoing, trauma-informed workforce development and supports. Trauma-informed preschool classrooms should ensure that teachers and other school staff are trained to realize, recognize, and respond to early childhood trauma and should also ensure that school staff have supports to mitigate against secondary trauma and to engage in self-care to promote staff well-being. Teacher training is a component of many trauma-informed models and is an important area of further development and evaluation. This is particularly true for the preschool population, where trauma-related behaviors are often seen as "challenging behaviors" and may be grounds for preschool suspension or expulsion. Similar to the HSTS model (Holmes et al., 2015), trauma-informed workforce development would ideally be provided to all school staff, including teachers, assistant teachers, school bus drivers, cafeteria staff, and managerial staff. All school staff who interact with children and caregivers, who themselves may have experienced trauma, should be trained to recognize and respond to trauma responses.

Table 1. Key components of a trauma-informed preschool

Component	Examples of trauma-informed component in action
A trauma-informed school climate	• Trauma-responsive policies across the organization (e.g., discipline policies, responding to community and cultural traumas)
Ongoing, trauma-informed workforce development and supports	• Trauma-informed training opportunities for teachers and other school staff • Early Childhood Mental Health Consultation • Interventions to reduce teacher stress (e.g., peer support groups, peer coaching models, access to socio-learning supports)
Psychoeducation and supports to enhance relationships between parents and schools	• Parent trauma-informed education • Support groups for caregivers of children effected by trauma • Screening/referral for parents effected by trauma • Interventions to enhance the parent-teacher relationship
Interventions to support the student-teacher relationship for trauma-exposed preschoolers	• Relationship focused interventions to support the development of children impacted by trauma (e.g., Banking Time, Playing-2-gether)
Screening and access to targeted mental health services	• Trauma screening resources available to appropriate staff • Developmentally appropriate universal classroom curricula covering stress, emotion regulation, and problem solving • School based targeted trauma interventions (e.g., TF-CBT) • Referral system in which kids can be referred for targeted mental health treatment (e.g., Child-Parent Psychotherapy)

Although a common element of many of the trauma-informed school-based interventions discussed above, the trauma-informed training provided by many schools may be inadequate. Research suggests that many teachers do not feel competent addressing trauma within the classroom, and that trauma-informed training and resources for teachers is lacking (Alisic, Bus, Dulack, Pennings, & Splinter, 2012; Toros & Tiirik, 2016). Even teachers participating in trauma-informed school-based interventions where training was a key component have indicated a need for even more trauma education (Baweja et al., 2016).

One potential way to support the ongoing workforce development of preschool teachers and other staff is through the use of Early Childhood Mental Health Consultants (ECMHCs). A resource unique to ECE settings, and perhaps comparable to school social workers in elementary grades and above, ECMHCs are mental health consultants who serve as classroom-based consultants for preschool and ECE staff. ECMHCs often engage in classroom observations and can provide developmental guidance and strategies to teachers related to challenging classroom behaviors. ECMHCs may be a role that can be leveraged to provide not only direct consultation, but also ongoing workforce development and support specific to effects of trauma and trauma-informed staff responses to trauma-related behaviors. Classroom consultation by ECMHCs was a part of the Head Start Trauma Smart intervention (Holmes et al., 2015) and may be more widely used to support other trauma-informed preschool programs. The use of ECMHCs has been found to reduce preschooler's problem behaviors in a randomized control trial and is touted as a cost-effective way to integrate early childhood mental health into preschool settings (Gilliam, Maupin, & Reyes, 2016). As training for ECMHC's include units on assessing young children's mental health as well as addressing abuse and neglect, ECMHC's may support ongoing trauma-informed support and training for school staff that can go beyond single or brief trainings.

For many schools, ECMHC's may not be feasible due to cost limitations. There are many free resources available to support ongoing trauma-informed workforce development for ECE staff. These include *The Heart of Teaching and Learning: Compassion, Resiliency, and Academic Success* developed in Washington state (Wolpow, Johnson, Hertel, & Kincaid, 2016). Although not specific to preschool, this manual covers definitions and examples of trauma and how trauma plays out in the classroom, strategies for developing trauma-informed classrooms and curricula, and strategies and resources for bridging trauma-informed school-community partnerships. Another free resource, the *Child Trauma Toolkit for Educators* was developed by

the National Child Traumatic Stress Network (2008) and includes information about recognizing and responding to trauma from preschool through high school. This toolkit also covers information about self-care for educators and a guide for caregivers. These free resources may be a good starting point for preschools interested in beginning to develop trauma-informed training for staff.

Resources are also needed to support staff wellness and mitigate the effects of potential secondary trauma. Most of the trauma-informed education interventions mentioned above do not go beyond staff training and into staff wellness promotion. In preschools, teacher stress is predicted by children's classroom behaviors (Friedman-Krauss, Raver, Morris, & Jones, 2014) and in turn predicts the use of expulsion (Gilliam & Shahar, 2006) and other child outcomes (Friedman-Krauss et al., 2014). The importance of addressing the wellness of the teacher parallels many early childhood trauma interventions, which do not focus exclusively on the child but also integrate supports (and evaluates wellbeing outcomes) for parents and caregivers. Existing interventions to support staff wellness that may be integrated into trauma-informed preschools include peer support groups (Holmes et al., 2015), peer coaching models (Johnson, Finlon, Kobak, & Izard, 2016), and increased access to socio-learning supports such as mental health consultants and curricula (Zinsser, Zulauf, Nair Das, & Callie Silver, 2017).

Psychoeducation and supports to enhance relationships between parents and schools. The engagement of parents should be a key component of trauma-informed preschool models, highlighted by the emphasis of parent/family components into trauma-informed school models for older children and therapeutic preschools. Not only is parent education related to positive outcomes in trauma-informed school interventions (Santiago et al., 2014), but parent-teacher relationships are also a key contributor to children's school success (Hughes, Power, O'Connor, & Fisher, 2015). Many caregivers of children who have experienced trauma will also

have experienced trauma themselves (Toth, Rogosch, Manly, & Cicchetti, 2006), thus it is also important to consider how trauma may affect caregivers in the preschool context.

Parents can be engaged in a trauma-informed preschool in a number of ways, including but not limited to: psychoeducation around the impact of trauma, support groups for caregivers of children who have experienced trauma, and clinical referrals or supports for parents who have also experienced trauma. ECMHCs may be a helpful point of intervention for providing training opportunities to caregivers and for addressing the potential mental health needs of caregivers through connections to community supports. The parent-teacher relationship may be another potential port-of-entry through which parents of trauma-exposed children can be supported. Strengthening the parent-teacher relationship is a focus for interventions that aim to address preschool children's challenging behaviors (Kuhn, Marvin, & Knoche, 2017), and such interventions may also seek to support children who have experienced trauma and other adversities. Parent connections to preschool teachers can facilitate discussions about children's development, trauma-related symptoms, strategies to support the parent-child relationship, and discussions about discipline and promoting positive development. Ultimately, a school's connection to parents may also serve as a point of prevention of future maltreatment, through enhanced parent capacity and reductions in parenting stress.

Interventions to support the student-teacher relationships for trauma-exposed preschoolers. Close teacher-child relationships positively influence the development of socio-emotional health outcomes for preschool children (Cadima, Verschueren, Leal, & Guedes, 2016), and may be especially important for children who have been exposed to maltreatment or trauma (Lipscomb et al., 2013). The student-teacher relationship has been a focus of and outcome related to therapeutic preschool programs (Howes & Ritchie, 1998). Guided by attachment theory, a focus on interventions to support children's relationships with major caregivers, such as

teachers, is of particular importance for young children who have experienced trauma (Melville, 2017). A meta-analysis on the association between parent-child relationship patterns and teacher-child relationship patterns found that they tend to be related (Ahnert, Pinquart, & Lamb, 2006), however a recent study found that teacher characteristics can buffer the impact of insecure parent-child attachment patterns on child behavior issues (Buyse, Verschueren, & Doumen, 2011). Thus, a preschooler's relationship with their teacher may buffer the impact of trauma, particularly trauma such as abuse and neglect that may impact a child's relationship with their caregiver.

Trauma-informed preschool programs should incorporate relationship-focused interventions to support young children's development, particularly children who have experienced trauma or adversity. There are multiple interventions that have been used to support the student-teacher relationship among preschoolers, including Banking Time (Driscoll & Pianta, 2010) and Playing-2-gether (Vancraeyveldt et al., 2014), which both seek to support the student-teacher relationship through a number of play sessions with the child and teacher. Although not specifically studied with children who have experienced trauma, Banking Time has been shown to support preschool outcomes that have been associated with trauma exposure, such as self-regulation, problem behaviors, and the student-teacher interactions (Driscoll & Pianta, 2010; Driscoll, Wang, Mashburn, & Pianta, 2011), and Playing-2-gether was associated with decreases in relationship conflict and improvements in children's behaviors (Vancraeyveldt et al., 2014). The use of interventions to support the student-teacher relationship may help promote socio-emotional health and resilience among trauma-exposed preschoolers.

Screening and access to targeted mental health services. The third tier of whole school models for trauma-informed education include targeted, mental health interventions for children who are struggling after trauma exposure. Screening for childhood trauma exposure and

symptoms is an important component of a trauma-informed system and supports early

identification and intervention. Providers who screen for trauma can support families in

identifying the impact of trauma and can initiate referrals to trauma-focused services for children

and families. Some school models have chosen to screen children for trauma prior to

implementing interventions (Jaycox et al., 2012) while others have implemented interventions to

groups of students without prior trauma screening (Mendelson et al., 2015).

School-based targeted interventions for trauma-exposed youth have been found effective in

models with older children (Allison & Ferreira, 2017; Jaycox et al., 2012; Mendelson et al.,

2015) and have been used in therapeutic preschools (Barfield, Dobson, Gaskill, & Perry, 2012;

Oates et al., 1995). Early childhood trauma interventions should incorporate developmentally

appropriate themes such as play and a use of the child's caregiving relationships (Melville,

2017), which in the school context could include teachers, other school staff (such as social

workers or psychologists), as well as the child's primary caregivers. Access to targeted mental

health services within a trauma-informed preschool could also include engagement with

community mental health agencies to which referrals for developmentally appropriate, evidence-

based interventions (such as Child-Parent Psychotherapy) can be made.

Policy Needs to Support Trauma-Informed Preschools

To support the components identified above, large-scale implementation, evaluation, and

sustainment of trauma-informed ECE systems will require policy makers to recognize the effects

of trauma and the need to support young children through systems of care, which may take place

through legislation and funding. Several states have recently passed resolutions in support of

trauma-informed education, including Pennsylvania, Massachusetts, and Connecticut. The

Pennsylvania house resolution HR 191 declared support for the establishment of Statewide

trauma-informed education due to evidence that youth violence is a "public health epidemic"

(Pennsylvania General Assembly, 2013). In 2013, Massachusetts Senate and House of Representatives legislators petitioned for adoption of "An act relative to safe and supportive schools" (General Court of Massachusetts, 2013) to support integrating behavioral health and trauma-informed education into school districts. In 2015, Connecticut amended existing statutes to include trauma-informed practices into in-service training programs for teachers (Connecticut General Assembly, 2015). However, these resolutions do not readily translate into appropriations for trauma-informed training or services and do not specifically focus on preschools as areas of focus. Funding for interventions, such as the inclusion of ECMHCs into preschools, or incentives for schools that implement trauma-informed components (e.g., workforce development) would reflect trauma-informed policies that support the well-being of young, children. Statewide *and* national policies that evaluate and fund preschool programs may benefit by exploring professional development, teacher support, and parenting interventions within schools that serve to create trauma-informed environments for students. National conversations and policy changes around preschool suspension and expulsion may also be leveraged to support policy changes in support of implementation of trauma-informed practices within preschools.

Future Research for Trauma-Informed Preschools

There is a need to build a more robust research base for trauma-informed school-based services, particularly around implementation, professional development, and evaluation (Chafouleas et al., 2016), including long-term randomized control trials identifying the long-term effects of trauma-informed education as well as research exploring the part that unique components of trauma-informed education play in supporting children's wellbeing. What follow are some recommendations for areas of needed research in light of the current research being done around early childhood mental health and trauma-informed schools.

Workforce development. Although there is a plethora of trauma-informed curricula and resources available on the internet for educators (e.g., NCTSN Child Trauma Toolkit for Educators), the effects on these of teacher competence and perceptions related to trauma in the classroom is relatively unknown. Additionally, teacher training often varies in terms of dosage. For example, while CBITS offers a teacher education piece, it is typically limited to one session (Jaycox et al., 2012) which may not be enough to change cultures and perceptions of trauma within school systems. Future research should evaluate short- and long-term effects of trauma-informed psychoeducation for teachers and assess the unique impacts of trauma education and dosing on teaching, acceptance of trauma-informed interventions, job stress, student-teacher relationships, disciplinary practices, and perceptions of student behavior. Schools may also choose to develop trauma-informed models over time, perhaps beginning with workforce development. This would allow for a prime opportunity for researchers to evaluate just the effects of teacher training on child outcomes as a way to isolate specific components of trauma-informed care.

Parent engagement. Parent engagement is a common element of early childhood and trauma-informed school-based interventions. Valuable research would be to compare trauma-informed preschool interventions with family support to those without, to determine the relative impact of these additional supports on child and family outcomes, as well as to see whether parent engagement moderate the effect of trauma-informed school interventions on child outcomes. Additionally, existing interventions aimed at strengthening the parent-teacher relationship should be adapted and evaluated for use with trauma-effected young children and caregivers to determine whether they are an appropriate and feasible fit within trauma-informed preschools.

Access to targeted interventions. Screening and access to targeted, trauma-informed interventions are a central piece of a targeted trauma-informed system. Research priority areas should focus on the development and testing of early childhood trauma screening tools for the preschool settings, as well as the feasibility of use by school staff. Interventions that have been used in therapeutic preschools and the Head Start Trauma Smart, play therapy, Trauma-Focused Cognitive Behavioral Therapy (TF-CBT), and the Attachment Regulation and Competency (ARC) model, are mental health interventions that have not been rigorously tested with preschool-aged children nor within preschool settings and warrant future evaluation. Future research can focus both on the continued development and implementation of early childhood trauma interventions as well as the adaptation of these interventions to school settings.

Conclusion

Young children are exposed disproportionately to traumatic events and yet many of the systems approaches to intervening to support childhood trauma exposure are exclusively available for older children. Intervening with young children within existing systems of care such as preschools may enable more children and families to receive trauma-informed care and promote the well-being of young children. Based on available research on therapeutic interventions and trauma-informed education with young and older children, several key components of trauma-informed preschools have been identified in this article. Trauma-informed preschools should include: a trauma-informed school climate, ongoing trauma-informed workforce development and supports, interventions to support the student-teacher relationship for trauma-exposed preschoolers, and screening and access to targeted mental health services. There is much work to be done to determine trauma-informed best-practices for supporting trauma-exposed young children within the preschool setting, including advocacy to support funding of early childhood school based trauma-informed models and research that evaluates the

efficacy of specific components of trauma-informed education. As the trend towards "trauma-informed schools" continues, contributions are needed to inform relevant policies and practices to guide better support for maltreated children and families within preschool settings.

References

Ahnert, L., Pinquart, M., & Lamb, M. E. (2006). Security of children's relationships with nonparental care providers: A meta-analysis. *Child Development*, *74*(3), 664–679. https://doi.org/10.1111/j.1467-8624.2006.00896.x

Alisic, E., Bus, M., Dulack, W., Pennings, L., & Splinter, J. (2012). Teachers' experiences supporting children after traumatic exposure. *Journal of Traumatic Stress*, *25*(1), 98–101. https://doi.org/10.1002/jts.20709

Allison, A. C., & Ferreira, R. J. (2017). Implementing cognitive behavioral intervention for trauma in schools (CBITS) with Latino youth. *Child and Adolescent Social Work Journal*, *34*(2), 181–189. https://doi.org/10.1007/s10560-016-0486-9

Barfield, S., Dobson, C., Gaskill, R., & Perry, B. D. (2012). Neurosequential model of therapeutics in a therapeutic preschool: Implications for work with children with complex neuropsychiatric problems. *International Journal of Play Therapy*, *21*(1), 30–44. https://doi.org/10.1037/a0025955

Baweja, S., Santiago, C. D., Vona, P., Pears, G., Langley, A., & Kataoka, S. (2016). Improving implementation of a school-based program for traumatized students: Identifying factors that promote teacher support and collaboration. *School Mental Health*, *8*(1), 120–131. https://doi.org/10.1007/s12310-015-9170-z

Briggs-Gowan, M. J., Carter, A. S., & Ford, J. D. (2012). Parsing the effects violence exposure in early childhood: Modeling developmental pathways. *Journal of Pediatric Psychology*, *37*(1), 11–22. https://doi.org/10.1093/jpepsy/jsr063

Briggs-Gowan, M. J., Ford, J. D., Fraleigh, L., McCarthy, K., & Carter, A. S. (2010). Prevalence 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.

Buyse, E., Verschueren, K., & Doumen, S. (2011). Preschoolers' attachment to mother and risk for adjustment problems in kindergarten: Can teachers make a difference? *Social Development*, *20*(1), 33–50. https://doi.org/10.1111/j.1467-9507.2009.00555.x

Cadima, J., Verschueren, K., Leal, T., & Guedes, C. (2016). Classroom interactions, dyadic teacher–child relationships, and self–regulation in socially disadvantaged young children. *Journal of Abnormal Child Psychology*, *44*(1), 7–17. https://doi.org/10.1007/s10802-015-0060-5

Cervantes, W., Ullrich, R., & Matthews, H. (2018). *Our children's fear: Immigration policy's effects on young children*. Washington, D.C.: The Center for Law and Social Policy. Retrieved from https://www.clasp.org/sites/default/files/publications/2018/03/2018_ourchildrensfears.pdf

Chafouleas, S. M., Johnson, A. H., Overstreet, S., & Santos, N. M. (2016). Toward a blueprint for trauma-informed service delivery in schools. *School Mental Health*, *8*(1), 144–162. https://doi.org/10.1007/s12310-015-9166-8

Child and Adolescent Health Measurement Initiative. (2016). *2016 National Survey of Children's Health (NSCH) data query*. Available from www.childhealthdata.org.

Connecticut General Assembly. (2015). *An act concerning trauma-informed practice training for teachers, administrators and pupil personnel* [Public Act No. 15-232]. Retrieved from https://www.cga.ct.gov/2015/act/pa/pdf/2015PA-00232-R00SB-00843-PA.pdf

Culp, R. E., Heide, J., & Richardson, M. T. (1987). Maltreated children's developmental scores: Treatment versus nontreatment. *Child Abuse & Neglect*, *11*, 29–34.

DePrince, A. P., Weinzierl, K. M., & Combs, M. D. (2009). Executive function performance and trauma exposure in a community sample of children. *Child Abuse & Neglect*, *33*(6), 353–361. https://doi.10.1016/j.chiabu.2008.08.002

Dinehart, L. H., Manfra, L., Katz, L. F., & Hartman, S. C. (2012). Associations between center-based care accreditation status and the early educational outcomes of children in the child welfare system. *Children and Youth Services Review*, *34*(5), 1072–1080. https://doi.org/10.1016/j.childyouth.2012.02.012

Dorado, J. S., Martinez, M., McArthur, L. E., & Leibovitz, T. (2016). Healthy Environments and Response to Trauma in Schools (HEARTS): A whole-school, multi-level, prevention and intervention program for creating trauma-informed, safe and supportive schools. *School Mental Health*, *8*(1), 163–176. https://doi.org/10.1007/s12310-016-9177-0

Driscoll, K. C., & Pianta, R. C. (2010). Banking time in Head Start: Early efficacy of an intervention designed to promote supportive teacher–child relationships. *Early Education & Development*, *21*(1), 38–64. https://doi.org/10.1080/10409280802657449

Driscoll, K. C., Wang, L., Mashburn, A. J., & Pianta, R. C. (2011). Fostering supportive teacher-child relationships: Intervention implementation in a state-funded preschool program. *Early Education and Development*, *22*(4), 593–619. https://doi.org/http://dx.doi.org/10.1080/10409289.2010.502015

Dube, S. R., Felitti, V. J., Dong, M., Giles, W. H., & Anda, R. F. (2003). The impact of adverse childhood experiences on health problems: Evidence from four birth cohorts dating back to 1900. *Preventive Medicine*, *37*(3), 268–277. https://doi.org/10.1016/S0091-7435(03)00123-3

Fantuzzo, J. W., & Fusco, R. A. (2007). Children's direct exposure to types of domestic violence crime: A population-based investigation. *Journal of Family Violence*, *22*(7), 543–552. https://doi.org/10.1007/s10896-007-9105-z

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., …
Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of
the leading causes of death in adults. *American Journal of Preventive Medicine*, *14*(4), 245–
258. https://doi.org/10.1016/S0749-3797(98)00017-8

Friedman-Krauss, A. H., Raver, C. C., Morris, P. A., & Jones, S. M. (2014). The role of
classroom-level child behavior problems in predicting preschool teacher stress and
classroom emotional climate. *Early Education and Development*, *25*(4), 530–552.
https://doi.org/10.1080/10409289.2013.817030

General Court of Massachusetts. (2013). *An act relative to safe and supportive schools* [S 210].
Retrieved from https://malegislature.gov/Bills/188/S210

Ghosh Ippen, C., Harris, W. W., Van Horn, P., & Lieberman, A. F. (2011). Traumatic and
stressful events in early childhood: Can treatment help those at highest risk? *Child Abuse
and Neglect*, *35*(7), 504–513. https://doi.org/10.1016/j.chiabu.2011.03.009

Gilliam, W. S., Maupin, A. N., & Reyes, C. R. (2016). Early childhood mental health
consultation: Results of a statewide random-controlled evaluation. *Journal of the American
Academy of Child and Adolescent Psychiatry*, *55*(9), 754–761.
https://doi.org/10.1016/j.jaac.2016.06.006

Gilliam, W. S., & Shahar, G. (2006). Preschool and child care expulsion and suspension: Rates
and predictors in one state. *Infants & Young Children*, *16*(3), 228–245.
http://dx.doi.org/10.1097/00001163-200607000-00007

Goodkind, J. R., Lanoue, M. D., & Milford, J. (2010). Adaptation and implementation of
cognitive behavioral intervention for trauma in schools with American Indian youth.
Journal of Clinical Child and Adolescent Psychology, *39*(6), 858–872.
https://doi.org/10.1080/15374416.2010.517166

Grasso, D. J., Dierkhising, C. B., Branson, C. E., Ford, J. D., & Lee, R. (2016). Developmental patterns of adverse childhood experiences and current symptoms and impairment in youth referred for trauma-specific services. *Journal of Abnormal Child Psychology*, *44*(5), 871–886. https://doi.org/10.1007/s10802-015-0086-8

Holmes, C., Levy, M., Smith, A., Pinne, S., & Neese, P. (2015). A model for creating a supportive trauma-informed culture for children in preschool settings. *Journal of Child and Family Studies*, *24*, 1650–1659. https://doi.org/10.1007/s10826-014-9968-6

Howes, C., & Ritchie, S. (1998). Changes in child–teacher relationships in a therapeutic preschool program. *Early Education and Development*, *9*(4), 411–422. https://doi.org/10.1207/s15566935eed0904

Hughes, S. O., Power, T. G., O'Connor, T. M., & Fisher, J. O. (2015). Executive functioning, emotion regulation, eating self-regulation, and weight status in low-income preschool children: How do they relate? *Appetite*, *89*, 1–9. https://doi.org/10.1016/j.appet.2015.01.009

Jaycox, L. H., Kataoka, S., Stein, B. D., Langley, A. K., & Wong, M. (2012). Cognitive behavioral intervention for trauma in schools. *Journal of Applied School Psychology*, *28*(3), 239–255. https://doi.org/10.1080/15377903.2012.695766

Jimenez, M. E., Wade, R., Lin, Y., Morrow, L. M., & Reichman, N. E. (2016). Adverse experiences in early childhood and kindergarten outcomes. *Pediatrics*, *137*(2), 1–11. https://doi.org/10.1542/peds.2015-1839

Johnson, S. R., Finlon, K. J., Kobak, R., & Izard, C. E. (2016). Promoting student-teacher interactions: Exploring a peer coaching model for teachers in a preschool setting. *Early Childhood Education Journal*, *45*(4), 1–10. https://doi.org/10.1007/s10643-016-0790-1

Kain, L. (2015, October 2nd). Trauma-informed schools: An essential for student & staff success. Huffington Post Blog. Retrieved from https://www.huffingtonpost.com/lara-kain/trauma-informed-schoolsan_b_8234038.html

Kaplow, J. B., & Widom, C. S. (2007). Age of onset of child maltreatment predicts long-term mental health outcomes. *Journal of Abnormal Psychology*, *116*(1), 176–187. https://doi.org/10.1037/0021-843X.116.1.176

Kinniburgh, K. J., Blaustein, M., Spinazzola, J., & van der Kolk, B. A. (2005). Attachment, self-regulation, and competency: A comprehensive intervention framework for children with complex trauma. *Psychiatric Annals*, *35*(5), 424.

Krezmien, M. P., Leone, P. E., & Achilles, G. M. (2006). Suspension, race, and disability: Analysis of statewide practices and reporting. *Journal of Emotional and Behavioral Disorders*, *14*(4), 217–226. https://doi.org/10.1177/10634266060140040501

Kuhn, M., Marvin, C. A., & Knoche, L. L. (2017). In it for the long haul: Parent-teacher partnerships for addressing preschool children's challenging behaviors. *Topics in Early Childhood Special Education*, *37*(2), 81–93. https://doi.org/10.1177/0271121416659053

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*(2),

Lieberman, A. F., Ghosh Ippen, C., & Van Horn, P. (2006). Child-parent psychotherapy: 6-month follow-up of a randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry*, *45*(8), 913–918. https://doi.org/10.1097/01.chi.0000222784.03735.92

Lipscomb, S. T., Pratt, M. E., Schmitt, S. A., Pears, K. C., & Kim, H. K. (2013). School readiness in children living in non-parental care: Impacts of Head Start. *Journal of Applied Developmental Psychology*, *34*(1), 28–37. https://doi.org/10.1016/j.appdev.2012.09.001

Lowell, D. I., Carter, A. S., Godoy, L., Paulicin, B., & Briggs-Gowan, M. J. (2011). A randomized controlled trial of Child First: A comprehensive home-based intervention translating research into early childhood practice. *Child Development*, *82*(1), 193–208. https://doi.org/10.1111/j.1467-8624.2010.01550.x

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

Mendelson, T. S., Tandon, D., O'Brennan, L., Leaf, P. J., & Ialongo, N. S. (2015). Brief report: Moving prevention into schools: The impact of a trauma-informed school-based intervention. *Journal of Adolescence*, *43*, 142–147. https://doi.org/10.1016/j.adolescence.2015.05.017

Merritt, D. H., & Klein, S. (2015). Do early care and education services improve language development for maltreated children? Evidence from a national child welfare sample. *Child Abuse and Neglect*, *39*, 185–196. https://doi.org/10.1016/j.chiabu.2014.10.011

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 & Neglect*, *37*(11), 917–925.

Milot, T., Éthier, L. S., St-Laurent, D., & Provost, M. A. (2010). The role of trauma symptoms in the development of behavioral problems in maltreated preschoolers. *Child Abuse and Neglect*, *34*(4), 225–234. https://doi.org/10.1016/j.chiabu.2009.07.006

National Child Traumatic Stress Network Schools Committee. (2008). *Child trauma toolkit for educators*. Los Angeles, CA. Retrieved from https://www.nctsn.org/sites/default/files/resources//child_trauma_toolkit_educators.pdf

National Child Traumatic Stress Network Schools Committee. (2017). *Creating, supporting, and sustaining trauma-informed schools: A system framework.* Los Angeles, CA and Durham, NC. Retrieved from http://www.nctsn.org/sites/default/files/assets/pdfs/creating_supporting_sustaining_trauma_informed_schools_a_systems_framework.pdf

Noltemeyer, A. L., Ward, R. M., & Mcloughlin, C. (2015). Relationship between school suspension and student outcomes: A meta-analysis. *School Psychology Review*, *44*(2), 224–240. https://doi.org/10.17105/spr-14-0008.1

Oates, R. K., Gray, J., Schweitzer, L., Kempe, R. S., & Harmon, R. J. (1995). A therapeutic preschool for abused children: The Keepsafe project. *Child Abuse & Neglect*, *19*(11), 1379–1386.

Oppenheim, D., Goldsmith, D., & Koren-Karie, N. (2004). Maternal insightfulness and preschoolers' emotion and behavior problems: Reciprocal influences in a therapeutic preschool program. *Infant Mental Health Journal*, *25*(4), 352–367. https://doi.org/10.1002/imhj.20010

Pennsylvania General Assembly. (2013). *A resolution declaring youth violence as a public health epidemic and supporting the establishment of Statewide trauma-informed education* [HR 191]. Retrieved from http://www.legis.state.pa.us/cfdocs/billinfo/billinfo.cfm?syear=2013&sind=0&body=H&type=R&bn=191

Project Direct. (2017). *An evaluation of Trauma Smart® in three community Head Start*

programs and three elementary schools: Annual expansion report. New Orleans, LA: Tulane University. Retrieved from http://traumasmart.org/uploads/aggregated-trauma-smart-evaluation-results.pdf

Redford, J. (Director). (2015). *Paper tigers* [Documentary]. Retrieved from https://kpjrfilms.co/paper-tigers/contact/

Santiago, C. D., Lennon, J. M., Fuller, A. K., Brewer, S. K., & Kataoka, S. H. (2014). Examining the impact of a family treatment component for CBITS: When and for whom is it helpful? *Journal of Family Psychology*, *28*(4), 560–570. https://doi.org/10.1037/a0037329

Substance Abuse and Mental Health Services Administration. (2014). *SAMHSA's concept of trauma and guidance for a trauma-informed approach*. HHS Publication No. (SMA) 14-4884. Rockville, MD.

Toros, K., & Tiirik, R. (2016). Preschool teachers' perceptions about and experience with child abuse and neglect. *Early Childhood Education Journal*, *44*(1), 21–30. https://doi.org/10.1007/s10643-014-0675-0

Toth, S. L., Rogosch, F. A., Manly, J. T., & Cicchetti, D. (2006). The efficacy of toddler-parent psychotherapy to reorganize attachment in the young offspring of mothers with major depressive disorder: A randomized preventive trial. *Journal of Consulting and Clinical Psychology*, *74*(6), 1006–1016. https://doi.org/10.1037/0022-006X.74.6.1006

Updegrove, N., Long, D., & Ruth, L. (2017). *The changing state of early childhood 2016-2017*. Connecticut Voices for Children: New Haven, CT. https://doi.org/10.1111/1467-9663.00172

U.S. Census Bureau. (2016). *School enrollment, 2012-2016 American Community Survey 5-year estimates* (S1401). Retrieved from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

U.S. Department of Health and Human Services Administration for Children and Families. (2016). *State and local action to prevent expulsion and suspension in early learning settings*. Retrieved from https://www.acf.hhs.gov/sites/default/files/ecd/state_and_local_profiles_expulsion.pdf

U.S. Department of Health and Human Services, Administration on Children, Youth and Families, & Children's Bureau. (2017). *Child maltreatment 2015*. https://doi.org/10.1177/1077559505283548

Vancraeyveldt, C., Verschueren, K., Wouters, S., Van Craeyevelt, S., Van den Noortgate, W., & Colpin, H. (2014). Improving teacher-child relationship quality and teacher-rated behavioral adjustment amongst externalizing preschoolers: Effects of a two-component intervention. *Journal of Abnormal Child Psychology*, *43*(2), 243–257. https://doi.org/10.1007/s10802-014-9892-7

Walkley, M., & Cox, T. L. (2013). Building trauma-informed schools and communities. *Children and Schools*, *35*(2), 123–126. https://doi.org/10.1093/cs/cdt007

Wiest-Stevenson, C., & Lee, C. (2016). Trauma-informed schools. *Journal of Evidence-Informed Social Work*, *13*(5), 498–503. https://doi.org/10.1080/23761407.2016.1166855

Wolpow, R., Johnson, M. M., Hertel, R., & Kincaid, S. O. (2016). *The heart of learning and teaching: Compassion, resiliency, and academic success*. Washington State Office of Superintendent of Public Instruction. https://doi.org/10.1017/CBO9781107415324.004

Zinsser, K. M., Zulauf, C. A., Nair Das, V., & Callie Silver, H. (2017). Utilizing social-emotional learning supports to address teacher stress and preschool expulsion. *Journal of Applied Developmental Psychology*. https://doi.org/10.1016/j.appdev.2017.11.006

Chapter Three: Effects of Household and Environmental Adversity on Self-Regulation for Latino and African American Preschool Children: Closing the School Readiness Gap

Abstract

Addressing factors that influence children's self-regulation is a critical step towards closing achievement gaps that have consistently been found for African American and Hispanic children as well as children living in poverty. Cumulative adversity in childhood is now widely understood to be a developmental risk factor for children. However, the relationship between cumulative adversity and multi-method indicators of self-regulation have not been widely explored, particularly with diverse preschool populations. This study examines the relationship between cumulative household and environmental adversity, bottom-up indicators of self-regulation (fear, attention bias to threat), and top-down indicators of self-regulation (inhibitory and emotional control) in a sample of 126 predominantly Hispanic and African American preschoolers. Findings from indirect effects path analyses suggest a pathway from cumulative environmental adversity to inhibitory self-regulation through bias to threat and fear, as reported by both parents and teachers. Bottom-up self-regulation may be an important and under-researched area of focus for interventions that seek to support the inhibitory and emotional control of young, adversity-exposed children. Additionally, these findings support incorporating environmental adversities, such as community violence exposure and food insecurity, into conceptualizations of childhood adversity. An expanded conceptualization of adversity may support the development of systemic interventions that address factors disproportionately experienced by ethnic minority children in low-income urban areas and reduce disparities in early school readiness.

Keywords: teacher, parent, violence, child maltreatment, attention bias, adverse childhood experiences, bi-directional model of self-regulation

Effects of Household and Environmental Adversity on Self-Regulation for Latino and

African American Preschool Children: Closing the School Readiness Gap

Introduction

Recently, the conceptualization of children's school readiness has gone beyond simple measures of scores on reading and math tests to include self-regulation (Blair & Raver, 2015; Reardon & Portilla, 2016). This shift is likely due in large part to the recognition that self-regulation, or the ability to manage thoughts, feelings, and behaviors, is foundational for the development of other skills in early childhood, such as reading, that are traditionally considered important to school readiness and academic achievement (Blair & Raver, 2015; Valiente et al., 2011). Children who can tolerate frustration are better poised to learn new skills and manage the various demands associated with the school environment. In contrast, children who struggle with managing their emotions or behaviors may be aggressive or be less able to tolerate typical stressors during the school day, such as transitioning from one activity to another. These struggles may disrupt the child's learning and place them at higher risk for disciplinary actions. The relationship between self-regulation and school achievement is long-lasting (Moffitt et al., 2011; Turney & McLanahan, 2015), demonstrating the importance of considering children's early self-regulation as a component of educational achievement and long-term well-being.

Exposure to childhood adversity, such as child maltreatment and witnessing domestic violence, has been associated with poor self-regulation skills (Kim-Spoon, Haskett, Longo, & Nice, 2012; Kim & Cicchetti, 2010; Shipman et al., 2007) and may be a mechanism through which cumulative adversity influences children's health, mental health, and well-being. This is concerning, given that children birth through age five are exposed to disproportionate rates of adversity compared to older children, including maltreatment (U.S. Department of Health & Human Services Administration for Children and Families Administration on Children Youth

and Families Children's Bureau, 2018) and domestic violence (Fantuzzo & Fusco, 2007). Higher rates of cumulative adversities have also been found for young ethnic minority children and children living in poverty (Jimenez, Wade, Lin, Morrow, & Reichman, 2016; Mersky, Topitzes, & Reynolds, 2013).

Addressing factors related to children's self-regulation is a critical step towards closing achievement gaps that have consistently been found for ethnic minority children and children living in poverty (Kuhfeld, Gershoff, & Paschall, 2018; Reardon & Portilla, 2016). Gaps in math and reading scores, as well as behavioral regulation, have been identified between poor and non-poor children as well as between African American and Hispanic children and their White counterparts (Kuhfeld et al., 2018; Reardon & Galindo, 2009; Reardon & Portilla, 2016). These gaps start early, seen through differences in school readiness as children enter kindergarten (Reardon & Portilla, 2016) that persist throughout the school years (Kuhfeld et al., 2018). Young preschoolers of color also experience other barriers to school readiness, such as suspension and expulsion, at higher rates than their White counterparts (U.S. Department of Education Office for Civil Rights, 2016). These disparate rates are likely largely explained by implicit biases on the part of educators (Gilliam et al., 2016), however may also be due in part to the intersection between race/ethnicity and exposure to adversity. Addressing achievement gaps early on in a child's education may help to reduce academic disparities and promote the well-being of youth.

Cumulative Early Childhood Adversity

Over the past few decades, research has multiplied linking cumulative childhood adversity to numerous short and long-term health outcomes (Dube, Felitti, Dong, Giles, & Anda, 2003; Felitti et al., 1998; Jimenez et al., 2016; Merrick et al., 2017; Mersky, Janczewski, & Topitzes, 2017). Much of the research on cumulative adversity has focused on the childhood experiences measured in the original Adverse Childhood Experiences (ACEs) study out of the

Kaiser Permanente Center in San Diego, California (Felitti et al., 1998). The original study measured ten types of childhood adversity as part of a two-factor structure including child maltreatment (5 categories of abuse and neglect) and household dysfunction (household incarceration, parent mental health, parent separation/divorce, mother treated violently, and parent substance abuse). These ten adversities traditionally used in research on ACEs have been found to be linked to increased rates of adult poor physical health (Dube et al., 2003), poor mental health (Brockie, Dana-Sacco, Wallen, Wilcox, & Campbell, 2015), and health risk behaviors (Dube et al., 2003).

Notably, the original ACEs research was done with a predominantly White, middle to upper class sample of adults. More recent research has explored the prevalence and effects of cumulative adversity in urban, minority samples and has found prevalence rates of adversity to be higher than those in the original sample (Mersky et al., 2013). Childhood adversity, such as maltreatment and violence, can be concentrated in urban areas and in areas with high levels of poverty. Young children of color, including African American and Latino children, are more likely to live in urban areas of high poverty (Koball & Jiang, 2018) and experience higher numbers of cumulative adversities (Mersky et al., 2013). In fact, in a diverse preschool sample, African American children and children with an annual family income of less than $20,000 were significantly more likely to have exposure to at least one adversity, compared to their counterparts (Jimenez et al., 2016), indicating the need to specifically explore risks associated with stressful life experiences within economically-disadvantaged and racially diverse samples.

The original ACEs research was also conducted using adult retrospective reports of experiences in childhood from age zero through age 18. Although the original research has immense value for broadly highlighting the potential risks of adversity throughout childhood, it is difficult to determine how to translate ACE findings into specific early childhood interventions

or policies. Recently work has begun to explore adversity exposure among children through caregiver reports or child protective service (CPS) data (Jimenez et al., 2016; McKelvey, Whiteside-Mansell, Conners-Burrow, Swindle, & Fitzgerald, 2016; Melville, 2017a) which adds depth to ACEs research by exploring cumulative adversity prospectively during childhood. In a systematic review, several studies (n=5) with large, high-risk samples were noted to have identified the dose-response relationship between cumulative adversity and child outcomes in populations of young children (Liming & Grube, 2018); however, research on early childhood cumulative adversity is still scarce compared to studies of older children.

Going beyond the traditional household and maltreatment adversities explored in the original ACE studies, researchers have begun to incorporate additional ACEs into their conceptualization of cumulative adversity, including community violence exposure, and food insecurity (Finkelhor, Shattuck, Turner, & Hamby, 2015; Merrick et al., 2017; Mersky et al., 2017). One such study by Mersky et al. (2017) identified a four-factor structure when including adversities such as financial stress, food insecurity, and violent crime victimization with traditional ACEs. One factor included child maltreatment, household adversities, and violence exposure, a second included neglect adversities, such as physical and emotional neglect, a third included family dissolution/loss and substance abuse, and a fourth included indicators of extreme poverty (financial distress, food insecurity, homelessness). These findings support the need to use an expanded conceptualization of cumulative adversity that incorporates both household dysfunction as well as environmental stressors, such as food insecurity. This expanded definition of ACEs also takes into account the unique experiences that youth in economically disadvantaged, urban environments may face. Exploring environmental ACEs as contributors to child and adult outcomes may support the development of interventions that go beyond a focus

solely on the child's household to include structural factors, such as neighborhood and economic influences on children's well-being.

Preschool Self-Regulation

Self-regulation has been conceptualized as the ability to monitor and regulate emotions, thoughts, and behaviors. Self-regulation develops rapidly in the preschool years, with the majority of preschool-aged children experiencing significant gains in self-regulation skills by age 5 (Montroy, Bowles, Skibbe, McClelland, & Morrison, 2016), and it is an important component of school readiness (Blair & Raver, 2015; Reardon & Portilla, 2016). The relationship between self-regulation and school achievement is long-lasting; self-regulation in preschool-aged children has been found to be associated with children's test scores in middle childhood (Turney & McLanahan, 2015), as well as their later adult physical and mental health outcomes (Moffitt et al., 2011).

There are a number of different constructs related to self-regulation, such as emotional control, inhibitory control, and behavioral control, and different measures have been developed to measure childhood self-regulation (Raver et al., 2012). Performance-based measures and observer-report measures are commonly used to assess children's self-regulation. Performance-based measures assess a child's performance on a task completed with an interviewer. For example, the Pencil Tap test is a common performance-based measure of self-regulation that requires children to follow certain rules, such as tapping their pencil twice when an assessor taps theirs once. This task requires children to remember rules and inhibit responses to tap more or less and measures their ability to do so consistently (Raver et al., 2012). Observer-report measures typically ask the child's caregiver or teacher to report on the child's behaviors that map onto self-regulatory tasks. Caregiver or teacher reports of children's self-regulation in their home or school context have been found to be minimally related to performance-based measures

(O'Meagher, Norris, Kemp, & Anderson, 2018), indicating that these different measurements may tap into different aspects of children's self-regulation.

Typically, studies exploring self-regulation isolate single, specific components of self-regulation, such as behavioral regulation, or use single types of measurement to capture a child's self-regulation or predict outcomes. In contrast, bidirectional models of self-regulation highlight the relationship between different indicators of self-regulation (Bridgett, Burt, Edwards, & Deater-Deckard, 2015; Ursache, 2014). Bi-directional models of self-regulation emphasize the interplay between top-down and bottom-up processes of self-regulation. Top-down self-regulation includes measures of effortful ("slow") regulatory processes, such as executive functioning (Ursache, 2014) or behavioral and emotional regulation (Bridgett et al., 2015) that are developing rapidly in preschoolers. As top-down self-regulation skills develop in a preschooler, they are more able to control their emotions in the classroom, such as managing frustration when needing to share a toy or during transitions. Bottom-up self-regulation includes measures of automatic ("quick") reactive and regulatory processes, such as physiological stress responses, emotional reactivity (Ursache, 2014), impulsivity, and fear (Bridgett et al., 2015). A child with difficulty with bottom-up self-regulation may present as more fearful and shy and may have impacted physiological stress response systems.

Including various constructs of self-regulation in a study can highlight the interplay between these different constructs and lead to the development of targeted interventions to support children's developing self-regulation. For example, if top-down self-regulation is influenced in part by a child's developing bottom-up self-regulation, then interventions that focus on improving bottom-up responses (i.e., decreasing a child's exhibited fear) may in turn enhance a child's top-down self-regulation (i.e., a child's ability to tolerate frustrating tasks in class).

In addition to gathering information on children's different aspects of self-regulation in the same study, there is value in gathering information from multiple informants. Observer-report methods often capture data from individuals, such as parents and teachers, who spend large amounts of time with children in a specific context. However, parent and teacher ratings of a child's self-regulation have been found to be only moderately correlated. In fact, in a meta-analysis of studies that gathered information on a child's behavior from different informants, parent and teacher reports had a mean correlation of only .28 (Achenbach, McConaughy, & Howell, 1987). More recent studies have also identified significant differences in parent and teacher reports of children's self-regulation (McCann, Rider, Weiss, Litman, & Baron, 2014; O'Meagher et al., 2018). Differences between parent reports is likely due to the different contexts in which the respondents interact with children, as well as the different demands put on children, and these differences are indicative of the need to include both parent and teacher reports in measures of preschoolers (Ezpeleta, Granero, Penelo, Osa, & Domènech, 2015).

Some research has found that attending preschool, in and of itself, does not significantly improve children's self-regulation (Skibbe, Connor, Morrison, & Jewkes, 2011), indicating that concerted effort needs to be put forth to enhance children's self-regulation in preschools. This may be because it is not preschool activities per se, but rather the experiences that children have in interaction with adults in the preschool setting, that supports the development of children's self-regulation. A number of interventions are available to support children's self-regulation in preschool settings. One such intervention incorporates skills related to self-regulation (resisting natural inhibitions, following alternative rules) into a twice weekly playgroup during the preschool day (Tominey & McClelland, 2011), which is an example of enhancing children's top-down self-regulation skills. In randomized trials, the intervention was found to significantly improve self-regulation skills for children with low initial levels of self-regulation (Tominey &

McClelland, 2011) and children in Head Start (Schmitt, McClelland, Tominey, & Acock, 2015). In another example, the Chicago School Readiness Project (CSRP) integrated mental health consultants with teacher training on using classroom strategies (such as managing challenging behaviors), and the approach was associated with improvements in children's self-regulation and school readiness (Raver et al., 2011). Enhancing the caregiving skills of teachers is an example of an intervention that may tap into bottom-up levels of self-regulation by enhancing the emotional support of the child's environment.

Adversity and Self-Regulation

An area that has been significantly understudied is the contribution of children's exposure to adversity and hardship to their school readiness and self-regulation (Kuhfeld et al., 2018), particularly for African American and Hispanic children and children living in low-income, urban environments. Studies identifying a link between childhood adversity and skills related to self-regulation more commonly include samples of older children (Kim & Cicchetti, 2010; Shipman et al., 2007). Research conducted specifically with preschool aged children that does exist has identified significant differences in self-regulation for children with maltreatment experience compared to those without; children with maltreatment experiences had significantly higher parent-reported problems with self-regulation across a number of domains (Fay-Stammbach & Hawes, 2018). However, one can see the added value that data from a second informant (such as a teacher) would add to the interpretation of these results, as parent reports of the child's self-regulation may be more linked to the maltreating parent's perceptions then to the child's self-regulation skills. Related to research on self-regulation in low-income preschool samples, in one study economic adversity accounted for part of the disparities in preschooler's school readiness, even above and beyond general intelligence and cognitive processing speed (Fitzpatrick, McKinnon, Blair, & Willoughby, 2014).

Bottom-up processes can be primed in children exposed to experiences that activate automatic, physiological survival systems (e.g., exposure to interpersonal violence, community violence, neglect, and physical, emotional, and sexual abuse) (Briggs-Gowan et al., 2015; Yehuda, Halligan, & Grossman, 2001). Based on the bi-directional model of self-regulation, one can hypothesize that poor bottom-up self-regulation due to childhood adversity may disrupt the development of top-down self-regulation skills. Disrupted development of top-down self-regulation may present as impaired effortful control of behaviors and emotions as well as poorer executive functioning skills in maltreated children.

However, there continues to be a dearth of available research exploring the relationship between self-regulation and adversity exposure in young children, particularly research that uses information from multi-methods (e.g., caregiver report and performance based tasks) or from multi-informants (e.g., caregivers and teachers) (Fay-Stammbach & Hawes, 2018). Research that examines the unique influences of cumulative adversity on the self-regulation of children with well-documented disparities in school readiness, such as with ethnic minority children and children living in poverty (Kuhfeld et al., 2018; Reardon & Galindo, 2009; Reardon & Portilla, 2016) is also lacking.

Theoretical Framework

In this study, a cumulative risk model is mapped onto Bronfenbrenner's ecological framework to conceptualize cumulative types of adversity. Children can experience adversity across a number of ecological systems, such as the microsystem (e.g., child abuse and neglect), the exosystem (e.g., community violence) and the macrosystem (e.g., cultural trauma). Bronfenbrenner's ecological framework supports an understanding of the various interacting contexts in which a child develops and demonstrates self-regulatory skills (Bronfenbrenner & Ceci, 1994). Children's interactions with home and school and other micro contexts may

influence their self-regulatory skills in each of the other systems, and children may exhibit different skills with different caregivers depending on the context. For this reason, in the current study, reports on children's self-regulation are obtained from both parents and teachers, to determine whether hypothesized pathways from cumulative adversity to self-regulation are similar for parents and teachers.

According to cumulative risk models, such as the model used in the ACEs study, it is the accumulation of these adverse experiences that disrupts children's development more than any single, specific adversity (Evans, Li, & Whipple, 2013). Cumulative risk models are frequently used when exploring childhood adversity exposure (Melville, 2017a; Mersky et al., 2013). In this study, a cumulative risk framework is used, in which the cumulative number of different types of environmental and household experiences is hypothesized to have an effect on a child's well-being, rather than the severity or frequency of such events. Based on Bronfenbrenner's different but intersecting systems, this study is looking specifically at the unique effects of traditionally used household/familial ACEs (such as domestic violence and parent substance use) as well as environmental/financial ACEs (such as community violence and food insecurity) that were suggested in Mersky et al.'s (2017) four factor structure of ACEs. These cumulative ACEs will be examined as two separate constructs as interventions targeted at preventing household versus economic adversities may vary significantly; thus, there is value in identifying the unique contribution that each play in the study outcomes.

Current Study

The current study aims to determine whether cumulative household and environmental childhood adversity predicts different constructs of children's self-regulation in an urban, predominantly Hispanic and African American sample. It was hypothesized that both environmental and household adversities would predict children's self-regulation. This study

also sought to determine whether cumulative adversity predicts children's top-down self-regulation indirectly through their bottom-up self-regulation (see Figure 1). Based on the literature, it was hypothesized that children's bottom-up regulation would mediate the relationship between cumulative adversity and top-down self-regulation.

Figure 1. Hypothesized Conceptual Model
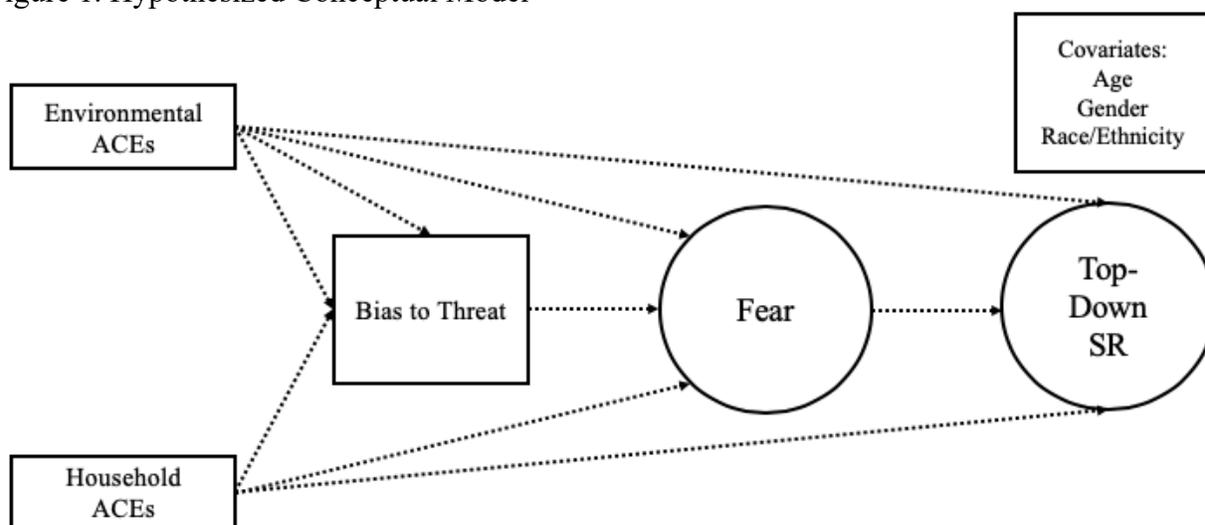
Method

Participants and Procedures

This study uses data from the initial stage of a multi-phase study conducted to explore the relationship between cumulative adversity exposure and child outcomes in the preschool context, drawing data from caregivers, teachers, and preschoolers. All study procedures were reviewed and approved by the University of Connecticut Institutional Review Board. Participants were recruited from a preschool in a large, urban city in the Northeast U.S. Child and caregiver sample demographics are available in Table 1. All 26 preschool teachers from the site were contacted for the study; of those, 22 teachers gave verbal consent for the researcher to recruit caregivers and children from their classrooms. Of the 22 teachers who agreed to recruit from their classrooms, one classroom did not have parents sign up, so the sample was drawn from 21 classrooms.

Teachers were all female and had a mean of 15 years of preschool teaching experience. Almost

half, 47.6%, of the teachers identified as non-Hispanic White (n=10), 5 as Hispanic (23.8%), 2 as

African American (14.3%), and 3 (14.3%) as another race.

Table 1. Preschool Sample Demographics (N=126)

Variable (range)	n (%) or Mean (SD)
Child Age (36-59 months)	48.5 (6.7)
Child Gender	
Female	73 (57.9)
Male	53 (42.1)
Child Race/Ethnicity	
Hispanic	90 (71.3)
African American	36 (28.6)
Other race	17 (13.5)
Caregiver Gender	
Female	114 (90.5)
Male	10 (7.9)
Missing	2 (1.6)
Caregiver Role	
Mother	110 (87.3)
Father	9 (7)
Other legal guardian[+]	7 (5.7)
Caregiver Age (19-74)	31 (7.3)
Caregiver Race/Ethnicity	
Hispanic	79 (62.7)
African American	19 (15.1)
Non-Hispanic White	20 (15.9)
Other race[2]	8 (6.3)

Note: Groups with less than n=10 were aggregated
[1]Non-Hispanic White, Asian, American Indian, and other races
[2] Asian, American Indian, and other races
[+]Including grandparent and adoptive parent

Teachers distributed a flyer to all caregivers in their classroom with study information.

Research staff onsite at the preschool screened caregivers and distributed and collected consent

forms as well as parent surveys. Parents provided consent, were enrolled, and completed the first

survey in the winter of the 2017-2018 school year. All caregivers who were screened for the study were eligible to participate in the study. In total, 181 caregivers were screened and given the study survey, and 126 caregivers returned the consent and survey and had their child enrolled in the study. After obtaining permission from parents for their child to participate in the study, teachers were consented and completed surveys and children were assented and completed a computer task. Caregivers and teachers received a gift card incentive for each survey completed and children received a sticker incentive for participating in the computer task.

Measures

Child adversity. Children's lifetime exposure to the following adverse experiences were gathered from caregivers: caregiver mental illness, family violence, incarcerated household member, household substance abuse, community violence exposure, food insecurity, foster care, neighborhood safety, family financial problems, and homelessness. These adversities were included based on prior studies on conventional and expanded ACEs (see Table 2 for operationalization of variables). Of note, due to findings from a pilot study for this project (Loomis & Mogro-Wilson, 2019), specific maltreatment variables, such as physical and sexual abuse were not specifically measured. Instead, child welfare involvement was used as a proxy of potential exposure to maltreatment. Each variable was dichotomized (yes/no) and summed together to create separate cumulative scores of environmental ACEs and household ACEs.

Self-regulation. Guided by the bi-directional model of self-regulation, top-down and bottom-up measures of the child's self-regulation were collected.

Table 2. Adverse Childhood Experiences Question and Measurement

Concept	Question	Measurement
	During your child's lifetime…	
Family Violence	Has the child ever seen, heard, or heard about adults in their household physically fighting, hitting, slapping, kicking, or pushing each other?	Yes/No
Caregiver mental illness	Do you or any of your child's other primary caregivers have depression or mental illness or past suicide attempts?	Yes/No[1]
Household substance abuse	Have any of the child's caregivers ever received treatment for alcohol or drug use?	Yes/No
Financial Problems	How often has your family experienced serious financial problems?[m]	5-point Likert[2]
Food Insecurity	Have you not been able to afford food?[m]	5-point Likert[3]
Homelessness	How often was your family homeless?[m]	5-point Likert[3]
Child Welfare Involvement	Was the household in which the child was living ever involved with DCF (the Department of Children and Families)? Was the child ever involved with DCF in another setting, such as in daycare, preschool, or any setting other than home?	Yes/No[1]
Household Member Arrested	Has your child ever known or seen that a family member was arrested, jailed, imprisoned or taken away?	Yes/No
Foster Care	Has your child ever been in foster care?	Yes/No
Community Violence	Has your child ever seen or heard people outside your family fighting, hitting, pushing, or attacking each other? Or seen or heard about violence such as beatings, shootings, or muggings that occurred in settings that are important to your child, such as school, your neighborhood, or the neighborhood of someone important to your child? [g]	Yes/No
Neighborhood Support	Do you feel that people in your neighborhood look out for each other, stand up for each other, and can be trusted?[w]	4-point Likert[4]
Unsafe Neighborhood	Do you feel safe in your neighborhood?[w]	4-point Likert[4]

[m](Mersky et al., 2017); [g](Ippen et al., 2002), [w](Wade et al., 2016),
[1]Marked as present if responded "yes" to either/any questions
[2]Sometimes, often, or very often marked as present
[3]Rarely, sometimes, often, or very often marked as present
[4]Some of the time or none of the time

Top-down self-regulation. Top-down self-regulation was measured through the inhibit and emotional control subscales of the Behavior Rating Inventory of Executive Functioning-Preschool Version (BRIEF-P). The BRIEF-P assesses self-regulation and executive functioning in preschool aged children as reported by parents and/or teachers (Gioia, Espy, & Isquith, 2003) and has been used past work to operationalize preschool self-regulation (Graziano et al., 2015). The BRIEF-P is available for children 2-6 years old, contains 63 questions rated on a 3-point Likert scale (never, sometimes, and, often), and takes approximately 10-15 minutes to complete. Internal consistency, reliability, and validity have been established for the BRIEF-P (Gioia, Espy, & Isquith, 2003) and reliability and validity of the five-scale structure of the BRIEF-P has been supported through confirmatory factor analysis (Ezpeleta et al., 2015). Internal consistency coefficients for the two scales in this study ranged from .87-.91 for parents and .93 to .95 for teachers.

Bottom-up self-regulation. Bottom-up self-regulation was measured through both parent and teacher report of fear as well as through a child-administered task that measures attention bias to threatening images.

Bias to threat. Bias to threat was captured using the dot-probe task, a widely used measure of attentional biases toward or away from emotionally charged stimuli that has more recently been used with young children (Briggs-Gowan et al., 2015, 2016; Susa, Pitică, Benga, & Miclea, 2012; Ursache & Blair, 2015). This procedure was adapted from a protocol for the dot-probe task previously modified for use with preschool children (Briggs-Gowan et al., 2015, 2016) and was administered at the school. Ten children were not included in the dot-probe task due to chronic absences during the data collection period or disenrollment from school in between the parent survey and the child data collection period, thus 116 children were administered the dot-probe task.

Each trial of the dot-probe task began with the presentation of a 500-ms central fixation cross. The cross was followed by a 750-ms presentation of a pair of faces (IAPS; Center for the Study of Emotion and Attention, 1999) that appeared to the right and left of the fixation cross. Face pairs were photographs of emotional expressions of the same person (Angry-Neutral, Happy-Neutral, Neutral-Neutral). The location (left/right) for each type of emotional stimuli was counterbalanced. Immediately after the face-pair appears on screen, a target (a coin) appeared on the left or right side of the screen. Children were asked to "catch as many coins as possible as quickly as possible". In order to "catch a coin" children were asked to press the button that corresponded with the side of the screen on which the coin appeared. The coin remained on the screen until the child pressed a button. Based on initial piloting of this task, the task was set up as four sets of 20 trials, with an opportunity for researcher feedback and encouragement for several seconds in between each trial.

The task began with 10 practice trials with the option of completing the practice trials twice. If children did not reach 70% accuracy in the practice round, the task was discontinued (n=10). The task was discontinued if the child asked to stop the task or became too distracted to continue. Ninety-six children completed the first set of trials, 77 completed the second set, 65 completed the third set, and 59 children completed all four sets of trials. The task took 5-10 minutes depending on how long it took for children to "catch the coins" in each trial and the number of sets of trials completed. The dot-probe task was administered using E-Prime Version 3.0 software on a laptop.

The dot-probe raw data was cleaned using established standards (Briggs-Gowan et al., 2016; Pine et al., 2005), which included deleting incorrect trials (trials where a child pressed the button that did not correspond with the side of the screen that the coin was on), cleaning reaction times (RT) that were <200 ms, >7000 ms, or >2.5 SDs from the child's mean RT across all

emotions, and reining in trials that were > 3.5 SDs from the sample mean (n=2). Data were not used for a child if there were less than seven usable RTs for the anger condition (n= 17) or if accuracy was below 65% (n= 16). After data cleaning, attention bias data was available for 71 children.

Chi-square and independent samples t-test analyses were run to determine whether key variables predicted whether a child had a valid score or not. Children who did not attempt the dot-probe (n=10), as noted above due to chronic absenteeism or being disenrolled from the school prior to the child data collection period, had significantly higher household ACEs ($M =$ 2.3, $SD = 1.57$) than children who attempted the task ($M = 1.27$, $SD = 1.23$); t(124) = 2.48, $p=$ .015. There were no significant differences based on adversity exposure for children who attempted the task but did not have scorable data (e.g., due to low accuracy or too few data points to obtain a valid score). However, children without scorable data were more likely to be age three, X^2 (1, n=126) = 20.37, p<.001, indicating that although the task may be appropriate for some children age three, there is a higher risk of not being able to capture bias scores in this age range.

Fear. Fear was measured using the 6-question fear subscale of the Child Behavior Questionnaire-Short Form (CBQ-SF; Putnam & Rothbart, 2006) and the fear subscale of the CBQ-TSF, a version of the CBQ-SF adapted for use by preschool and kindergarten teachers (Teglasi et al., 2015). This subscale has been used with parents and teachers in prior work that looked at links between fear and top-down self-regulation in young children (Nozadi, Spinrad, Eisenberg, & Eggum-wilkens, 2015). The CBQ-TSF fear subscale is significantly associated with preschool teacher ratings of social competence (Teglasi et al., 2015).

The CBQ-SF asks caregivers to rate the child on a 7-point Likert scale ranging from 1 (extremely untrue of your child) to 7 (extremely true of your child). The CBQ-SF Fear subscale

has questions that measure the presence of fear (e.g., is afraid of loud noises) as well as the absence of fear (e.g., is not afraid of the dark) which are typically reverse coded for scoring. Prior research on child symptomatology has recommended not using reverse-coded questions in subscales, due to the potential for incorrect responses to reverse coded questions as well as findings that the reverse of a construct (such as fear) may not be the same as the opposite of that construct (Rodebaugh, Woods, & Heimberg, 2007). Thus, the four affirmative questions of the CBQ-SF fear subscale were used to create a latent constructs of parent and teacher-rated fear.

Covariates. Child age, gender, and race/ethnicity are used as covariates in all initial path models.

Data Analysis

Descriptive analyses were used to explore the prevalence rates of cumulative adversity exposure among this preschool population. Foster care involvement was not included in descriptive statistics or analyses as the reported rate of exposure was less than 5% of the sample. Bivariate analyses were run to determine the relationship between key variables.

Latent variables for top-down self-regulation were formed with the t-scores from the BRIEF emotional control and inhibitory control subscales, which are normed for both child age and gender. Unique latent variables for teacher and parent reports of children's fear were created using the four included questions from the CBQ – fear subscale. Due to poor fit in a confirmatory factor analysis (CFA), fear and attention bias to threat were not included into a latent variable of bottom-up self-regulation, but rather were included separately within models. Latent variable models for teacher and parent self-regulation were assessed for adequate to exact model fit with CFA models prior to running path models. All models were run using the MPlus "TYPE=COMPLEX" and "CLUSTER" options to correct standard errors due to children being nested within classrooms (Muthén & Muthén, 1998).

Structural equation modeling (SEM) path analysis was conducted to simultaneously examine direct and indirect pathways between household and environmental ACEs, bottom-up self-regulation and top-down self-regulation. SEM allows for testing of theory-driven research and testing of reciprocal relationships (Jaccard & Jacoby, 2010), which is highly relevant to a novel application of the bidirectional model of self-regulation to maltreated children. In each model, the direct pathway from ACEs to top-down self-regulation and the indirect pathway through bottom-up self-regulation was examined. Models were run separately with fear, attention bias, and with attention bias predicting fear as the bottom-up self-regulation. In the exploratory mediated mediator model (attention bias predicting fear), attention bias was included as a predictor of fear as children's bias was an observed variable while fear was gathered through parent/teacher report, so it was hypothesized that children's performance on the observational task would predict informant observations, rather than the other way around.

Due to the small sample size, there was not enough power to conduct more complex and/or multi-group path analyses with the latent variables, as evidenced by models that would not converge or had errors. The cluster size (number of classrooms) reaches the minimal threshold for SEM TYPE = COMPLEX analyses, however recommendations for multi-level analyses are for cluster sizes of 30-50 (Muthén & Muthén, 2012), thus analyses did not include second level factors such as teacher level variables. To decrease the complexity of models run, pathways were pruned if not significant in the model and after assessing for model fit, the more parsimonious models were chosen for reporting. Based on the presence of missing data, particularly for the dot-probe data, robust maximum likelihood estimation (MLR) was used for path analyses. MLR estimation provides the most accurate parameter estimates when missing data is present (Enders, 2010). In MRL, Mplus treats missing data as missing at random (Little &

Rubin, 2002), and missingness is treated as a function of included covariates and outcome variables.

The following measures and fit indices of acceptable to exact fit were used to evaluate all models: Comparative Fit Index (CFI) of > .90, Tucker-Lewis Index (TLI) of > .90, Root Mean Square Error of Approximation (RMSEA) of < .08, and Standardized Root Mean Residual (SRMR) of < .08. Data cleaning, descriptive, and bivariate analyses were conducted using SPSS Version 25.0 and SEM analyses were conducted using Mplus Diagrammer Version 1.6.

Results

Descriptive Statistics

Descriptions of key variables are found in Table 3. Correlations between key variables are reported in Table 4. Child age (in months) was not significantly associated with any key variables and pathways from child age to dependent variables was pruned from path analysis models.

Parent ratings of emotional control and teacher ratings of inhibitory control were significantly higher for boys than girls. Parent-rated fear and teacher-rated emotional control were significantly different for African American children, with lower mean levels of parent-rated fear [t (123) = 3.09, p= .002] and higher mean ratings of teacher-reported emotional control [t (48) = -2.2, p= .03] compared to their non-African American peers. Hispanic children and non-Hispanic children did not significantly differ on any key variables. Of note, parent and teacher ratings of child fear were not correlated. However, parent and teacher ratings of inhibitory control were significantly positively correlated, as were their ratings of the child's emotional control, indicating moderate levels of congruence between child and teacher-ratings of children's top-down self-regulation.

Table 3. Descriptives of Key Variables

Variable (range)	n	M (SD) or n (%)
Parent-Reported SR		
BRIEF Emotional Control (35-89)	123	53.48 (12.35)
BRIEF Inhibition (34-87)	123	55.32 (12.42)
CBQ Fear	125	4.32 (1.64)
Teacher-Reported SR		
BRIEF Emotional Control (40-89)	125	51.83 (13.37)
BRIEF Inhibition (39-86)	125	52.19 (11.02)
CBQ Fear	122	3.52 (1.53)
Attention Bias (-614.74-654.84)	71	20.64 (167.81)
Adverse Childhood Experiences	126	
Total ACEs (0-9)		2.58 (2.01)
Household ACEs (0-5)		1.36 (1.28)
Domestic violence		25 (19.8)
Household member arrested		16 (12.7)
Caregiver mental illness		23 (18.3)
Caregiver substance abuse		12 (9.5)
Single parent household		66 (52.4)
DCF involvement		29 (23.0)
Environmental ACEs (0-5)		1.22 (1.25)
Community violence		23 (18.3)
Food insecurity		16 (12.7)
Financial distress		39 (31.0)
Unsafe neighborhood		35 (27.8)
Lack of neighborhood support		41 (32.5)
Homelessness		8 (6.3)

Children's exposure to cumulative adversies was significantly correlated with parent and teacher ratings of their self-regulation. Exposure to household ACEs was moderately associated with exposure to environmental ACEs. There were no significant differences in the number of household or environmental ACEs a child had experienced based on their age, race/ethnicity, or gender.

Pathways from Adversity to Self-Regulation

Results from structural models for parents and teachers with pathways from cumulative adversity to top-down self-regulation through fear, bias to threat, and fear through bias to threat

are presented in Table 5. The hypothesized structural models for parents and teachers fit the provided acceptable to exact fit indices, indicating that the data was a good fit to the model. Direct pathways from cumulative household ACEs to key variables were not significant for parent or teachers. In all models including bias, the direct pathway from environmental ACEs to bias was significant (B = .20, p=.009); meaning that higher cumulative environmental ACEs predicted higher bias towards angry faces. For parents, a direct relationship was also found between environmental ACEs and self-regulation (B = .26, p=.001) and the relationship between household ACEs and parent-rated self-regulation trended in the hypothesized direction (B = .13, p=.112).

Table 4. Correlations among Key Variables

		1	2	3	4	5	6	7	8	9
1	Cumulative ACEs	1								
2	Household ACEs	.80**	1							
3	Env. ACEs	.79**	.27**	1						
4	Anger Bias	.10	-.03	.18	1					
5	Fear^P	.06	-.03	.13	.16	1				
6	Fear^T	-.02	-.11	.09	.24*	.10	1			
7	Inhibition^P	.24**	.13	.26**	-.03	.23*	-.06	1		
8	Emotion control^P	.29**	.20*	.26**	-.05	.25**	-.12	.76**	1	
9	Inhibition^T	.14	.10	.13	.31*	.04	.27**	.32**	.24*	1
10	Emotion control^T	.19*	.19*	.12	.16	-.03	.22*	.28**	.34**	.68**

*p<.05 **p<.01; ^{T} indicates teacher-rated measures; ^{P} indicates parent-rated measures
ACEs = adverse childhood experiences

In the bias only model, bias significantly predicted top-down self-regulation for teachers but not for parents; however, indirect effects from cumulative adversity to self-regulation through bias were not significant for teachers or parents. In the fear-only model, environmental ACEs significantly predicted observed fear for teachers (B = .14, p=.030) and trended in the expected direction for parents (B = .16, p=.093), indicating that higher cumulative environmental ACEs contributed to more observed fear from both parents and teachers. In the fear-only model, both parent and teacher reported fear predicted their respective reports of the

child's top-down self-regulation. For teachers, indirect effects from cumulative adversity to top-down self-regulation through fear trended in a direction that indicates a potential full mediation that warrants exploration in future research with a larger sample (B = .05, $p=.105$).

Table 5. Standardized Path Coefficients B (SE)

	Mediator in Model					
	Bias		Fear		Bias → Fear[a]	
	Teacher	Parent	Teacher	Parent	Teacher	Parent
Direct effects						
Env. ACE on M	.19 (.08)**	.21 (.08)**	.14 (.06)*	.16 (.09)+	.20 (.08)**	.21 (.08)**
House ACE on M	-.04 (.15)	-.07 (.16)	.11 (.13)	-.05 (11)	-.04 (.15)	-.08 (.16)
Bias on fear	--	--	--	--	.24 (.12)*	.20 (.10)*
Fear on SR	--	--	.31 (.12)**	.32 (.10)**	.26 (.12)*	.31 (.10)**
Bias on SR	.27 (.14)*	-.10 (.11)	--	--	--	--
Total indirect effect						
Env. ACE to SR	.05 (.04)	-.02 (.03)	.05 (.03)+	.05 (.03)	.07 (.04)*	-.01 (.01)
House ACE to SR	-.01 (.04)	.01 (.02)	-.03 (.04)	-.02 (.03)	-.04 (.05)	.01 (.01)+
Model Fit						
X^2 (p-value)	7.49 (.59)	8.98 (.25)	41.60 (.10)	25.48 (.38)	56.49 (.39)	29.24 (.30)
RMSEA (95% CI)	.00 (.00-.08)	.05 (.00-.13)	.05 (.00-.09)	.02 (.00-.08)	.06 (.01-.09)	.00 (.00-.07)
CFI	1.00	.98	.96	.99	.94	1.00
TLI	1.03	.97	.95	.99	.92	1.01
SRMR	.04	.04	.05	.05	.06	.06

ACE = adverse childhood experiences; SR = self-regulation; M = mediator
Note: Models control for child gender, age, and race/ethnicity
[a]Pathway to bias reported as direct effects
$^+p<.1$, $*p<.05$, $**p<.01$, $***p<.001$

In the bias + fear model the pathway from attention bias to fear was significant for both teachers and parents, as was the pathway from fear to problems in self-regulation. Hypothesized directions were confirmed, in that higher bias to threat predicted higher teacher and parent rated fear, and higher ratings of fear predicted more reported problems in self-regulation. For parents, the indirect effects of the pathways from ACEs to self-regulation through bias to threat and fear approached significance (B = .01, $p=.10$). This suggests a partially mediated relationship, whereby environmental ACES predicted self-regulation both directly and indirectly through bottom-up indicators of self-regulation. For teachers, the direct pathway from cumulative ACEs

to self-regulation were not significant. The indirect effects of the pathways were significant (B = .07, $p=.049$) but small.

As is common with mediation models, indirect effects for the models were small (.07-.01). This is likely due to these effects being the product of three regression coefficients. Despite being small, these indirect effects should not be dismissed, but rather should be explored in a larger study with more classrooms and a larger sample size. Cumulative adversity, bias to threat, and fear explained approximately a quarter of the variance in problems in emotional regulation for both parents ($R^2 = .22$, $p=.015$) and teachers ($R^2 = .26$, $p= .005$), indicating that these variables are of significant importance to consider within preschool and home contexts.

Discussion

The goal of this study was to explore the relationship between household and cumulative adversity exposure and preschool self-regulation in a predominantly Hispanic and African American sample. Further, this study aimed to identify whether bottom-up constructs of self-regulation mediate the relationship between cumulative adversity and top-down self-regulation to inform future preschool interventions. It was hypothesized that higher cumulative household and environmental adversity would predict greater problems with self-regulation and higher threat responses and that threat/fear would mediate the relationship between cumulative adversity and self-regulation. These hypotheses were grounded in ecological theory and the bi-directional model of self-regulation. Exploring the predicted pathways for both parent and teacher reports of children's self-regulation allowed for a more in-depth exploration of the relationship between cumulative adversity and constructs of self-regulation across contexts.

Exposure to adverse childhood experiences in this sample was comparable, and in some instances higher, compared to other samples of urban, minority preschoolers. For example, similar to prevalence rates in Jimenez et al.'s (2016) study of preschool-aged children in a

national, urban birth cohort, the prevalence rates of having had a household member arrested was

18% (compared to 16% in this study), prevalence of caregiver substance abuse was 15%

(compared to 12% in this study), and although not analyzed as an ACE specifically in the

Jimenez et al. (2016) study, the prevalence of financial distress, as measured by a household

income of < $20,000 was 35% (compared to 39% in this study). However, a number of ACEs

were significantly higher in this sample compared to Jimenez et al.'s sample, including maternal

depression (12% in the Jimenez et al. study compared to 23% in this study) and domestic

violence exposure (11% in the Jimenez et al. study compared to 25% in this study).

This study measured cumulative household adversity (domestic violence, household

member arrested, caregiver mental illness, parental separation/single parent household, child

welfare involvement) and cumulative environmental adversity (community violence, food

insecurity, financial distress, unsafe neighborhood, lack of neighborhood support, homelessness).

Traditionally, cumulative adversity is measured as a single construct including cumulative

exposure to all types of adversities (Dube et al., 2003; Felitti et al., 1998), and this approach was

also taken in recent studies that incorporate expanded ACEs not measured in the original ACE

surveys (Merrick et al., 2017; Wade, Shea, Rubin, & Wood, 2014). More recently, factor

structures beyond the one or two factor structure of the original research have been identified

(Mersky et al., 2017), suggesting the potential validity of including distinct ACEs to measure

economic hardship separately from household ACEs. In this study, household and environmental

ACEs were significantly positively correlated ($r = .27$), however the correlation was weak which

indicates that the subgroups are measuring different constellations of risk that warrant being

independently considered.

Similar to work done by Fay-Stammbach and Hayes (2018), children's adversity

exposure in this study was correlated with higher parent-reported problems in domains of self-

regulation on the BRIEF-P. Within path models, separate pathways from cumulative environmental adversity to both attentional bias to threat and fear were significant, suggesting influences of economic hardship and violence/lack of safety in the environment on children's hypervigilance toward threat and fear-related behaviors. Although the effects of only community violence exposure was not measured in this study, these findings do map onto research with older African American children where hypervigilance was found to mediate the relationship between community violence exposure and child outcomes (Kohl, Gross, Harrison, & Richards, 2015).

Although it was not surprising that cumulative environmental adversity predicted bias to threat and fear in the path models, it was notable that household adversity did not predict any of the self-regulation variables in path analyses. Prior work looking at the effect of cumulative household adversity and maltreatment has found relationships between cumulative adversity and school readiness outcomes, such as academic skills, aggression, and social problems (Jimenez et al., 2016), suggesting that household adversity should have an effect on the outcomes in this study. However, it may be that the effects of the cumulative environmental adversity essentially "washed out" the effects of the household adversity. In fact, some work comparing the effects of risk factors (including primarily economic and neighborhood adversities) versus early histories of maltreatment on children's long-term behavior problems found that cumulative risk was a stronger predictor of children's behavior problems than actual maltreatment reports (MacKenzie, Kotch, Lee, Augsberger, & Hutto, 2011). In MacKenzie et al.'s (2011) study and in this study, it appears that cumulative environmental adversity may be particularly salient for young children. This may especially be the case for racial and ethnic minority children living in low-income, urban environments, who may be exposed to higher rates of environmental adversities than other children.

Within path models, independent pathways from attention bias and fear to self-regulation were significant for teacher reports, and the pathway from fear to self-regulation was significant for parent reports. Indirect effects with models separately looking at attention bias and fear as mediators between environmental adversity and self-regulation were not significant for parents or teachers; however, they were trending in directions suggesting that mediation effects would be found in a larger sample. Within the bias + fear model, pathways from attention bias to fear were significant for both parents and teachers, suggesting that children's hypervigilance to threatening images may predict parent and teacher's observations of children's fearful behaviors. Indirect effects in this mediated mediator model were significant for teachers, suggesting that bias to threat and fear significantly mediated the relationship between environmental adversity and self-regulation.

These findings suggest some consistency in parent and teacher reports of the relationship between bottom-up and top-down self-regulation in a sample of children exposed to high rates of adversity, despite a lack of strong consistency between parent and teacher reports of independent self-regulation variables. As noted, multi-method and multi-informant research on the self-regulation of preschoolers who have been exposed to maltreatment and other adversity is rare (Fay-Stammbach & Hawes, 2018). This study uses various methods, including both caregiver report and performance measures of children's self-regulation, and gathers information from both parents and teachers. The fact that relationships between cumulative adversity and the included variables and model pathways are relatively similar between parents and teachers serves to highlight the importance of considering the relationship between these variables further.

The findings related to the independent contribution of environmental adversity are important, both in supporting the use of an ecological model to conceptualize early childhood adversity in future work and for informing trauma-informed early childhood interventions with

families and schools. Many trauma-informed mental health models used with young children focus on changing child or parent behaviors (Melville, 2017b). This study points to a need to focus on implementing interventions that target the environments in which children and caregivers live in order to promote children's well-being as well as school readiness and later outcomes. Such interventions may focus, for example, on reducing community violence and enhancing the economic well-being of families. In fact, recent work looking at national trends in minimum wages and child maltreatment reports found that a $1 increase in minimum wage was associated with an almost 10% decrease in child maltreatment reports, particularly for young children ages 0-6 (Raissian & Bullinger, 2017), highlighting the importance of addressing structural and economic factors that influence young children's well-being.

An example of an intervention that recognizes both interpersonal and environmental family adversities is Child First, a model that includes services from a mental health clinician and services from a case manager to address environmental stressors. In a randomized control trial, families receiving this intervention had higher service access, lower protective service involvement, lower parenting stress, and lower child psychopathology at follow-ups compared to control families receiving treatment as usual (Lowell, Carter, Godoy, Paulicin, & Briggs-Gowan, 2011). Future research should focus on the specific impact of combining case management with trauma-focused interventions to address and prevent the environmental stressors that were found to make such a contribution in this study.

Addressing gaps in early academic achievement for young ethnic minority children and children living in poverty has been an area of much focus and intervention in schools, however with little resulting changes (Garcia & Weiss, 2017). Focusing on the effects of cumulative environmental and household adversity on children's school readiness requires attention to both preventing the adverse environments within which children are living and intervening to support

the development of self-regulation in young children. One way to intervene may be the use of interventions that seek to improve children's self-regulation, such as those that include teacher coaching, mental health consultation, and targeted skill development with children (Raver et al., 2011; Schmitt et al., 2015). School-based self-regulation interventions may have more significant effects for children who have low-self-regulation at baseline (Tominey & McClelland, 2011), indicating that they may be particularly beneficial for young ethnic minority children in low-income urban environments at risk of self-regulation deficits due to cumulative adversity exposure.

Increasingly, trauma-informed education is being conceptualized as a way to intervene to mitigate the effects of adversity exposure within a natural system of care (Chafouleas, Johnson, Overstreet, & Santos, 2016; Loomis, 2018). Recommendations for trauma-informed preschools include a focus on trauma-informed workforce development, interventions that support children's socioemotional health, classroom curricula that focuses on emotional regulation, and the development of a trauma-informed school climate (Loomis, 2018). Children who experience high rates of environmental adversity, such as community violence and food insecurity, may not typically be targeted for trauma-informed interventions that seek to reduce children's fear-based responses. The current study suggests that providing children with high environmental adversity with trauma-informed supports and resources may be a key step towards ensuring healthy development for all youth.

The findings of the current study also suggest that interventions that focus solely on top-down self-regulation, such as those discussed above, may not be sufficient for children who have experienced trauma. Interventions that reduce fear and address bias to threat in adversity-exposed children may also be needed in order to fully support the development of top-down self-regulation. Such interventions may focus on supporting children during classroom routines that

may elicit fear, such as if lights are dimmed during naptime, to help reduce the amount of fear during these typical daily activities. Other interventions may focus on helping teachers to reduce fear-inducing behaviors, such as yelling or raising their voice, in order to minimize the threat that students may perceive in a classroom environment.

Limitations

There are many strengths to this study, notably the multi-method and multi-informant design and the collection of data on a wide range of child adversities. However, there are limitations to this study that should be considered. First, cumulative adversity is measured through parent-report only. Due to social desirability bias, parents may have been reluctant to disclose their child's exposures to various adversities, resulting in underreporting of their child's adversities. It should be noted, however, that the prevalence rates of cumulative adversities in this study mirror those found in other studies, notably over 50% of children having one or more ACE (Jimenez et al., 2016), indicating that there is some validity to the cumulative adversity as collected.

Additionally, there are obvious limitations based on the amount of missing data on the dot-probe task. Although the dot probe task has been used in prior studies with preschool-aged children, this is the first study to use the dot probe with a large sample of preschool-aged children as young as three. Compared to a mean age of 4 years old (48 months) in this study, the mean age in a Susa et al. (2012) preschool dot probe study is age six and the mean age in the Briggs-Gowan et al. (2016) study using the dot probe is age five. Based on these findings, it appears that age had an effect on the scoring of children's task in this study. Although the missing dot probe data did not significantly affect the study findings (models were run without the dot-probe and overall results and parameter estimates were very similar to those run with the dot-probe data), the missing data does limit the robustness of our findings. However, this

provides novel information for future studies, which should explore changes in the dot-probe over the course of the preschool year to determine whether there is a cut-off within age three (such as at age 42 months) after which the dot-probe task may be more appropriate for administration. As this is a task that has not been widely used with preschool populations, there is value in continuing to explore this task within the context of adversity exposure and preschool self-regulation.

Conclusion

This study is one of the first to explore the relationship between environmental and household cumulative adversity exposure and multiple measures of self-regulation in a predominantly Hispanic and African American preschool sample. This study identified pathways from cumulative environmental adversity through bottom-up self-regulation (attention bias to threat and fear) to top-down self-regulation (inhibitory and emotional control). In the study, children with more cumulative environmental adversity demonstrated a greater hypervigilance towards threat, higher teacher and parent-reported fear, and more self-regulation problems as reported by teachers and parents. Implications support the exploration of interventions that support bottom-up self-regulation of young, adversity-exposed children that reduce hypervigilance toward threat and fear to support inhibitory and emotional self-regulation and promote school readiness. Additionally, children who experience high rates of environmental adversity, such as community violence and food insecurity, may not traditionally be targeted for trauma-informed interventions that seek to reduce children's fear-based responses. This study suggests that providing children who have experienced high rates of environmental adversity with trauma-informed supports and resources may be a key step towards ensuring healthy development for all youth.

References

Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, *101*(2), 213–232. https://doi.org/10.1037/0033-2909.101.2.213

Blair, C., & Raver, C. C. (2015). School readiness and self-regulation: A developmental pyschobiological approach. *Annual Review of Psychology*, *66*, 711–731. https://doi.org/10.1146/annurev-psych-010814-015221.School

Bridgett, D. J., Burt, N. M., Edwards, E. S., & Deater-Deckard, K. (2015). Intergenerational transmission of self-regulation: A multidisciplinary review and integrative conceptual framework. *Psychological Bulletin*, *141*(3), 602–654. https://doi.org/10.1037/a0038662

Briggs-Gowan, M. J., Grasso, D., Bar-Haim, Y., Voss, J., McCarthy, K. J., Pine, D. S., & Wakschlag, L. S. (2016). Attention bias in the developmental unfolding of post-traumatic stress symptoms in young children at risk. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *57*(9), 1083–1091. https://doi.org/10.1111/jcpp.12577

Briggs-Gowan, M. J., Pollak, S. D., Grasso, D., Voss, J., Mian, N. D., Zobel, E., … Pine, D. S. (2015). Attention bias and anxiety in young children exposed to family violence. *Journal of Child Psychology and Psychiatry*, *56*(11), 1194–1201. https://doi.org/10.1111/jcpp.12397

Brockie, T. N., Dana-Sacco, G., Wallen, G. R., Wilcox, H. C., & Campbell, J. C. (2015). The relationship of adverse childhood experiences to PTSD, depression, poly-drug use and suicide attempt in reservation-based Native American adolescents and young adults. *American Journal of Community Psychology*. https://doi.org/10.1007/s10464-015-9721-3

Bronfenbrenner, U., & Ceci, S. J. (1994). Nature-nuture reconceptualized in developmental

    perspective: A bioecological model. *Psychological Review*, *101*(4), 568–586.

    https://doi.org/10.1037/0033-295X.101.4.568

Center for the Study of Emotion and Attention [CSEA NIMH] (1999). *The International*

    Affective Picture System: Digitized photographs. Gainesville, FL: University of Florida,

    The Center for Research in Psychophysiology.

Chafouleas, S. M., Johnson, A. H., Overstreet, S., & Santos, N. M. (2016). Toward a blueprint

    for trauma-informed service delivery in schools. *School Mental Health*, *8*(1), 144–162.

    https://doi.org/10.1007/s12310-015-9166-8

Dube, S. R., Felitti, V. J., Dong, M., Giles, W. H., & Anda, R. F. (2003). The impact of adverse

    childhood experiences on health problems: Evidence from four birth cohorts dating back to

    1900. *Preventive Medicine*, *37*(3), 268–277. https://doi.org/10.1016/S0091-7435(03)00123-

    3

Evans, G. W., Li, D., & Whipple, S. S. (2013). Cumulative risk and child development.

    Psychological Bulletin, *139*(6), 1342–1396. https://doi.org/10.1037/a0031808

Ezpeleta, L., Granero, R., Penelo, E., Osa, N. De, & Domènech, J. M. (2015). Behavior Rating

    Inventory of Executive Functioning – Preschool (BRIEF-P) applied to teachers :

    Psychometric properties and usefulness for disruptive disorders in 3-year-old preschoolers.

    Journal of Attention Disorders, *19*(6), 476–488. https://doi.org/10.1177/1087054712466439

Fantuzzo, J. W., & Fusco, R. A. (2007). Children's direct exposure to types of domestic violence

    crime: A population-based investigation. *Journal of Family Violence*, *22*(7), 543–552.

    https://doi.org/10.1007/s10896-007-9105-z

Fay-Stammbach, T., & Hawes, D. J. (2018). Caregiver ratings and performance-based indices of executive function among preschoolers with and without maltreatment experience. *Child Neuropsychology*, *00*(00), 1–21. https://doi.org/10.1080/09297049.2018.1530344

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., … Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *American Journal of Preventive Medicine*, *14*(4), 245–258. https://doi.org/10.1016/S0749-3797(98)00017-8

Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2015). A revised inventory of Adverse Childhood Experiences. *Child Abuse and Neglect*, *48*, 13–21. https://doi.org/10.1016/j.chiabu.2015.07.011

Fitzpatrick, C., McKinnon, R. D., Blair, C. B., & Willoughby, M. T. (2014). Do preschool executive function skills explain the school readiness gap between advantaged and disadvantaged children? *Learning and Instruction*, *30*, 25–31. https://doi.org/10.1016/j.learninstruc.2013.11.003

Garcia, E., & Weiss, E. (2017). *Education inequalities at the school starting gate: Gaps, trends, and strategies to address them*. Washington, D.C.: Economic Policy Institute. Retrieved from https://www.epi.org/publication/education-inequalities-at-the-school-starting-gate/

Gilliam, W. S., Maupin, A. N., Reyes, C. R., Accavitti, M., Shic, F., Fontaine, J. J., … Stevenson, H. (2016). *Do early educators' implicit biases regarding sex and race relate to behavior expectations and recommendations of preschool expulsions and suspensions*? New Haven, CT: Yale University Child Study Center. Retrieved from http://ziglercenter.yale.edu/publications/Preschool Implicit Bias Policy Brief_final_9_26_276766_5379.pdf

Gioia, G. A., Espy, K. A., & Isquith, P. K. (2003). *Behavior Rating Inventory of Executive Function–Preschool (BRIEF-P) version.* Lutz, FL: Psychological Assessment Resources.

Graziano, P. A., Slavec, J., Ros, R., Garb, L., Hart, K., & Garcia, A. (2015). Self-regulation assessment among preschoolers with externalizing behavior problems. *Psychological Assessment*, *27*(4), 1337–1348. https://doi.org/10.1037/pas0000113

Jaccard, J., & Jacoby, J. (2010). Theory construction and model-building skills: a practical guide for social scientists. *Methodology in the social sciences*. New York, NY: The Guilford Press. https://doi.org/34,11

Jimenez, M. E., Wade, R., Lin, Y., Morrow, L. M., & Reichman, N. E. (2016). Adverse experiences in early childhood and kindergarten outcomes. *Pediatrics*, *137*(2), 1–11. https://doi.org/10.1542/peds.2015-1839

Kim-Spoon, J., Haskett, M. E., Longo, G. S., & Nice, R. (2012). Longitudinal study of self-regulation, positive parenting, and adjustment problems among physically abused children. *Child Abuse and Neglect*, *36*(2), 95–107. https://doi.org/10.1016/j.chiabu.2011.09.016

Kim, J., & Cicchetti, D. (2010). Longitudinal pathways linking child maltreatment, emotion regulation, peer relations, and psychopathology. *The Journal of Child Psychology and Psychiatry*, *51*(6), 706–716. https://doi.org/10.1111/j.1469-7610.2009.02202.x

Koball, H., & Jiang, Y. (2018). Basic facts about low-income children: Children under 9 years, 2016. New York, NY. Retrieved from http://www.nccp.org/publications/pdf/text_1194.pdf

Kohl, K. L., Gross, I. M., Harrison, P. R., & Richards, M. H. (2015). Numbing and hyperarousal as hediators of exposure to community violence and depression in urban African-American youth. *Journal of Child and Adolescent Trauma*, *8*(1), 33–43. https://doi.org/10.1007/s40653-015-0038-z

Kuhfeld, M., Gershoff, E., & Paschall, K. (2018). The development of racial/ethnic and socioeconomic achievement gaps during the school years. *Journal of Applied Developmental Psychology*, *57*(2017), 62–73. https://doi.org/10.1016/j.appdev.2018.07.001

Liming, K. W., & Grube, W. A. (2018). Wellbeing outcomes for children exposed to multiple adverse experiences in early childhood: A systematic review. *Child and Adolescent Social Work Journal*, *35*(4), 317–335. https://doi.org/10.1007/s10560-018-0532-x

Little, R. J., & Rubin, D. B. (2002). Statistical analysis with missing data. Hoboken, NJ: John Wiley & Sons, Inc. https://doi.org/10.2307/1533221

Loomis, A. M. (2018). The role of preschool as a point of intervention and prevention for trauma-exposed children: Recommendations for practice, policy, and research. *Topics in Early Childhood Special Education*, *38*(3), 134–145. https://doi.org/10.1177/0271121418789254

Lowell, D. I., Carter, A. S., Godoy, L., Paulicin, B., & Briggs-Gowan, M. J. (2011). A randomized controlled trial of Child First: A comprehensive home-based intervention translating research into early childhood practice. *Child Development*, *82*(1), 193–208. https://doi.org/10.1111/j.1467-8624.2010.01550.x

MacKenzie, M. J., Kotch, J. B., Lee, L. C., Augsberger, A., & Hutto, N. (2011). A cumulative ecological-transactional risk model of child maltreatment and behavioral outcomes: Reconceptualizing early maltreatment report as risk factor. *Children and Youth Services Review*, *33*(11), 2392–2398. https://doi.org/10.1016/j.childyouth.2011.08.030

McCann, J. P., Rider, G. N., Weiss, B. A., Litman, F. R., & Baron, I. S. (2014). Latent mean comparisons on the BRIEF in preterm children: Parent and teacher differences. *Child Neuropsychology*, *20*(6), 737–751. https://doi.org/10.1080/09297049.2013.859663

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

Melville, A. (2017a). Adverse childhood experiences from ages 0-2 and young adult health: Implications for preventive screening and early intervention. *Journal of Child & Adolescent Trauma*, *10*, 207–215. https://doi.org/10.1007/s40653-017-0161-0

Melville, A. (2017b). Trauma-exposed infants and toddlers: A review of impacts and evidence-based interventions. *Advances in Social Work*, *18*(1), 53. https://doi.org/10.18060/21287

Merrick, M. T., Ports, K. A., Ford, D. C., Afifi, T. O., Gershoff, E. T., & Grogan-Kaylor, A. (2017). Unpacking the impact of adverse childhood experiences on adult mental health. *Child Abuse & Neglect*, *69*, 10–19. https://doi.org/10.1016/j.chiabu.2017.03.016

Mersky, J. P., Janczewski, C. E., & Topitzes, J. (2017). Rethinking the measurement of adversity: Moving toward second-generation research on adverse childhood experiences. *Child Maltreatment*, *22*(1), 58–68. https://doi.org/10.1177/1077559516679513

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 & Neglect*, *37*(11), 917–925. https://doi.org/10.1016/j.chiabu.2013.07.011

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., … Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences of the United States of America*, *108*(7), 2693–2698. https://doi.org/10.1073/pnas.1010076108

Montroy, J. J., Bowles, R. P., Skibbe, L. E., McClelland, M. M., & Morrison, F. J. (2016). The development of self-regulation across early childhood. *Developmental Psychology*, *52*(11), 1744–1762. https://doi.org/10.1037/dev0000159

Muthén, L., & Muthén, B. (1998). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén. https://doi.org/10.1111/j.1600-0447.2011.01711.x

Muthén, L., & Muthén, B. (2012). *Mplus user's guide* (6th ed.). Los Angeles, CA: Muthén & Muthén. https://doi.org/10.1111/j.1600-0447.2011.01711.x

Nozadi, S. S., Spinrad, T. L., Eisenberg, N., & Eggum-wilkens, N. D. (2015). Associations of anger and fear to later self-regulation and problem behavior symptoms. *Journal of Applied Developmental Psychology*, *38*, 60–69. https://doi.org/10.1016/j.appdev.2015.04.005

O'Meagher, S., Norris, K., Kemp, N., & Anderson, P. (2018). Examining the relationship between performance-based and questionnaire assessments of executive function in young preterm children: Implications for clinical practice. *Child Neuropsychology*, 1–15. https://doi.org/10.1080/09297049.2018.1531981

Pine, D. S., Mogg, K., Bradley, B. P., Montgomery, L. A., Monk, C. S., McClure, E., … Kaufman, J. (2005). Attention bias to threat in maltreated children: Implications for vulnerability to stress-related psychopathology. *American Journal of Psychiatry*, *162*(2), 291–296. https://doi.org/10.1176/appi.ajp.162.2.291

Putnam, S. P., & Rothbart, M. K. (2006). Development of short and very short forms of the Children's Behavior Questionnaire. *Journal of Personality Assessment*, *87*(1), 102–112. https://doi.org/10.1207/s15327752jpa8701_09

Raissian, K. M., & Bullinger, L. R. (2017). Money matters: Does the minimum wage affect child maltreatment rates? *Children and Youth Services Review*, *72*, 60–70. https://doi.org/10.1016/j.childyouth.2016.09.033

Raver, C. C., Carter, J. S., McCoy, D. C., Roy, A., Ursache, A., & Friedman, A. (2012). Testing

models of children's self-regulation within educational contexts: Implications for

measurement. *Advances in Child Development and Behavior*, *42*, 245–270.

https://doi.org/10.1016/B978-0-12-394388-0.00007-1

Raver, C. C., Jones, S. M., Li-Grining, C., Zhai, F., Bub, K., & Pressler, E. (2011). CSRP's

impact on low-income preschoolers' preacademic skills: Self-regulation as a mediating

mechanism. *Child Development*, *82*(1), 362–378. https://doi.org/10.1111/j.1467-

8624.2010.01561.x

Reardon, S. F., & Galindo, C. (2009). The Hispanic-White achievement gap in math and reading

in the elementary grades. *American Educational Research Journal*, *46*(3), 853–891.

https://doi.org/10.3102/0002831209333184

Reardon, S. F., & Portilla, X. A. (2016). Recent trends in income, racial, and ethnic school

readiness gaps at kindergarten entry. *AERA Open*, *2*(3), 1–18.

https://doi.org/10.1177/2332858416657343

Rodebaugh, T. L., Woods, C. M., & Heimberg, R. G. (2007). The reverse of social anxiety is not

always the opposite: The reverse-scored items of the Social Interaction Anxiety Scale do

not belong. *Behavior Therapy*, *38*(2), 192–206. https://doi.org/10.1016/j.beth.2006.08.001

Schmitt, S. A., McClelland, M. M., Tominey, S. L., & Acock, A. C. (2015). Strengthening

school readiness for Head Start children: Evaluation of a self-regulation intervention. *Early

Childhood Research Quarterly*, *30*, 20–31. https://doi.org/10.1016/j.ecresq.2014.08.001

Shipman, K. L., Medical, C., Fitzgerald, M. M., Carolina, S., Sims, C., & Edwards, A. (2007).

Maternal emotion socialization in maltreating and non-maltreating families: Implications

for children's emotion regulation. *Social Development*, *16*(2), 268–285.

https://doi.org/10.1111/j.1467-9507.2007.00384.x

Skibbe, L. E., Connor, C. M., Morrison, F. J., & Jewkes, A. M. (2011). Schooling effects on preschoolers' self-regulation, early literacy, and language growth. *Early Childhood Research Quarterly*, *26*(1), 42–49. https://doi.org/10.1038/jid.2014.371

Susa, G., Pitică, I., Benga, O., & Miclea, M. (2012). Anxiety-related attention biases in preschoolers: An investigation using the pictorial dot-probe task. *Procedia - Social and Behavioral Sciences*, *33*, 637–641. https://doi.org/10.1016/j.sbspro.2012.01.199

Teglasi, H., Schussler, L., Gifford, K., Annotti, L. A., Sanders, C., & Liu, H. (2015). Child Behavior Questionnaire-Short Form for teachers: Informant correspondences and divergences. *Assessment*, *22*(6), 730–748. https://doi.org/10.1177/1073191114562828

Tominey, S. L., & McClelland, M. M. (2011). Red light, purple light: Findings from a randomized trial using circle time games to improve behavioral self-regulation in preschool. *Early Education and Development*, *22*(3), 489–519. https://doi.org/10.1080/10409289.2011.574258

Turney, K., & McLanahan, S. (2015). The academic consequences of early childhood problem behaviors. *Social Science Research*, *54*, 131–145. https://doi.org/10.1016/j.ssresearch.2015.06.022

U.S. Department of Education Office for Civil Rights. (2016). *2013-2014 Civil Rights Data Collection: A first look.* Washington, D.C. Retrieved from https://www2.ed.gov/about/offices/list/ocr/docs/2013-14-first-look.pdf

U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children Youth and Families, Children's Bureau. (2018). *Child maltreatment 2016*. Available from https://www.acf.hhs.gov/cb/research-data-technology/statistics-research/child-maltreatment

Ursache, A. (2014). *Do bottom-up aspects of self-regulation predict executive functioning?: Testing a bi-directional model of self-regulation and applying it to home and school context*s. Retrieved from ProQuest Dissertations and Theses. (UMI 3624584)

Ursache, A., & Blair, C. (2015). Children's cortisol and salivary alpha-amylase interact to predict attention bias to threatening stimuli. *Physiology and Behavior*, *138*, 266–272. https://doi.org/10.1016/j.physbeh.2014.10.002

Valiente, C., Eisenberg, N., Haugen, R., Spinrad, T. L., Hofer, C., Liew, J., & Kupfer, A. (2011). Children's effortful control and academic achievement: Mediation through social functioning. *Early Education and Development*, *22*(3), 411–433. https://doi.org/10.1080/10409289.2010.505259

Wade, R., Cronholm, P. F., Fein, J. A., Forke, C. M., Davis, M. B., Harkins-Schwarz, M., … Bair-Merritt, M. H. (2016). Household and community-level Adverse Childhood Experiences and adult health outcomes in a diverse urban population. *Child Abuse & Neglect*, *52*, 135–145. https://doi.org/10.1016/j.chiabu.2015.11.021

Wade, R., Shea, J. A., Rubin, D., & Wood, J. (2014). Adverse childhood experiences of low-income urban youth. *Pediatrics*, *134*(1), e13–e20. https://doi.org/10.1542/peds.2013-2475

Yehuda, R., Halligan, S. L., & Grossman, R. (2001). Childhood trauma and risk for PTSD: Relationship to intergenerational effects of trauma, parental PTSD, and cortisol excretion. *Development and Psychopathology*, *13*(3), 733–753. https://doi.org/10.1017/S0954579401003170

Chapter Four: Self-Regulation as a Mediator Between Cumulative Adversity Exposure and Student-Teacher Conflict in Preschool: The Role of Race and Gender

Abstract

Nearly half of young children nationally have some sort of preschool experience by the time they enter kindergarten. Many of these children have experienced one or more types of adverse childhood experiences (ACEs), such as child maltreatment or exposure to violence. Exploring how adversity impacts children in their preschool context may highlight potential opportunities for trauma-informed interventions as well as ways to reduce racial disparities seen in preschool outcomes, such as school readiness and suspension/expulsion rates. This study explores the relationship between children's exposure to cumulative adversity, their self-regulation, and their relationship with their teachers in a sample of predominantly Latino and African American children. The children in the sample were predominantly from single parent households (52%) and over 43% were from households with an annual household income of under $20,000. Data were collected from caregivers of preschool children (n=126) on their child's lifetime exposure to twelve childhood adversities, including traditional ACEs (e.g., domestic violence exposure and parental substance use) and environmental ACEs (e.g., community violence exposure and food insecurity). Data was also collected from teachers at the middle and end of the preschool year on the child's self-regulation and on the student-teacher relationship. Children in the sample experienced an average of 3 adversities, with a range of 0 to 10 ACEs. In a series of path analyses, children's mid-year self-regulation problems mediated the relationship between children's ACEs and their end-of-year student-teacher conflict. Above and beyond the contribution of cumulative adversity, teachers reported higher self-regulation problems and student-teacher conflict for African American children in the study than for other children. The findings in this study highlight the potential negative impact of cumulative adversity on children

in the preschool context and supports the need for the development of trauma-informed preschool models that attend to racial disparities and implicit bias to best support the well-being of adversity-exposed young children.

Self-Regulation as a Mediator Between Cumulative Adversity Exposure and Student-Teacher

Conflict in Preschool: The Role of Race and Gender

Introduction

Preschool aged children are exposed to higher rates of adversity, such as child

maltreatment and domestic violence, compared to older children (Fantuzzo & Fusco, 2007; U.S.

Department of Health & Human Services Administration for Children and Families

Administration on Children Youth and Families Children's Bureau, 2018), with estimates

suggesting that 25-50% of preschool aged children have experienced at least one type of

adversity (Briggs-Gowan, Ford, Fraleigh, McCarthy, & Carter, 2010; Jimenez, Wade, Lin,

Morrow, & Reichman, 2016).Young ethnic minority children and children living below the

poverty line are at increased risk for experiencing adversity (Jimenez et al., 2016; Mersky,

Topitzes, & Reynolds, 2013). Cumulative adversity exposure in early childhood places young

children at increased risk on a number of outcomes such as academic engagement, mental and

physical health, and early mortality (Dube, Felitti, Dong, Giles, & Anda, 2003; Felitti et al.,

1998; Melville, 2017; Mersky et al., 2013; Porche, Costello, & Rosen-Reynoso, 2016).

Almost half of all children nationally have some preschool experience by the time they

reach kindergarten (U.S. Census Bureau, 2016). Many of these children will already have

experienced one or more different types of adversities by the time they enter the classroom.

However, little research has explored the impact of adversity in the preschool setting or the

mechanisms through which adversity influences preschool outcomes. Further, there is scarce

evidence looking at the specific impact of adversity for young ethnic minority children and low-

income children, who exhibit comparatively poorer school readiness, higher rates of negative

school contact such as suspension and expulsion, and worse academic outcomes than their peers

(Reardon & Portilla, 2016; U.S. Department of Education Office for Civil Rights, 2016).

Self-regulation, or the ability to modulate one's own emotions and behaviors, may be a mechanism through which early maltreatment impacts school outcomes for preschoolers and thus may be an important area of study to support early intervention. Understanding the impact of maltreatment on self-regulation, as well as contextual factors within the preschool setting, such as student-teacher relationships, can inform initiatives to better support trajectories for preschoolers who have been exposed to adversity. Such knowledge may also help equip school systems to better address children's challenging behavior and thus reduce rates of preschool suspension and expulsion, which have been found to be disproportionately higher for young children of color (Reardon & Galindo, 2009; Reardon & Portilla, 2016). This study seeks to expand the current understanding of self-regulation as it relates to early childhood trauma exposure and to highlight the preschool context as an important place of prevention and intervention for children at risk of adverse educational outcomes based on their exposure to adversity, their race/ethnicity, and their socioeconomic status.

Literature Review

Early Childhood Adversity

Children are consistently found to be exposed to higher rates of adversity early in childhood compared to later on in childhood (Finkelhor, Saito, & Jones, 2018; Thompson et al., 2015; U.S. Department of Health & Human Services Administration for Children and Families Administration on Children Youth and Families Children's Bureau, 2018). Estimates of the number of preschool aged children, typically ages three to five, who have experienced at least one type of maltreatment or other trauma in their lifetime range from 25% (Briggs-Gowan et al., 2010) to over 50% (Jimenez et al., 2016). Existing work highlights a relationship between multiple adversities in early childhood and polyvictimization during later childhood epochs of middle childhood and adolescence (Grasso, Dierkhising, Branson, Ford, & Lee, 2016),

underscoring the importance of preventing and intervening to address adversity early in childhood.

In recent decades, children's cumulative experiences of different types of adversities has also been widely recognized. Such cumulative risk models consider the number of different types of adversities that a child has been exposed to in their lifetime rather than any single type of adversity as potential risk factors for child development (Evans, Li, & Whipple, 2013). The popularity of cumulative risk models in child development research is in large part due to the Adverse Childhood Experiences (ACEs) study in the 1990s, which found that adults' retrospective reports of their cumulative experiences of maltreatment and household adversities from birth to 18 were highly predictive of a number of health and well-being outcomes in adulthood (Felitti et al., 1998). Since that seminal study, research has multiplied identifying links between exposure to cumulative adversities in childhood and adverse adult outcomes, including increased risk for chronic disease, health-related worry, substance use, and early mortality (Dong, Anda, Dube, Giles, & Felitti, 2003; Felitti et al., 1998; Melville, 2017; Merrick et al., 2017; Mersky et al., 2013). Recent work has also expanded the traditionally measured types of childhood adversities to go beyond household and maltreatment adversities to include environmental adversities, such as lack of neighborhood safety and financial distress (Merrick et al., 2017; Mersky, Janczewski, & Topitzes, 2017). Such expanded cumulative risk models align well with Bronfenbrenner's ecological theory, which describes the effects of the ecological environment (including neighborhood and community contexts) on children's developmental outcomes (Bronfenbrenner & Ceci, 1994), and warrant future exploration within the early childhood population.

Compared to studies that examine exposure to adversity from birth to adulthood, studies that explore the effects of cumulative adversity specifically in early childhood are still much less

common (Liming & Grube, 2018). In a recent systematic review of studies that looked at multiple ACEs in children ages 0-6, 12.3% to 30.0% of children in the studies had been exposed to three or more ACEs (Liming & Grube, 2018). African American and Latino children and children living in poverty have been found to have significantly higher rates of cumulative adversity compared to their non-Hispanic white peers both early in childhood (Jimenez et al., 2016) and in adulthood (Mersky et al., 2013), indicating the importance of considering the intersection of demographic risk and cumulative adversity.

Adversity in early childhood has been linked with a number of childhood outcomes, including increased post-traumatic stress (PTS) symptoms (Crusto et al., 2010), poor academic engagement, behavior problems (Briggs-Gowan et al., 2010), and physical and socio-emotional health conditions (Roberts, Ferguson, & Crusto, 2013). Early cumulative adversity has also been linked to negative outcomes in middle childhood and adulthood; in a recent study, children with six or more early ACEs by age five had three times the odds of having teacher-reported behavior problems at age nine compared to children with zero or one early ACE (Schroeder, Slopen, & Mittal, 2018). In another study that examined classes of exposure to ACEs prior to age six, children in the "high varied" class of early childhood ACEs (with a mean of five ACEs) had significantly higher PTS symptoms in adolescence than those in the low/no ACEs classes (Grasso et al., 2016). Finally, another recent study identified a link between adversities in infancy and toddlerhood and health-related worry in young adults (Melville, 2017). All of these studies point to the importance of understanding and intervening to address early childhood ACEs due to the demonstrated long-term effects of adversity of very young children.

Early Adversity and Self-Regulation

Although the impact of childhood adversity is well documented, the mechanisms through which adversity impacts later outcomes is less well understood. Self-regulation, or the ability to

monitor and regulate emotions, thoughts and behaviors, is associated with outcomes such as physical and mental health in adulthood (Fitzpatrick, McKinnon, Blair, & Willoughby, 2014; Moffitt et al., 2011). Many of the outcomes related to self-regulation parallel outcomes related to prospective reports of childhood adversity (Dube et al., 2003), indicating that self-regulation is one potential mechanism through which childhood adversity may impact later outcomes.

Self-regulation has been identified as a main component of child well-being (Newland, 2014) and a predictor for a wide range of long-term well-being outcomes (Moffitt et al., 2011). Poor self-regulation in preschool is a risk factor for future poor childhood outcomes, predicting externalizing problem behaviors from pre-school to 1st grade and poor school readiness (Fitzpatrick et al., 2014). Additionally, poor preschool self-regulation is moderately predictive of poor physical health, substance use, and criminal offenses in adulthood, even when controlling for the independent impact of intelligence and socioeconomic status (Moffitt et al., 2011), indicating the unique impact of early self-regulation on adult outcomes.

Studies exploring the link between early childhood trauma, including maltreatment, and developing self-regulatory skills are scarce (Fay-Stammbach & Hawes, 2018). Studies with older children have found that maltreated children have poorer emotional regulation, such as being able to control anger or frustration, compared to non-maltreated children (Kim & Cicchetti, 2010; Shipman et al., 2007). In one of the few studies of childhood adversity and preschool self-regulation, Fantuzzo, Perlman, and Dobbins (2011) found that preschool maltreatment and other adversities, such as homelessness, foster care, and poverty, were associated with increased problems with early learning behaviors, social skills, and attendance. In another study, preschool children with maltreatment experiences had significantly higher parent-reported problems with self-regulation compared to children without (Fay-Stammbach & Hawes, 2018). For maltreated children, poor self-regulation has been linked to later behavioral problems such as aggression

(Kim-Spoon, Haskett, Longo, & Nice, 2012; Kim & Cicchetti, 2010). Based on the importance of self-regulatory skills for academic success and adult outcomes, and the potential opportunities to intervene to support self-regulation in young children, it is important to better understand adversity exposure as a potential predictor of self-regulatory skills.

Self-Regulation and Student-Teacher Relationships in Preschool

The preschool environment is a natural setting within which children's self-regulation skills may be assumed to develop; however, it is unclear whether typical preschool experiences are associated with significant growth in children's development of self-regulation. For example, when using the same measure of self-regulation, one study exploring preschoolers' self-regulation throughout the school year identified significant changes in self-regulation from the beginning to end of the school year (McClelland et al., 2007), whereas another found changes in self-regulation during the school year to be attributed to children's maturation rather than schooling (Skibbe, Connor, Morrison, & Jewkes, 2011).

Despite the lack of clarity around the role of schooling in a child's developing self-regulation, a number of studies have identified associations between children's relationship with their teachers and their self-regulation (Cadima, Verschueren, Leal, & Guedes, 2016; McKinnon et al., 2018; McKinnon & Blair, 2018; Skalická, Belsky, Stenseng, & Wichstrøm, 2015). In one study, children with close relationships with teachers had more significant gains in self-regulation than children with less close relationships with teachers (Cadima et al., 2016). In a racially diverse, low SES, rural sample, higher executive functioning skills (including self-regulation) at age 4 predicted more closeness and less conflict with teachers in kindergarten (McKinnon et al., 2018). These two studies suggest that positive student-teacher relationships may support the development of self-regulation and that positive self-regulation may support the

development of relationships with teachers, indicating a potential bi-directional relationship between self-regulation and student-teacher relationships.

A few studies have looked at this bi-directional relationship between students and teachers (McKinnon & Blair, 2018; Skalická et al., 2015), exploring whether self-regulation predicts student-teacher relationships and/or whether student-teacher relationships predict children's development of self-regulation over time. Skalická et al. (2015) found a bi-directional relationship in which student-teacher closeness in preschool predicted reduced behavioral problems two years later in first grade, and that behavioral problems in preschool predicted higher student-teacher conflict in first grade. In McKinnon and Blair's (2018) longitudinal study of 759 children followed from kindergarten to first grade, student-teacher conflict in kindergarten did predict children's performance on an executive functioning task (tapping into self-regulation) in first grade; however, kindergarten executive functioning did not predict children's student-teacher conflict in first grade. Taken together, these findings suggest that there may be a bi-directional association between children's self-regulation and student-teacher relationships; however, future work is warranted. It is also important to note that neither study explored this bi-directional relationship during a single school year with the same teacher.

Childhood Adversity and Student-Teacher Relationships

There are only a few studies that look at the relationship between childhood adversity, such as abuse and poverty, and student-teacher relationships (Armstrong, Haskett, & Hawkins, 2017; Lee & Bierman, 2018; Sabol & Pianta, 2012). One of the few such studies explores how children's relational schemas predict student-teacher conflict and closeness in a sample of 70 preschool children who experienced physical abuse (Armstrong et al., 2017). Similar rates of overall conflict and closeness in student-teacher relationships were found compared to other studies of non-abused children, however physically abused children with more positive relational

schemas had less conflict and dependency than children with negative relational schemas. This means that it may not be abuse itself that influences a child's relationship with their teacher, but rather how that abuse may have influenced other factors, such as how a child perceives relationships.

Despite identified protective aspects of student-teacher closeness on children's development (Cadima et al., 2016), student-teacher conflict may be more relevant when exploring risks factors associated with childhood adversity. This is in part because student-teacher conflict has been found to be more stable across grades than closeness in a number of studies (Jerome, Hamre, & Pianta, 2009; Lee & Bierman, 2018; Mason, Hajovsky, McCune, & Turek, 2017), indicating that if a child has a conflictual relationship with a teacher in preschool, this negative relationship with other teachers is likely to persist throughout their school career. Additionally, in several studies of young children, student-teacher conflict but not closeness has predicted outcomes such as math achievement (Mason et al., 2017) and aggression late in elementary school (Lee & Bierman, 2018).

Child Adversity, Race, and the Preschool Context

If cumulative adversity puts children at risk for impacted self-regulation and poor relationships with their teachers, then it likely also contributes to a child's risk of facing exclusionary discipline in school, such as suspension and expulsion, that are potential outcomes of challenging classroom behaviors. Suspension and expulsion are also known to be associated with poor long-term well-being outcomes, including decreased academic performance, reduced employment and increased involvement with the criminal justice system (Noltemeyer, Ward, & Mcloughlin, 2015; Rosenbaum, 2018). Identifying predictors of decision-making around preschool suspension and expulsion is an important precursor to developing interventions to reduce disparities in rates of exclusionary discipline and promote children's well-being. Teacher

perceptions of children's challenging behavior may play a role in decision making around suspension and expulsion. A qualitative study of the accounts of expulsion among 30 preschool teachers found that teachers often attempt several strategies to understand and address children's challenging behavior. However, when this fails, teacher perceptions shift from "struggling children to bad parents" in which sympathy for children is replaced by blaming parenting for children's behaviors and a view of children's behaviors as unfixable, which leads to expulsion (Martin, Bosk, & Bailey, 2018). Other research has identified that decisions to expel a child depend on the following factors: teacher perception that the child's behavior is damaging or disruptive to the overall class, teacher concerns that they will be held liable for the child's behavior, and teacher stress related to the child's behavior (Gilliam & Reyes, 2018).

A teacher's perception of a child's adversity-related behavior may also vary based on the child's race, ethnicity, or gender, which may in part explain disproportionately higher rates of expulsion and suspension found for children of color (Skiba et al., 2011, 2014; U.S. Department of Education Office for Civil Rights, 2016; Van Dyke, 2016) and boys (U.S. Department of Education Office for Civil Rights, 2016). In fact, in a study by Gilliam and colleagues (2016), early childcare educators were more likely to perceive African American boys (and boys in general) as exhibiting challenging childhood behaviors, even in the absence of such challenging behaviors and regardless of the race of the educator. This finding suggests that teachers are primed to look for and respond to challenging behaviors from African American students more than their white peers, and from boys more than girls. It may also be that teachers perceive similar behaviors as more challenging when presented by an African American student based on implicit and explicit biases.

Another study of 2,900 children from 701 preschool classrooms looked at how the match between a child and teacher's race predicted teacher reports of children's behaviors and

academic skills at the beginning of a preschool year and from the beginning to end of the preschool year (Downer, Goble, Myers, & Pianta, 2016). The authors found that at the beginning of a school year there were no differences on scores related to problem behaviors or social competence based on the teacher/child race congruence or incongruence. However, at the end of the school year, when controlling for earlier levels of child functioning, child gender, as well as child and classroom poverty, African American boys taught by White teachers were rated as having significantly higher behavior problems than African American boys taught by African American teachers (Downer et al., 2016). No differences were found for Latino children within this study, indicating that teacher-child ethnic match may not be as strong of a contributor to teacher perceptions of children's academic skills or problem behaviors for Latino children compared to African American children.

In addition to perceiving behaviors differently, teachers may also perceive their relationship with a child differently based on the child's gender or race. Preschool-aged boys have been rated as having significantly more student-teacher conflict than girls by teachers (Cadima et al., 2016) as have school-aged boys (Jerome et al., 2009). Further, teachers have been found to rate higher levels of student-teacher conflict with African American students. For example, in a study by Jerome and colleagues (2009), teacher ratings of conflict with African American children was higher than non-African American children, regardless of the child's academic achievement, gender, behavior problems, or maternal factors such as education, or time spent in childcare.

Current Study

No studies to date have looked at the relationship between cumulative adversity, self-regulation, and student-teacher relationships in a preschool sample. Additionally, there is little research looking at the relationship between these factors within a sample of low-income,

African American and Latino preschoolers. This study examines whether self-regulation in the middle of the school year mediates the relationship between children's cumulative adversity and their relationship with their teacher at the end of the school year, also looking at the influence of the child's race and gender on the model. Informed by the ecological model of child development (Bronfenbrenner, 1977), a range of adversities (including household, economic, and neighborhood adversities) are included in the measure of cumulative adversity in this study. It is hypothesized that self-regulation will indeed mediate the relationship between children's cumulative adversity and conflict in their student-teacher relationship. This study also explores whether the mediation model differs for boys and girls, with no *a priori* hypothesis about that relationship.

Method

Participants and Procedures

The current study is from a multi-phase study of cumulative adversity and child preschool outcomes that drew data from preschool children as well as their caregivers and teachers. Caregivers of children were recruited from a large preschool in a medium-sized city in the Northeast. Lead teachers from all 26 classrooms in the site were asked permission to recruit from their classrooms for the study. Of the 26 teachers, 22 gave permission to recruit from their classrooms and of the 22 available classrooms, one classroom had no caregivers sign up to participate, resulting in a sample drawn from 21 classrooms.

Recruitment began in the late fall of the 2017-2018 school year. Teachers sent home and/or handed out a flyer with study information to all caregivers in their classroom. The researcher was also onsite at the preschool to screen, consent, and enroll caregivers in the study during drop-off and pick-up times. Caregivers were eligible to participate in the study if they were over the age of 18 and if they could participate in either English or Spanish. Children were

eligible to participate if they were between ages three and six and had been enrolled in the school for at least two months (to allow for ample time for the student-teacher relationship to develop). All children screened were eligible to participate in the study. Caregivers were able to complete surveys via paper and pencil surveys or over the phone in either English or Spanish. Of the 400 eligible children in the 22 classrooms, 181 caregivers were screened and given the study survey and 126 caregivers returned the consent and had their child enrolled in the study, for a response rate of 32%. Of the 126 caregivers who gave permission for their child to participate in the study, thirty completed the survey over the phone and eighteen completed the survey in Spanish. The rest completed the paper and pencil survey in English. Caregiver consent also gave permission for the researcher to collect data from the child's teacher at two subsequent time points. Teachers completed surveys during January and February of 2018 and again in May-June of 2018 at the end of the school year. Caregivers received a $10 gift card and teachers received a $5 gift card incentive for each survey completed. All study procedures were reviewed and approved by the University of Connecticut Internal Review Board.

Caregivers in the study were overwhelmingly female (90.5%), 31 years old on average (ranging from 19 to 74), and included biological mothers (87.3%), biological fathers (7%), and other legal guardians (5.7%). Caregivers were predominantly Hispanic (62.7%), followed by African American (15.1%), non-Hispanic White (15.9%), and another race, including Asian and American-Indian (6.3%). Teachers were all female, with an average age of 43 (ranging from 28 to 62), and a mean of 15 years of experience working in a preschool. A quarter of teachers identified as Hispanic (n=5). In terms of race, almost half of teachers identified as non-Hispanic White (n=10), 10% identified as African American (n=2), and 16% identified another race (n=3).

Measures

     Cumulative early childhood adversity. Caregivers were asked about their child's

lifetime exposure to a number of different adversities at the first data collection point (described

in depth in Loomis, under review). Childhood adversities included traditional household

adversities captured in ACEs literature, including: caregiver mental illness, family violence,

incarcerated household member, and household substance abuse. Child maltreatment risk was

measured through caregiver report of family lifetime involvement with child welfare since the

child was born. Additional expanded ACEs more recently used in research related to cumulative

adversities were also measured (Merrick et al., 2017; Mersky et al., 2013; Wade et al., 2016).

These were community violence exposure, food insecurity, neighborhood safety, lack of

neighborhood support, and family financial problems. Each adversity was dichotomized to

indicate presence or absence of that experience and summed to create a total cumulative

adversity score to represent the number of different types of adversities that a child had

experienced. Outliers of over six ACEs (n=7) were reined in and coded as six ACEs to reduce

their influence on the models; truncated ACE scores are included only in model analyses and full

scores are reflected in descriptive statistics.

     Self-regulation. Self-regulation was measured through the inhibitory self-regulation

score of the Behavior Rating Inventory of Executive Functioning-Preschool Version (BRIEF-P)

as rated by teachers. The inhibitory self-regulation score of the BRIEF-P is a composite of the

inhibit and emotional control subscales. The BRIEF-P assesses self-regulation and executive

functioning in preschool aged children through parent and/or teacher reports of child behaviors

(Gioia, Espy, & Isquith, 2003). The BRIEF-P is available for children ages 2-6, contains 63

questions that are rated on a 3-point Likert scale (*never, sometimes,* and *often*), and takes

approximately 10-15 minutes to complete. Internal consistency, reliability, and validity have

been established for the BRIEF-P (Gioia et al., 2003) and have been established with children from diverse ethnic and economic backgrounds (Fay-Stammbach & Hawes, 2018). Reliability and validity of the five-scale structure of the BRIEF-P has been supported through confirmatory factor analysis (Ezpeleta, Granero, Penelo, Osa, & Domènech, 2015). Internal consistency coefficients for the inhibitory self-regulation subscale at the middle and end of the school year in this study were both .96.

Student-teacher conflict. Student-teacher conflict was assessed through the conflict subscale of the Student-Teacher Relationship Scale-Short Form (STRS-SF; Pianta, 2001). The STRS-SF is a 15-question self-report measure that assesses a teacher's perception of their relationship with a student, through domains of conflict and conflict (Pianta, 2001). The STRS-SF takes approximately 5 to 10 minutes to complete and is used for students from preschool through grade 3. The STRS and the STRS-SF has established reliability and validity with children and teachers from diverse ethnic and economic backgrounds (Cadima et al., 2016; Doumen, Koomen, Buyse, Wouters, & Verschueren, 2012) and has been found to be predictive of preschoolers' classroom behavior (Ewing & Taylor, 2009). Internal consistency for student-teacher conflict at the middle and end of the school year in this study were .88 and .85, respectively .

Covariates. Children's gender, race/ethnicity, and age were used as covariates in analyses.

Analysis

Bivariate analyses were run to determine relationships between key variables. To understand the relationship between cumulative adversity, self-regulation, and student-teacher conflict across both time points, cross-lagged path analysis models were run (Muthén & Muthén, 1998). The proposed model is shown in Figure 1. Similar to other studies of student-teacher

conflict and closeness (McKinnon & Blair, 2018), teacher ratings of conflict in this study were skewed, with teachers reporting low levels of conflict with students. To account for the skewed conflict rating, as well as the missing data due to attrition at the end of the school year, models were estimated using the MLR estimator, which is robust to non-normal and missing data. Additionally, all models were run using the MPlus "TYPE=COMPLEX" and "CLUSTER" options to correct standard errors for nesting within classrooms (Muthén & Muthén, 1998). Exploratory multi-group models were run using the "grouping" option in Mplus. The following measures and fit indices of acceptable to exact fit were used to evaluate all models: Comparative Fit Index (CFI) of $\geq$ .90, Tucker-Lewis Index (TLI) of $\geq$ .90, Root Mean Square Error of Approximation (RMSEA) of $\leq$ .08, and Standardized Root Mean Residual (SRMR) of $\leq$ .08. Data cleaning, descriptive, and bivariate analyses were conducted using SPSS Version 25.0 and SEM analyses were conducted using Mplus Diagrammer Version 1.6.

Results

Descriptive Statistics

Child demographics are available in Table 1. Children in the study had experienced an average of three ACEs. Only 13.5% of children in the sample had experienced no ACEs, and the majority of children (59.5%) experienced between one and three ACEs. There were some variations in key outcome variables by the child's race/ethnicity. African American students were rated with significantly higher self-regulation problems and student-teacher conflict compared to their non-African American peers at both time points ($p<.05$), despite African American students in the study having a similar number of adversities (M=2.72, SD = 1.91) compared to their peers (M = 2.52, SD = 2.06).

Table 1. Descriptives of Key Variables

Variable (range)	M (SD) or n (%)		
	Total (n=126)	Females (n=73)	Males (n=53)
Child Age (36-59 months)	48.5 (6.7)	48.92 (6.92)	47.92 (6.45)
Child Race			
Latino	90 (71.4)	52 (71.2)	38 (71.7)
African American	36 (28.6)	17 (23.3)	19 (35.8)
Other	17 (13.5)	10 (13.7)	7 (13.2)
Self-Regulation problems T1	51.89 (12.14)**	49.25 (9.35)	55.62 (14.53)
Self-Regulation problems T2	50.63 (12.39)*	48.46 (10.80)	54.00 (13.90)
Student-teacher conflict T1	13.26 (6.27)$^+$	12.35 (4.56)	14.51 (7.96)
Student-teacher conflict T2	12.83 (5.95)	12.06 (4.87)	13.98 (7.18)
Total ACEs (0-9)	2.58 (2.01)	2.62 (1.87)	2.53 (2.21)
Domestic violence	25 (19.8)	11 (15.1)	14 (26.4)
Household member arrested	16 (12.7)	8 (11.0)	8 (15.1)
Caregiver mental illness	23 (18.3)	13 (17.8)	10 (18.9)
Caregiver substance abuse	12 (9.5)	-	-
Single parent household	66 (52.4)	39 (53.4)	27 (50.9)
Child welfare involvement	29 (23.0)	18 (24.7)	11 (20.8)
Community violence	23 (18.3)*	8 (11.0)	15 (28.3)
Food insecurity	16 (12.7)	-	-
Financial distress	39 (31.0)	24 (32.9)	15 (28.3)
Unsafe neighborhood	35 (27.8)	23 (31.5)	12 (22.6)
Lack of neighborhood support	41 (32.5)	26 (35.6)	15 (28.3)

$^+$ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ [indicating difference between males and females]
T1 = mid-year; T2 = end of year; ACEs = cumulative adversity
Note: N not reported if less than 5 in either group
Note: 17 children (10 males and 7 females) identified as Black and Hispanic so are represented in both columns

Model Testing and Mediating Effects for Entire Sample

The mediation model (see Figure 1) was tested first with the entire sample and had an excellent fit to the data [X^2 (2, N=126)=1.363); RMSEA=.00 (90% CI=[.00, .15]); CFI=1.00; TLI=1.02; SRMR=.01]. This model was retained for subsequent analysis and is presented in Table 2. Cumulative adversity was positively related to T1 self-regulation and student-teacher conflict. Self-regulation problems at T1 were significantly higher for boys ($B = -.21, p = .018$) and marginally associated with being African American ($B = .18, p = .110$). Similarly, higher

T1 student-teacher conflict was significantly associated with the child being African American

(B = .20, p = .021) and marginally associated with gender (B = -.16, p = .111).

Figure 1. Mediation Model with Covariates (n=126)
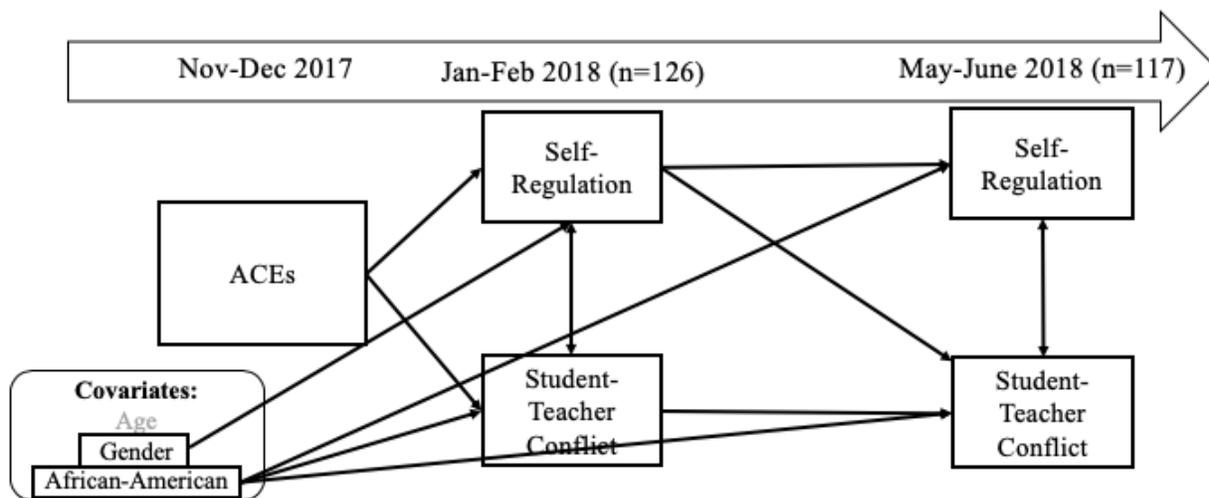
T1=mid-year; T2 = end of year; SR =Self-regulation; S-T = student-teacher

At the second time-point, pathways from gender to self-regulation and student-teacher

conflict were no longer significant, however pathways from being African American to self-

regulation (B=.11, p=.02) and student-teacher conflict (B=.22, p=.001) were both significant. As

was expected, T1 self-regulation predicted T2 self-regulation and the same was true for T1 and

T2 student-teacher conflict. Student-teacher conflict at the end of the year was significantly

positively related to self-regulation problems in the middle of the year. Within the sample, a one

standard deviation increase in children's cumulative adversity (an increase of 2 adversities)

predicted a .17 standard deviation increase in children's self-regulation problems as reported by

their teacher at the middle of the school year. A 1 standard deviation increase in children's self-

regulation problems at the middle of the school year predicted a .25 standard deviation increase in children's conflict in their relationship with their teacher at the end of the year.

Standardized coefficients can be interpreted similarly to effect sizes, where values less than .10 indicate a small effect, values around .30 indicate a medium effect, and values over .5 indicate a large effect (Cohen, 1988). Cumulative adversity had a larger effect on mid-year student-teacher conflict than it did for children's problems with self-regulation. Large effect sizes were found for the relationship between self-regulation at both time points as well as the relationship between student-teacher conflict at both time points, indicating (as expected) that child preschool outcomes in the middle of the year predict those same outcomes at the end of the year. Effect sizes for the influence of mid-year self-regulation on end of year conflict were medium, indicating children's ability to regulate their emotions and behaviors in the middle of the school year to be moderately related to their relationship with their teacher at the end of the school year.

Table 2. Direct and Indirect Effects *B* (SE)

	Total[s]	Boys[u]	Girls[u]
Direct Effects			
Cumulative ACEs on mid-year SR	.17 (.09)*	2.00 (1.04)*	.10 (.46)
Cumulative ACEs on mid-year conflict	.25 (.09)**	1.39 (.53) **	.40 (.33)
Mid-year conflict on end of year conflict	.46 (.09)***	.35 (.14)*	.46 (.13)***
Mid-year SR on end of year SR	.65 (.10)***	.63 (.17)***	.69 (.15)***
Mid-year conflict on end of year SR	.13 (.10)	.36 (.34)	.18 (.18)
Mid-year SR on end of year conflict	.25 (.08)**	.17 (.07)*	.16 (.09)[+]
Indirect Effects			
Total indirect effect	.16 (.06)**	.83 (.35)*	.20 (.21)
Specific indirect	.04 (.03)[+]	.34 (.18)*	.02 (.07)

[s] standardized results, [u] unstandardized results
ACEs = cumulative adversity; SR = self-regulation
[+] $p < .10$, * p<.05, ** p<.01, *** p<.001
Specific indirect is from cumulative adversity to end of year conflict through mid-year SR

Tests of total indirect effects are presented in Table 2. Tests of specific indirect mediation effects showed that even when controlling for earlier student-teacher conflict and covariates,

early self-regulation marginally mediated the relationship between cumulative adversity and later conflict in the student-teacher relationship (standardized indirect effect = .04, SE=.03, p=.100).

 Multiple Group Path Analysis

With the multiple group path model exploring the model fit for boys and girls, constraining the structural parameters in the path model to be equal across the two groups resulted in a statistically significant worsening of overall model fit (X^2=23.54, df=10, p=.009 OR change in X^2 = 24.091, change in df =10), rejecting the null hypothesis that the paths as a whole are the same across gender. The fully unconstrained model provided an acceptable to close fit to the data [X^2 (126) = 4.04, RMSEA =.01 (.00-.19), SRMR =.02, CFI=1.00, TLI=.99]. The estimates of the direct and indirect effects for boys and girls are presented in Table 2. For boys, specific unstandardized indirect effects showed that mid-year self-regulation significantly mediated the relationship between cumulative adversity and student-teacher conflict, even when controlling for mid-year conflict and covariates (B=.34, SE=.18, p=.05). Indirect pathways for girls were not significant.

Constraining each parameter to equality one at a time enabled identifying which parameters differed between male and female students through chi-square difference testing. The pathway from identifying as African American to mid-year student-teacher conflict differed significantly for boys and girls (p<.001). Marginally significant differences between boys and girls were pathways from cumulative adversity to mid-year self-regulation problems (p=.121) and student-teacher conflict (p=.077), as well as the pathway from being African American to end of year student-teacher conflict (p=.120).

Discussion

This study explored the relationship between preschooler's cumulative adversity exposure and their mid-year and end-of-year self-regulation and student-teacher conflict.

Preschoolers in the study had experienced, on average, 3 different types of ACEs by the time the study began. The hypothesis that children's self-regulation at the middle of the school year would mediate the relationship between their cumulative adversity and conflict in their relationship with their teacher was partially supported. Children's cumulative adversity predicted their self-regulation at the middle of the school year, with higher adversity predicting more problems in self-regulation. Even after controlling for children's mid-year student-teacher conflict, higher mid-year problems in self-regulation positively predicted higher student-teacher conflict at the end of the school year. Cumulative adversity did not predict end of year student-teacher conflict, suggesting full mediation in the model. A bi-directional relationship between self-regulation and student-teacher conflict was not identified in this study but warrants future exploration with more time points.

The indirect pathway from cumulative adversity to end of year student-teacher conflict through children's self-regulation was marginally significant, which is promising based on the small sample size of the study. This suggests that exposure to a number of different types of adversities in childhood increases a child's risk of problems in their self-regulation, which impacts the relationship that they have with their preschool teacher. These findings suggest a need for addressing the ways in which adversity, such as abuse and violence exposure, may impact children's ability to regulate their thoughts, emotions, and behaviors. Teachers who are aware of the link between adversity and self-regulation, may be able to respond in trauma-informed ways to reduce children's trauma-related behaviors.

In the exploratory multi-group models, the mediation relationship between adversity and student-teacher conflict through self-regulation was only significant for boys. This aligns with some research that has found that, compared to girls, boys tend to demonstrate more externalizing behaviors after traumatic experiences (Haskins, 2014). It may be that the behaviors

related to self-regulation measured in this study map more closely onto externalizing behaviors that are more common in boys, and that girls may tend toward other trauma-related symptoms not measured in this study. However, more recent work exploring the relationship between cumulative adversity in kindergarten and children's problem behaviors in middle childhood found no significant gender differences in ACE-related externalizing behaviors (Hunt, Berger, & Slack, 2017), suggesting that this is an area in which future study is warranted.

In this study, African American children were rated by teachers as having significantly more student-teacher conflict, even when adjusting for levels of cumulative adversity and teacher-reported self-regulation problems. In multigroup models, teachers rated more conflict in their end-of-year relationships with African American girls and more conflict at both time points for African American boys compared to their peers. This is similar to findings related to disparities in school-related outcomes for African American children, such as disproportionately high rates of suspension and expulsion (U.S. Department of Education Office for Civil Rights, 2016). Implicit bias has been linked to teacher perceptions of children's behaviors (Gilliam et al., 2016) and likely plays a role in contributing to the higher reported student-teacher conflict found in this study. This finding aligns with work done by Jerome et al. (2009) where teachers reported significantly higher conflict in their relationships with African American students from kindergarten through grade six, even when controlling for (as was done in the current study) children's problems regulating their behaviors. The current study is perhaps the first to identify the link between children's race and student-teacher conflict in a sample of preschoolers and suggests that biases may impact a child's school experience from the time they start school.

Nationally, boys make up a little over a half of children attending preschool but over three quarters of children who are suspended from preschool (U.S. Department of Education Office for Civil Rights, 2016). Significant disparities are also found for preschool children of

color. African American children are 3.6 times as likely as white children to have one or more

suspensions, and rates of African American boys and girls suspended from school are over

double that of the actual rates of preschool attendance (U.S. Department of Education Office for

Civil Rights, 2014). Although African American students are suspended and expelled at higher

rates than Latino or non-Hispanic white students, Latino children are also at risk compared to

white children. In a study of risks of expulsion in preschool, teachers in classrooms with a higher

proportion of Latino children were significantly more likely to have suspended a child in the past

year (Gilliam & Shahar, 2006). Although Latino children in this study did not have significantly

higher student-teacher conflict than other children, this does not mean that disparities would not

be found in a sample with a larger proportion of white children. These disparities reflect a

"school to prison pipeline" in which inequities and discriminatory practices in school reflect

structural practices throughout education that place children at risk for a trajectory of

development that may culminate in incarceration or other poor outcomes in adulthood (Barnes &

Motz, 2018). However, currently there is no research that identifies *why* preschool expulsion is

disproportionately higher for boys and children of color (Gilliam et al., 2016). The current study

highlights cumulative adversity and teacher perceptions of their relationships with children

(particularly as associated with a child's gender and race) as potential contributors to these

disparities.

This study also highlights the need to expand the research base on ACEs to look at early

childhood adversity, as well as the need to consider ways in which cumulative adversity may

disadvantage children in their educational environments early on. This study is innovative in

gathering information on the student-teacher relationship at two time points during the same

school year and connecting this information to children's caregiver-reported cumulative

adversity and teacher-reported self-regulation skills. Despite the strengths of this study, there are

a number of factors that limit the scope of the implications. First, the sample was collected through convenience sampling in a single preschool in a city in the Northeast, which may limit the generalizability of the study results. Additionally, children's self-regulation was gathered through informant-report only and was not corroborated through observational measures. It is possible that the self-regulation measure reflects teacher perceptions of the child's behavior, which may be subject to factors such as teacher stress or biases, rather than an objective indicator of self-regulation.

The study findings as a whole support school-based interventions that integrate trauma-informed practices with concerted efforts to address the role that implicit (and explicit) biases play in teacher's assessment of a child. Such models should combine trauma-informed and "equity-oriented" practices, which include restorative practices to address student-teacher relationships (Gregory, Clawson, Davis, & Gerewitz, 2016). Such models would aim to increase teachers' capacities to respond to challenging behaviors related to trauma and other stressors as well as increase their capacities to reflect on how a child's identity may shape the teacher's responses to that child. Trauma-informed preschool models that increase certain teacher skills, such as reflection, can help to reduce disparities in discipline rates for African American children. For example, trauma-informed school models for older children have been associated with significant decreases in school discipline referrals (Mendelson, Tandon, O'Brennan, Leaf, & Ialongo, 2015) and out of school suspensions (Dorado, Martinez, McArthur, & Leibovitz, 2016), suggesting that trauma-informed models are a viable strategy for reducing rates of preschool suspension and expulsion.

Additionally, trauma-informed interventions should focus on relational factors with teachers, such as responsiveness, which can improve teachers relationships with students. Enhancing student-teacher relationships is also a component of interventions that aim to reduce

racial disparities in teachers' use of discipline. For example, a recent study explored how factors related to responsive teaching predicted changes in children's executive functioning and social and academic development from the fall to spring of a preschool year using a sample of 1,407 children from 325 classrooms. In this study, children in classrooms with overall higher teacher responsiveness had more gains in academic skills and working memory and reductions in student-teacher conflict (Hamre, Hatfield, Pianta, & Jamil, 2014). Additionally, students of teachers who had high levels of positive classroom management and routines had greater gains in inhibitory control throughout the preschool year (Hamre et al., 2014).

Another promising practice that could be adapted for equity-oriented trauma-informed preschool models is a professional development intervention for middle school teachers that focuses on individualized coaching and feedback (Gregory et al., 2016). This intervention was associated with a reduction in discipline referrals, particularly with decreases in referrals for African American students, and was associated with no race/discipline gaps (compared to the control group who still had race/discipline gaps). Although a potentially time-consuming intervention, what is promising is that the results held even a year after the intervention ended. In the intervention, changes in teacher analysis and inquiry (i.e., self-reflection) were associated with reductions in rates of African American student discipline referrals (Gregory et al., 2016). The findings of the current study suggest that a coaching intervention may also help to reduce teacher's perceptions of student-teacher conflict and promote positive relationships for adversity-exposed students and African American students. Within a trauma-informed framework, increasing preschool teachers' responsiveness and self-reflection can serve not only children who have experienced adversity and children of color, but all children.

Conclusion

This study identified a link between preschool children's exposure to cumulative adversities, including domestic and community violence, and outcomes related to their preschool experience throughout the school year. In a path analysis, children's exposure to cumulative adversities was significantly associated with their self-regulation problems at the middle of the school year, which predicted more conflict in their relationship with their teacher at the end of the school year. In a multi-group analysis, these relationships were found to be particularly salient for boys. This study also identified that in a sample of predominantly Latino and African American children, African American boys and girls were reported by their teachers to have more student-teacher conflict, even when adjusting for the effects of their cumulative adversity and self-regulation. Higher conflict in the student-teacher relationship may place young children at risk of negative school outcomes, such as suspension and expulsion. The findings from the current study suggest that trauma exposure and implicit bias can (and should) be addressed simultaneously, rather than being separate goals with separate interventions. Intervening to assist schools to better support the needs of trauma-exposed preschoolers as well as identifying contributions of teachers' implicit and explicit biases on their perceptions of children in the classroom is necessary to creating an equitable environment where all young children can thrive.

References

Armstrong, J. M., Haskett, M. E., & Hawkins, A. L. (2017). The student–teacher relationship

quality of abused children. *Psychology in the Schools*, *54*(2), 142–151.

https://doi.org/10.1002/pits.21989

Barnes, J. C., & Motz, R. T. (2018). Reducing racial inequalities in adulthood arrest by reducing

inequalities in school discipline: Evidence from the school-to-prison pipeline.

Developmental Psychology, *54*(12), 2328–2340.

Briggs-Gowan, M. J., Ford, J. D., Fraleigh, L., McCarthy, K., & Carter, A. S. (2010). Prevalence

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.

https://doi.org/10.1002/jts.20593

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American

Psychologist*, *32*(7), 513–531. https://doi.org/10.1037/0003-066X.32.7.513

Bronfenbrenner, U., & Ceci, S. J. (1994). Nature-nuture reconceptualized in developmental

perspective: A bioecological model. *Psychological Review*, *101*(4), 568–586.

https://doi.org/10.1037/0033-295X.101.4.568

Cadima, J., Verschueren, K., Leal, T., & Guedes, C. (2016). Classroom interactions, dyadic

teacher–child relationships, and self–regulation in socially disadvantaged young children.

Journal of Abnormal Child Psychology, *44*(1), 7–17. https://doi.org/10.1007/s10802-015-

0060-5

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ:

Erlbaum. https://doi.org/10.1234/12345678

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

Dong, M., Anda, R. F., Dube, S. R., Giles, W. H., & Felitti, V. J. (2003). The relationship of
exposure to childhood sexual abuse to other forms of abuse, neglect, and household
dysfunction during childhood. *Child Abuse & Neglect*, *27*(6), 625–639.
https://doi.org/10.1016/S0145-2134(03)00105-4

Dorado, J. S., Martinez, M., McArthur, L. E., & Leibovitz, T. (2016). Healthy Environments and
Response to Trauma in Schools (HEARTS): A whole-school, multi-level, prevention and
intervention program for creating trauma-informed, safe and supportive schools. *School
Mental Health*, *8*(1), 163–176. https://doi.org/10.1007/s12310-016-9177-0

Doumen, S., Koomen, H. M. Y., Buyse, E., Wouters, S., & Verschueren, K. (2012). Teacher and
observer views on student-teacher relationships: Convergence across kindergarten and
relations with student engagement. *Journal of School Psychology*, *50*(1), 61–76.
https://doi.org/10.1016/j.jsp.2011.08.004

Downer, J. T., Goble, P., Myers, S. S., & Pianta, R. C. (2016). Teacher-child racial/ethnic match
within pre-kindergarten classrooms and children's early school adjustment. *Early
Childhood Research Quarterly*, *37*, 26–38. https://doi.org/10.1016/j.ecresq.2016.02.007

Dube, S. R., Felitti, V. J., Dong, M., Giles, W. H., & Anda, R. F. (2003). The impact of adverse
childhood experiences on health problems: Evidence from four birth cohorts dating back to
1900. *Preventive Medicine*, *37*(3), 268–277. https://doi.org/10.1016/S0091-7435(03)00123

Evans, G. W., Li, D., & Whipple, S. S. (2013). Cumulative risk and child development.
Psychological Bulletin, *139*(6), 1342–1396. https://doi.org/10.1037/a0031808

Ewing, A. R., & Taylor, A. R. (2009). The role of child gender and ethnicity in teacher-child

    relationship quality and children's behavioral adjustment in preschool. *Early Childhood*

    Research Quarterly, *24*(1), 92–105. https://doi.org/10.1016/j.ecresq.2008.09.002

Ezpeleta, L., Granero, R., Penelo, E., Osa, N. De, & Domènech, J. M. (2015). Behavior Rating

    Inventory of Executive Functioning – Preschool (BRIEF-P) applied to teachers :

    Psychometric properties and usefulness for disruptive disorders in 3-year-old preschoolers.

    Journal of Attention Disorders, *19*(6), 476–488. https://doi.org/10.1177/1087054712466439

Fantuzzo, J. W., & Fusco, R. A. (2007). Children's direct exposure to types of domestic violence

    crime: A population-based investigation. *Journal of Family Violence*, *22*(7), 543–552.

    https://doi.org/10.1007/s10896-007-9105-z

Fay-Stammbach, T., & Hawes, D. J. (2018). Caregiver ratings and performance-based indices of

    executive function among preschoolers with and without maltreatment experience. *Child*

    Neuropsychology, 1–21. https://doi.org/10.1080/09297049.2018.1530344

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

    Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of

    the leading causes of death in adults. *American Journal of Preventive Medicine*, *14*(4), 245–

    258. https://doi.org/10.1016/S0749-3797(98)00017-8

Finkelhor, D., Saito, K., & Jones, L. (2018). *Updated trends in childmaltreatment, 2016*.

    Durham, NH: University of New Hampshire Crimes Against Children Research Center.

    Retrieved from http://unh.edu/ccrc/pdf/Updated%20trends%202016.pdf

Fitzpatrick, C., McKinnon, R. D., Blair, C. B., & Willoughby, M. T. (2014). Do preschool

    executive function skills explain the school readiness gap between advantaged and

    disadvantaged children? *Learning and Instruction*, *30*, 25–31.

    https://doi.org/10.1016/j.learninstruc.2013.11.003

Gilliam, W. S., Maupin, A. N., Reyes, C. R., Accavitti, M., Shic, F., Fontaine, J. J., …

    Stevenson, H. (2016). *Do early educators' implicit biases regarding sex and race relate*

    to behavior expectations and recommendations of preschool expulsions and suspensions?

    New Haven, CT: Yale University Child Study Center. Retrieved from

    http://ziglercenter.yale.edu/publications/Preschool Implicit Bias Policy

    Brief_final_9_26_276766_5379.pdf

Gilliam, W. S. & Reyes, C. (2018). Teacher decision factors that lead to preschool expulsion.

    Infants & Young Children, 31(2), 93-108.

    https:// doi.org/10.1097/IYC.0000000000000113

Gilliam, W. S., & Shahar, G. (2006). Preschool and child care expulsion and suspension: Rates

    and predictors in one state. *Infants & Young Children*, *16*(3), 228–245.

    https://doi.org/10.1097/00001163-200607000-00007

Gioia, G. A., Espy, K. A., & Isquith, P. K. (2003). *Behavior Rating Inventory of Executive*

    Function–Preschool (BRIEF-P) version. Lutz, FL: Psychological Assessment Resources.

Grasso, D. J., Dierkhising, C. B., Branson, C. E., Ford, J. D., & Lee, R. (2016). Developmental

    patterns of adverse childhood experiences and current symptoms and impairment in youth

    referred for trauma-specific services. *Journal of Abnormal Child Psychology*, *44*(5), 871–

    886. https://doi.org/10.1007/s10802-015-0086-8

Gregory, A., Clawson, K., Davis, A., & Gerewitz, J. (2016). The promise of restorative practices

    to transform teacher-student relationships and achieve equity in school discipline. *Journal*

    of Educational and Psychological Consultation, *26*(4), 325–353.

    https://doi.org/10.1080/10474412.2014.929950

Gregory, A., Hafen, C. A., Ruzek, E., Mikami, A. Y., Allen, J. P., & Pianta, R. C. (2016).

    Closing the racial discipline gap in classrooms by changing teacher practice. *School*

    Psychology Review, *45*(2), 171–191. https://doi.org/10.17105/SPR45-2.171-191

Hamre, B., Hatfield, B., Pianta, R., & Jamil, F. (2014). Evidence for general and domain-specific

    elements of teacher-child interactions: Associations with preschool children's development.

    Child Development, *85*(3), 1257–1274. https://doi.org/10.1111/cdev.12184

Haskins, A. R. (2014). Unintended consequences: Effects of paternal incarceration on child

    school readiness and later special education placement. *Sociological Science*, *1*(April), 141–

    158. https://doi.org/10.15195/v1.a11

Hunt, T. K. A., Berger, L. M., & Slack, K. S. (2017). Adverse childhood experiences and

    behavioral problems in middle childhood. *Child Abuse & Neglect*, *67*, 391–402.

    https://doi.org/10.1016/j.chiabu.2016.11.005.Adverse

Jerome, E. M., Hamre, B. K., & Pianta, R. C. (2009). Teacher-child relationships from

    kindergarten to sixth grade: Early childhood predictors of teacher-perceived conflict and

    closeness. *Social Development*, *18*(4), 915–945. https://doi.org/10.1111/j.1467-

    9507.2008.00508.x

Jimenez, M. E., Wade, R., Lin, Y., Morrow, L. M., & Reichman, N. E. (2016). Adverse

    experiences in early childhood and kindergarten outcomes. *Pediatrics*, *137*(2), 1–11.

    https://doi.org/10.1542/peds.2015-1839

Kim-Spoon, J., Haskett, M. E., Longo, G. S., & Nice, R. (2012). Longitudinal study of self-

    regulation, positive parenting, and adjustment problems among physically abused children.

    Child Abuse and Neglect, *36*(2), 95–107. https://doi.org/10.1016/j.chiabu.2011.09.016

Kim, J., & Cicchetti, D. (2010). Longitudinal pathways linking child maltreatment, emotion

    regulation, peer relations, and psychopathology. *The Journal of Child Psychology and*

    Psychiatry, *51*(6), 706–716. https://doi.org/10.1111/j.1469-7610.2009.02202.x

Lee, P., & Bierman, K. L. (2018). Longitudinal trends and year-to-year fluctuations in student–

    teacher conflict and closeness: Associations with aggressive behavior problems. *Journal of*

    School Psychology, *70*, 1–15. https://doi.org/10.1016/j.jsp.2018.06.002

Liming, K. W., & Grube, W. A. (2018). Wellbeing outcomes for children exposed to multiple

    adverse experiences in early childhood: A systematic review. *Child and Adolescent Social*

    Work Journal, *35*(4), 317–335. https://doi.org/10.1007/s10560-018-0532-x

Martin, K. A., Bosk, E., & Bailey, D. (2018). Teachers' perceptions of childcare and preschool

    expulsion. *Children and Society*, *32*(2), 87–97. https://doi.org/10.1111/chso.12228

Mason, B. A., Hajovsky, D. B., McCune, L. A., & Turek, J. J. (2017). Conflict, closeness, and

    academic skills: A longitudinal examination of the teacher–student relationship. *School*

    Psychology Review, *46*(2), 177–189. https://doi.org/10.17105/SPR-2017-0020.V46-2

McClelland, M. M., Cameron, C. E., Connor, C. M., Farris, C. L., Jewkes, A. M., & Morrison, F.

    J. (2007). Links between behavioral regulation and preschoolers' literacy, vocabulary, and

    math skills. *Developmental Psychology*, *43*(4), 947–959. https://doi.org/10.1037/0012-

    1649.43.4.947

McKinnon, R. D., & Blair, C. (2018). Bidirectional relations among executive function, teacher–

    child relationships, and early reading and math achievement: A cross-lagged panel analysis.

    Early Childhood Research Quarterly, *46*, 152–165.

McKinnon, R. D., Blair, C., Vernon-Feagans, L., Greenberg, M., Cox, M., Blair, C., … Ittig, M.

    (2018). Does early executive function predict teacher-child relationships from kindergarten

    to second grade? *Developmental Psychology*, *54*(11), 2053–2066.

Melville, A. (2017). Adverse childhood experiences from ages 0-2 and young adult health: Implications for preventive screening and early intervention. *Journal of Child & Adolescent Trauma*, *10*, 207–215. https://doi.org/10.1007/s40653-017-0161-0

Mendelson, T. S., Tandon, D., O'Brennan, L., Leaf, P. J., & Ialongo, N. S. (2015). Brief report: Moving prevention into schools: The impact of a trauma-informed school-based intervention. *Journal of Adolescence*, *43*, 142–147. https://doi.org/10.1016/j.adolescence.2015.05.017

Merrick, M. T., Ports, K. A., Ford, D. C., Afifi, T. O., Gershoff, E. T., & Grogan-Kaylor, A. (2017). Unpacking the impact of adverse childhood experiences on adult mental health. *Child Abuse & Neglect*, *69*, 10–19. https://doi.org/10.1016/j.chiabu.2017.03.016

Mersky, J. P., Janczewski, C. E., & Topitzes, J. (2017). Rethinking the measurement of adversity: Moving toward second-generation research on adverse childhood experiences. *Child Maltreatment*, *22*(1), 58–68. https://doi.org/10.1177/1077559516679513

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 & Neglect*, *37*(11), 917–925. https://doi.org/10.1016/j.chiabu.2013.07.011

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., … Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences of the United States of America*, *108*(7), 2693–2698. https://doi.org/10.1073/pnas.1010076108

Muthén, L., & Muthén, B. (1998). *Mplus user's guide (7th ed.)*. Los Angeles: CA. https://doi.org/10.1111/j.1600-0447.2011.01711.x

Newland, L. A. (2014). Supportive family contexts: Promoting child well-being and resilience. *Early Child Development and Care*, *184*(9), 11. https://doi.org/10.1080/03004430.2013.875543

Noltemeyer, A. L., Ward, R. M., & Mcloughlin, C. (2015). Relationship between school suspension and student outcomes: A meta-analysis. *School Psychology Review*, *44*(2), 224–240. https://doi.org/10.17105/spr-14-0008.1

Pianta, R. C. (2001). *Student-teacher relationship scale (STRS): Professional manual*. Odessa, FL: Psychological Assessment Resources, Inc.

Porche, M. V., Costello, D. M., & Rosen-Reynoso, M. (2016). Adverse family experiences, child mental health, and educational outcomes for a national sample of students. *School Mental Health*, *8*(1), 44–60. https://doi.org/10.1007/s12310-016-9174-3

Reardon, S. F., & Galindo, C. (2009). The Hispanic-White achievement gap in math and reading in the elementary grades. *American Educational Research Journal*, *46*(3), 853–891. https://doi.org/10.3102/0002831209333184

Reardon, S. F., & Portilla, X. A. (2016). Recent trends in income, racial, and ethnic school readiness gaps at kindergarten entry. *AERA Open*, *2*(3), 1–18. https://doi.org/10.1177/2332858416657343

Roberts, Y. H., Ferguson, M., & Crusto, C. A. (2013). Exposure to traumatic events and health-related quality of life in preschool-aged children. *Quality of Life Research*, *22*(8), 2159–2168. https://doi.org/10.1007/s11136-012-0330-4

Rosenbaum, J. (2018). Educational and criminal justice outcomes 12 years after school suspension. *Youth & Society*, 1-33. https://doi.org/10.1177/0044118X17752208

Sabol, T. J., & Pianta, R. C. (2012). Recent trends in research on teacher-child relationships. *Attachment and Human Development*, *14*(3), 213–231. https://doi.org/10.1080/14616734.2012.672262

Schroeder, A., Slopen, N., & Mittal, M. (2018). Accumulation, timing, and duration of early childhood adversity and behavior problems at age 9. *Journal of Clinical Child and Adolescent Psychology*, 1–14. https://doi.org/10.1080/15374416.2018.1496440

Shipman, K. L., Medical, C., Fitzgerald, M. M., Carolina, S., Sims, C., & Edwards, A. (2007). Maternal emotion socialization in maltreating and non-maltreating families: Implications for children's emotion regulation. *Social Development*, *16*(2), 268–285. https://doi.org/10.1111/j.1467-9507.2007.00384.x

Skalická, V., Belsky, J., Stenseng, F., & Wichstrøm, L. (2015). Reciprocal relations between student-teacher relationship and children's behavioral problems: Moderation by child-care group size. *Child Development*, *86*(5), 1557–1570. https://doi.org/10.1111/cdev.12400

Skiba, R. J., Chung, C.-G., Trachok, M., Baker, T. L., Sheya, A., & Hughes, R. L. (2014). Parsing disciplinary disproportionality: Contributions of infraction, student, and school characteristics to out-of-school suspension and expulsion. *American Educational Research Journal*, *51*(4), 640–670. https://doi.org/10.3102/0002831214541670

Skiba, R. J., Horner, R. H., Chung, C.-G., Rausch, M. K., May, S. L., & Tobin, T. J. (2011). Race is not neutral: A national investigation of African-American and Latin disproportionality in school discipline. *School Psychology Review*, *40*(1), 85–107. https://doi.org/10.1093/jmedent/6.3.263

Skibbe, L. E., Connor, C. M., Morrison, F. J., & Jewkes, A. M. (2011). Schooling effects on preschoolers' self-regulation, early literacy, and language growth. *Early Childhood Research Quarterly*, *26*(1), 42–49. https://doi.org/10.1038/jid.2014.371

Thompson, R., Flaherty, E. G., English, D. J., Litrownik, A. J., Dubowitz, H., Kotch, J. B., &
Runyan, D. K. (2015). Trajectories of adverse childhood experiences and self-reported
health at age 18. *Academic Pediatrics*, *15*(5), 503–509.

U.S. Census Bureau. (2016). *School enrollment, 2012-2016 American Community Survey 5-Year
estimates S1401*. Retrieved from
https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

U.S. Department of Education Office for Civil Rights. (2014). *Data snapshot: Early childhood
education (suspension policies in early childhood settings).* Washington, D.C.

U.S. Department of Education Office for Civil Rights. (2016). *2013-2014 Civil Rights Data
Collection: A first look*. Washington, D.C.

U.S. Department of Health & Human Services, Administration for Children and Families,
Administration on Children Youth and Families, Children's Bureau. (2018)*. Child
maltreatment 2016*. Available from https://www.acf.hhs.gov/cb/research-data-
technology/statistics-research/child-maltreatment

Van Dyke, J. D. (2016). Removing defiance: An analysis of disciplinary referral data of African
American children within a title 1 school. *Journal of African American Studies*, *20*(1), 53–
66. https://doi.org/10.1007/s12111-015-9318-9

Wade, R., Cronholm, P. F., Fein, J. A., Forke, C. M., Davis, M. B., Harkins-Schwarz, M., …
Bair-Merritt, M. H. (2016). Household and community-level Adverse Childhood
Experiences and adult health outcomes in a diverse urban population. *Child Abuse &
Neglect*, *52*, 135–145. https://doi.org/10.1016/j.chiabu.2015.11.021

Williford, A. P., Wolcott, C. S., Whittaker, J. V., & Locasale-Crouch, J. (2015). Program and
teacher characteristics predicting the implementation of Banking Time with preschoolers who
display disruptive behaviors. *Prevention Science*, *16*(8), 1054–1063.

Chapter Five: Conclusion and Future Directions

Major Findings

This dissertation focused on understanding the specific ways in which a child's exposure to cumulative adversities in early childhood affects their well-being within the preschool environment. The conceptual article in Chapter Two drew from the existing base of literature on childhood adversity, early care and education, and trauma-informed school models for mostly older children to identify components that may be particularly important to consider when developing trauma-informed preschool models. This conceptual article was a foundation upon which the data-driven articles in Chapters Three and Four were developed, as the article highlighted the need for future research exploring childhood adversity within the early care and education context. The need for such an article is demonstrated by the relative dearth of evidence-based trauma-informed school programming for young children and the timely publication of this article in a special issue in the journal of *Topics in Early Childhood Special Education* focused on "Research to Practice in Maltreatment, Trauma, and Toxic Stress." This article made recommendations for trauma-informed early childhood education models specific to school climate, workforce development and supports, parent engagement, and screening/access to targeted mental health supports for young children. The article also identified research recommendations for expanding our understanding of the specific needs of trauma-exposed young children as well as policy recommendations to drive systemic and practice changes.

Chapter Two identified some potential areas of study and future intervention that can begin to close the knowledge gap related to supporting young preschool children who have experienced adversity and trauma. Chapters Three and Four were drawn from a large study that aimed to better understand how cumulative adversity, including maltreatment and violence exposure, may influence children's well-being within the preschool setting. In this large study,

126 children and their caregivers were recruited from 21 classrooms in a large, urban city in Connecticut. Children's exposure to adversities such as domestic violence, community violence, parental substance use, parental incarceration, and food insecurity, among others, were measured. Children's exposure to various types of adversity and trauma in the sample of preschoolers was similar to prevalence rates found in other samples of ethnic minority children living in urban areas (Jimenez, Wade, Lin, Morrow, & Reichman, 2016). Only approximately thirteen percent of children in the sample had experienced no adversities by the start of the study, and children experienced an average of almost three different types of adversities. Data in this study was drawn from parents, teachers, and children at the middle and end of the school year.

In Chapter Three, pathways from environmental and household adversity through bottom-up and top-down self-regulation were explored. Fear and attention bias to threat were conceptualized as "bottom-up" aspects of self-regulation, and inhibition and emotional control were conceptualized as "top-down" aspects of self-regulation. Children's cumulative exposure to environmental adversities, such as community violence, lack of neighborhood safety, and food insecurity, significantly predicted their attention bias, where children with more cumulative adversities demonstrated a hypervigilance toward threatening images. Environmental adversities also predicted the child's fear, as reported by their teacher and parent, where more adversities predicted more reported fear. This meant that children who had experience a greater number of different types of environmental adversities were more likely to be rated by parents and teachers as fearful of things like loud noises, the dark, and scary monsters or characters. Finally, pathways from fear to top-down self-regulation (inhibitory and emotional control) were significant for both parents and teachers, meaning that more fearful children were also reported to have more difficulty controlling their impulses and emotions by both their parents and their teachers.

Chapter Four also explored cumulative adversities and self-regulation, but as predictors of children's relationship with their teacher. This study adds depth to the findings presented in Chapter Three by identifying the impact of children's development on relationships in their social environment. Chapter Four tested mediation path models that examined whether children's self-regulation at the middle of the school year mediated the relationship between their cumulative adversity exposure and their end-of-year student-teacher conflict. Similar to Chapter Three, children's cumulative adversity significantly predicted their self-regulation. Significant mediation pathways were found, suggesting that children with higher adversity had more problems with self-regulation at the middle of the school year, which predicted more conflict in their relationship with their teacher at the end of the year. In multi-group analyses, this pathway was found to be significant for boys and not for girls, suggesting that in this study cumulative adversity predicted top-down self-regulation for boys but not for girls. For both boys and girls, African American children were reported by teachers to have significantly more conflict in the student-teacher relationship, even when controlling for the effects of adversity exposure and self-regulation on the student-teacher relationship.

Strengths and Limitations

The research highlighted in this body of work is innovative through the use of a multi-method, triangulated approach. Triangulated data from parents, teachers, and preschoolers added depth to the findings as did data collected both through survey and task-based assessment. This study is also one of the first to collect data on the dot-probe, a measure of children's hypervigilance towards threatening images, with a relatively large sample of children under age four, in a community setting, and during two distinct time points. Finally, by gathering information from caregivers on their children's exposure to adverse childhood experiences (ACEs) this study also overcame limitations that have plagued the ACEs literature, which

traditionally gathers childhood adversity information through retrospective reports and has not often focused exclusively on adversity in early childhood.

Despite these strengths, there are some limitations that should be addressed in future studies. First of all, the sample in this study was recruited from a single preschool site in a single city. While the sample does reflect the general population of large urban areas in the state of Connecticut and elsewhere throughout the country, the sample may not be generalizable to all areas or all populations. Additionally, teachers and caregivers elected to participate in the study, so the sample is subject to sample bias, in that caregivers whose children have higher rates of adversity or with other potentially distinguishable characteristics may have elected not to participate in the study.

There are additional limitations related to the gathering of adversity indicators in this study. First, not all types of adversity is reflected in this study. Data was not gathered on some traditional measures of adversity such as physical abuse, sexual abuse, and emotional abuse due to mandated reporter requirements. Second, this study only collected data related to the presence or absence of adversity exposure by the time the child entered the study, thus there is no data on factors that would add depth to the data, such as information related to the severity, timing, and chronicity of the exposure. And last, due to social desirability bias, parents may not have reported truthfully on their child's exposure to adverse events, so the prevalence of adversity in this sample may be underreported. The exclusion of questions that would require a mandated report and the completion of survey reporting by paper and pencil rather than via interview reflect attempts made to reduce this form of bias, however it is likely that it still exists. Although a limitation, the fact that the findings still demonstrate a link between children's adversity and key outcomes despite the likelihood that adversity was underreported means that the effects in this study are likely to be even larger were this bias controlled for.

Implications for Social Work and Early Childhood Systems

There are numerous ways in which the fields of early childhood and social work are a natural fit (Kahn, 2014). Social work is already involved in fields, such as child welfare, in which young children are over-represented and at higher risk of outcomes, such as maltreatment related fatalities (U.S. Department of Health & Human Services Administration for Children and Families Administration on Children Youth and Families Children's Bureau, 2018). However, despite this natural fit, social workers continue to be underrepresented within the field of early childhood practice (Azzi-Lessing, 2010) and curricula on early childhood practice is rarely covered in social work education (Greenberg, Herman-Smith, Allen, & Fram, 2013). By exploring the relationship between childhood adversity, including environmental adversities, and children's outcomes within the preschool context, this study highlights the inherent relationship between social work and early childhood systems. Based on study findings, implications for social work practice, policy, education, and future research are discussed below.

Implications for Practice

As discussed in Chapter One, early care and education is and should be a social justice issue and area of focus for the field of social work practice (Kahn, 2014). Social workers should be involved in addressing disparities in educational and well-being outcomes in young children, as these disparities are likely to result in long-term health and well-being outcomes for adults. The disparate child outcomes linked to environmental and overall adversities, as well as race and gender, found in this study all fall within the scope of social justice and social work. The findings in this body of work emphasize the need for social workers to be integrated within early care and education settings as well as the need for more cross-system collaboration between systems in which social workers are frequently embedded, such as the child welfare system, and early childhood systems.

Social workers have long worked within schools for older children, however are rarely integrated within early care and education settings. This is likely to change in future years in large part due to the increased awareness of the influence of environmental factors on early childhood development. International social work practices are already shifting; in 2018, Hong Kong approved funding to expand social work services into kindergarten in a three year pilot starting in the 2018-2019 school year with goals of using social workers to respond to family needs and support early child development within the early care and education environment (Lau & Ho, 2018). Social workers, with their unique training in understanding and responding to the effects of environmental adversities such as food insecurity and homelessness, are well poised to address such issues within the preschool environment. Incorporating social workers in a more comprehensive capacity, such as providing targeted mental health interventions, addressing family adversities and economic circumstances, and supporting teacher mental health are all feasible practice options for social workers.

Another implication for interdisciplinary practice relates to specific interventions to enhance self-regulation for adversity-exposed children. In both Chapter Three and Four, high rates of adversity overall, including child welfare involvement, in this study was found to be related to self-regulation, a key factor in children's school readiness (Reardon & Portilla, 2016). In Chapter Three, adversity exposure predicted children's top-down self-regulation through their attention bias to threats and fear. This suggests that practices that focus on improving self-regulation in children who have been exposed to maltreatment and other adversities should not only focus on top-down self-regulation but should also seek to reduce fear and responses to threat ("bottom-up" constructs of self-regulation), as these are key mechanisms through which adversity impacts several typically-measured constructs of self-regulation. Such interventions

may naturally focus less on children and more on the physical and relational environment that children are in, such as improving feelings of safety in the classroom.

Finally, this study points to a need for changes in practices and support for early care and education staff. Workforce development is one way to influence practice changes for preschool teachers. The findings related to the importance of environmental adversities, the contribution of cumulative adversity to children's self-regulation and student-teacher relationship, as well as the role that race and gender play in the student-teacher relationship are all areas that would be beneficial to incorporate into workforce development for early care and education providers. In fact, social justice issues related to implicit bias and the effects of poverty and trauma on children's development are natural issues for early care educators to be informed about and about which they are in a position to advocate for (Nolan & Lamb, 2018). Teachers who are aware of factors that contribute to children's behaviors in the classroom as well as factors that contribute to disparities in school outcomes will be better prepared to respond to these factors.

Implications for Social Work Education

Despite the natural fit between social work and the field of early childhood education (Azzi-Lessing, 2010), social work education generally lacks focus on early childhood (Greenberg et al., 2013). Social workers frequently practice within medical settings, school settings, family services, and child welfare settings and are likely to encounter young children. The findings of this study highlight the need for social workers in these and other settings to be aware of the impact of childhood adversity on early childhood well-being in order to be able to effectively respond to the needs of young children and their families. This awareness starts through social work education, which can prepare social work students to recognize and respond to early childhood trauma and adversity.

Foundational level Human Behavior in the Social Environment courses are a good fit for training specific to early childhood development and the effects of trauma, including the developmental impact of early trauma, and how to recognize and respond to trauma early in life. Additionally, clinical courses on early childhood would benefit social workers specifically seeking to work with this population, as skills related to assessing, intervening, and evaluating practices with older children and adolescents may not prepare students for work with children ages zero to six. Such training would also prepare students to better advocate for the policy needs of young children and families with young children.

Examples of activities that can be integrated within social work curricula to enhance understanding of early childhood practice include exploring the role of social work in developing early childhood programs, thinking about the connection between social context and early childhood development, practicing observing child behaviors in early care and education settings, and advocacy around issues related to infant mental health and early childhood well-being (Greenberg et al., 2013). This study particularly highlights that social work students should learn about the impact of environmental adversities, such as financial insecurity and community violence, on outcomes related to children's success in early care and education settings.

Implications for Policy

There are a number of policy implications that come out of the findings presented above, several of which echo policy recommendations made in Chapter Two. These implications primarily center around the need for policies that improve access to mental health services for young children, for trauma-informed resources for school staff, as well as for policies that address the impact of trauma and racial disparities on young children's educational outcomes.

Currently, a number of states have either proposed or passed legislation to eliminate or limit the use of suspension and expulsion in preschools (National Conference of State

Legislatures, 2019). This legislation is a policy response to the extreme and pervasive racial disparities found in rates of suspension and expulsion for children of color and the detrimental effects of the early use of exclusionary discipline (U.S. Department of Health and Human Services Administration for Children and Families, 2016). The link between cumulative adversity and children's behaviors related to self-regulation and relationships with teachers found in this study underscores that exposure to trauma and other stressors are potential predictors of suspension and expulsion and should be addressed in related legislation.

Further, the finding that teachers reported more perceived student-teacher conflict with African American students is a direct link to the racial disparities found in school discipline rates across all ages. Currently, while much of the existing or proposed pre-k expulsion legislation cites racial disparities in suspension and expulsion rates as a reason for the need for such legislation, very few address the role that implicit bias may play in such disciplinary action. Further, almost all of the legislation highlights some sort of alternative to suspension or expulsion, such as behavioral interventions, training on responding to challenging behaviors, or early childhood mental health consultation, within the text of the legislation. However, none highlight training around implicit bias as a potential alternative practice (Cruden, Davis, Loomis, Padilla, & Drazen, 2019). Based on the findings of this study that teachers perceived more conflict in their relationship with African American students as compared to their non-Black peers, implicit bias training should be mandated as part of all policies related to promoting equity in early care and education.

Finally, these three studies highlight the negative impact of cumulative adversity exposure, thus emphasizing the need for mental health services that can address early childhood adversity. However, in some states mental health services for young children are not reimbursable due to challenges of diagnosing young children (Melville, 2017). One way to

address this challenge is to support the ability of mental health providers to diagnose a child with "toxic stress" which would reflect conditions such as violence exposure and chronic poverty that have been shown to impact a child's development (for an example, see Michigan Department of Health and Human Services, 2016). This type of policy response is supported by the current studies, as many of the adversities captured as environmental adversities are also considered to be toxic stressors. Policy responses to increase access to mental health services for young children may also include the appropriation of funding for interventions, such as early childhood mental health consultants, that have been shown to be effective (Gilliam, Maupin, & Reyes, 2016).

Future Research

The above chapters have important implications for social work research. First, the findings support the need to consider childhood adversity with an ecological frame that considers the influence of the child's larger environment. Experiences such as witnessing community violence, living in an unsafe neighborhood, and experiencing food insecurity are childhood adversities not typically captured in measures of child abuse and neglect, yet in this study were influential factors related to children's outcomes. To identify the specific influence of these adversities on children's well-being, they should be considered independently and together with more traditional measures of adversities to predict other outcomes related to child well-being. In Chapter Three, environmental but not household ACEs were found to significantly predict children's self-regulation. This finding was surprising, as past research has found household ACEs to significantly predict outcomes, although such studies typically do not include environmental ACEs. It may be that including the environmental adversities essentially washes out the predictive significance of household adversities, indicating that environmental adversities are important to include in all measures of childhood adverse experiences.

Additionally, this study supports the use of the dot-probe task with preschool populations in future research. This study was one of the first to use the dot-probe task with a preschool sample administered in a community setting and is the first sample to gather dot-probe data with a relatively large number of three year-old children. Traditionally the dot-probe task is administered in a laboratory setting, which may limit the sample that researchers are able to capture. Further work should be done to explore the use of the dot-probe with younger samples to determine age limit accuracy thresholds to further refine the preschool adaptation of the dot-probe.

Finally, the findings related to the link between cumulative adversity and a child's race and their school outcomes highlights these two areas as potentially important predictors of adverse school outcomes, such as suspension and expulsion. Trauma-exposure has not been widely studied as a predictor for these outcomes in young children and should be explored in future research. The findings from this study also supports future research that considers a child's race, the teacher-child racial/ethnic match, or the teacher's levels of implicit bias as predictors of children's risk of suspension or expulsion.

Conclusions

As a whole, this body of work supports the notion that early childhood matters. Bridging concepts of social work (particularly related to the ecological environment) and the role of trauma in children's well-being with the field of early childhood can help to address the dearth of research related to supporting the well-being of young, adversity-exposed children. This body of work paints a picture of the risk associated with early childhood adversity, and the role that adversity may play in children's well-being in preschool and school readiness, setting the stage for altered developmental trajectories that influence children's well-being long into adulthood. However, this body of work also paints a picture of hope that trauma-informed and equity-

oriented changes within preschools can help to buffer the effects of adversity and boost children's well-being through protective experiences and relationships. Schools are a critical bridge between families and communities. Promoting trauma-informed school models that are committed to equity and reducing disparities in education for young children has the potential to effect deep and long-lasting positive change.

References

Azzi-Lessing, L. (2010). Growing together: Expanding roles for social work practice in early

childhood settings. *Social Work*, *55*(3), 255–263. https://doi.org/10.1093/sw/55.3.255

Cruden, G., Davis, A., Loomis, A. M., Padilla, C., & Drazen, Y. (2019). Building a framework

for comprehensive preschool suspension and expulsion legislation: A qualitative analysis.

In *2019 Society for Research on Child Development Biennial Meeting*. Baltimore, MD.

Gilliam, W. S., Maupin, A. N., & Reyes, C. R. (2016). Early childhood mental health

consultation: Results of a statewide random-controlled evaluation. *Journal of the American*

Academy of Child and Adolescent Psychiatry, *55*(9), 754–761.

https://doi.org/10.1016/j.jaac.2016.06.006

Greenberg, J. P., Herman-Smith, R., Allen, S. F., & Fram, M. S. (2013). Early childhood

education and care content for the social work curriculum. *Journal of Teaching in Social*

Work, *33*(3), 308–324. https://doi.org/10.1080/08841233.2013.794761

Jimenez, M. E., Wade, R., Lin, Y., Morrow, L. M., & Reichman, N. E. (2016). Adverse

experiences in early childhood and kindergarten outcomes. *Pediatrics*, *137*(2), 1–11.

https://doi.org/10.1542/peds.2015-1839

Kahn, J. M. (2014). Early childhood education and care as a social work issue. *Child and*

Adolescent Social Work Journal, *31*(5), 419–433. https://doi.org/10.1007/s10560-014-0332-

x

Lau, Y. K., & Ho, W. M. (2018). Family-centered kindergarten social work services in Hong

Kong: A pilot project. *Asian Social Work and Policy Review*, *12*(2), 116–126.

https://doi.org/10.1111/aswp.12144

Melville, A. (2017). Trauma-exposed infants and toddlers: A review of impacts and evidence-

based interventions. *Advances in Social Work*, *18*(1), 53. https://doi.org/10.18060/21287

Michigan Department of Health and Human Services. (2016). *Coverage of trauma services for children under 21 years of age*, Pub. L. No. MSA 16-46 (2016). Retrieved from https://www.michigan.gov/documents/mdhhs/MSA_16-46_546952_7.pdf

National Conference of State Legislatures. (2019). *Early care and education bill tracking database 2008-2018*. Washington, D.C. Retrieved from http://www.ncsl.org/research/human-services/child-care-and-early-education-legislation-databas.aspx

Nolan, A., & Lamb, S. (2018). Exploring the social justice work of early childhood educators. *Policy Futures in Education*, 1–16. https://doi.org/10.1177/1478210318796282

Reardon, S. F., & Portilla, X. A. (2016). Recent trends in income, racial, and ethnic school readiness gaps at kindergarten entry. *AERA Open*, *2*(3), 1–18. https://doi.org/10.1177/2332858416657343

U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children Youth and Families, Children's Bureau. (2018). *Child maltreatment 2016*. Available from https://www.acf.hhs.gov/cb/research-data-technology/statistics-research/child-maltreatment

U.S. Department of Health and Human Services Administration for Children and Families. (2016). *State and local action to prevent expulsion and suspension in early learning settings*. Retrieved from https://www.acf.hhs.gov/sites/default/files/ecd/state_and_local_profiles_expulsion.pdf