THE ROLE OF EARLY CARE AND EDUCATION SETTINGS IN PROSOCIAL DEVELOPMENT ACROSS INFANCY, TODDLERHOOD, AND EARLY CHILDHOOD

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In their first few years of life, children develop prosocial behavior during everyday affective interactions with others, both within and outside their home environments. Early childcare and education (ECE) settings may be especially influential, but the mechanisms of prosocial development in these settings remain unknown. Three studies aim to inform our understanding of the social mechanisms of prosocial development in ECE contexts. Study 1 posits a structure-process-outcome model of prosocial development and explores how ECE structural and process characteristics predict the emergence of prosocial behavior at 24 months; Study 2 examines bidirectional associations between prosocial behavior and ECE caregiving across the third year; and Study 3 determines whether experiences in ECE contexts in toddlerhood predict prosocial behavior at school entry and across elementary school.

Study 1 revealed warm and positive caregiving at 15 months, but not caregiver beliefs about childrearing, to be a robust predictor of prosocial behavior at 24 months. Warm and positive caregiving was higher in in-home and family daycare settings than in centers, and in ECE settings with lower caregiver-child ratios and smaller group sizes, but was not associated with caregiver education or training. Study 2 found prosocial behavior to increase from 24 to 36

months and show moderate relative stability. Warm and positive caregiving at 24 months did not explain change in prosocial behavior from 24 to 36 months, but prosocial behavior at 24 months did account for some of the change in warm and positive caregiving over the third year, suggesting that children who exhibit higher levels of prosocial behavior elicit more warm and positive caregiving from their caregivers. Study 3 demonstrated that levels of prosocial behavior remained flat across elementary school, and found that prosocial behavior at 36 months predicted prosocial behavior at school entry, such that children who were more prosocial in toddlerhood were also more prosocial in elementary school. Together, these findings begin to chart the developmental course of prosocial behavior from emergence through late childhood and underscore the important and nuanced role that early childcare settings play in the expression and development of prosociality across the lifespan.

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1.0 INTRODUCTION

Young children display a remarkable capacity and propensity to attend to and care for others. Even in their second year, toddlers show concern for others in distress (Hoffman, 2000), help, comfort, and share with needy others (Eisenberg, Spinrad, & Knafo, 2015), and volunteer to assist with chores around the house (Dahl, 2015), frequently with great enthusiasm (Rheingold, 1982). Individual differences in these tendencies emerge as early as the second year of life (Nichols, Svetlova, & Brownell, 2009; Drummond, Paul, Waugh, Hammond, & Brownell, 2014), and set the stage for positive social outcomes later in development. By the time children enter school, prosocial behaviors have become an important part of their social repertoire. Early prosocial behavior has been associated, concurrently and longitudinally, with higher levels of school-readiness (Raver, 2002); social and moral cognitions (Laible, McGinley, Carlo, Augustine, & Murhpy, 2014); and peer acceptance, peer status, high-quality relationships, mutual friendship, and coping skills (Ladd, Birch, & Buhs, 1999; see Eisenberg et al., 2015). Moreover, early levels of prosocial behavior predict lower levels of, and higher rates of decline in, aggression and externalizing behavior (Eisenberg et al., 2015). Prosocial behavior has also been shown to predict long-term academic competence (Denham & Brown, 2010) and achievement (Caprara et al., 2014), reflecting the functional dependence between social and academic competence during these crucial early years (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Hamre & Pianta, 2000). Promoting prosocial behavior in young children has taken

on added significance given recent findings that as many as one in six children enter kindergarten with serious adjustment problems, and two in six with minor problems (Rimm-Kaufman, Pianta & Cox, 2007).

The mechanisms by which early prosocial behavior emerges and develops, however, remain unclear. Recent years have seen a surge in questions of whether prosocial behavior is socialized at all in the first few years of life, or whether it emerges independent of environmental input (Warneken & Tomasello, 2009, 2013; Wynn, 2008; Hamlin, 2012; Hamlin, Wynn & Bloom, 2007; Martin & Olson, 2015; see Brownell et al., 2016). The supposition that prosociality, and morality writ large, is evolutionarily-endowed has taken hold in both popular and academic press, despite its stark contrast to long-standing theoretical traditions arguing that social input drives prosocial development (Brownell et al., 2016; Hastings, Utendale & Sullivan, 2007; Eisenberg et al., 2015). These long-standing traditions propose that the emergence and development of prosocial behavior is facilitated by the exploration and gradual refinement of prosocial behaviors during everyday affective interactions with others. Supporting this perspective is a wealth of empirical research demonstrating that parents and siblings are central to the development of prosociality (Grusec & Lytton, 1988; Hastings et al., 2007; Dunn, 1988; Eisenberg et al., 2015; Denham & Grout, 1992; Drummond & Brownell, in preparation). Although the bulk of this research has focused on prosocial development in the home, the interactions within which prosocial behaviors develop are not limited to young children's home environments. According to bioecological models (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006), development is the result of multiple interacting systems that influence the child, directly and indirectly, over time. These systems include both familial and extrafamilial settings.

Childcare is one extrafamilial setting that may be especially influential. The majority of toddlers receive routine care from someone other than a parent during their first year of life, often by the time they are 3 months old (Huston, Bobbitt & Bentley, 2015; Burchinal, Magnuson, Powell, & Hong, 2015). Such early care and education (ECE) settings offer a wealth and variety of social interactions with novel adults and peers during which toddlers can explore and build their burgeoning prosocial abilities, over and above, but also in concert with, the development that occurs in their home environments (NICHD ECCRN, 2001). In this way, ECE settings can be uniquely formative for prosocial development. Parents and policymakers alike have a vested interest in identifying how ECE settings promote the development of these skills. Nevertheless, there remain significant gaps in our understanding of which features and characteristics of ECE settings facilitate prosocial development.

Three studies aim to address these gaps and inform our understanding of the social mechanisms of prosocial development in ECE contexts. Each involves analysis of a large existing longitudinal dataset: the first explores how structural and process characteristics of ECE settings facilitate the emergence of prosocial behavior at the end of the second year; the second examines how prosocial development unfolds over the third year and analyzes its bidirectional association with ECE process factors; and the third determines whether experiences in ECE settings in toddlerhood predict prosocial behavior at school entry and developmental trajectories over elementary school. In each study, ECE factors are considered alongside family characteristics. First, the literature on prosocial behavior's emergence and development across childhood will be reviewed, followed by a review of the literature specifically examining how its development is shaped by ECE settings.

1.1 PROSOCIAL BEHAVIOR

Prosocial behavior is traditionally defined as any intentional action that benefits another (Eisenberg et al., 2015). Throughout the lifespan, prosocial behavior tends to be associated with and predictive of a wide range of positive outcomes, both for the child herself and for others who interact with her (see Eisenberg et al., 2015). Much empirical research over the last few decades has focused on the development of prosocial behavior, as well as the social precursors and consequences of its development, across a wide span of ages. In particular, there has been a considerable effort to understand and describe the emergence and early expression of prosocial behavior, its development during the toddler years, and its development across elementary school.

1.1.1 Emergence and early expression

The earliest manifestations of prosocial behavior appear during second year of life and include instrumental helping (Warneken & Tomasello, 2007; Svetlova, Nichols, & Brownell, 2010), cooperating (Brownell, Ramani, & Zerwas, 2006; Hay, 1979; Warneken & Tomasello, 2007), and comforting (Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). Over the second and third years, these behaviors tend to become more frequent, varied, nuanced, and complex (Dunn & Munn, 1986; Eisenberg, Wolchik, Goldberg, & Engel, 1992; for reviews, see Eisenberg et al., 2015 and Hastings et al., 2007), and children begin to exhibit more advanced behaviors such as sharing (Brownell, Svetlova & Nichols, 2009) and altruistic helping (Svetlova et al., 2010). These individual prosocial behaviors, while conceptually distinct and reliant upon different social, cognitive, and physical abilities, all reflect a “basic impulse to engage positively

with other people that only gradually becomes *selective, socially appropriate, self-regulated,* and *morally informed* activity" (original emphasis) (Hay & Cook, 2007, p. 102).

Individual differences in the emergence and early expression of prosocial tendencies also appear as early as the second year of life (Nichols et al., 2009; Drummond et al., 2014), and these differences arise to a large degree from social processes (Brownell, Svetlova, Anderson, Nichols, & Drummond, 2013; Brownell et al., 2016). Infants are active participants in their social worlds, eliciting and engaging in complex interactions with others beginning shortly after birth. These interactions over the first years of life are the contexts in which infants experience and explore the emotions, cognitions and behaviors that ultimately give rise to prosocial behavior (Brownell et al., 2016; Carpendale & Lewis, 2004). This is reflected in a growing body of research showing that parents actively and frequently socialize prosocial behavior in their infants during the second year (Gralinski & Kopp, 1993; Smetana, Kochanska, & Chuang, 2000; Dahl, 2015; Hammond & Brownell, 2015; Rheingold, 1982); and, crucially, that these socialization practices are associated with (Rheingold, 1982; Brownell et al., 2013; Drummond et al., 2014; Hammond & Carpendale, 2015; Pettygrove, Hammond, Karahuta, Waugh, & Brownell, 2013; Zahn-Waxler, Radke-Yarrow, & King, 1979) and predictive of (Dahl, 2015; Dahl et al., in press) early expressions of prosociality. The emergence of prosocial behavior is governed, at least in part, by the social interactions infants experience in their first two years of life.

1.1.2 Development during toddlerhood

This socialization process continues throughout the rest of toddlerhood. Prosocial behavior does not emerge fully formed (Brownell et al., 2016), is rudimentary and limited in its early expressions (Svetlova et al., 2010; Zahn-Waxler et al., 1992; Hoffman, 2000), and undergoes

dramatic reorganization over the third year. The few longitudinal examinations of prosocial behavior over the third year have found little evidence for relative stability in prosocial behavior. Hay and colleagues found no significant autocorrelations of toddlers' sharing with peers across 24, 30, and 36 months (Hay, Castle, Davies, Demetriou & Stimson, 1999); and Eisenberg et al. (1992) found no significant autocorrelations of toddlers' spontaneous prosocial behavior with parents at 24 and 30 months. Additionally, findings regarding mean level change in prosocial behavior across the third year are inconsistent (for reviews see Hay & Cook, 2007; Eisenberg et al., 2015). Cross-sectional analyses have found prosocial behavior to increase from 18 to 30 months of age (Svetlova et al., 2010; Brownell et al., 2013; Drummond et al., 2014); while longitudinal analyses tend to find no change or declines over this period (Demetriou & Hay, 2004; Hay et al., 1999; Eisenberg et al., 1992). Taken together, these findings illustrate that development does not necessarily imply, and may not be marked by, an increase in frequency; and they suggest that toddlerhood is a period of transition, during which prosocial behavior gradually becomes more organized, consolidated and coherent (Hay & Cook, 2007; Hay et al., 1999).

Just as they do earlier in ontogeny, social experiences play a critical role in this organization and consolidation. Parents continue to socialize prosociality in their toddlers during this period. Global aspects of parenting, such as sensitivity and responsiveness, and specific parenting practices, such as discipline techniques and emotion talk, have been associated with prosocial development (for reviews, see Laible & Thompson, 2007; Drummond & Brownell, in preparation). Additionally, toddlers play an active role in their own socialization, co-constructing the environments and shaping the social interactions in which they explore and develop prosocial understanding and motivation (Kuczynski & Parkin, 2007; Grusec & Goodnow, 1994; Grusec,

Goodnow, & Kuczynski, 2000). Prosocial children likely contribute to positive social environments and elicit positive caregiving, both frequent predictors of prosociality; indeed, prosocial behavior at 24 months has been shown to explain changes in sensitive parenting from 24 to 36 months (Barnett, Gustafsson, Deng, Mills-Koonce, & Cox, 2012). Despite strong theoretical grounds for bidirectionality, there is a relative dearth of research on bidirectional processes between prosocial development and the social interactions in which it takes place, notably with respect to children's elicitation of positive caregiving in childcare; such examinations are necessary for a thorough understanding of prosocial development in toddlerhood and the settings in which it takes place.

1.1.3 Trajectories across elementary school

Individual differences in behavior tend to become more stable after the dramatic development and consolidation that occurs during the early years (McCall, 1981), and prosociality is no exception. By the time children enter school, individual differences in prosocial behavior have begun to stabilize: the few longitudinal analyses of prosocial behavior in elementary school have found moderate relative stability from kindergarten to grade 6 (Côté, Tremblay, Nagin, Zoccolillo, & Vitaro, 2002; Kokko, Tremblay, Lacourse, Nagin, & Vitaro, 2006); across grades 3, 5, and 6 (Newton, Laible, Carlo, Steele, & McGinley, 2014); and from age 7 to 12 (Eisenberg et al., 1987).

Conversely, there is little consensus regarding the shape of developmental change over this period; that is, changes in mean levels of prosocial behavior rather than stability of individual differences. A meta-analysis found prosocial behavior to generally increase across middle childhood (Eisenberg & Fabes, 1998), while the few extant longitudinal analyses reveal

flat (Côté et al., 2002; Newton et al., 2014) or declining (Kokko et al., 2006) trajectories. The shape of these trajectories may vary by behavior and reporter (Eisenberg et al., 2015), but such suggestions are preliminary given the paucity of longitudinal analyses.

Additionally, very little is known about whether, and how, early social experiences shape these trajectories. There is evidence that early experiences at home and in school predict levels of prosociality up to several years later (for a review, see Eisenberg et al., 2015), but no studies, to our knowledge, have examined whether early experiences predict the shape or nature of later developmental change. Additional research is needed for a thorough understanding of both the trajectories of prosocial behavior over elementary school and the early settings that may shape them (Eisenberg et al., 2015).

In short, prosocial behavior emerges in the second year of life, undergoes dramatic consolidation and organization during the preschool years, and continues to develop throughout elementary school. Social experiences play an important role across these periods, predicting the emergence of prosociality, shaping and responding to its early expressions, and laying the foundation for later trajectories of growth.

1.2 EARLY CARE AND EDUCATION SETTINGS: A DEVELOPMENTAL CONTEXT

The primary processes that govern the emergence of prosocial behavior, its early development in toddlerhood, and its growth across middle childhood, are fundamentally social in nature. Young children co-construct prosocial understanding and lay the foundation for prosocial motivation throughout the course of repeated, affectively-charged interactions with others (Brownell et al.,

2013; Brownell & Kopp, 2007; Carpendale & Lewis, 2004; Hoffman, 2000; Drummond et al., 2014). Much of a child's early social interactions occur in the home setting, and during these interactions parents and other family members routinely contribute to the development of prosocial behavior. Parents, in particular, play a central role in theories of prosocial socialization. Attachment theory emphasizes parental warmth, sensitivity, and responsiveness as crucial components of secure parent-child relationships that set the stage for positive developmental outcomes; empirical research over the last several decades has revealed these aspects of parenting to be consistent and robust predictors of prosocial development (for a review, see Hastings et al., 2007). Building on attachment theory, theories of parenting styles argue that parents who exhibit an authoritative style, combining high levels of warmth, responsiveness, and control, promote prosocial behavior through modeling, encouraging, and reinforcing; associations between parenting styles and prosocial behavior have mostly, though not always, supported this conceptualization (for a review, see Hastings et al., 2007). Clearly, prosocial development is facilitated and shaped by the social interactions that occur in a child's home environment.

Nevertheless, the social processes that contribute to development are not isolated to this home setting. Widely-accepted bioecological models (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006) recognize that children are embedded in a series of nested and interacting ecological systems that impact development, and that these systems extend beyond the family. Indeed, extrafamilial settings are emphasized as having critical and potentially large direct and indirect impacts on child development, over and above family settings. Early care and education settings represent one of the primary extrafamilial contexts in which development occurs. Through the bioecological lens, ECE settings represent a range of ecological systems,

including proximal microsystems, such as individual dyadic relationships between children and caregivers, and somewhat more distal mesosystems, such as classrooms or childcare providers. Microsystems are embedded within mesosystems, and the characteristics of the micro- and mesosystems continuously interact with, and are dependent upon, one another. Classroom characteristics can both shape and be shaped by characteristics of the individual dyadic relationships that exist within the classroom system (Votruba-Drzal, Coley, Maldonado-Carreño, Li-Grining, & Chase-Landsdale, 2010). No system is fully independent of the others, and development is a product of the continuous interactions among these multiple micro- and mesosystems.

ECE settings are important extrafamilial contexts in part because they often differ in meaningful ways from children's home environments. In ECE settings, children are more likely to play with groups of same-age peers, be exposed to a different set of routines and social norms, and interact with multiple caregivers who may have childrearing approaches that differ from those they experience at home (Burchinal et al., 2015; Lamb & Ahnert, 2006; Votruba-Drzal, Coley, Koury, & Miller, 2013; Degol & Bachman, 2015). In addition, children may experience less one-on-one time with their caregivers (Burchinal et al., 2015; Lamb & Ahnert, 2006). Hence, ECE settings are unique socialization contexts, and the socialization processes that occur in these settings may be fundamentally different from those that occur in the home (Lamb & Ahnert, 2006).

ECE settings may also be especially impactful as the bulk of extrafamilial social interaction for most children in their first years of life occurs in these settings. The percentage of children who experience nonparental childcare before their first birthday has been estimated to range from 48% to 72%, and many children begin as early as 3 months when their parents return

to work (Burchinal et al., 2015; Huston et al., 2015; Votruba-Drzal et al., 2013). Head Start, the oldest and largest federally funded preschool program, has served over 27 million children since it was first implemented in 1965 (Burchinal et al., 2015); and Early Head Start, which provides comprehensive services for children from birth to age 3, served over 140,000 families in 2014 alone (U.S. Department of Health and Human Services, 2015). Children accumulate many hours in these settings by the time they enter school: on average, children spend about 27 hours per week in childcare settings from 3 through 54 months (Huston et al., 2015).

Experiences in ECE settings influence the quality and nature of children's social relationships (Hay et al., 1999; Huston et al., 2015). Evidence suggests that this process begins in the first years of life, when prosocial behavior is first emerging, with early ECE experiences predicting peer competence (NICHD ECCRN, 2001) and social behavior at the end of the second year (Burchinal et al., 2015). Prosociality then develops over the preschool years within ECE settings; early education in these settings has been identified as one of the most effective ways to improve school readiness, including social and emotional skills, at the end of the preschool period (Burchinal et al., 2015; Votruba-Drzal, Coley, Collins, & Miller, 2015). A wide range of social-emotional learning curricula with explicit scaffolding and teaching of prosocial skills have been applied in ECE settings during the preschool years, many of which have yielded encouraging findings despite variation in theoretical orientation and lesson content (CASEL, 2013). Finally, ECE has a lasting impact on social adjustment and behavior, with demonstrated impacts persisting across elementary school and into adolescence, in spite of the considerable variation in children's experiences after they leave ECE (Burchinal et al., 2015; Vandell et al., 2010; Huston et al., 2015; Hamre, 2014; Peisner-Feinberg et al., 2001). These findings demonstrate that experiences in ECE settings play an important role in the early and ongoing

development of social behavior in the preschool years, and set the stage for future social development in school.

As a result, policymakers have implemented a variety of policies to measure and improve ECE quality, independent of curricula (Burchinal et al., 2015). The most prominent and extensive such effort has been the implementation of market-based incentive systems referred to as Quality Rating and Improvement Systems (QRIS). These systems measure and aggregate a series of ECE variables, varying state by state, into a single standard rating of overall quality of the caregiving environment that parents can review when making childcare decisions (Burchinal et al., 2015). Despite considerable investment in the development of QRIS, ratings have not been found to reliably predict positive social outcomes (Burchinal et al., 2015; Mashburn et al., 2008; Sabol, Hong, Pianta, & Burchinal, 2013). This may be due, in part, to the aggregation across multiple indicators that associate differentially, or not at all, with prosocial behavior (Huston et al., 2015; Mashburn et al., 2008; Sabol et al., 2013). That is, aggregation across many measures of ECE quality may obscure the individual factors that are most important for prosocial development (Zaslow et al., 2006). Additionally, there is no consensus for how to define or measure quality of learning environments and caregiving, and correspondingly little consistency in how QRIS composites are derived (Mashburn et al., 2008; Hamre, 2014; Burchinal et al., 2015; Mashburn et al., 2008). A secondary goal of the proposed studies is to contribute to the development of QRIS systems by identifying specific ECE characteristics most strongly predictive of positive social outcomes.

Research on the effects of ECE settings on social development has focused primarily on problem behavior and general social competence. Prosocial behavior itself has not been measured frequently, or with adequate specificity, as an outcome or correlate of experiences in

ECE settings (Lamb & Ahnert, 2006), despite its important role in fostering positive classroom climate and diffusing conflict and disruptiveness (Jennings & Greenberg, 2009). As a consequence, empirical findings regarding prosocial development are sparse, and there remains a lack of thorough understanding about which ECE features promote prosocial behavior. In response, several prominent investigators have called for additional research to address this gap (Burchinal et al., 2015; Huston et al., 2015). Nevertheless, theory and extant research on broad social behavioral outcomes suggest the potential importance of several characteristics of the caregiving environment that have a history in the literature on ECE effects and are often included in composite QRIS measures. These fall broadly into two categories, both of which will be included in the proposed research: process and structural factors.

It should be acknowledged that other features of ECE, most notably peer influences, are likely to shape the development of prosocial behavior. Peers play a unique role in prosocial development, and close reciprocal relationships with peers may facilitate the development of perspective taking, empathy, and prosocial behavior (Eisenberg et al., 2015). Indeed, children who more frequently attend ECE settings with other children exhibit more positive and skilled play with peers (NICHD ECCRN, 2001), suggesting that the presence of peers in ECE settings may provide opportunities to explore and develop prosocial behavior. The current studies focus on the caregiving environment rather than the characteristics of children's peers or their peer relationships.

1.2.1 Process factors

Just as parents do in the home, caregivers play a large role in the development that occurs in ECE settings (Eisenberg et al., 2015; Jennings & Greenberg, 2009). In a bioecological

framework, the caregiver-child relationship is viewed as a microsystem, one of the immediate and proximal processes posited to be the "primary engines of development" (Bronfenbrenner & Morris, 2006, p. 798). Factors that capture the quality and dynamics of this relationship are labelled process factors (Burchinal et al., 2015). Process factors, including warm and positive caregiving and caregiver childrearing styles, are considered the most important and proximal ECE mechanisms of social development (Burchinal et al., 2015).

1.2.1.1 Warm and positive caregiving Much of the literature on warm and positive caregiving in ECE settings is grounded in attachment theory. Positive affective interactions between children and caregivers are thought to encourage feelings of emotional security that afford effective communication and allow children to devote their attention and emotional resources to learning (Burchinal et al., 2015; Burchinal, Peisner-Feinberg et al., 2002). Furthermore, warm and positive caregivers likely promote prosocial behavior by modeling, encouraging, and reinforcing positive social behaviors (Eisenberg et al., 2015; Jennings & Greenberg, 2009; Ramaswamy & Bergin, 2009; Denham, Bassett, & Zinsser, 2012). When measured in parents, warmth and positivity have been associated with prosocial behavior across multiple ages, starting in toddlerhood (Eisenberg et al., 2015; Eisenberg, Fabes, & Spinrad, 2006; Hastings et al., 2007). Additionally, there is evidence that children who are more prosocial elicit more sensitive parenting in toddlerhood than children who are less prosocial (Barnett et al., 2012), suggesting bidirectionality in these associations.

Warm and positive caregiving is arguably the most consistent ECE predictor of positive social behavior in preschool (Mashburn et al., 2008). Caregiver-child relationships that are characterized by warmth, positivity and responsiveness have been associated with social skills

(Peisner-Feinberg et al., 2001; Peisner-Feinberg & Burchinal, 1997; Burchinal, Peisner-Feinberg et al., 2002; Hamre, 2014; Mashburn et al., 2008; Howes, 1990; Howes, Phillips & Whitebook, 1992), positive social behavior (Huston et al., 2015; Votruba-Drzal, Coley, & Chase-Lansdale, 2004), positive affect (Howes, 1990), self-regulation (Williford, Vick Whittaker, Vitiello, & Downer, 2013; Raver et al., 2011; Howes, 1990; Howes & Olenick, 1986), and compliance (Howes, 1990; Howes & Olenick, 1986). These findings persist over and above prior skill level, child and family characteristics, and physical setting characteristics; and their causal nature has been validated in experimental designs (Mashburn, Downer, Hamre, Justice, & Pianta, 2010; Raver et al., 2011). Only three studies, to our knowledge, have measured specific prosocial behaviors, and all found significant associations with positive caregiving in ECE: in children aged 24 to 36 months (Clarke-Stewart, Vandell, Burchinal, O'Brien, & McCartney, 2002), 3-5 years (Johnson, Seidenfeld, Izard, & Kobak, 2013), and 4-5 years (Romano, Kohen, & Findlay, 2010).

The impact of caregiver-child relationships persists beyond preschool. Warm, responsive, and positive caregiving has been associated with language and academic achievement in elementary school (Burchinal, Peisner-Feinberg et al., 2002; Peisner-Feinberg et al., 2001; NICHD ECCRN, 2005b), and children who experienced more responsive and warm caregiving showed higher levels of cognitive and academic achievement, and fewer externalizing behaviors, into middle childhood and adolescence (Vandell et al., 2010; Votruba-Drzal et al., 2010). Although not specific to prosocial behavior, these findings illustrate that children's relationships with their caregivers in ECE settings have lasting impact on their social developmental trajectories (Hamre, 2014).

As a caveat to these findings, it is important to note that there remains little consistency or precision in how positive caregiving is measured (Hamre, 2014; Burchinal et al., 2015; Mashburn et al., 2008), and some suggestion that different measures yield distinct patterns. For instance, two studies (Mashburn et al., 2008; Peisner-Feinberg et al., 2001) measured caregiving quality in multiple ways, and both found that the measure most directly and specifically capturing warm and positive caregiver-child relationships was the most strongly associated with child social outcomes. These findings highlight the need for specific and detailed measures of positive caregiving, as well as more research to explore and justify these measures. Additionally, there has been very little research on bidirectional associations between prosociality and positive caregiving in childcare; more research is needed to more fully explore these processes.

1.2.1.2 Childrearing styles The role of childrearing style in promoting prosocial development has primarily been explored with parents. Childrearing style is traditionally represented as two orthogonal dimensions along which caregivers vary: one of warmth, responsiveness, and sensitivity; and the other of behavior control (Grusec & Lytton, 1988; Hastings et al., 2007). Authoritative parenting, characterized by high levels of both warmth and control, is thought to promote prosociality by modeling and encouraging prosocial and affiliative behavior; while authoritarian parenting, characterized by low levels of warmth but high levels of control, is thought to undermine it by modeling lack of concern for others and eliciting hostility (Hastings et al., 2007). Findings are largely, although not always, consistent with these conceptualizations: toddlers and children tend to be more prosocial when their parents are authoritative rather than authoritarian (for a review, see Hastings et al., 2007).

The ECE-relevant literature has focused mostly on the role of caregiver childrearing style in promoting warm and positive interactions, and several investigations have found positive caregiving to be associated with caregivers' child-centered and authoritative beliefs, a proxy for childrearing style (NICHD ECCRN, 2000; Pianta et al., 2005; Clarke-Stewart et al., 2002). Findings regarding the association between caregiver beliefs and prosocial development are sparse and mixed: in two studies, child-centered authoritative beliefs have been associated with social competence (Rosenthal, 1994) and self-regulation (Hur, Buettner & Jeon, 2015), an important component and predictor of prosocial behavior; conversely, another study found no association between caregiver childrearing beliefs and positive social behavior (Clarke-Stewart et al., 2002).

In sum, the extant research suggests that caregivers play an important and lasting role in social development, including a small literature that includes prosocial behavior. Similar to findings with parents, warm and positive caregiving in ECE settings is consistently associated with children's social competence, including prosocial behavior, and may be predictive of later prosocial development even after children leave these settings. Childrearing styles and caregiver beliefs about childrearing are less consistently found to associate with prosocial behavior.

Although sparse, research has found these patterns across the age spectrum, starting as early as the end of the second year (Clarke-Stewart et al., 2002) when some prosocial behaviors are emerging. In early ECE settings, characterized by frequent social interaction and shared space/resources, positive and warm caregivers likely engage in explicit socialization efforts to maintain a positive classroom climate, such as teaching how to take turns, resolve conflicts constructively and positively, and recognize and regulate emotions; they may even specifically scaffold prosocial behaviors like sharing and cooperation (Jennings & Greenberg, 2009; Howes,

1990; Howes et al., 2008). Under these circumstances, and with children accumulating many experiences in ECE settings in their first two years of life, it can be hypothesized that high quality caregiving plays a role in the emergence of prosocial behavior as well as its later development during the toddler and middle childhood years.

1.2.2 Structural factors

Structural factors include the resources and setting characteristics that provide the foundation for high quality care. From the bioecological perspective, these characteristics pertain to the classroom or ECE mesosystem, as they describe the broader system in which caregiver-child microsystems are embedded; hence, these factors likely operate on development indirectly, through more proximal caregiver-child interactions (Bronfenbrenner & Morris, 2006). Indeed, structural factors are thought to promote child outcomes through process factors (NICHD ECCRN, 2002a; Burchinal, Roberts, Nabors, & Bryant, 1996), and have been considered necessary for high process quality (Burchinal et al., 2015; Clarke-Stewart et al., 2002; Lamb & Anert, 2006). Furthermore, as they are more "regulable" than process factors, structural factors are often included in quality rating systems when "nonregulable" process factors are not (Clarke-Stewart et al., 2002; Mashburn et al., 2008; NICHD ECCRN, 2002a). Research on ECE quality and child outcomes has focused both on direct associations between structural factors and child behavior, and on whether potential effects of structural factors on child outcomes are mediated through process factors, and in particular through warm and positive caregiving; a growing body of research supports this mediated pathway. Commonly studied structural factors include caregiver education and training, child-to-caregiver ratio, group size, and childcare type.

1.2.2.1 Caregiver education Caregiver education is one of the most frequently used and examined structural factors, and is considered a hallmark of high-quality care (Burchinal et al., 2015; NICHD ECCRN, 1999, 2002a). States vary widely in their regulations for minimum level of education for caregivers (Burchinal, Cryer, Clifford, & Howes, 2002), but the American Academy of Pediatrics (2005) recommends at least an associate's credential in child development (Burchinal et al., 2015). Caregivers with higher levels of formal education are thought to better understand and respond to children, and provide more scaffolding and better opportunities for exploration; in this way, caregiver education is viewed as a proxy for caregiver skill (Burchinal et al., 2015).

In general, caregiver education is one of the most consistent and robust predictors of warm and positive caregiving, with small to medium effect sizes (Burchinal, Cryer, et al., 2002; Burchinal, Howes, & Kontos, 2002; NICHD ECCRN, 2000). Caregivers with an Associate degree or higher are more sensitive and responsive, and less harsh, than those with less formal education (Howes, 1997). Direct associations between caregiver education and child outcomes are less consistent. Individual studies have found caregiver education to predict language scores (Burchinal, Cryer, et al., 2002; Howes, 1997) and learning (Sabol et al., 2013), although a recent meta-analysis found neither educational degree nor teaching certification to be related to child academic outcomes (Early et al., 2007). Direct associations with social outcomes is similarly mixed: one study found children whose caregivers had a BA or Child Development Associate (CDA) to engage in more complex and advanced play with peers, including reciprocal and cooperative play (Howes, 1997); while another found no significant association between caregiver education and positive social behavior (NICHD ECCRN, 1999).

Several studies have found evidence for a mediated pathway from caregiver education to social competence through positive caregiving. Two studies found that associations between caregiver education and social competence were fully mediated through caregiving quality; indirect, but not direct, associations were significant (NICHD ECCRN, 2002a; Burchinal et al., 1996). Another study found caregiver education to predict social competence to a smaller and less consistent degree than caregiver emotional support. In the latter study, the authors concluded that caregiver education fosters positive social outcomes only if it leads to more positive caregiving and higher quality caregiver-child interactions (Mashburn et al., 2008).

Ongoing and specialized training are also often included in quality rating systems and considered measures of structural quality, over and above education level. The American Academy of Pediatrics (2005) recommends ongoing in-service training for all caregivers, and there is growing understanding that ongoing coaching provides a strong opportunity for quality improvement (Burchinal et al., 2015). Attending workshops, whether at a training center, community center, or professional meeting, has been associated with higher quality and more sensitive caregiver-child interactions (Burchinal, Cryer, et al., 2002; Burchinal, Howes, et al., 2002). Direct effects of specialized training on child outcomes are also mixed. Two studies have found training to positively predict language (Mashburn et al., 2010; Burchinal, Cryer, et al., 2002), and another found teacher training to improve self-regulatory functioning (Raver et al., 2011), but two others found no associations between caregiver training and positive social behavior (NICHD ECCRN, 1999; Clarke-Stewart et al., 2002). There are many plausible reasons for these mixed findings, including varying levels of quality and intensity of the training to which caregivers were exposed, and whether the training was aligned with a rigorous curriculum (Burchinal et al., 2015). Furthermore, caregiver training and education tend to be highly

correlated, and are sometimes collapsed into a single measure (Burchinal, Cryer, et al., 2002). In general, caregiver education and training are inconsistent direct contributors to social behavior. Evidence suggests that caregiver education, and likely ongoing training, operate indirectly on social development through caregiving quality.

1.2.2.2 Child-to-Caregiver ratio A low child-to-caregiver ratio is considered necessary for caregivers to interact optimally with individuals or small groups of children (Burchinal et al., 2015). Caregivers responsible for a small number of children are more able to individualize care, respond to social bids, and provide developmentally appropriate activities that afford hands-on, child-driven exploration (Howes et al., 1992). The National Association for the Education of Young Children (NAEYC) recommends a ratio of 3:1 or 4:1 for infants and toddlers under 21 months, 4:1 to 6:1 for toddlers 21 to 36 months, 6:1 to 9:1 for preschoolers, and 8:1 to 10:1 for 4- and 5-year olds (NAEYC, 2013). Low child-to-caregiver ratio is considered a hallmark of high quality care (Burchinal et al., 2015).

Ratio and positive caregiving tend to be empirically related, although several examinations have found no significant associations between ratio and observed quality (Burchinal, Howes, et al., 2002; NICHD ECCRN, 2000). Howes (1997) found caregivers to exhibit higher levels of sensitivity and responsiveness, and lower levels of harshness and detachment, when in settings that adhered to NAEYC recommendations for child-to-caregiver ratio. Furthermore, Howes and colleagues (1992) found that caregivers were rated as providing higher quality care and more developmentally appropriate activities when in settings with lower ratios. One experiment manipulated ratio and found that caregivers exhibited significantly higher support and overall caregiving quality in lower-ratio groups (3:1 vs. 5:1), offering evidence for a

causal relationship (de Schipper, Riksen-Walraven & Geurts, 2006). Direct associations between ratio and child outcomes have been mixed. The aforementioned experiment found lower child-to-caregiver ratios to result in higher child cooperation with the caregiver (de Schipper et al., 2006), and ratio has been significantly associated with mother-reported positive social behavior (NICHD ECCRN, 1999). On the other hand, ratio has not been associated with caregiver-reported social skills (Mashburn et al., 2008) or problem behaviors (Howes, 1997). Similar mixed patterns emerge for social and language development, and may result from indirect associations through positive caregiving (for reviews, see Dunn, 1993a, 1993b)

Empirical evidence for these indirect paths through positive caregiving has been fairly consistent. Child-to-caregiver ratio has been indirectly associated, via caregiving quality, with cognitive development (Burchinal et al., 1996); social competence with peers (Howes et al., 1992); and a latent factor representing mother- and caregiver-reported social competence (NICHD ECCRN, 2002a). In all three studies, direct associations were not significant. Child-to-caregiver ratio appears to primarily shape social development indirectly, through its affordance of higher quality, more child-centered, and more responsive caregiving.

1.2.2.3 Group Size A small to moderate group size, independent of the child-to-caregiver ratio, is also considered necessary for optimal caregiving (Burchinal et al., 2015). Larger classes have been characterized by less caregiver-child interaction as well as more child aimless wandering and non-involvement with peers, perhaps because caregivers cannot devote the time to scaffold interactions (Dunn, 1993b). The American Academy of Pediatrics (2005) recommends maximum group sizes to be 6 for infants, 8 for 1- to 2-year olds, 10 for 2- to 3-year olds, 14 for 3- to 4-year olds, and 16 for 4- to 6-year olds (Burchinal et al., 2015).

Associations between group size and positive caregiving have been inconsistent (Clarke-Stewart et al., 2002). Several studies have found overall caregiving quality to be associated with group size (Howes et al., 1992; NICHD ECCRN, 1996, 2000; Clarke-Stewart et al., 2002), while others have found associations to be inconsistent and/or non-significant (Burchinal, Howes, et al., 2002; Phillipsen, Burchinal, Howes, & Cryer, 1997). Early work on prosocial behavior and ECE group size suggested that children in smaller groups were more compliant, cooperative, and socially competent, and less antisocial (Clarke-Stewart & Gruber, 1984; Howes, 1983; Holloway & Reichhart-Erickson, 1988; Howes & Rubenstein, 1985; Ruopp, Travers, Glantz, & Coelen, 1979; see Dunn, 1993b for a review). Conversely, recent studies have found no significant associations with cooperation (Clarke-Stewart et al., 2002), social competence or problem behaviors (Mashburn et al., 2008), or positive social behavior (NICHD ECCRN, 1999). This discrepancy may be due to the inclusion of measures of process quality in this more recent work – indeed, Howes and colleagues (1992) found group size to operate on social competence with peers entirely through caregiving quality. Hence, much like child-to-caregiver ratio, group size likely shapes prosocial behavior indirectly by facilitating positive and warm caregiving.

1.2.2.4 Type of Childcare Children's experiences in childcare vary considerably by type of setting. In-home care settings, most frequently in the child's own home with a grandparent, tend to be informal and non-educational in focus; family daycare settings, frequently with other children, tend to involve mostly free-play; and center-based settings tend to include more time spent in structured adult-directed activities, offer more physical resources and space, and afford interactions with more children (Burchinal et al., 2015; NICHD ECCRN, 2004). Children acquire social and emotional understanding, as well as communication skills and knowledge,

during the interactions with their peers and caregivers (Denham, McKinley, Couchoud, & Holt, 1990; NICHD ECCRN, 2001), and as such, different setting types likely differentially shape prosocial development.

Caregiving quality has been shown to vary across types of childcare settings, likely due in part to the nature of the relationship between child and caregiver. In particular, caregiving quality for toddlers has been found to be highest when provided by a relative, followed by non-relative caregivers in in-home care settings, and lowest in center-based care (NICHD ECCRN, 2004). Associations between childcare type and behavior are mixed. Studies have found children in center-based settings to be more cooperative in preschool (Harper & Huie, 1985; NICHD ECCRN, 2001), and exhibit higher social skills and positive peer interactions into and beyond elementary school (Burchinal et al., 2015) than children in informal care settings. However, children in center-based care also tend to show more behavior problems and externalizing behavior (Burchinal et al., 2015; Huston et al., 2015). Increases in both social competence and externalizing behavior may reflect sociability and result from rudimentary efforts to engage with others (NICHD ECCRN, 2001).

1.2.2.5 Quantity of Non-Parental Care In addition to other structural characteristics, the quantity of time in non-parental childcare settings has frequently been included in examinations of ECE. Quantity varies widely among children, with average hours per week ranging from 0 to as high as 90 hours (NICHD ECCRN, 2003). Average hours per week remains fairly stable across the first four years of life, leading to large differences in cumulative time in such settings (Huston et al., 2015). Associations between quantity of non-parental care and child behavior are mixed. Children have been found to be more cooperative and positive with playmates, and less

socially withdrawn, the more hours per week they spent in center care with other children (NICHD ECCRN, 2001). Conversely, many examinations have revealed the "quantity effect," that extensive childcare tends to correlate positively with caregiver ratings of externalizing behavior (NICHD ECCRN, 2001; Huston et al., 2015). Still other studies have found no associations between quantity of non-parental care and child behavior (Erel, Oberman, and Yirmiya, 2000; Huston et al., 2015). Much like attending center-based care, accumulating extensive experience in non-parental care in general may result in greater sociability and comfort in social settings that manifests as both greater social competence and increased aggressive and boisterous social behavior (NICHD ECCRN, 2001).

1.2.3 Summary

Evidence shows that process and structural factors both play a role in prosocial development. Positive and warm caregiving is the most widely examined ECE factor, and is consistently associated with social and prosocial outcomes, both concurrently and longitudinally. Bidirectional associations, akin to those found in the parenting literature, have not been adequately explored. Findings on caregiver childrearing styles are few and mixed, although childrearing styles in parents are consistently associated with prosocial development. In general, structural factors appear to operate on social development primarily by affording and facilitating higher levels of positive and warm caregiving.

Much of the empirical literature has examined ECE and child behavior during the preschool years. Nevertheless, evidence for the associations between ECE settings and prosocial behavior have been found in children as young as 24 months, suggesting that ECE may shape the emergence of prosocial behavior (Clarke-Stewart et al., 2002). Additionally, children's

experiences in ECE settings have been associated with their behavior years later, illustrating the lasting impact of such settings above and beyond the characteristics of children's environments after leaving ECE (Burchinal et al., 2015; Vandell et al., 2010; Huston et al., 2015; Hamre, 2014; Peisner-Feinberg et al., 2001). Such findings, although few, suggest that ECE settings play an important role in the emergence of prosocial behavior as well as its development during toddlerhood and across elementary school.

1.3 GAPS IN THE LITERATURE

There remain significant gaps in our understanding of how child care settings facilitate prosocial development. First, the extant research suffers from insufficient and inconsistent measurement of both *prosocial outcomes* and the *ECE features and characteristics* that may promote their development (Huston, et al, 2015; Burchinal et al., 2015). Only a handful of studies on the effects of ECE have explicitly examined prosocial behavior. Those that examine general socioemotional development tend to rely on broad measures of social competence that emphasize adult definitions of "well-behaved children" and do not capture the complex skills required for prosocial interaction (Huston, et al., 2015). Additionally, there is little consistency across these studies, with outcomes ranging from "impulse control" and "self-esteem" to "popularity" and "attractiveness" (Zaslow et al., 2006).

Furthermore, there is no consensus definition of or methodology for evaluating ECE caregiving quality, and consequently there is considerable inconsistency in the combination of process and structural factors included in analyses to capture caregiving quality effects (Mashburn et al., 2008; Pianta et al., 2005). As process and structural factors are interrelated,

reported associations and parameter estimates likely vary depending on which factors are under examination, and composite measures of quality regulated at the state level (i.e. QRIS) may suffer from aggregation across multiple distinct measures that may not be promotive of prosocial development (Zaslow et al., 2006). Similarly, there is no consensus procedure for measuring warm and positive caregiving (Hamre, 2014; Burchinal et al., 2015; Mashburn et al., 2008), and different measures yield different findings (Mashburn et al., 2008; Peisner-Feinberg et al., 2001). The current studies begin to address these gaps by measuring specific prosocial behaviors and a detailed and extensive set of measures of ECE characteristics, both process and structural.

Questions remain regarding if and how ECE operates on prosocial behavior across development. As noted previously, many children enter ECE settings long before prosocial behavior emerges, and there is evidence that these ECE experiences shape the earliest expressions of prosocial behavior. Only a handful of studies have examined associations between ECE caregiving and prosocial or positive social behavior in these early years (e.g. Clarke-Stewart et al., 2002; Howes, 1990; Howes et al., 1992). Additionally, the preschool years are a period of rapid development and important bidirectional socialization processes (Kuczynski & Parkin, 2007; Grusec & Goodnow, 1994; Grusec et al., 2000). Caregiving in ECE settings likely shapes, and is itself shaped by, prosocial behavior during this period; the extant literature, to our knowledge, has not explored the bidirectional nature of ECE caregiving and prosocial behavior. Finally, the care that children experience in these ECE settings may influence the trajectories of prosocial behavior over the elementary school years, both in initial levels at school entry and in patterns of growth over time; trajectories of prosocial behavior, and how they may be shaped by early ECE experiences, have been largely unexplored.

1.4 THE CURRENT STUDIES

Three studies were conducted to address these questions using data collected as part of the NICHD Study of Early Child Care and Youth Development (NICHD SECCYD). These data include relevant ECE process and structural characteristics, a specific set of prosocial behaviors, and maternal and family characteristics measured across the course of childhood beginning in infancy. Data also include several covariates to account for selection effects and mitigate endogeneity bias (Coley, Votruba-Drzal, Collins & Miller, 2014; Duncan, Magnuson, & Ludwig, 2004). All methods were subjected to rigorous training and reliability procedures, ensuring high quality, extensive, and robust measurement of both child outcomes and ECE characteristics over this period. Using these data, the current studies: 1) identify which characteristics of ECE settings predict the emergence of prosocial behavior at the end of the second year; 2) examine bidirectional associations between prosocial behavior and ECE process factors over the third year; and 3) determine whether positive caregiving predicts differences in either the level of prosocial behavior at school entry or the trajectory of prosocial behavior over elementary school. See Tables 1 and 2 for the measures used in the current studies.

1.4.1 Study 1: The emergence of prosocial behavior

The first study explores the role of ECE settings in the emergence of prosociality. The primary aims are to (1) identify whether ECE process characteristics, over and above demographic and maternal characteristics, significantly predict individual differences in emerging prosocial behavior; and (2) explore whether structural factors are indirectly associated with prosocial behavior through these process factors.

A set of specific and developmentally-appropriate prosocial behaviors were measured at 24 months: helping, cooperating, sharing, and empathizing. These behaviors have been shown to emerge by the end of second year and develop over the third year (Svetlova et al., 2010; Hay, 1979; Brownell et al., 2009; Zahn-Waxler et al., 1979). ECE process characteristics (i.e. warm and positive caregiving and caregiver child-rearing beliefs) and structural factors (i.e. caregiver education, caregiver recent training, caregiver formal training, child-to-caregiver ratio, group size, type of primary ECE arrangement) were measured at 15 months. Structural equation modeling was used to examine associations among prosocial behavior and ECE process and structural characteristics. It is hypothesized that: 1) warm and positive caregiving and caregiver childrearing beliefs, measured at 15 months, will both significantly and directly predict later prosocial behavior; and 2) structural factors will significantly indirectly relate to prosocial behavior through these process factors.

1.4.2 Study 2: Prosocial development in ECE settings

Study 2 explores how the development of prosocial behavior unfolds in ECE settings over the third year of life. The specific aims of Study 2 are to 1) examine the levels of absolute and relative stability in prosocial behavior from 24 to 36 months; 2) identify whether ECE process factors predict change in prosocial behavior from 24 to 36 months; and 3) explore the bidirectional nature of prosocial development by analyzing whether levels of prosocial behavior at 24 months predict changes in ECE process factors from 24 to 36 months.

Prosocial behavior and ECE process characteristics were measured at 24 and 36 months in the same way they were measured in Study 1. Process factors (i.e. warm and positive caregiving and/or caregiver childrearing beliefs) were included only if they emerged as

significant predictors of prosocial behavior in Study 1. Structural equation modeling was used to examine associations among prosocial behavior and ECE process characteristics. As the few longitudinal studies of prosocial behavior over the third year have found little evidence for relative stability (Hay et al., 1999; Eisenberg et al., 1992) or mean level change (Demetriou & Hay, 2004; Hay et al., 1999; Eisenberg et al., 1992), it is hypothesized that there will be no absolute change in prosocial behavior and only low levels of relative stability in prosocial behavior over the third year. Additionally, it is hypothesized that ECE process characteristics at 24 months will significantly and positively predict change in prosocial behavior from 24 to 36 months; and that prosocial behavior at 24 months will significantly and positively predict change in ECE process characteristics from 24 to 36 months.

1.4.3 Study 3: Prosocial trajectories across elementary school

Study 3 explores the development of prosocial behavior over elementary school and examines whether early ECE experiences predict prosocial behavior at school entry and/or the rate of change in prosocial behavior across elementary school, over and above demographic and maternal characteristics and early levels of prosocial behavior.

Measures of prosocial behavior similar to those described in Studies 1 and 2 were collected in Kindergarten and Grades 1, 3, 4, 5 and 6. Latent growth curve modeling was conducted to describe the shape and nature of change across elementary school. Several variables were then examined as predictors of average growth: ECE process characteristics measured at 36 months; demographic and maternal characteristics; and lastly, to account for initial prosociality and examine whether early prosocial behavior predicts the level or shape of later prosocial trajectories, the prosocial behavior composite at 36 months described in Study 2.

As few longitudinal studies have examined the shape of prosocial development across elementary school, with conflicting findings (Eisenberg & Fabes, 1998; Côté et al., 2002; Newton et al., 2014; Kokko et al., 2006), no hypotheses were generated regarding shape or rate of change. ECE process characteristics and early prosocial behavior are hypothesized to predict the level of prosocial behavior in Kindergarten (the intercept of the growth curve).

2.0 METHOD

2.1 PARTICIPANTS

Studies include data from subsets of participants in the NICHD Study of Early Child Care and Youth Development (NICHD SECCYD). Participants were recruited from 31 hospitals from 10 sites around the US. Mothers were selected randomly from 8,986 mothers giving birth during select periods; 5,416 met eligibility criteria; 1,364 became study participants upon completing a home interview when their infants were one month old.

For Study 1, all participants who were in their primary non-parental childcare settings for at least 10 hours a week when they were 15 months old were included (*n*=616; 45% of the full sample); this sample is 50% female and includes 18% ethnic-minority families. For Study 2, participants who were in their primary non-parental childcare setting for at least 10 hours a week when they were 24 months old were included (*n*=662; 49% of the full sample); this sample is 50% female and includes 18% ethnic-minority families. For Study 3, participants who were in their primary non-parental childcare setting for at least 10 hours a week when they were 36 months old were included (*n*=699; 51% of the full sample); this sample is 51% female and includes 18% ethnic-minority families. All samples include a wide range of income levels and span urban, rural, and suburban families. See Table 3 for demographic characteristics of each sample.

Families included in analyses were compared to those omitted on demographic and family variables. In all three analytic samples, families included were no more likely than those omitted to belong to an ethnic minority group (all *p*'s > .05). Families included in all 3 analytic samples have significantly higher levels of maternal education than those omitted: in Study 1 (*M*=14.77 vs. 13.91; *F*(1,1267)=9.40, *p*<.001), Study 2 (*M*=14.71 vs. 13.89; *F*(1,1237)=35.57, *p*<.001), and Study 3 (*M*=14.63 vs. 13.95; *F*(1,1227)=22.78, *p*<.001). Families included in each analytic sample also have significantly higher income-to-need ratios at all ages than those omitted (all *p*'s < .001).

2.2 PROCEDURES

Children were followed from birth to age 15. Major assessments occurred when children were 1, 6, 15, 24, 36, and 54 months old; and at Kindergarten and grades 1, 3, 4, 5, and 6. Data were collected in home, laboratory, childcare and school settings via observation, parent-report, and caregiver-report. Detailed measures were obtained of home and family environments, primary ECE setting, and child social behavior. Extensive standardization, training, and reliability procedures were used to ensure high quality data (NICHD ECCRN, 2005a). Accordingly, the NICHD SECCYD has produced a wealth of reliable measures from multiple reporters, in multiple contexts, and at many ages spanning infancy, toddlerhood, and middle childhood.

2.3 MEASURES

2.3.1 Demographic characteristics

Mothers reported on their child's sex and race when their child was one month old. *Sex* was coded dichotomously (male = 0; female = 1). A *minority status* variable was generated reflecting whether or not mothers reported that their child primarily identified as belonging to a minority racial/ethnic group (non-minority = 0; minority = 1). Additionally, mothers provided data on family income at 15, 24, and 36 months; at Kindergarten; and at grades 1, 3, 4, 5, and 6. From these data, *income-to-needs ratio* was calculated for each child at each age (family income divided by the poverty threshold for household size), and standardized.

2.3.2 Maternal Characteristics

Mothers reported on their level of *education* (in years) when their child was one month old. Additionally, *maternal sensitivity* was measured from observations of mother-child interaction at 15, 24, and 36 months. At each age, mother-child interaction was videotaped in semi-structured 15-minute play observations (see NICHD ECCRN, 1999 for details). At 15 and 24 months, an a priori composite was generated from the sum of mother's scores on three aspects of behavior, coded by trained observers on a 1-4 scale (1 = not at all characteristic…4 = highly characteristic): sensitivity to non-distress, positive regard, and intrusiveness (reverse-scored). At 36 months, an a priori composite was generated from the sum of mother's scores on three aspects of behavior, coded by trained observers on a 1-7 scale (1 = very low…7 = very high): supportive presence, respect for autonomy, and hostility (reverse-scored). Internal consistency was adequate

at 15, 24, and 36 months (Cronbach's α = .70, .74, and .78, respectively). Both maternal education and maternal sensitivity were standardized.

2.3.3 ECE Characteristics

Characteristics of children's primary ECE setting were measured across infancy and toddlerhood. Structural variables were measured when children were 15 months old, and process variables were measured when children were 15, 24, and 36 months old. Process variables include positive and warm caregiving and caregiver child-rearing beliefs; structural variables include caregiver education, caregiver formal training, caregiver recent training, child-to-caregiver ratio, and type and amount of care.

2.3.3.1 Process Characteristics

Warm and positive caregiving. Warm and positive caregiving was captured by four observations: caregiver sensitivity, positive regard, child positive engagement with the primary caregiver, and positive behavior toward the child. All were coded by trained observers using the Observational Record of the Caregiving Environment (ORCE). The ORCE was developed to assess characteristics of the child-care environment and nonmaternal caregiving (see NICHD ECCRN, 2002b). Sensitivity, positive regard, and child positive engagement with the caregiver were coded on a 1-4 scale (1 = not at all characteristic; 4 = highly characteristic) following each of four 44-minute observations of the participating child in the caregiving environment; scores were averaged across observations. Positive behavior was itself composited from the following three behaviors event-coded (presence or absence) during thirty 30-second segments in four observation cycles obtained during children's regular child-care routines: mutual exchange,

positive physical contact, and speaks positively to child. Event codes were summed over all segments; most children had a total of 120 segments (30 segments for 4 cycles), and final values were retained only for those children with 45 or more segments. Each measure was standardized at each age.

Caregiver beliefs about childrearing. Caregivers reported on their own beliefs about childrearing using the Modernity Scale (Schaefer & Edgerton, 1985), a 30-item self-report index that captures authoritarian and nonauthoritarian child-rearing attitudes and values. Higher scores reflected more authoritarian beliefs, and lower scores reflected more authoritative beliefs (Cronbach α = .90). Scores were standardized.

2.3.3.2 Structural Characteristics

Caregiver education. Caregivers reported on their highest level of education on a 1-6 scale (1 = less than high school; 2 = high school graduate; 3 = some college/AA; 4 = BA degree; 5 = some graduate work/MA; 6 = advanced degree).

Caregiver formal education. Caregivers reported on the level of early childhood training they received on a 0-4 scale (0 = none; 1 = high school; 2 = certification, degree in a related field, or vocational/adult education; 3 = some college; 4 = college or graduate degree).

Caregiver recent training. Caregivers reported whether they had received education or training in the past year.

Group size and *Child-to-caregiver ratio.* Child-care observers recorded the group size and child-to-caregiver ratio at the beginning and end of each ORCE observation cycle, which were then averaged across the 4 observation cycles at each age. Both measures were centered in all subsequent analyses.

Type and Amount of Care. During interviews with parents, interviewers recorded the type of primary ECE arrangement for each child at each age. Primary ECE arrangements were coded as parent, center, in-home with a caregiver other than the parent (e.g. a non-parental family member or other caregiver in the child's home), or family daycare (e.g. in another's home with a non-parental caregiver). Interviewers also recorded the number of hours per week children attended their primary ECE setting; this measure of hours was standardized.

2.3.4 Prosocial Behavior

Prosocial behavior was assessed using a multi-method, multi-reporter, multi-context measurement approach at each major assessment age starting at 24 months. At each age, all relevant items were averaged to create composite *prosocial behavior* measures. Composites were generated, even if reliability was low, to capture context-general prosociality.

At 24 and 36 months, mothers and caregivers completed the Adaptive Social Behavior Inventory (ASBI; Hogan, Scott, & Buer, 1992), a thirty-item scale designed to assess prosocial behaviors in pre-kindergarten-aged children. Parents and caregivers rated, on a 1-3 scale (1 = rarely or never; 2 = sometimes; 3 = almost always), the degree to which a series of statements best described the participating child. For both mother and caregiver, four items were selected for their focus on specific prosocial behaviors: helping (i.e. "is helpful to other children"); sharing (i.e. shares toys); cooperating (i.e. "cooperates"); and empathizing (i.e. "is sympathetic"). Scores were recoded to reflect the same 0-2 scale used for prosocial measures in elementary school. Cronbach α ranged from .61 to .67 across ages and studies.

At Kindergarten and grades 1, 3, 4, 5, and 6, mothers and teachers completed the Social Skills Rating System (SSRS; Gresham & Elliott, 1990). Mothers and teachers rated how often

their child exhibited 38 social behaviors on a 0-2 scale (0 = never; 1 = sometimes; 2 = very often). Five items were selected for their focus on specific prosocial behaviors: helping was assessed by two mother-report items (i.e. “often helps with household tasks without being asked” and “often volunteers to help family members”) and one teacher-report item (i.e. “volunteers to help peers with classroom tasks”); and cooperating was measured with one mother-report item (i.e. “cooperates with family members without being asked”), and one teacher-report item (i.e. “cooperates with peers without prompting”). Cronbach α ranged from .50 to .56 across ages and studies.

3.0 RESULTS

All analyses were performed using Mplus 7.4. For all studies, all dependent variables were continuous and met assumptions of normality, so maximum likelihood estimation was used. No participants were missing data on sex, minority status, or maternal education. Percentage of data missing for each other variable range from 2% for *maternal sensitivity* at 15 months in Study 1 to 27% for *caregiver beliefs about childrearing* at 15 months in Study 1. Missingness for all variables was associated with minority status, maternal education, and income; accordingly, data was considered missing at random. Values for missing data points were "filled-in" using a state-of-the-art multiple imputation method in Mplus 7.4. The imputation analysis generated 50 complete datasets on which analyses were performed, and all parameter estimates and standard errors from each imputed data set were then combined into a single set of results. Imputation was conducted separately for each study on each analytic sample.

For all studies, model fit was evaluated using several fit indices. Because the chi-square statistic (χ^2) is highly influenced by sample size and is likely to be overly sensitive to negligible departures from exact model fit when the sample sizes are large, as they are in the current studies, several other indices of overall model fit were used: comparative fit index (*CFI*), Tucker-Lewis index (*TLI*), root mean square error of approximation (*RMSEA*), and standardized root mean square residual (*SRMR*). Good model fit was defined by the following criteria: $CFI > .95$, $TLI > .95$, $RMSEA < .05$, $SRMR < .08$ (Hu & Bentler, 1999). Adequate model fit was defined

by the following criteria: *CFI* > .90, *TLI* > .90, *RMSEA* < .08, *SRMR* < .08 (Hu & Bentler, 1999). To test for mean differences in latent factors or indicators over time, models with and without the means constrained to equality were compared using the chi-square difference test ($\Delta\chi^2$).

3.1 PRELIMINARY ANALYSES

Preliminary analyses were conducted to determine whether prosocial behavior at 24 months differed significantly by type of primary ECE arrangement at 15 months. A single-factor one-way ANOVA revealed that children in parental care (*M*=1.32, *SD* = .36) and in-home care (*M*=1.35, *SD* = .31) were significantly more prosocial than were children in center care (*M*=1.24, *SD* = .34) ($F(3,1186) = 3.92$, $p<.01$). Children in family daycare settings (*M*=1.29, *SD* = .33) did not differ from any other group.

3.2 STUDY 1

The primary aims of study 1 were to (1) identify whether ECE process characteristics, over and above demographic and maternal characteristics, significantly predict individual differences in emerging prosocial behavior, and (2) explore whether structural factors are indirectly associated with prosocial behavior through these process factors. To identify which ECE process factors directly predict the emergence of prosocial behavior, the prosocial behavior composite at 24 months was regressed on the two ECE process characteristics, measured when children were 15 months old: a single indicator of caregiver beliefs about childrearing, and a latent factor

representing warm and positive caregiving (see Figure 1). This latent factor was estimated from four observed indicators: caregiver sensitivity, positive regard for the child, positive behavior with the child, and child's positive engagement when interacting with the caregiver. To examine whether structural characteristics promote high levels of process quality, these process characteristics were themselves regressed on seven ECE structural characteristics, also measured when children were 15 months old: single indicators of caregiver education, caregiver recent training, caregiver formal training, child-to-caregiver ratio, group size, and dummy indicators representing whether the primary ECE setting was in-home or family (center care is treated as the referent). Additionally, the prosocial behavior composite was regressed on sex, minority status, and maternal education, measured when children were 1 month old; and income-to-needs ratio, maternal sensitivity, and hours spent in primary ECE arrangement, measured when children were 15 months old. These covariates were included to account for selection effects, mitigate endogeneity bias in associations between prosocial behavior and ECE characteristics (Coley, Votruba-Drzal, Collins & Miller, 2014; Duncan, Magnuson, & Ludwig, 2004), determine the contributions of ECE to early prosociality within the context of the family, and account for different amounts of time spent in ECE. Each covariate has previously been associated with children's prosocial behavior (Eisenberg et al., 2006; Burchinal et al., 2015). All ECE structural characteristics and covariates were free to covary (Please see Table 4 for intercorrelations and descriptives).

We first conducted a measurement model for the positive caregiving latent factor. Model fit was excellent ($\chi^2_{(2)} = .73$, *ns*; *RMSEA* = 0.00, *CFI* = 1.00, *TLI* = 1.003, *SRMR* = .00) and all four indicators loaded significantly on the positive caregiving latent factor: caregiver sensitivity ($\lambda = .74$, $p < .001$), caregiver positive regard ($\lambda = .80$, $p < .001$), caregiver positive behavior ($\lambda =$

.47, $p < .001$), and child positive engagement with caregiver ($\lambda = .79$, $p < .001$). We then added all indicators and paths to test the implied covariance matrix from our complete conceptual model (Figure 1) against the observed item covariance matrix. The model evidenced good fit to the data ($\chi^2_{(66)} = 159.68$, $p < .001$; *RMSEA* = 0.05, *CFI* = .94, *TLI* = .92, *SRMR* = .04), demonstrating that the observed covariance matrix supports the conceptual model (see Figure 2 for model results). Standardized path coefficients (β) are reported for continuous indicators and latent factors; unstandardized path coefficients (*B*) are reported for discrete indicators (i.e. child-to-caregiver ratio, group size, caregiver recent training, ECE type dummy indicators, sex, and minority). See Table 5 for all path coefficients.

To identify whether ECE process characteristics, over and above covariates, significantly predict individual differences in emerging prosocial behavior, regression coefficients from caregiver childrearing beliefs and warm and positive caregiving to prosocial behavior were examined. The coefficient from the warm and positive caregiving latent factor ($\beta = .13$, $p < .01$), but not from caregiver child-rearing beliefs ($\beta = .03$, *ns*), was significant. Prosocial behavior was also significantly predicted by maternal sensitivity ($\beta = .14$, $p < .01$) and sex ($B = .08$, $p < .01$), but not maternal education ($\beta = .07$, *ns*), minority status ($B = -.04$, *ns*), income ($\beta = .01$, *ns*), or hours in ECE ($\beta = .05$, *ns*). Warm and positive caregiving and caregiver childrearing beliefs were significantly negatively correlated ($r = -.17$, $p < .01$).

To examine whether ECE structural characteristics were indirectly associated with prosocial behavior via process characteristics, over and above covariates, we first examined whether ECE structural features promote process characteristics. Child-to-caregiver ratio ($B = -.17$, $p < .001$), group size ($B = -.08$, $p < .01$), and both ECE type dummy indicators (In-home care ($B = .42$, $p < .05$) and family daycare ($B = .48$, $p < .01$)) were significant predictors of positive

caregiving, while caregiver education (β = .07, *ns*), recent training (*B* = .18, *ns*), and formal training (β = .05, *ns*) were not significant. Conversely, caregiver education (β = -.33, $p < .001$), recent training (*B* = -.31, $p < .01$), and formal training (β = -.14, $p < .01$) were significant predictors of caregiver child-rearing beliefs, while child-to-caregiver ratio (*B* = .01, *ns*), group size (*B* = .00, *ns*), and both ECE type dummy indicators (In-home care (*B* = .28, *ns*) and family daycare (*B* = -.02, *ns*)) were not significant. Finally, indirect paths from each structural characteristic to prosocial behavior via process factors were tested for significance. Only one indirect path was significant: from child-to-caregiver ratio to prosocial behavior through positive and warm caregiving (β = -.03, $p < .05$). These findings suggest that positive caregiving, but not caregiver child-rearing beliefs, may promote later prosociality; and that positive and warm caregiving is itself fostered by group and setting characteristics, while caregiver child-rearing beliefs are partially shaped by education and training.

3.3 STUDY 2

The goal of Study 2 was to explore the bidirectional processes between prosocial behavior and ECE process characteristics over the third year. This goal was addressed in several steps. First, we conducted a measurement model including two latent factors representing warm and positive caregiving at 24 months (estimated from the same indicators as those in Study 1) and 36 months (estimated from analogous indicators measured at 36 months), prosocial behavior composites at 24 and 36 months, and covariates (Please see Table 6 for intercorrelations and descriptives). Caregiver childrearing beliefs was not included in Study 2 as it did not emerge as a significant predictor of prosocial behavior in Study 1. Warm and positive caregiving latent factors and

prosocial behavior composites were free to covary. To control for potential selection effects and endogeneity bias, prosocial behavior and warm and positive caregiving at both ages were regressed on sex, minority, maternal education, and their concurrent measures of income-to-needs ratio (e.g. prosocial behavior at 24 months was regressed on income-to-needs ration at 24 months). Hours in childcare was not included as a covariate as it did not emerge as significant in Study 1; additionally, as the primary goal of study 2 is to explore how prosocial behavior unfolds in ECE settings, maternal sensitivity was not included as a covariate.

Before addressing specific study aims, measurement invariance was established for the warm and positive latent factors at 24 and 36 months; doing so ensures that any significant change over time reflects meaningful differences on identical constructs at each age and are not due to different constructs being measured at each time point. Measurement invariance was tested in a multi-step process (Chen, Sousa & West, 2005). First, we tested configural invariance by estimating both latent factors but allowing all factor loadings and intercepts to vary freely. This model achieved excellent fit ($\chi^2_{(67)} = 146.27$, $p < .001$; *RMSEA* = 0.04, *CFI* = .97, *TLI* = .96, *SRMR* = .04), indicating that warm and positive caregiving had the same factor structure at 24 and 36 months. Following this, all factor loadings were constrained to be equal across time points and model fit was examined for a significant degradation. As noted previously, the chi-square statistic is highly sensitive to sample size. Monte Carlo simulations have suggested that changes in *CFI* may be a less strict test of measurement equivalence, and that changes in *CFI* of .01 or less indicate measurement equivalence (Cheung & Rensvold, 2002). By this criterion, the difference between the model with factor loadings constrained to equality and the previous model was not significant ($\Delta CFI = .00$), illustrating that factor loadings can be held invariant across time. Finally, all factor loadings and item intercepts were constrained to be equal across

time; the difference between this model and the previous model was not significant (ΔCFI = .00), illustrating that factor loadings and intercepts can be held invariant across time. This is sufficient evidence to conclude strong measurement invariance across time. Invariance of indicator residuals was not tested as this type of invariance is considered impractical and of little concern (Byrne, 1998). This model fit the data very well ($\chi^2_{(73)} = 156.42$, $p < .001$; *RMSEA* = 0.04, *CFI* = .97, *TLI* = .96, *SRMR* = .04), and all factor loadings on both warm and positive caregiving latent factors were significant: caregiver sensitivity ($\lambda = .86$, $p < .001$), caregiver positive regard ($\lambda = .91$, $p < .001$), caregiver positive behavior ($\lambda = .60$, $p < .001$), and child positive engagement with caregiver ($\lambda = .83$, $p < .001$).

After establishing measurement invariance, specific aims were addressed. The aims of Study 2 were to 1) examine the levels of absolute and relative stability in prosocial behavior from 24 to 36 months; 2) identify whether warm and positive caregiving at 24 months predicts change in prosocial behavior from 24 to 36 months; and 3) explore the whether prosocial behavior at 24 months predicts change in warm and positive caregiving from 24 to 36 months.

First, absolute stability in the level of prosocial behavior was tested by constraining the intercepts of the prosocial behavior composites at 24 (*M* = 1.27; *SD* = .32) and 36 months (*M* = 1.36, *SD* = .33) to equality. Constraining these intercepts to equality significantly degraded model fit ($\Delta\chi^2_{(1)} = 14.88$), indicating that the level of prosocial behavior increased significantly with a small to medium effect size (*d* = .27) from 24 to 36 months. These intercepts were left unconstrained in subsequent models.

Finally, regression paths were added to complete a two-wave cross-lagged panel design: warm and positive caregiving at 36 months was regressed on warm and positive caregiving and prosocial behavior at 24 months; prosocial behavior at 36 months was regressed on prosocial

behavior at 24 months and on warm and positive caregiving at both 24 and 36 months; and prosocial behavior and warm and positive caregiving at 24 months were allowed to covary (see Figure 3).

Overall, the model achieved good fit to the data ($\chi^2_{(73)}$ = 155.80, $p < .001$; *RMSEA* = 0.04, *CFI* = .97, *TLI* = .96, *SRMR* = .04; see Figure 4 for model results and Table 7 for path coefficients). To test for relative stability in prosocial behavior, the autocorrelation of prosocial behavior at 36 months on 24 months was examined: this coefficient was significant (β = .40, $p <$ .001), demonstrating moderate levels of relative stability in prosocial behavior over the third year. Warm and positive caregiving was also moderately stable over the third year (β = .39, $p <$ .001).

Prosocial behavior and warm and positive caregiving were significantly correlated at 24 months (r = .14, $p < .01$). However, contrary to hypotheses, prosocial behavior at 36 months was not significantly predicted by warm and positive caregiving at 24 months (β = -.05, *ns*) or 36 months (β = .06, *ns*). Conversely, warm and positive caregiving at 36 months was significantly predicted by prosocial behavior at 24 months (β = .10, $p < .05$). Taken together, these findings suggest that prosocial behavior increases in frequency and retains relative stability over the third year, and that children who are more prosocial may, over time, elicit more warm and positive caregiving from their ECE caregivers; however, warm and positive caregiving at 36 months does not motivate concurrent prosocial behavior nor predict change in prosocial behavior over time.

Additionally, prosocial behavior at 24 months was significantly predicted by sex (B = .09, $p < .001$), but not minority status (B = -.03, *ns*), maternal education (β = .09, *ns*), or income (β = -.03, *ns*); prosocial behavior at 36 months was significantly predicted by sex (B = .08, $p <$ .08) and minority status (B = -.10, $p < .001$), but not maternal education (β = .08, *ns*) or income

(β = .00, *ns*). Warm and positive caregiving at 24 months was significantly predicted by minority status (*B* = -.32, $p < .05$) and maternal education (β = .12, $p < .0$), but not sex (*B* = .12, *ns*) or income (β = .09, *ns*); warm and positive caregiving at 36 months was also significantly predicted by minority status (*B* = -.31, $p < .05$), but not sex (*B* = .08, *ns*), maternal education (β = .01, *ns*), or income (β = -.05, *ns*).

3.4 STUDY 3

The primary aims of Study 3 were to (1) describe the development of prosocial behavior over elementary school, and (2) examine whether early experiences, over and above demographic and maternal characteristics, predict the level or shape of such development. To address the first aim, a latent growth curve was estimated from the composite measures of prosocial behavior at Kindergarten and Grades 1, 3, 4, 5 and 6 (Please see Table 8 for intercorrelations and descriptives). As prosocial behavior appeared linear and stable over time, with a slight decline (see Figure 5), intercept and linear slope factors were estimated (see Figure 6). A latent factor representing the intercept was estimated by fixing all factor loadings to 1.0. A latent factor representing the linear slope was estimated by setting the factor loadings to reflect the distance in time between observations: the loading for the kindergarten composite, selected as the intercept, was fixed to 0.0; the loading for the grade 1 composite was fixed to 1.0; the loading for the grade 3 composite was fixed to 3.0; and so on. By fixing the loadings in this way, the intercept latent factor represents prosocial behavior in kindergarten, and the slope latent factor represents the linear rate of change per year over the period from kindergarten to grade 6. To account for regression to the mean, the slope was regressed on the intercept. Because prosocial development

in childhood has been associated with minority status, income, maternal education, and sex (Eisenberg et al., 2006), all were included in the model. Income-to-needs ratio was treated as a time-varying covariate; that is, prosocial behavior at each age was regressed on income-to-needs ratio measured at the same age. Maternal education, minority status, and sex were treated as time-invariant covariates; that is, the intercept and slope latent factors were regressed on these indicators. All measures of income-to-needs were allowed to correlate with one another and with maternal education.

Overall, this model achieved very good fit to the data ($\chi^2_{(80)} = 165.18$, $p < .001$; *RMSEA* = 0.04, *CFI* = .95, *TLI* = .95, *SRMR* = .06). All factor loadings on the warm and positive caregiving latent factor were significant: caregiver sensitivity ($\lambda = .92$, $p < .001$), caregiver positive regard ($\lambda = .98$, $p < .001$), caregiver positive behavior ($\lambda = .57$, $p < .001$), and child positive engagement with caregiver ($\lambda = .85$, $p < .001$). The mean of the intercept factor ($M = 1.37$, $p < .001$) was significantly different from zero. The mean of the slope factor ($M = .03$, *ns*) was not significantly different from zero, illustrating that prosocial behavior does not change in a linear fashion across elementary school. The slope factor was significantly predicted by the intercept ($B = -.04$, $p < .05$), indicating that those children with higher levels of prosocial behavior in kindergarten were more likely to have smaller rates of change; or, conversely, that children exhibiting less prosocial behavior in kindergarten showed greater increases in prosocial behavior over the school years. This may be due to effects of peers or school environments on less prosocial children, and/or may reflect regression to the mean. Both the intercept ($B = .10$, $p < .001$) and slope ($B = .01$, $p < .05$) factors were significantly predicted by sex, illustrating that girls were rated as more prosocial in kindergarten and have slightly larger rates of change across elementary school.

Minority status and maternal education were not significantly predictive of either the intercept (*B* = -.05 and β = .07, respectively) or slope factor (*B* = -.01 and β = .05, respectively).

To address the second aim, that early experiences in ECE and families predict prosocial behavior at school entry and/or the rate of change in prosocial behavior across elementary school, the intercept and slope factors from this growth curve were regressed on a latent factor representing warm and positive caregiving measured at 36 months, estimated from the same four indicators as in Study 2. They were also regressed on maternal sensitivity at 36 months, as maternal sensitivity emerged as significant in Study 1. Finally, to account for initial prosocial levels and examine whether early prosocial behavior predicts the level or shape of later prosocial trajectories, the intercept and slope factors were also regressed on the prosocial behavior composite at 36 months described in Study 2 (see Figure 7). Covariances among warm and positive caregiving, maternal sensitivity, maternal education, and prosocial behavior at 36 months were freely estimated. Maternal sensitivity, prosocial behavior at 26 months, and the four indicators from which the warm and positive caregiving latent factor were regressed on income at 36 months.

Overall, this model achieved good fit to the data ($\chi^2_{(162)}$ = 350.54, $p < .001$; *RMSEA* = 0.04, *CFI* = .93, *TLI* = .92, *SRMR* = .06; see Figure 8 for model results and Table 9 for path coefficients). The intercept latent factor at Kindergarten was significantly predicted by prosocial behavior at 36 months (*B* = .08, $p < .001$) and sex (*B* = .07, $p < .01$) but not maternal sensitivity at 36 months (*B* = .02, *ns*), warm and positive caregiving at 36 months (*B* = .01, *ns*), minority status (*B* = .00, *ns*), or maternal education (*B* = .00, *ns*). The slope factor was significantly predicted by warm and positive caregiving at 36 months (*B* = -.01, $p < .05$) and sex (*B* = .01), but

not prosocial behavior at 36 months (*B* = .00, *ns*), maternal sensitivity (*B* = .00, *ns*), minority status (*B* = -.01, *ns*), or maternal education (*B* = .00, *ns*).

4.0 DISCUSSION

The current studies aimed to address three main goals: identify which ECE characteristics, if any, predict the emergence of prosocial behavior at 24 months; explore bidirectional processes between prosocial development and ECE caregiving from 24 to 36 months; and examine whether warm and sensitive caregiving in ECE settings predicts the shape or level of prosocial development over the elementary school years. That children spend considerable time in non-parental settings (in this sample, children spent 35.46 hours per week, on average), underscores the importance of understanding the mechanisms by which ECE settings may promote positive developmental outcomes.

Regarding the first goal, as hypothesized, warm and positive caregiving significantly predicted the emergence of prosocial behavior at 24 months, and was itself associated with child-to-caregiver ratio, group size, and ECE type. Caregiver beliefs about childrearing did not predict emergent prosocial behavior, and child-to-caregiver ratio was the only structural factor that significantly indirectly predicted prosocial behavior via caregiving. Regarding the second goal, prosocial behavior was found to increase from 24 to 36 months and show moderate relative stability over this period; warm and positive caregiving at 24 months did not explain change in prosocial behavior from 24 to 36 months, but prosocial behavior at 24 months did account for some of the change in warm and positive caregiving from 24 to 36 months, suggesting that children who exhibit higher levels of prosocial behavior elicit more warm and positive

caregiving from their caregivers. Finally, regarding the third goal, prosocial development across elementary school was characterized by a flat linear trajectory, suggesting that levels of prosocial behavior do not increase or decrease, on average, over this period; the level of this trajectory was predicted by earlier levels of prosociality, such that children who were more prosocial in toddlerhood were also more prosocial in elementary school. Findings from each study will be explored individually, followed by general conclusions, limitations, and future directions.

4.1 STUDY 1

The main goal of Study 1 was to identify the role of ECE process and structural characteristics in the emergence of prosocial behavior at the end of the second year. The first specific aim was to identify whether warm and sensitive caregiving and/or caregiver beliefs about childrearing significantly predicted individual differences in emerging prosocial behavior over and above demographic and maternal characteristics. As hypothesized, warm and positive caregiving at 15 months significantly predicted prosocial behavior at 24 months. During the second year, children undergo dramatic development in the affective and cognitive capacities and understanding required for prosocial action, including emotion understanding, regulation, and empathy (see Eisenberg et al., 2015). Warm and positive caregiving affords and invites the repeated and affectively-charged social interactions in which children explore and build these capabilities (Hastings et al., 2007; Burchinal et al., 2015; Brownell et al., 2013; Brownell & Kopp, 2007; Carpendale & Lewis, 2004). During such interactions, warm and positive caregivers engage in a variety of behaviors that have been found to promote prosocial behavior, such as reinforcing the child's own rudimentary prosocial actions and directing the child's attention to the emotions of

others (Hoffman, 2000; Zahn-Waxler et al., 1979; Garner, 2006; Dahl, 2015; Brownell et al., 2013; Drummond et al., 2014; for a review, see Drummond & Brownell, in preparation).

Furthermore, warm and positive caregiving predicted prosocial behavior over family and demographic characteristics, most notably maternal sensitivity; and the effect size for ECE caregiver warmth and positivity was similar to that of maternal sensitivity. These findings highlight the importance of the ECE setting as a unique and distinct ecological context that shapes prosocial development beyond what occurs in the home. Children's experiences in ECE settings differ from those in their home in many ways and likely place distinct demands on children's rudimentary affective and cognitive abilities. In non-parental care settings, children build relationships with new adults, navigate complex group dynamics with multiple peers, and adapt to new and unfamiliar routines and physical spaces (Burchinal et al., 2015; Lamb & Ahnert, 2006; Votruba-Drzal et al., 2013; Degol & Bachman, 2015). All of these new experiences tax their regulatory capacities, and many prosocial actions rely heavily on emotion regulation as they occur within arousing situations in which children must regulate their own distress and attend to the distress of another (Laible, Thompson & Froimson, 2015; Laible & Murphy, 2014; Grusec & Davidov, 2015). Warmth and positivity from caregivers can help the child regulate her emotions when she is unable to do so on her own; over time, children internalize these regulatory techniques and learn to employ them without caregiver assistance (Eisenberg et al., 2006; Hoffman, 2001; Laible et al., 2015; Laible & Murphy, 2014; Grusec & Davidov, 2015). Children also look to their caregivers for information and direction in these situations, and warm and positive caregivers encourage, model, and discuss appropriate social behavior that helps children negotiate potentially problematic interactions with their peers. In non-parental care settings where children spend less time in one-on-one interaction with

caregivers, children rely on their burgeoning emotion knowledge and regulatory and prosocial abilities to facilitate positive peer interactions, which themselves represent an important context in which prosocial behavior develops. Indeed, in an experimental investigation, children whose caregivers involved them in discussions about emotions showed higher levels of emotion knowledge, used more emotion talk, and were more prosocial than children whose caregivers refrained from these conversations (Ornaghi, Brazzelli, Grazzani, Agliati & Lucarelli, 2006). Finally, not all prosocial behaviors occur in distressing circumstances. Children often exhibit helping behaviors spontaneously, with positive affect, and absent any distress or request; these prosocial actions emerge from affiliative motivations that are aroused in social settings and are likely encouraged by caregiver warmth and positivity (Rheingold, 1982).

Findings from the present study, however, do not support caregiver childrearing beliefs, meant to capture caregiver childrearing style, as a significant independent predictor of prosocial development. This may be due, in part, to the presence of warm and positive caregiving in the model. Authoritative childrearing is often characterized by high levels of warmth (Hastings et al., 2007), and in ECE settings has been shown to correlate positively with warm and positive caregiving (Burchinal et al., 2015). Indeed, the two factors were significantly correlated in the current study. Warmth and positivity is the more proximal and immediate construct to the child-caregiver interaction, and is likely one mechanism through which childrearing style operates; consequently, the extent to which childrearing style operates through caregiver warmth and positivity will be reflected in the coefficient for warmth and positivity (Burchinal et al., 2015). The current study did not thoroughly explore this potential mediational pathway; nevertheless, the analytic models tested in the current study can be amended in future research to include a direct path from caregiver childrearing beliefs to warm and positive caregiving. The inclusion of

such a pathway would afford the examination of whether caregiver beliefs directly predicts warmth and positivity and/or indirectly shapes prosocial behavior through such caregiving.

Alternatively, childrearing style may not be as influential in the caregiver-child context as it is in the parent-child context. Parenting style governs more than just interactional characteristics; it both reflects and influences a wide range of parenting choices that shape all aspects of a child's home environment, including to some degree what kind of ECE setting, if any, the child attends. Additionally, parenting style may arise from characteristics with hereditary components that also promote prosocial development, such as behavioral control and sociability (Hastings et al., 2007). ECE caregiver childrearing style, on the other hand, may be dictated to some degree, or its impact limited, by the organizational orientation or chosen curricula. Consequently, the childrearing style of any given caregiver may not influence many of the interactions and routines children experience while in ECE settings. Research on childrearing style and prosocial development in ECE contexts is sparse; nevertheless, findings from this research are less consistently significant than are those from research on parenting styles and prosocial development, suggesting that the link between childrearing style is not as strong in ECE settings as in home settings (Burchinal et al., 2015; Hastings et al., 2007).

The second aim of Study 1 was to explore whether ECE structural characteristics (i.e. caregiver education, recent training, formal training, child-to-caregiver ratio, group size, and ECE type) directly facilitated ECE process characteristics and indirectly promoted prosocial behavior through these process factors. All structural factors were hypothesized to associate with process factors and would indirectly predict prosocial behavior. Warm and positive caregiving was higher in ECE settings with lower child-to-caregiver ratios and smaller group sizes, and was higher in in-home and family daycare settings than in centers; caregiver education and training

measures were not associated with warm and positive caregiving. These findings suggest that warm and positive caregiving is facilitated by group and setting characteristics that foster personal and meaningful caregiver-child relationships. In smaller groups and in groups with smaller child-to-caregiver ratios, children can have more, and more extended, one-on-one interactions with their caregivers during which they build rapport. Larger groups and larger ratios may also lead to increased levels of caregiver stress, which impedes caregivers' abilities to be sensitive to children's needs (Burchinal et al., 2015; Blair & Raver, 2012). Additionally, warm and positive caregiving is higher in in-home and family settings where the child is more likely to have a relationship with the caregiver that pre-exists, or extends beyond, the ECE setting: in-home and family daycare is often provided by a relative or family friend who is more personally invested in the child than would be a non-relative caregiver (Burchinal et al., 2015).

Conversely, caregivers who had higher levels of education, higher levels of formal early childhood training, and who had received training or education within the past year, endorsed more authoritative beliefs about childrearing; no other structural measures were associated with childrearing beliefs. Childrearing beliefs and approaches partly rely on an understanding of developmental processes and an appreciation for children's competencies during a given developmental period, material that is easily translated in training and education sessions. As caregiver childrearing style reflects a broad orientation toward interacting with children, it may be less easily shaped by immediate group and setting characteristics. Finally, although structural characteristics do facilitate process factors, evidence for an indirect association with prosocial development was largely absent: child-to-caregiver ratio was the only structural characteristic that significantly indirectly predicted later prosocial behavior, operating through increased warm and positive caregiving, and the magnitude of the effect was small.

Taken together, the findings from Study 1 highlight the centrality of the caregiver-child relationship in the emergence and early development of prosocial behavior. Caregiver warmth and positivity, the most proximal measure of caregiver-child interactions, was the strongest ECE predictor of later prosocial behavior. ECE structural characteristics only shape prosocial development insofar as they facilitate these interactions; and even then, indirect associations are small. Non-parental ECE settings are rich and unique contexts for children's exploration of prosocial behavior, and the presence of a warm and positive caregiver can facilitate its development.

4.2 STUDY 2

The main goal of Study 2 was to explore how prosocial behavior develops in ECE settings over the third year. Specific aims of Study 2 were to analyze absolute and relative stability of prosocial behavior from 24 to 36 months; to examine whether warm and positive caregiving at 24 months predicted change in prosocial behavior from 24 to 36 months; and to explore whether prosocial behavior at 24 months predicted change in warm and positive caregiving from 24 to 36 months. We hypothesized no absolute change and low levels of relative stability across the third year; that warm and positive caregiving would predict change in prosocial behavior; and that prosocial behavior would predict change in warm and positive caregiving.

Regarding the first aim, prosocial behavior increased significantly from 24 to 36 months, with a small to medium effect size, and showed evidence of moderate relative stability. By the end of the third year, children can recognize when another is in distress, regulate their own negative emotions (to some degree), ascertain the nature and cause of the distress, and come up

with a solution (Eisenberg et al., 2006; Hay & Cook, 2007; Drummond, Waugh, Hammond, & Brownell, 2015). They have also experienced more situations of distress and witnessed more modeling of prosocial behavior. As a consequence, children exhibit prosocial behavior more frequently, and in more complex and varied situations, as the third year progresses. These findings are consistent with cross-sectional research on three of four prosocial behaviors included in the current study: empathy (Zahn-Waxler et al., 1992; Nichols et al., 2009); helping (Svetlova et al., 2010; Brownell et al., 2013; Drummond et al., 2014); and cooperating (Dunn & Munn, 1986; Dunn, 1988; Warneken, Chen, & Tomasello, 2006; Brownell et al., 2006). Additionally, 16% of the variance in prosocial behavior at 36 months was explained by children's prosocial behavior at 24 months. This suggests that a small to medium portion of the individual differences in prosociality that appear at the end of the second year persist across the reorganization and development that occurs in the third. Although there is little evidence for relative stability in prosocial behavior, cross-situational consistency has been found for many prosocial behaviors, most notably empathy, suggesting that children display reliable individual differences in these behaviors that likely persist over time (Nichols et al., 2009; Gill & Calkins, 2003; van der Mark, IJzendoorn & Bakermans-Kranenburg, 2002; for a review, see Eisenberg et al., 2006). Over the second and third years, children appear to be laying the groundwork for lasting prosocial tendencies.

These findings are contrary to our hypotheses and inconsistent with the few extant longitudinal studies of prosocial development that found no change or declines in prosocial behavior and little relative stability over the third year. However, previous longitudinal studies focused on different prosocial behaviors than those explored in the current study: children's observed spontaneous prosocial reactions (such as distracting, comforting, or sharing) to

naturally-occurring episodes of distress in peers (Demetriou & Hay, 2004); observed spontaneous sharing with peers (Hay et al., 1999); and observed sharing and instrumental helping (Eisenberg et al, 1992). Different prosocial behaviors follow distinct developmental patterns over infancy and toddlerhood, may be more or less relatively stable over time, and may be responsive to distinct socialization practices and contextual characteristics (Dunfield, Kuhlmeier, O'Connell & Kelley, 2011; Drummond et al., 2015; Drummond et al., 2014; Brownell et al., 2013; Eisenberg et al., 2006). Additionally, naturally-occurring episodes of distress may be too arousing for young children and may vary in the amount of personal distress they induce. Over-arousal leads children to focus on their own distress, inhibiting prosocial behavior and reducing variability (Hoffman, 2000; Drummond & Brownell, in preparation). Naturally-occurring distress episodes are also inherently inconsistent in the amount of personal distress they induce, and this inconsistency introduces error variance that may wash out evidence of growth or relative stability. Finally, prior research employed observational measures of prosocial behavior, while the current studies relied on parent and caregiver reports; such reports may capture children's prosociality more completely or accurately than observations during toddlerhood when prosocial behaviors are relatively rare. These methodological and construct differences may account for the presence of significant growth and relative stability in the current study and the absence of such patterns in previous work.

Also contrary to hypotheses, prosocial behavior at 36 months was not predicted by warm and positive caregiving at either 24 or 36 months. Hence, warmth and positivity did not promote change in prosocial behavior over the third year. This lack of significant association, particularly in comparison to the significant comparable association in Study 1, may result in part from shifting group characteristics. Children are likely in settings with higher child-to-caregiver ratios

during the third year, when recommended and regulated ratios can be as high as 9:1, than they are during the first or second when ratios are no higher than 4:1 (NAEYC, 2013; Burchinal, Howes et al., 2002). This increased ratio may lead to less one-on-one time with caregivers and more time with peers, reducing the number of opportunities for caregiver-led socialization. Relatedly, children may be less responsive to their caregivers' socialization efforts over this year. Children become more sensitive to social dynamics, roles, and dominance hierarchies as they age, particularly in preschool (Camodeca, Caravita & Coppola, 2015; Strayer, Chapeskie, & Strayer, 1978), and look more to peers for cues in navigating peer interactions. The current findings may reflect the beginning of this process. Finally, this shift in emphasis from caregivers to peers as drivers of socialization may pertain particularly to prosocial development, in contrast to the development of other social competences such as emotion regulation and emotion understanding. The antecedents and consequences of prosocial action, as well as the actions themselves, are directly observable, and the consequences of prosocial behavior are almost uniformly positive, reducing personal distress that children have trouble managing without scaffolding from adults.

Again, methodological differences may contribute to the discrepancy between findings from the current study and those from previous research. To our knowledge, none of the previous studies that explored ECE caregiver warmth and positivity as a predictor of prosocial development during and beyond the third year (Clarke-Stewart et al., 2012; Johnson et al., 2013; Romano et al., 2010) included multiple distinct time points or controlled for previous levels of prosocial behavior, and consequently did not distinguish between the role caregiving plays in the level of prosocial behavior at a given age and how caregiving shapes the subsequent development of prosociality over time. The inclusion of two time points in the current study

allows us to examine both: whether caregiving is associated with the level of prosocial behavior at 24 months; and whether that same measure of caregiving also predicts changes in prosocial behavior over the third year, above and beyond the concurrent association and the initial levels of prosocial behavior at 24 months. Findings in the current study revealed a significant correlation between prosocial behavior and warm and positive caregiving at 24 months, and significant moderate relative stability of prosocial behavior over the third year. These patterns illustrate that warm and positive caregiving in ECE settings plays an important concurrent role in how prosocial behavior is expressed at the end of the second year, and that these prosocial expressions persist across the third year. However, warm and positive caregiving at the end of the second year does not appear to directly shape any change in prosocial behavior that occur over the third year.

Finally, prosocial behavior at 24 months, above and beyond its concurrent association with warm and positive caregiving, predicted change in warm and positive caregiving from 24 to 36 months. That is, children's prosocial behavior appears to elicit warm and positive caregiving from caregivers. This finding is consistent with our hypotheses and with previous research and theoretical orientations that emphasize the child's role in socialization processes. Toddlers play an active role in constructing their social environments and can shape both the frequency and nature of their social interactions with others (Kuczynski & Parkin, 2007; Grusec & Goodnow, 1994; Grusec et al., 2000). Prosocial behavior in particular has been shown to reduce levels of teacher-child conflict (Roorda, Verschueren, Vancraeyveldt, Van Craeyevelt & Colpin, 2014) and account for increases in parental sensitivity over time (Barnett et al., 2012; Newton et al., 2014). Prosocial behavior may be especially likely to elicit positive caregiving during the third

year as it stands in stark contrast to the emotional reactivity and limit testing characteristic of the "terrible twos" period.

The current findings are complicated by the fact that children may have had different caregivers at 24 and 36 months. Previous research on bidirectionality of prosocial behavior has included parents and caregivers that remain constant across measurement periods, ensuring that change in behavior from one time point to another reflects intraindividual change and not interindividual differences; the current study had no such controls, and findings should be considered in light of this limitation. Nevertheless, the difference in caregiver warmth and positivity that children experienced when they were 36 months old from when they were 24 months old was greater for children who exhibited more prosocial behavior at 24 months. The time points in the current study were static, but the processes that this pattern suggests are continuously operating throughout the third year. A child who exhibits prosocial behavior with one caregiver is likely to do so with another, and this child will be more likely than a child who exhibits very little prosocial behavior to elicit warm and positive caregiving from both the first and second caregiver. In this way, even children who switch caregivers between measurements contribute to the overall pattern that emerged in this study: that early prosocial behavior explains increases in warm and positive caregiving from 24 to 36 months, over and above initial levels of warmth and positivity. Future research is needed to fully explore this bidirectionality.

Together, the findings from Study 2 demonstrate the nuance and complexity of prosocial development in ECE settings over the third year. Children leave their second year with burgeoning prosocial tendencies, shaped in part by earlier experience with caregivers, and act on them with increasing frequency as they reach the end of their third year. Individual differences in these tendencies persist over this year, such that children who exhibit more prosocial behavior at

24 months also do so at 36. Surprisingly, caregiver warmth and positivity does not appear to contribute to the change in prosocial behavior that occurs during this third year, perhaps due to shifting group characteristics and a turn towards peers as socializers. However, prosocial behavior does appear to elicit warm and positive caregiving, illustrating its development as a bidirectional process that unfolds dynamically in ECE settings over infancy and toddlerhood.

4.3 STUDY 3

The main goals of Study 3 were to explore developmental change in prosocial behavior over elementary school and examine whether early ECE experiences predict the level of prosocial behavior at school entry and/or the rate of change in prosocial behavior over elementary school. Given the relative paucity of previous longitudinal studies on prosocial trajectories and their antecedents, no hypotheses were generated regarding the average shape of developmental change or how early experiences might predict the rate or shape. Prosocial behavior and warm and positive caregiving, both measured at 36 months, were hypothesized to positively predict level of prosocial behavior in kindergarten.

Findings revealed prosocial behavior to be stable from kindergarten to grade 6. Mean levels of prosocial behavior remained largely unchanged over this period (see Figure 5), and the latent slope factor was not significantly different from zero. As they progress through elementary school, children increasingly have to respond to complex social situations, learn and follow new social norms, and balance competing demands. In contrast to other social behaviors that decline over this period, such as aggression (NICHD ECCRN, 2004; Kokko et al., 2006), helping and cooperating are robust to these landscape shifts. Children use these prosocial behaviors

continuously across elementary school to navigate their changing environments, build friendships, and facilitate positive social interactions with their peers. This finding is consistent with previous work showing teacher-reported helpfulness to be stable from ages 6 to 12 (Côté et al., 2002). One previous study (Kokko, et al., 2006) found teacher-reported general prosocial behavior to decline slightly across ages 6 to 12, but differences in target prosocial behaviors may contribute to this discrepancy. The prosocial behavior composite measured by Kokko and colleagues (2006) included items capturing child-driven conflict resolution (e.g. "if there is a quarrel or dispute will try to stop it") and praise (e.g. "takes the opportunity to praise the work of less able children"), which may follow different developmental trajectories from helping and cooperating and may be more responsive to changing social norms. Prosocial behaviors in general, and helping and cooperating in particular, remain important parts of children's social repertoires throughout their time in elementary school.

Furthermore, these behaviors have their roots in toddlerhood. Children who exhibited higher levels of prosocial behavior at 36 months also did so in kindergarten, indicating low but significant levels of relative stability in prosocial behavior across the transition to school. Importantly, the measures of prosocial behavior at 36 months differed from those taken when children were in elementary school, implying stability in a latent prosocial orientation that motivates distinct behaviors at different ages. Additionally, this association highlights the importance of early social experiences that shape burgeoning prosociality in the toddler years. Experiences that contribute to early prosocial development can help set the stage for later development across the lifespan. Contrary to hypotheses, however, warm and positive caregiving at 36 months was not a significant predictor of prosocial behavior at school entry. This lack of association may have arisen in part from the processes discussed previously in regards to the

non-significant association between prosocial behavior and caregiving at 36 months in Study 2: children may experience less direct socialization from their caregivers, and/or may be less responsive to the prosocial socialization they do experience, at the end of their third year. Alternatively, measures of caregiving at 36 months may be too distal from kindergarten to account for any variance in kindergarten prosocial behavior. The transition to school entry presents new challenges to children, and the warmth and positivity of the caregivers who help them prepare for this transition in their final year in ECE settings, and teachers who help them navigate this transition, may be more relevant for their concurrent and future prosocial development.

Finally, findings revealed a few significant predictors of the latent slope factor. The sizes of these effects were very small, and were exploratory in nature, and should be interpreted with caution. Kindergarten prosocial behavior, the intercept of the latent growth curve, negatively predicted the slope; this likely reflects, and is typically included to account for, regression to the mean. Alternatively, more prosocial children may have less room to grow over the course of elementary school, leading to lower rates of change. Additionally, sex was a significant predictor of both the intercept and the slope. Girls were viewed as more prosocial than boys, a finding consistent with previous research (Eisenberg et al., 2015), and had significantly higher rates of change across elementary school. Prosociality may be a more important tool for girls in navigating their changing social hierarchies and dynamics than for boys; over elementary school, social structures become based more on relationships for girls and physicality for boys (Kwon, Kim & Sheridan, 2014). Accordingly, girls may practice prosocial behavior more as they age, while boys have less of an incentive to do so. Additionally, warm and positive caregiving was a significant negative predictor of the slope, indicating that children who experienced a warm and

positive caregiver when they were 36 months old showed significantly lower rates of change across elementary school. These children may have come to expect warmth and positivity from their caregivers, and consequently experienced more difficulty in moving from an ECE setting to a classroom with less one-on-one time with an adult and more emphasis on academic achievement.

Findings from Study 3 illustrate that mean levels of prosocial behavior remain stable across elementary school, and that children's levels of prosocial behavior at school entry are predicted by their prosocial expressions measured a few years earlier. Exploratory findings suggest that trajectories over elementary school are different for girls than for boys, and for those children who experienced more warm and positive caregiving at 36 months than those who did not; future research is needed to further examine these associations.

4.4 GENERAL CONCLUSIONS

This group of studies is the first, to our knowledge, to explore the role of ECE settings in the development of prosocial behavior across the lifespan from toddlerhood through the elementary school years and into late childhood. In particular, no previous studies examined the emergence of prosocial behavior as a function of early ECE characteristics, nor explored a structure-process-outcome model with specific prosocial behaviors as target outcomes. Prosocial behavior is distinct from other aspects of social competence, both in the capacities and understanding it requires and in the contexts in which it develops. Accordingly, exploring how ECE settings facilitate prosocial behavior can contribute to our understanding of the mechanisms of prosocial development and to our appreciation for the characteristics of ECE settings that promote a

diverse set of positive child outcomes. The current studies begin to chart a developmental arc of prosocial behavior from infancy through late childhood, and reveal the role that ECE settings play in the unfolding of this development. Prosocial behavior begins to emerge during the second year, increases in frequency during the third year, and is stable across elementary school. Individual differences in its emergence are facilitated by ECE caregiver warmth and positivity, itself a product of ECE group and setting characteristics, during the second year. ECE settings that more readily afford personal and meaningful caregiver-child relationships tend to promote warmth and positivity; prosocial behavior is also higher in smaller and more familiar settings, as well as in larger settings with lower child-to-caregiver ratios, suggesting that there may be more opportunities in such settings for children to generate and experience prosociality and for caregivers to socialize it. The individual differences expressed in these early ECE settings remain moderately stable over the third year and throughout the transition to kindergarten. Prosocial development during the early years is bidirectional, such that caregiver warmth and positivity in the first year promotes prosocial behavior at the end of the second, which in turn elicits warmth and positivity from ECE caregivers over the third.

These patterns highlight the importance of the first few years of life in the expression of prosociality across the lifespan. During these early years, children acquire the cognitive and affective capacities required for prosocial action, and explore their own prosociality repeatedly in interactions with others. These early interactions represent a dynamic process in which children co-create their social environments with the adults around them and begin set the foundation for their future prosociality (Kuczynski & Parkin, 2007; Grusec & Goodnow, 1994; Grusec et al., 2000). Children's prosocial tendencies begin to take root in this period, and by the time children enter elementary school, these tendencies have become moderately stable. Clearly, these early

years represent an important period during which children begin to develop the prosocial tendencies that they will carry throughout childhood and into adolescence. An appreciation of this continuity, and an examination of the contexts that shape prosociality in the early years, is necessary for a thorough understanding of how prosocial behavior develops later in life. Additionally, these patterns underscore the important and nuanced role that early childcare settings play in the development of prosocial behavior across infancy, toddlerhood, and childhood. ECE settings represent primary extrafamilial contexts in which development occurs, both because children spend many hours in these settings and because they differ from children's home environments in meaningful ways. In these settings, children build distinct relationships with novel adults and peers, and these relationships form a unique structure in which children explore their burgeoning prosociality outside the home. Children's experiences in these settings intersect with those at home and together drive prosocial development. This process occurs throughout a child's entire time in non-parental ECE settings, and is perhaps most important in the second year during which prosociality first emerges. These findings highlight the importance of ECE caregivers as socializers of prosociality, in concert with but distinct from parents, siblings, and peers. Hence, they contribute to the growing empirical consensus demonstrating that prosocial development and its earliest manifestations in the second year are shaped by children's social experiences. Prosocial development is a fundamentally social and dynamic process. Broadly, the current studies support the position that early social and moral development occurs within and is driven by everyday affective interactions with others, and that the emergence and gradual development of moral and prosocial behavior can be attributed to these developmental processes rather than to innately-endowed capacities alone (Brownell et al., 2016; Hastings, Utendale & Sullivan, 2007; Eisenberg et al., 2015).

Specifically, findings revealed warmth and positivity from caregivers in ECE settings as the most robust ECE predictor of prosocial development. Structural ECE characteristics promote prosocial behavior insofar as they facilitate this type of caregiving, and indirect associations are small. This suggests that structural characteristics are not influential as stand-alone predictors of behavior, likely because they are more distal than process factors that directly shape caregiver-child interactions, and that structure-process-outcomes models imply an additive process that perhaps exaggerates the importance of structural characteristics. Rather, process characteristics should be considered the "active ingredients" that drive development (Li & Julian, 2012); structural characteristics can act as vehicles for, or potential roadblocks to, high process quality, but do not themselves promote developmental outcomes.

These patterns suggest specific policy directions. First, caregiver education and training curricula should emphasize the importance of the caregiver-child relationship and provide specific instruction on how caregivers can interact with children in a positive and warm fashion. Teacher training programs that focus on improving interactional quality have been successful at promoting child outcomes and should be considered for widespread adoption (see Li & Julian, 2012). Training programs should not abandon instruction on developmental milestones and processes, as these likely contribute to caregivers' general childrearing orientations, but such instruction should not be the top training priority. Additionally, ECE providers should adopt interactional quality as an organization priority. Third, QRIS rating systems should be reorganized such that the majority of a provider's rating is based on the interaction skills of the caregivers. The current findings contribute to the growing consensus that rating systems built primarily on structural characteristics are insufficient and inaccurate (Mashburn et al., 2008; Hamre, 2014; Burchinal et al., 2015; Mashburn et al., 2010) and would benefit greatly from a

reorientation toward caregiver-child relationships. Finally, QRIS rating systems would benefit from the inclusion of observational measures of interactional quality such as those included in the current studies. Inconsistent operationalization of caregiving quality is a limitation of current systems and a gap in extant literature on caregiving quality and prosocial development (Lamb & Ahnert, 2006; Burchinal et al., 2015; Huston et al., 2015). By specifying aspects of ECE caregiving quality that are associated with positive developmental outcomes, the current study presents a model for how interactional quality can be operationalized in future research and in QRIS rating systems.

4.5 LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The current studies were subject to several limitations, including the measurement of prosocial behavior. In aiming to address a gap in the extant literature on ECE characteristics and prosocial development, the current studies focused on a select few specific prosocial behaviors: helping, sharing, cooperating, and empathizing. Other prosocial behaviors may not adhere to the same patterns found in the current studies. Indeed, prosocial behavior is best considered a multidimensional construct, with each component behavior following a distinct developmental course and responding differently to different socialization mechanisms (Hay & Cook, 2007; Drummond et al., 2015). Future research is needed to explore whether other prosocial behaviors, such as comforting or donating, follow similar developmental trajectories and have similar associations with ECE characteristics. Prosocial behaviors in other contexts, such as with siblings or pets in the home, or with peers in non-school or ECE settings, also need to be examined; the only contexts included in the current studies were home with a parent and

childcare/school with a caregiver/teacher. Additionally, in order to use identical measures of prosocial behavior at as many ages as possible, the current studies relied on parent and teacher reports of prosocial behavior. Parent and teacher reports may overemphasize continuity, and correspondingly overestimate relative stability and underestimate absolute change in behavior over time (Eisenberg et al., 2015). Parent and teacher reports may also reflect biases. This is most notably true for sex: while observational measures of prosocial behavior show no reliable gender differences, parents and teachers tend to rate girls as being more prosocial than boys (Eisenberg et al., 2015). The same pattern emerged in the current studies: in each study, girls had higher prosocial composite scores. Additionally, many of the prosocial measures used in the current studies were on fixed 3-point scales; these measures limit variability, hindering our ability to identify small changes in absolute growth and potentially overestimating relative stability. These measures may also follow different developmental trajectories, and hence reveal different shapes and rates of growth over time, than observational measures.

Furthermore, the composite prosocial measures used in the current studies had low levels of reliability, indicating that they may not have been psychometrically well-defined. This likely reflects the fact that different prosocial behavior are often uncorrelated with one another, and that prosocial behavior varies considerably by context (Hay & Cook, 2007; Drummond et al., 2015; Dunfield et al., 2011). The composites were generated despite low reliability in order to capture context-general prosociality. Nevertheless, low reliability may contribute to the lack of hypothesized significant associations between prosocial behavior and warm and positive caregiving. Future research is needed to identify whether broad measures of context-general prosociality, potentially including observational measures in addition to parent and teacher reports, can achieve acceptable levels of reliability and can better identify true relative stability,

absolute change, and sex differences in prosocial development. Such a measure may also reveal different growth patterns and/or patterns of association with caregiving measures, and should explore different shapes or profiles of change (i.e. quadratic) and examine person-centered growth trajectories.

Regarding ECE characteristics, the current studies focused only on children's primary caregiver. Children interact with many different caregivers in any single ECE setting, and these adults also likely contribute to prosocial development. Furthermore, prosocial development may more directly be a product of warmth and positivity, or other process quality measures, at the classroom level as opposed to the caregiver level. If so, including measures from all the caregivers that children interact with would yield a more robust measure of ECE warmth and positivity. Additionally, as noted in Study 2, primary caregivers may change across measurement points. This limits out ability to draw conclusions about change in warmth and positivity from one time period to another, and also how these measures each contribute independently to prosocial development. Future research is needed to distinguish between caregiver level and classroom level process characteristics, identify which is more predictive of positive developmental outcomes, and ensure that any relative stability or absolute change in these process characteristics is not due to different caregivers at each measurement period. The findings from the current studies are also limited by the exclusive focus on caregivers; the current studies did not examine the role of peers, who play a crucial role in prosocial development in ECE settings (Eisenberg et al., 2015; NICHD ECCRN, 2001). Future research is needed to explore the role of peers, and the interaction between peer and caregiver socialization influences, on prosocial development. Finally, the ECE caregiving measures were perhaps too broad to operate as hypothesized. The current studies didn't focus on specific socialization and

caregiving practices that may be more directly related to prosocial behavior, such as scaffolding or modeling of prosociality. Such prosocial caregiving may be more directly promotive of prosocial development. Additionally, the measure of caregiver child-rearing beliefs did not measure beliefs that are specifically relevant to prosociality. Caregivers' beliefs about prosocial and moral development, and their role in facilitating it, would be more likely to shape their behavior and facilitate prosocial development.

Finally, the current studies were subject to sample limitations. The analytic samples for each study, as compared to the sample as a whole, included families with higher levels of maternal education and income-to-need ratios. These families may be more likely to have access to higher quality childcare, formal childcare arrangements, and/or ECE settings that are consistent with their parenting practices (Burchinal et al., 2015). Additionally, families who refrain from using non-parental care for their children may differ in meaningful ways from those who choose or have access to non-parental care arrangements, especially when children are in their first few years of life. Selection effects vary by child age and are difficult to control with statistical techniques alone (Jaffee, Van Hulle, & Rodgers, 2011). Accordingly, future research is needed to ensure that the findings revealed in the current studies extend to families across the education and income spectrum and to families who do not use any form of non-parental care in the first years of life.

In their first few years of life, children begin to lay the foundation for complex moral thought and action. During their everyday affective interactions with others, children explore, refine, and build their prosocial competencies. For many children, ECE settings represent influential non-parental contexts in which these interactions occur, and caregivers in these settings play a key role in socializing prosociality. By engaging in warmth and positivity, these

caregivers afford and invite the kind of relationships in which prosociality is best incubated, and help children develop the prosocial tools that they will carry into and throughout elementary school.

APPENDIX A: TABLES

Table 1: Measures and ages across studies

	Age				
Measures	1 mo	15 mo	24 mo	36 mo	K - G6
Demographics					
Sex	x				
Minority status	x				
Income-to-needs ratio	x	x	x	x	x
Maternal characteristics					
Maternal education	x				
Maternal sensitivity		x	x	x	
ECE characteristics					
Structural factors		x			
Process factors		x	x	x	
Prosocial Behavior					
ASBI			x	x	
SSRS					x

Table 2: Measures and ages by study

	Measure								
	Demographics			Maternal Characteristics		ECE Characteristics		Prosocial Behavior	
Study	Sex	Minority	Income	Education	Sensitivity	Structural	Process	ASBI	SSRS
1	1 mo	1 mo	15 mo	1 mo	15 mo	15 mo	15 mo	24 mo	
2	1 mo	1 mo	24 mo 36 mo	1 mo			24 mo 36 mo	24 mo 36 mo	
3	1 mo	1 mo	36 mo K - G6	1 mo	36 mo		36 mo	36 mo	K - G6

Table 3: Demographics by Study

	Study 1	Study 2	Study 3
n	616	662	699
% Female	50%	50%	51%
% Minority	18%	18%	18%
	M(SD)	*M(SD)*	*M(SD)*
Maternal Education	14.77 (2.43)	14.71 (2.42)	14.63 (2.49)
Income (15 mos)	4.45 (3.55)	4.17 (3.36)	4.18 (3.54)
Income (24 mos)	4.41 (3.36)	4.30 (3.30)	4.21 (3.33)
Income (36 mos)	4.31 (3.40)	4.17 (3.31)	4.18 (3.40)
Income (K)	4.17 (3.01)	3.98 (2.91)	3.97 (2.91)
Income (G1)	4.58 (3.29)	4.46 (3.22)	4.49 (3.24)
Income (G3)	4.98 (4.02)	4.81 (3.89)	4.82 (3.87)
Income (G4)	5.23 (4.35)	4.99 (4.04)	5.05 (4.20)
Income (G5)	5.24 (4.40)	4.97 (4.10)	5.01 (4.18)
Income (G6)	5.27 (4.89)	4.97 (4.37)	5.08 (4.46)

Table 4: Study 1 – Intercorrelations and Descriptive Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	*M(SD)*
1. CG Sens	1																		2.68 (.73)
2. CG Pos Beh	.45	1																	13.13 (9.13)
3. Pos Eng CG	.78	.49	1																2.68 (.78)
4. CG Pos Reg	.80	.52	.85	1															2.79 (.75)
5. CG Belief	-.09	-.03	-.06	-.07	1														78.68 (19.78)
6. PSB 24	.13	.07	.13	.13	-.04	1													1.30 (.32)
7. CG Ed	.01	-.06	-.04	-.02	-.45	.00	1												2.57 (1.03)
8. CG FEd	.00	-.08	-.06	-.06	-.38	-.00	.54	1											1.14 (1.37)
9. CG REd	-.10	-.12	-.17	-.14	-.28	.01	.23	.38	1										.30 (.46)
10. Ratio	-.34	-.41	-.39	-.37	-.19	-.14	.21	.25	.41	1									2.72 (1.72)
11. Size	-.38	-.33	-.44	-.40	-.22	-.16	.24	.33	.44	.74	1								4.22 (3.49)
12. Type Hm	.15	.15	.18	.15	.20	.09	-.13	-.11	-.21	-.38	-.39	1							.22 (.41)
13. Type Fam	.11	.07	.18	.14	-.03	.03	-.05	-.08	-.15	-.02	-.26	-.59	1						.56 (.50)
14. CC Hours	-.14	-.02	-.12	-.13	.07	.02	-.05	-.03	.08	.07	.12	-.06	.02	1					35.46 (12.46)
15. Mat Sens	.06	.03	-.01	.01	-.17	.19	.12	.15	.02	.06	.10	-.03	-.07	-.07	1				9.50 (1.61)
16. Income	.19	.17	.14	.10	-.14	.11	.13	.09	-.05	-.09	-.04	.14	-.14	-.01	.27	1			4.45 (3.55)
17. Sex	.13	.04	.14	.17	-.07	.15	.07	.05	.12	-.03	-.07	.01	.04	-.01	.09	.02	1		.50 (.50)
18. Minority	-.08	-.02	.02	.02	.18	-.11	-.08	-.06	-.03	-.04	-.05	.04	.00	-.03	-.30	-.19	-.02	1	.18 (.39)
19. Mom Ed	.16	.09	.10	.09	-.21	.14	.17	.14	.01	-.03	-.01	.12	-.14	-.10	.36	.45	.02	-.16	14.77 (2.43)

CG Sens = Caregiver sensitivity; CG Pos Beh = Caregiver positive behavior; Pos Eng CG = Positive engagement with the caregiver; CG Pos Reg = Caregiver positive regard; CG Belief = caregiver childrearing beliefs; PSB 24 = Prosocial behavior composite at 24 months; CG Ed = Caregiver education; Cg FEd = Caregiver formal education; CG REd = Caregiver recent education; Ratio = Child-to-caregiver ratio; Size = Group size; Type Hm = CC Type In-home daycare (1 = yes); Type Fam = CC Type Family daycare (1 = yes); CC Hours = Weekly hours in primary ECE setting; Mat Sens = Maternal sensitivity; Income = Income-to-needs ratio; Sex = Sex (1 = female); Minority = Minority status (1 = minority); Mom Ed = Maternal education.

Table 5: Study 1 – Path Coefficients

Path	*B*	SE_B	p_B	β	SE_β	p_β
CG Ed → CG Positive Caregiving	.08	.06	.18	.07	.05	.17
CG FEd → CG Positive Caregiving	.04	.05	.35	.05	.05	.35
CG REd → CG Positive Caregiving	.18	.12	.13	.07	.05	.13
Ratio → CG Positive Caregiving	-.17	.04	.00	-.24	.06	.00
Group Size → CG Positive Caregiving	-.08	.03	.01	-.23	.08	.00
Type Hm → CG Positive Caregiving	.42	.20	.03	.15	.07	.03
Type Fam → CG Positive Caregiving	.48	.16	.00	.21	.07	.00
CG Ed → CG Childrearing Beliefs	-.32	.05	.00	-.33	.05	.00
CG FEd → CG Childrearing Beliefs	-.11	.04	.00	-.14	.05	.00
CG REd → CG Childrearing Beliefs	-.31	.10	.00	-.14	.05	.00
Ratio → CG Childrearing Beliefs	.01	.04	.81	.02	.07	.81
Group Size → CG Childrearing Beliefs	.00	.02	.98	.00	.08	.98
Type Hm → CG Childrearing Beliefs	.28	.16	.09	.11	.07	.09
Type Fam → CG Childrearing Beliefs	-.02	.14	.91	-.01	.07	.91
CG Positive Caregiving → PSB 24	.04	.01	.01	.13	.05	.01
CG Childrearing Beliefs → PSB 24	.01	.02	.54	.03	.05	.54
CC Hours → PSB 24	.02	.01	.22	.05	.04	.22
Mat Sens → PSB 24	.04	.01	.00	.14	.05	.00
Income → PSB 24	.00	.02	.80	.01	.05	.80
Sex → PSB 24	.08	.03	.00	.12	.04	.00
Minority → PSB 24	-.04	.04	.22	-.05	.04	.22
Mom Ed → PSB 24	.02	.02	.15	.07	.05	.15
CG Ed → CG Positive Caregiving → PSB 24	.00	.00	.23	.01	.01	.25
CG FEd → CG Positive Caregiving → PSB 24	.00	.00	.39	.01	.01	.40
CG REd → CG Positive Caregiving → PSB 24	.01	.01	.19	.01	.01	.21
Ratio → CG Positive Caregiving → PSB 24	-.01	.00	.03	-.03	.02	.04
Group Size → CG Positive Caregiving → PSB 24	-.00	.00	.05	-.03	.02	.07
Type Hm → CG Positive Caregiving → PSB 24	.02	.01	.10	.02	.01	.12
Type Fam → CG Positive Caregiving → PSB 24	.02	.01	.05	.03	.01	.06
CG Ed → CG Childrearing Beliefs → PSB 24	-.00	.01	.54	-.01	.02	.55
CG FEd → CG Childrearing Beliefs → PSB 24	-.00	.00	.55	-.00	.01	.56
CG REd → CG Childrearing Beliefs → PSB 24	-.00	.01	.56	-.00	.01	.56
Ratio → CG Childrearing Beliefs → PSB 24	.00	.00	.94	.00	.00	.94
Group Size → CG Childrearing Beliefs → PSB 24	.00	.00	.99	.00	.00	.99
Type Hm → CG Childrearing Beliefs → PSB 24	.00	.01	.59	.00	.01	.60
Type Fam → CG Childrearing Beliefs → PSB 24	.00	.00	.93	.00	.00	.93

CG Positive Caregiving = CG warm and positive caregiving at 24 mos; PSB 24 = Prosocial behavior composite at 24 months; CG Ed = Caregiver education; Cg FEd = Caregiver formal education; CG REd = Caregiver recent education; Ratio = Child-to-caregiver ratio; Group size; Type Hm = CC Type In-home daycare (1 = yes); Type Fam = CC Type Family daycare (1 = yes); CC Hours = Weekly hours in primary ECE setting; Mat Sens = Maternal sensitivity; Income = Income-to-needs ratio; Sex = Sex (1 = female); Minority = Minority status (1 = minority); Mom Ed = Maternal education.

Table 6: Study 2 – Intercorrelations and Descriptive Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	*M(SD)*
1. CG Sens 24	1															2.51 (.76)
2. CG Pos Beh 24	.59	1														10.80 (9.27)
3. Pos Eng CG 24	.76	.63	1													2.47 (.82)
4. CG Pos Reg 24	.81	.62	.80	1												2.51 (.79)
5. CG Sens 36	.33	.24	.35	.37	1											2.50 (.72)
6. CG Pos Beh 36	.30	.37	.29	.29	.46	1										9.73 (8.58)
7. Pos Eng CG 36	.28	.25	.34	.30	.70	.53	1									2.39 (.77)
8. CG Pos Reg 36	.30	.23	.34	.37	.83	.50	.76	1								2.39 (.77)
9. PSB 24	.14	.07	.18	.14	.17	.10	.12	.16	1							1.31 (.32)
10. PSB 36	.06	.02	.10	.07	.16	.05	.12	.12	.43	1						1.40 (.33)
11. Income 24	.19	.13	.16	.12	.10	.04	.01	.06	.02	.08	1					430 (3.30)
12. Income 36	.15	.12	.15	.11	.07	.06	-.03	.02	.01	.06	.85	1				4.17 (3.31)
13. MomEd	.23	.06	.13	.17	.10	.04	-.01	.11	.08	.13	.50	.49	1			14.71 (2.42)
14. Sex	.05	.06	.08	.04	.08	.03	.06	.07	.14	.18	.02	.02	.01	1		.50 (.50)
15. Minority	-.18	-.04	-.10	-.14	-.16	-.08	-.15	-.16	-.05	-.15	-.14	-.12	-.20	.00	1	.18 (.38)

CG Sens 24/36= Caregiver sensitivity at 24/36 mos; CG Pos Beh 24/36= Caregiver positive behavior at 24/36 mos; Pos Eng CG 24/36= Positive engagement with the caregiver at 24/36 mos; CG Pos Reg 24/36= Caregiver positive regard at 24/36 mos; PSB 24/36 = Prosocial behavior composite at 24/36 months; Income 24/36= Income-to-needs ratio at 24/36 mos; Mom Ed = Maternal education; Sex = Sex (1 = female); Minority = Minority status (1 = minority).

Table 7: Study 2 – Path Coefficients

Path	*B*	SE_B	p_B	β	SE_β	p_β
CG Positive Caregiving 24 → CG Positive Caregiving 36	.38	.05	.00	.39	.04	.00
CG Positive Caregiving 24 → PSB 36	-.02	.01	.26	-.05	.05	.26
CG Positive Caregiving 36 → PSB 36	.02	.02	.25	.06	.05	.25
PSB 24 → PSB 36	.42	.04	.00	.40	.04	.00
PSB 24 → CG Positive Caregiving 36	.32	.15	.03	.10	.05	.03
Sex → CG Positive Caregiving 24	.12	.09	.17	.06	.04	.17
Sex → CG Positive Caregiving 36	.08	.09	.34	.04	.04	.34
Sex → PSB 24	.09	.03	.00	.14	.04	.00
Sex → PSB 36	.08	.02	.00	.12	.04	.00
Minority → CG Positive Caregiving 24	-.32	.13	.01	-.12	.05	.01
Minority → CG Positive Caregiving 36	-.31	.12	.01	-.12	.05	.01
Minority → PSB 24	-.03	.03	.32	-.04	.04	.32
Minority → PSB 36	-.10	.03	.00	.12	.04	.00
Mom Ed → CG Positive Caregiving 24	.13	.05	.02	.12	.05	.01
Mom Ed → CG Positive Caregiving 36	.01	.05	.79	.01	.05	.79
Mom Ed → PSB 24	.03	.01	.06	.09	.05	.06
Mom Ed → PSB 36	.03	.01	.08	.08	.04	.08
Income 24 → CG Positive Caregiving 24	.09	.05	.07	.09	.05	.07
Income 24 → PSB 24	-.01	.01	.45	-.03	.05	.45
Income 36 → CG Positive Caregiving 36	-.05	.05	.33	-.05	.05	.33
Income 36 → PSB 36	.00	.02	.92	-.12	.04	.00

CG Positive Caregiving 24/36= CG warm and positive caregiving at 24/36 mos; PSB 24/36 = Prosocial behavior composite at 24/36 months; Income 24/36= Income-to-needs ratio at 24/36 mos; Mom Ed = Maternal education; Sex = Sex (1 = female); Minority = Minority status (1 = minority).

Table 8: Study 3 – Intercorrelations and Descriptive Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	*M(SD)*
1. CG Sens	1														2.50 (.74)
2. CG Pos Beh	.45	1													9.50 (8.58)
3. Pos Eng CG	.70	.54	1												2.36 (.77)
4. CG Pos Reg	.83	.50	.75	1											2.36 (.76)
5. Mat Sens	.23	.14	.15	.18	1										17.21 (2.70)
6. PSB 36	.15	.08	.15	.13	.23	1									1.39 (.32)
7. PSB K	.03	.03	.05	.03	.04	.10	1								1.41 (.32)
8. PSB G1	.00	.02	.01	.00	.04	.08	.04	1							1.40 (.32)
9. PSB G3	.02	.01	.03	.02	.05	.07	.04	.05	1						1.35 (.34)
10. PSB G4	.02	.02	.04	.01	.07	.10	.04	.05	.06	1					1.32 (.36)
11. PSB G5	-.01	-.01	-.01	-.02	.03	.08	.03	.04	.05	.06	1				1.33 (.35)
12. PSB G6	-.00	-.02	-.00	-.01	.05	.09	.04	.04	.06	.06	.06	1			1.29 (.35)
13. Income 36	.11	.11	.03	.08	.30	.11	.02	.02	.03	.04	.02	.02	1		4.18 (3.40)
14. Income K	.17	.14	.10	.14	.34	.14	.03	.03	.04	.06	.03	.03	.80	1	3.97 (2.91)
15. Income G1	.21	.13	.09	.16	.31	.12	.02	.03	.03	.04	.02	.03	.80	.88	4.49 (3.24)
16. Income G3	.17	.11	.06	.14	.31	.11	.03	.04	.04	.04	.03	.04	.72	.83	4.82 (3.87)
17. Income G4	.20	.12	.09	.16	.29	.14	.03	.03	.03	.03	.03	.03	.70	.77	5.05 (4.20)
18. Income G5	.19	.11	.08	.17	.30	.13	.03	.03	.03	.04	.03	.02	.69	.77	5.01 (4.18)
19. Income G6	.17	.09	.08	.14	.28	.15	.05	.03	.04	.04	.03	.03	.62	.69	5.08 (4.46)
20. Mom Ed	.15	08	.07	.16	.38	.14	.02	.03	.03	.04	.03	.02	.51	.54	14.63 (2.49)
21. Sex	.01	-.01	.01	.02	.02	.07	.02	.03	.03	.04	.02	.04	.02	-.00	.50 (.50)
22. Minority	-.08	-.05	-.07	-.07	-.10	-.07	-.01	-.01	-.01	-.02	-.01	-.01	-.05	-.08	.17 (.38)

CG Sens = Caregiver Sensitivity; CG Pos Beh = Caregiver positive behavior; Pos Eng CG = Positive engagement with the caregiver; CG Pos Reg = Caregiver positive regard; Mat Sens = Maternal Sensitivity; PSB 36/K/G1/G3/G4/G5/G6 = Prosocial behavior composite at 36 months/K/G1/G3/G4/G5/G6; Income 36/K/G1/G3/G4/G5/G6 = Income-to-needs ratio at 36 months/K/G1/G3/G4/G5/G6; Mom Ed = Maternal Education; Sex = Sex (1 = female); Minority = Minority status (1 = minority).

Table 8 (continued)

	15	16	17	18	19	20	21	22	*M(SD)*
1. CG Sens									2.50 (.74)
2. CG Pos Beh									9.50 (8.58)
3. Pos Eng CG									2.36 (.77)
4. CG Pos Reg									2.36 (.76)
5. Mat Sens									17.21 (2.70)
6. PSB 36									1.39 (.32)
7. PSB K									1.41 (.32)
8. PSB G1									1.40 (.32)
9. PSB G3									1.35 (.34)
10. PSB G4									1.32 (.36)
11. PSB G5									1.33 (.35)
12. PSB G6									1.29 (.35)
13. Income 36									4.18 (3.40)
14. Income K									3.97 (2.91)
15. Income G1	1								4.49 (3.24)
16. Income G3	.86	1							4.82 (3.87)
17. Income G4	.82	.90	1						5.05 (4.20)
18. Income G5	.81	.84	.90	1					5.01 (4.18)
19. Income G6	.75	.82	.82	.87	1				5.08 (4.46)
20. Mom Ed	.53	.50	.49	.50	.48	1			14.63 (2.49)
21. Sex	-.01	-.01	.00	.02	-.01	.00	1		.50 (.50)
22. Minority	-.09	-.06	-.07	-.07	-.06	-.08	.01	1	.17 (.38)

CG Sens = Caregiver Sensitivity; CG Pos Beh = Caregiver positive behavior; Pos Eng CG = Positive engagement with the caregiver; CG Pos Reg = Caregiver positive regard; Mat Sens = Maternal Sensitivity; PSB 36/K/G1/G3/G4/G5/G6 = Prosocial behavior composite at 36 months/K/G1/G3/G4/G5/G6; Income 36/K/G1/G3/G4/G5/G6 = Income-to-needs ratio at 36 months/K/G1/G3/G4/G5/G6; Mom Ed = Maternal Education; Sex = Sex (1 = female); Minority = Minority status (1 = minority).

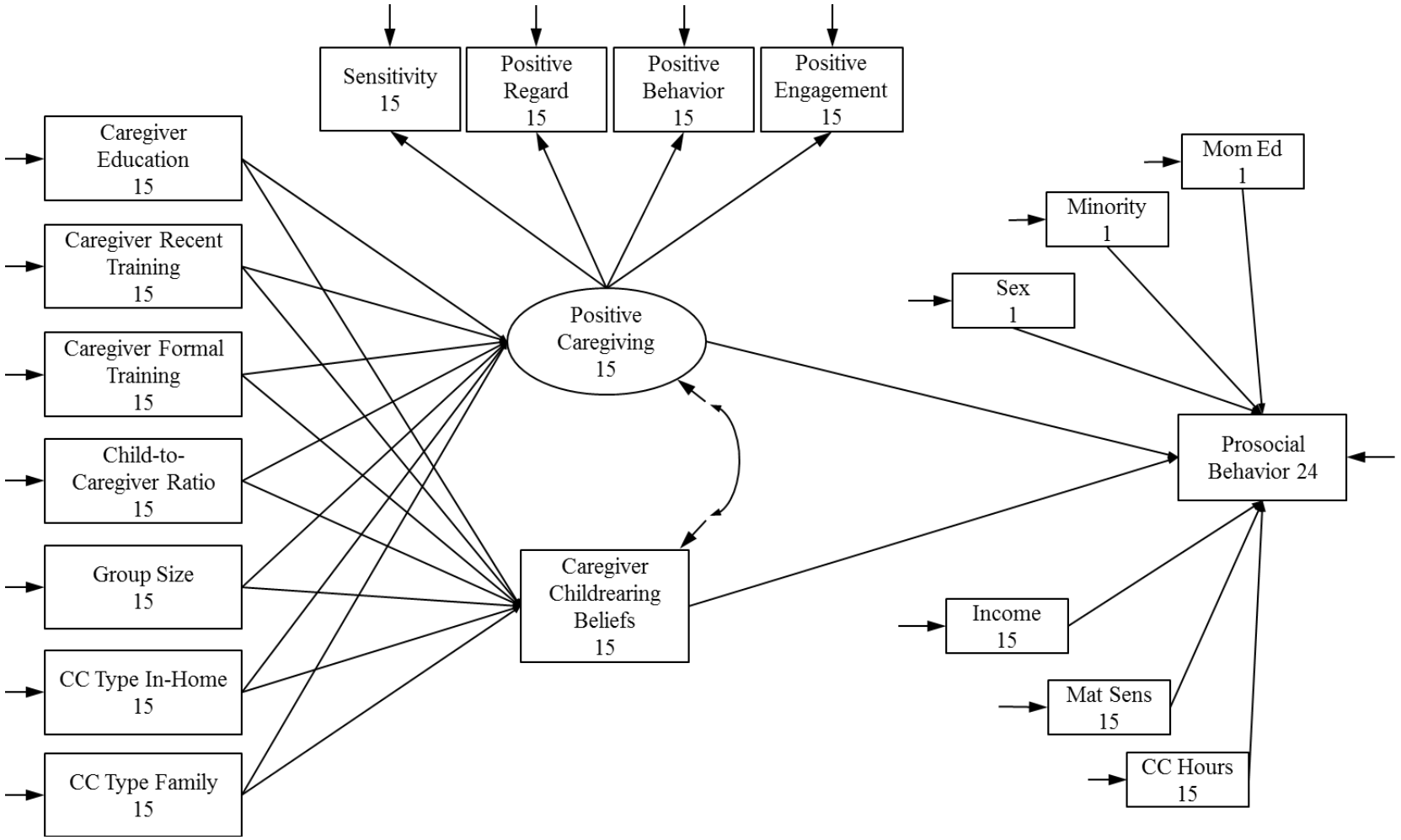
Table 9: Study 3 – Path Coefficients

Path	*B*	SE_B	p_B	β	SE_β	p_β
CG Positive Caregiving 36 → Intercept	.01	.01	.39	.05	.06	.39
PSB 36 → Intercept	.08	.01	.00	.37	.05	.00
Mat Sens 36 → Intercept	.02	.01	.07	.11	.06	.07
Mom Ed → Intercept	.00	.01	.97	.00	.06	.97
Sex → Intercept	.07	.02	.00	.17	.05	.00
Minority → Intercept	.00	.03	.93	.01	.06	.93
Intercept → Slope	-.04	.02	.05	-.25	.12	.03
CG Positive Caregiving 36 → Slope	-.01	.00	.01	-.19	.08	.01
PSB 36 → Slope	.00	.00	.51	.05	.08	.52
Mat Sens 36 → Slope	.00	.00	.51	.05	.08	.52
Mom Ed → Slope	.00	.00	.74	.03	.08	.74
Sex → Slope	.01	.01	.02	.16	.06	.02
Minority → Slope	-.01	.01	.12	-.11	.07	.12

CG Positive Caregiving 36 = CG warm and positive caregiving at 36 mos; PSB 36 = Prosocial behavior composite at 36 months; Mat Sens 36 = Maternal Sensitivity at 36 mos; Mom Ed = Maternal Education; Sex = Sex (1 = female); Minority = Minority status (1 = minority).

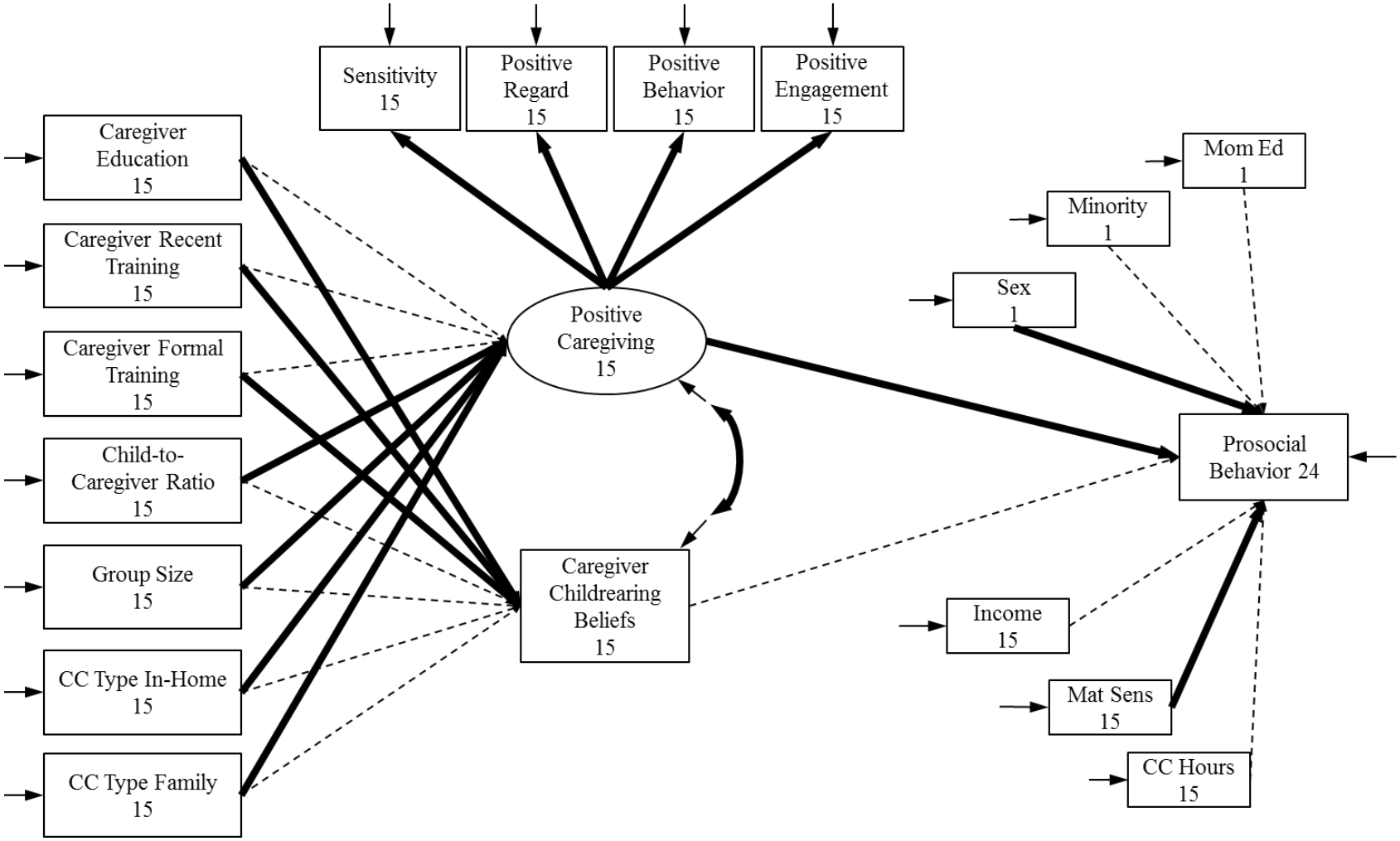
APPENDIX B: FIGURES

Figure 1: Study 1 – Conceptual Model



Note: Covariances among structural factors and covariates are not depicted.

Figure 2: Study 1 – Results



Note: Covariances among structural factors and covariates are not depicted.
Bold lines represent significant paths/correlations/factor loadings ($p < .05$). Dashed lines are not significant.

Figure 3: Study 2 – Conceptual Model

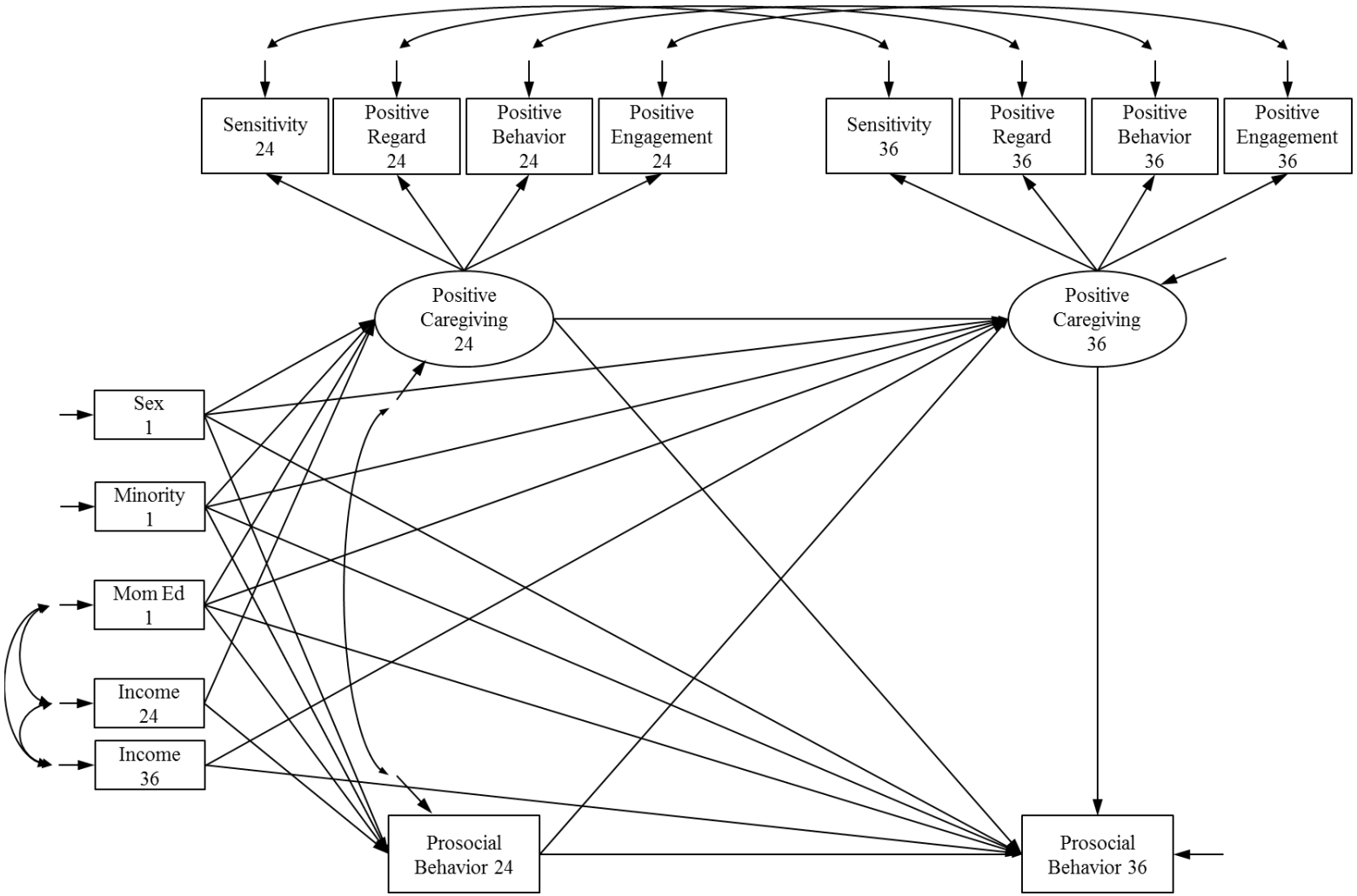
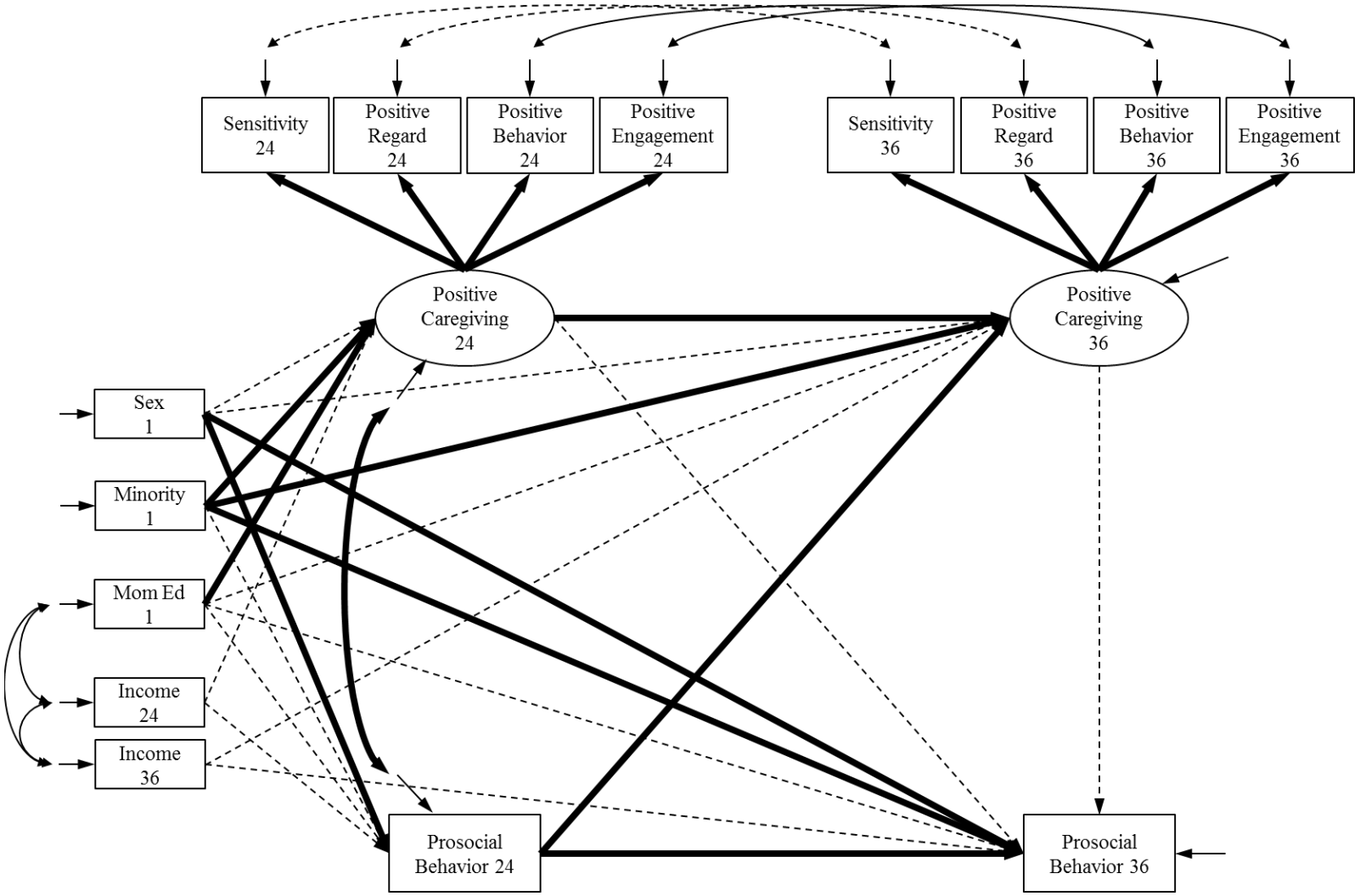


Figure 4: Study 2 – Results



Note: Bold lines represent significant paths/correlations/factor loadings ($p < .05$). Dashed lines are not significant.

Figure 5: Means of Prosocial Behavior across Elementary School

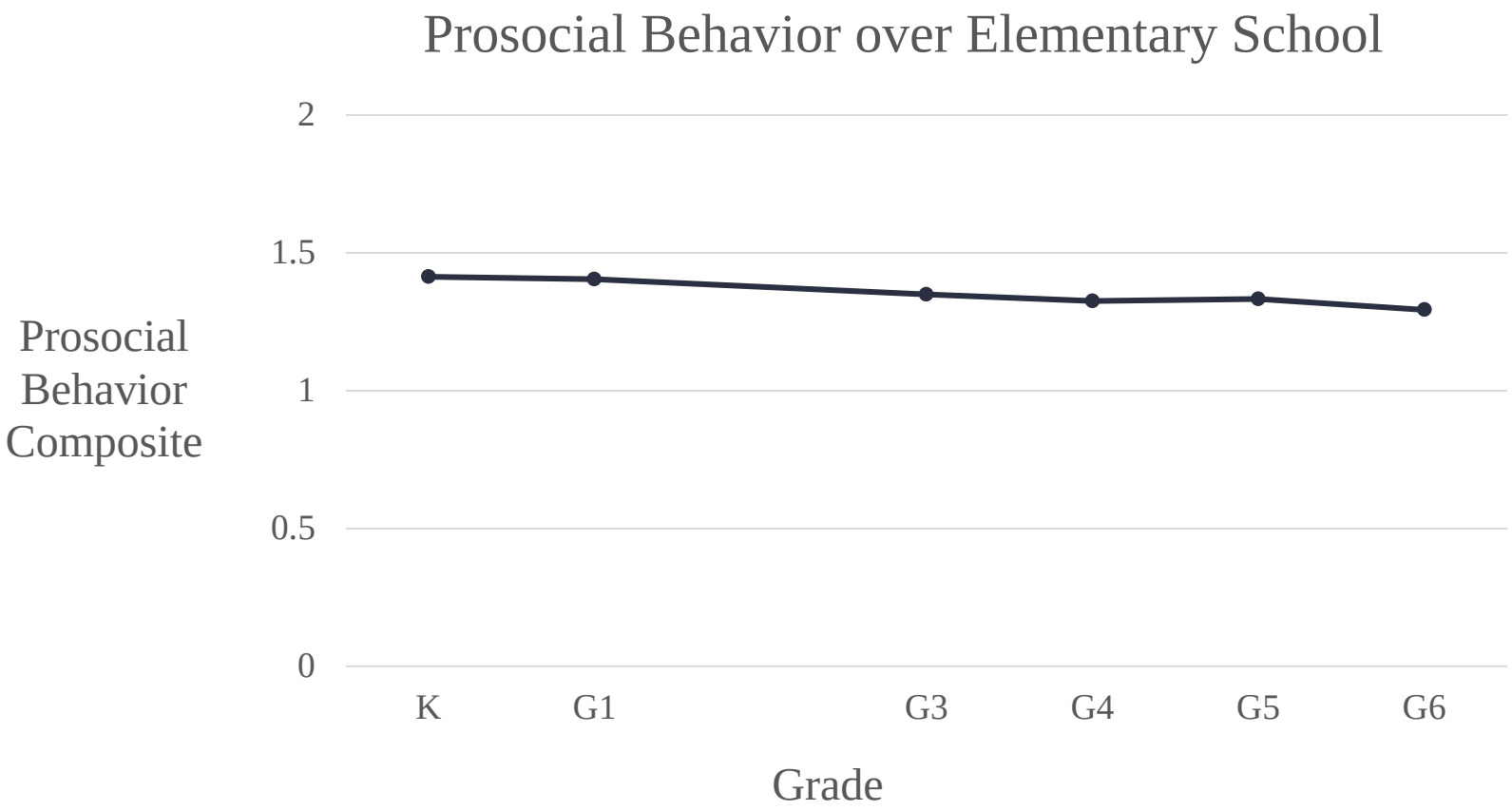
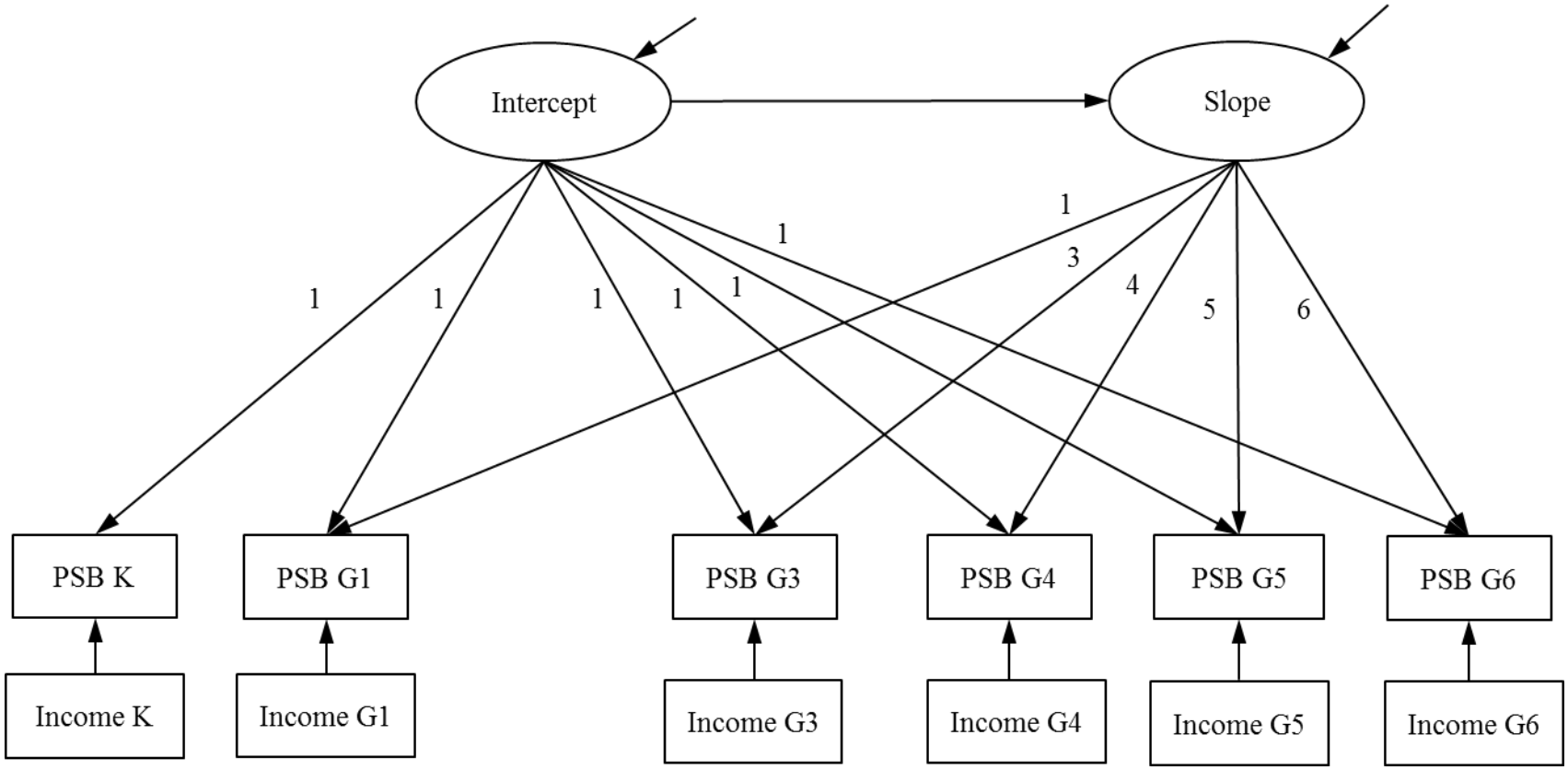
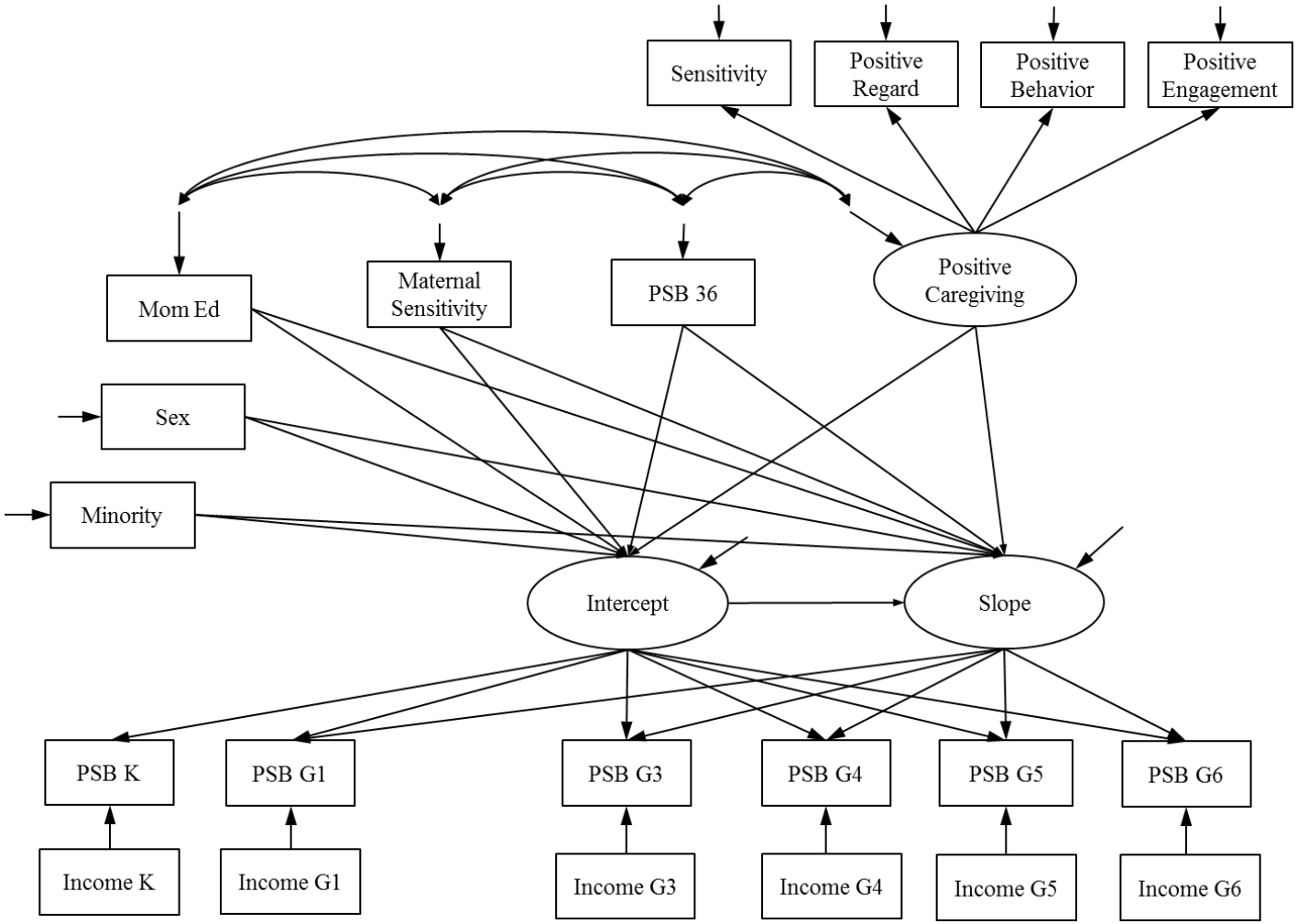


Figure 6: Study 3 – Latent Growth Curve – Conceptual Model



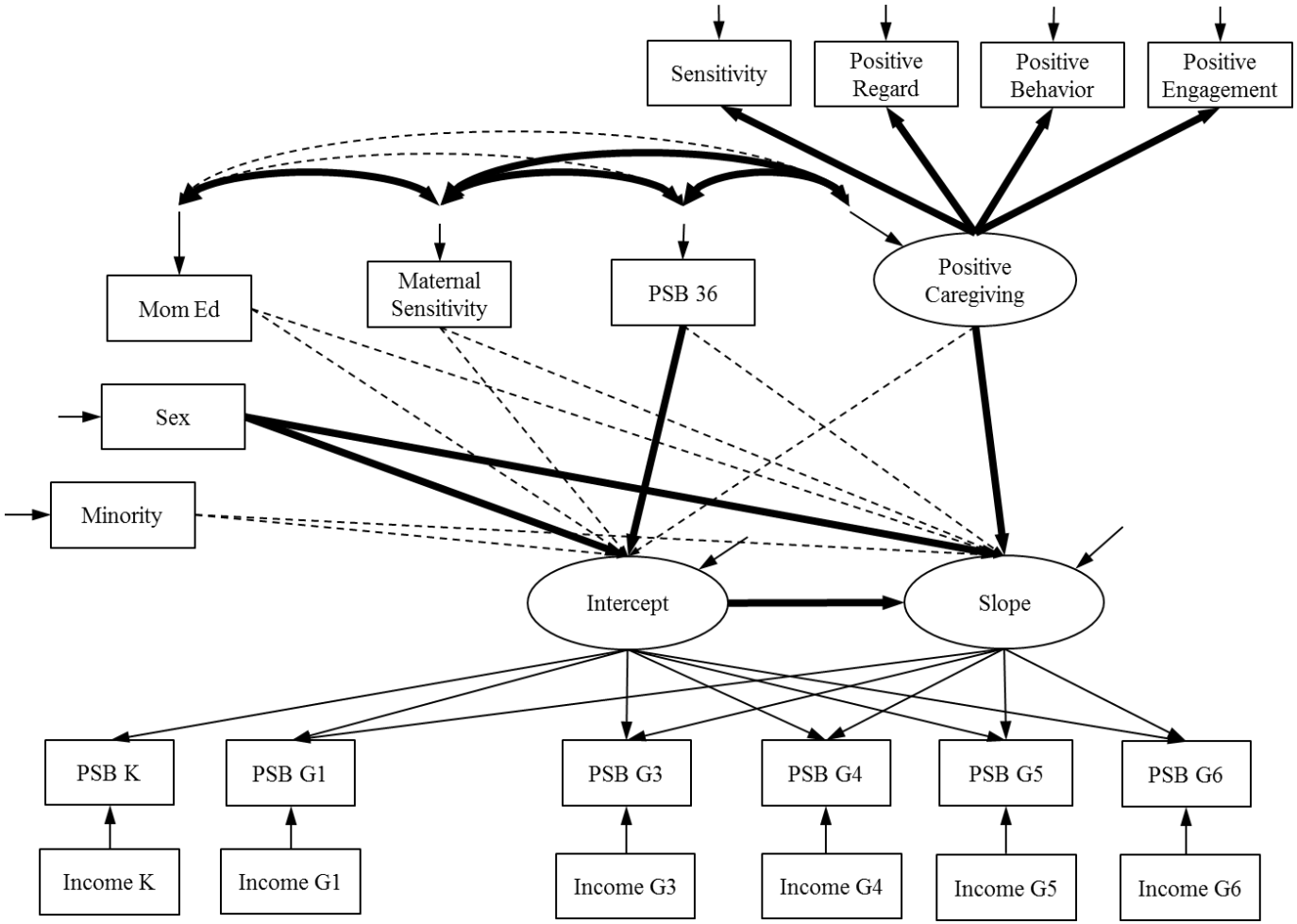
Note: Sex, minority status, and maternal education are not depicted and are included as time-invariant covariates. Covariances among covariates are not depicted.

Figure 7: Study 3 – Latent Growth Curve with Predictors – Conceptual Model



Note: Income-to-needs ratio at 36 months is not depicted. Covariances among covariates are not depicted.

Figure 8: Study 3 – Latent Growth Curve with Predictors – Results



Notes: Income-to-needs ratio at 36 months is not depicted. Covariances among covariates are not depicted. Bold lines represent significant paths/correlations/factor loadings ($p < .05$). Dashed lines are not significant.

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