

## Why Early Care and Education Deserves as Much Attention, or More, than Prekindergarten Alone

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*High-quality early care and education (ECE) programs promote positive child outcomes, allow parents to work, and contribute to the local economy. Although extant research takes into account the ECE sector in its entirety, recent economic and policy interest has centered on part-day prekindergarten for 3- and 4-year-olds only. Using an ecological framework, we review and synthesize the research literature to examine whether the emphasis on pre-k is justified as economically superior to a comprehensive approach. We compare impacts on the macrosystem (regional economy), exosystem (parents), and microsystem (children's long-term human development) and argue that a holistic approach that includes comprehensive ECE services has economic returns as great as or greater than pre-k alone. Finally, we explore the conceptual barriers that have contributed to the narrow focus on pre-k and the policy implications of ignoring the broader ecological context.*

Although historically education and care before age five was considered a private rather than public responsibility in the United States, early childhood education has received growing public attention in recent years (e.g., Barnett, 2004; Heckman & Masterov, 2004; Rolnick & Grunewald, 2003; Shonkoff & Phillips, 2000). Much of this new attention is derived from research on the long-term economic benefits of child development programs for young children from disadvantaged families

(e.g., Barnett & Masse, 2007; Belfield, Nores, Barnett, & Schweinhart, 2006; Masse & Barnett, 2002; Reynolds, Temple, Robertson, & Mann, 2002; Temple & Reynolds, 2007). Several economists including Rolnick and Grunewald (2003) of the Minnesota Federal Reserve have publicized this research. They highlight that the annual rate of return for public investment in the Perry Preschool program estimated at 17% is superior to the average annual rate of return of 6.3% in the stock market, and argue that early childhood is a better economic development investment.

This recent attention has been coupled with calls for increased investment. Economists such as Heckman and Masterov (2004) and Lynch (2004) recommend targeting prekindergarten to the 20% of the nation's 3- and 4-year-old children who live in poverty. In a recent commentary in *The Wall Street Journal*, Nobel laureate James Heckman (2006) emphasized the dual-purpose of early childhood interventions, namely promoting social justice and economic productivity, and stated that "early interventions targeted toward disadvantaged children have much higher returns than later interventions" (p. A15). The national Committee for Economic Development (CED, 2002, 2004) endorses universal prekindergarten to foster economic prosperity. Pre-k education is the top policy

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priority for the Pew Charitable Trusts, which grants monies to those who share their “desire to ensure that all 3- and 4-year-olds have access to high-quality prekindergarten education” (Pew Charitable Trusts, 2006). State policymakers are responding. In 1980, there were only 10 publicly-funded state pre-k programs; this number grew to 38 in 2005 (Barnett, Hustedt, Robin, & Schulman, 2005).

This increased attention to the importance of early childhood is good news for families and others interested in human development. However, there are two main problems with the economic argument. First, these economic predictions assert that pre-k programs directed at 3- and 4-year-old children can result in significant macro-level economic impacts (CED, 2002, 2004; Grunewald & Rolnick, 2005; Heckman & Masterov, 2004; Lynch, 2004; Rolnick & Grunewald, 2003). To assume that results equivalent to those of small model programs will be achieved when programs are taken to scale ignores the ecological importance of person, place and context in conditioning returns (Barnett & Ackerman, 2006). Furthermore, these economic calculations ignore the contexts in which many children live—families and communities—for whom employment often requires full-time child care.

Secondly, the complex structure of the early care and education (ECE) sector itself is left out of the debate. Traditionally, early childhood policy and research has been separated into two distinct spheres, with different ideological, theoretical, and methodological orientations: one focused on early education and interventions for disadvantaged children, and the other on nonparental child care for the general population (Barnett, 2004; Brauner, Gordic, & Zigler, 2004; Lamb, 1998). Early education programs and interventions such as part-day, academic-year prekindergarten and Head Start are viewed and substantiated by research as beneficial for children (e.g., Belfield, 2006; Garces, Thomas, & Currie, 2002; Gormley, Gayer, Phillips, & Dawson, 2005; Henry, Henderson, Ponder, Gordon, Mashburn, & Rickman, 2003; Magnuson, Ruhm, & Waldfogel, 2007). In contrast, participation in center- or home-based child care is often viewed as a “necessary evil,” a full-time custodial arrangement needed by parents with young children in order to work, and the negative impacts of child care on children’s development has dominated this literature (Barnett, 2004; Phillips & Adams, 2001; Lamb, 1998). Public perceptions of education as a public responsibility and care as a private responsibility mirror this dichotomy (Bales, 1998; Folbre, 2001; Harrington, 1999; Lakoff & Grady, 1998). Proponents of the

narrower pre-k approach perpetuate the separation of child care and pre-k to forward a human capital development argument for the educational intervention (CED, 2002; Heckman & Masterov, 2004; Lynch, 2004; Rolnick & Grunewald, 2003). The recent movement to combine the early education and child care realms under one umbrella term, early care and education (ECE), recognizes that all settings should be developmentally appropriate and educational (Brauner et al., 2004).

In this article, we use an ecological framework that addresses the economic and social structure of the ECE sector to synthesize research on the impacts of ECE at the macro-scale (regional economic development), exo-scale (parental environment) and the micro-scale (child development). We show how a comprehensive approach to ECE policy that addresses the multiple contexts in which families function results in economic benefits as great as or greater than policies focused on prekindergarten alone. Human development scholars are keenly aware of the importance of ecological context in evaluating programs and policies; we call for economists new to the ECE field to frame their work in a broader ecological context as well.

### An Ecological Perspective

Human development occurs through bi-directional effects between the contextual layers in which an individual is embedded; thus, a policy or program aimed at an individual also impacts the environments in which the individual is nested. Bronfenbrenner’s (1979) ecological systems theory asserts that individuals are embedded in several environmental layers: microsystems that they directly experience (e.g., home and school), exosystems that affect development indirectly through other individuals (e.g., a parent’s workplace), and macrosystems, or the prevailing societal structures, ideologies, and attitudes (e.g., economic structure of ECE sector and societal beliefs regarding child development).

Much psychological and sociological research uses ecological theory to understand human development within the contexts of physical, social, and economic systems (Bronfenbrenner, 1979, 1986; Lerner, 2002; Moen, Elder, & Luscher, 1995). Some recent economic research has also employed an ecological approach. For example, benefit-cost analyses of the Perry Preschool, Abecedarian, and the Chicago Child-Parent Centers child development programs take into account the contextual costs and savings at multiple levels, including personal benefits such as increased earnings and education, and societal benefits such as higher

public tax revenues and decreased criminal justice and welfare expenditures (Barnett & Masse, 2007; Belfield et al., 2006; Masse & Barnett, 2002; Temple & Reynolds, 2007). In contrast, the recent economic interest in pre-k asserts that macro-level economic benefits will result from a program targeted at the individual level, without taking into account the systems in which children live (CED, 2002; Heckman & Masterov, 2004; Lynch, 2004; Rolnick & Grunewald, 2003).

**Method**

We adapt Bronfenbrenner’s (1979) ecological theory to analyze the economic returns of ECE programs on three ecological contexts: the regional economy (macrosystem), working parents (exosystem), and the long-term human development of children (microsystem). The theoretical framework is presented in Figure 1. We explore the economic benefits of ECE programs at each of these contextual layers and challenge the narrow policy focus on prekindergarten.

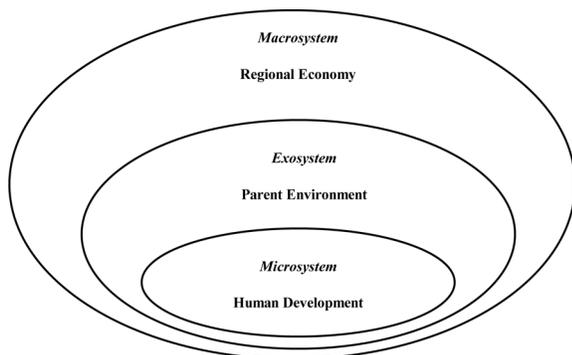
Using this ecological perspective, we conducted a review of recent leading studies that examine the economic effects of ECE on the regional economy, parents, and children. First, the structure of the ECE sector as part of the regional economy is discussed, and input-output analyses were conducted to determine the impact of ECE on the regional economy. We rely on Cornell University’s review of more than 70 state and local studies conducted over the last few years and their modeling of the regional economic impact of the child care sector in all 50 states (Liu, Ribeiro, & Warner, 2004;

Warner, 2006; Warner & Liu, 2005, 2006). Second, we discuss the conflicts and constraints regarding work-family balance and parents’ child care choices. For research on the effects of ECE on parents and their employers, we use studies conducted by the Families and Work Institute (e.g., Bond, Thompson, Galinsky, & Prottas, 2002) and by consultants (e.g., Shellenback, 2004). Given the paucity of peer-reviewed academic research on this topic, it is necessary to compare industry studies. Finally, the National Institute for Early Education Research (NIEER) is considered the leader in research on prekindergarten and serves as a clearinghouse for early childhood program research; thus, NIEER served as our primary source for child outcome research. Careful attention was given to the different measures, populations, and research methods included in the studies of short- and long-term effects of early childhood programs on child development.

**Analysis**

**Macrosystem: Regional Economy**

Although much national policy attention has centered on expanding pre-k programs, a growing number of state and local initiatives are using a broader contextual framework to examine the ECE sector’s three-fold impact: its educational impacts on child development, the importance of care as a support for working parents, and the role of the broader ECE sector as a social infrastructure for regional economic development (Warner, 2006). Around the country, more than 70 state and local teams of economic developers, policymakers, and members of the child care field have come together to better understand the regional economic importance of the ECE sector as a whole, including both early education and child care programs. These state and local teams have sought to understand the structure of the sector, number and size of establishments, labor force, and price and management issues (Warner, 2006). Using licensing data from child care agencies and taking into account the *entire* sector, from infant care to pre-k to after-school care, they show how standard economic data seriously undercount the size of the sector (e.g., New York State Child Care Coordinating Council, 2004; Quigley & Notarantonio, 2003; Ribeiro & Warner, 2004; Stoney, Thorman, & Warner, 2003) and argue for greater economic development attention (Hildebrand, 2003; Nishioka & Young, 2004). These teams view ECE as part of the social infrastructure for economic



**Figure 1.** Examining the economic returns of early care and education programs within an ecological framework. Many of the recent calls for investment in part-day pre-kindergarten based on economic returns do not take into account the multiple contexts in which children are embedded. Attention to contextual factors is needed to design and implement more effective early childhood policies.

**Table 1.** *Regional Economy: Selected Output, Employment and Multiplier Comparisons<sup>a</sup>*

Sectors	Output Multipliers		Industry Output (in millions)	Employment Multipliers		Industry Employment
	Type I	Type II		Type I	Type II	
Child care	1.49	1.91	638.76	1.27	1.50	14,221
Private K–12 Education	1.30	1.91	490.55	1.10	1.31	17,181
Job training and related services	1.32	1.84	258.92	1.23	1.50	6,350
Hospitals	1.25	1.79	6,225.73	1.19	1.67	88,939
Water supply and sewage systems	1.33	1.67	139.67	1.84	2.68	673

Note: Source: Warner & Liu, 2005, 2006.

<sup>a</sup>Average of the 50 states and the District of Columbia. Results from models based on IMPLAN data (2000).

development, similar to K-12 education and hospitals.

Economists are increasingly recognizing the importance of local service sectors to employment growth (Markusen et al., 2004; Kay, Pratt, & Warner, 2007). While manufacturing has moved off-shore, such global outsourcing is not possible for care work. Technological advances increase productivity in other sectors, but in care work, quality depends on human interaction, and low child-staff ratios are crucial to ensuring quality. Thus, job growth in the U.S. economy is led by services, particularly personal services like home health care and child care, and this is expected to continue in the future (U.S. Department of Labor, Bureau of Labor Statistics, 2005). Regional economic analyses have given increased attention to the role of the ECE sector (Pratt & Kay, 2006; Warner & Liu, 2005, 2006).

One method used by economic developers to determine the economic effects of investments is the multiplier or linkage effect of a sector on the regional economy. Multiplier or linkage effects measure how an industry's spending ripples through the regional economy, stimulating production, purchasing, and/or employment. Multiplier effects help economic developers compare sectors to determine which will have the greatest total impact on the regional economy if there is an increase in demand for that service or product. Because most of the ECE sector's purchases consist of goods available locally (e.g., toys and supplies), expenditures do not "leak out" to other regions and output multipliers are very high relative to other sectors in the economy (Liu et al., 2004; Warner & Liu, 2005). An analysis of input-output models for all 50 states shows child care's output multiplier ranks in the 93rd percentile across all sectors in state economies (Liu et al., 2004, Warner & Liu, 2006).

Furthermore, compared to other social infrastructures such as private K-12 education, hospitals, job training, and water and sewer, child care has larger employment, output and linkage effects

(Type I and Type II multipliers<sup>1</sup>; Warner & Liu, 2006, 2005), as displayed in Table 1. These multipliers show that in the short term, a dollar spent on child care stimulates as much or more regional economic activity than a dollar spent on private K-12 education (\$1.49 vs. \$1.30). In contrast, child care has lower direct employment multipliers than water and sewer because child care is more labor intensive and tends to purchase from less labor intensive sectors, such as toy manufacturing. Although the findings from multiplier analyses constitute just one of the many reasons to invest in child care, the analysis makes clear that child care for children of all ages is a competitive target for economic development policy, even on traditional regional economic grounds. These analyses move beyond the conventional view of child care as primarily a welfare expenditure and present a new perspective of child care as an investment for economic development.

Most intriguing from a policy perspective is that regional economic multipliers are higher in states that have higher quality standards (Liu et al., 2004). Correlation analyses show that higher multipliers are found in states that expend more federal funds on child care and have higher enrollment in state-funded prekindergarten, thereby increasing effective demand for ECE services. As shown in Table 2, states that pursue quality goals by setting their subsidy market rate at greater than the 75th percentile, those with lower child-staff ratios, and those with higher child care wages (to encourage caregiver retention and professionalization) also have higher multipliers (Liu et al., 2004). Higher fees, wages, and employment strengthen the economic development impact of the sector. These results suggest a mutually reinforcing relationship between regional economic impact and state policies promoting investment in quality for the ECE sector as a whole.

<sup>1</sup>Type I multipliers measure inter-industry linkages; Type II multipliers include linkages generated by household spending as well.

**Table 2.** *Correlation Results: Higher Public Investment in Child Care, Higher Sector Multipliers*

Variables	Type II Multiplier	
	Child Care Output	Child Care Employment
Federal Funds (Logged)	.481**	0.041
State Funds (Logged)	.580**	0.06
Enrollment in State Funded Pre-Kindergarten	.344*	0.025
Child/Staff Ratio for 4-year-olds	-.365**	-.423**
Price of Care (75th Percent of Market Rate)	.402**	0.184
Child Care Average Wage	.307*	0.05

\* $p < .05$ , \*\* $p < .01$ .

Note. Source: Liu, Ribeiro, & Warner (2004).

The introduction of large public programs such as state pre-k can significantly affect existing local and regional markets. Few studies have examined the impacts of pre-k programs on the surrounding ECE market; the small number that have reveal mixed implications for child development and the supply of ECE services. Henry and Gordon’s (2006) evaluation of Georgia’s universal pre-k program found that increased competition among pre-k providers raised children’s standardized test scores in elementary school but had few impacts on school readiness ratings or grade retention rates, areas in which most economic savings occur (Barnett, 2004). Additionally, there is evidence that the public subsidization of pre-k may decrease child enrollment and teacher retention at centers not involved in the public program (Morrissey, Lekies, & Cochran, 2007), a problem when large numbers of children remain in the private system. The impacts of increased public subsidization need to be carefully considered in context when designing policy.

**Exosystem: Parent Environment**

Although high-quality ECE programs are good for the regional economy, many parents do not or cannot choose high-quality ECE programs for their children. Full-time, year-round child care that meets the needs of both parents and children is expensive and difficult to find, particularly for infants and toddlers (Helburn & Howes, 1996; Phillips & Adams, 2001). American families can spend up to one-quarter of their income on child care (Kimmel, 2006; Organisation for Economic Co-operation and Development [OECD], 2005). In all but one of the 50 states, the market prices of full-time, mediocre-quality child care exceed the costs of public college tuition (Schulman, 2003), but, unlike the parents of college-age children, the parents of young children are at the lowest earning years of their life cycle and have not had time to save for their children’s education

(Stoney, Mitchell, & Warner, 2006). Furthermore, most child care in the U.S. is not considered high quality (Helburn & Howes, 1996), and the average quality of care for children under three is even lower than care for preschool-age children (Helburn & Howes, 1996; NICHD ECCRN, 2000). Moreover, parents have been shown to be poor judges of child care quality (Cryer & Burchinal, 1997). Cultural, logistical, and financial constraints limit access to the regulated sector and encourage parents to pursue unregulated, informal care by relatives, friends, or neighbors (Meyers & Jordan, 2006). About half of children under five in nonparental care are cared for by relatives, babysitters, or neighbors, and a larger proportion of infants and toddlers are in unregulated child care arrangements than older children (Sonenstein Gates, Schmidt, & Bolshun, 2002; Kimmel, 2006). Informal care tends to be less expensive, more flexible, and more accommodating to parents’ work schedules, particularly odd-hour work, than regulated center- or home-based care (Kontos, Howes, Shinn, & Galinsky, 1994). Although there is some evidence that high-quality home-based care may offer higher-quality caregiving for infants and toddlers than center care (NICHD ECCRN, 2000), most research suggests that on average unregulated care is of lower quality than regulated care (Fuller, Kagan, Loeb, & Chang, 2004; Kontos et al., 1995). Therefore, many children are in arrangements that do not maximize either their developmental outcomes or societal economic returns.

Part-day pre-k programs do not address the needs of the many working families who lack access to informal and other private child care arrangements. Women are now nearly as likely to be working when they have an infant as when they have an older preschooler. In 2005, 54% of mothers with children under age one were in the labor force, and about 70% of employed mothers with children under six worked at least 35 hours per week (U.S. Department of Labor, Bureau of Labor Statistics, 2006). Although the part-day

services of pre-k programs, ranging from two-and-a-half to six hours a day (Barnett et al., 2005), address the cognitive and social needs of participating children, employed parents require reliable, full-time care. Policies targeted at either children or parents highlight their potentially conflicting needs. For example, welfare reform in the 1990s was designed to move parents from welfare to work. Although the dramatic increase in public subsidy funds for child care for low-income working parents contributed to higher employment rates and reduced welfare roles (Chang, Huston, Crosby, & Gennetian, 2007), reimbursement rates were often set too low to encourage high quality (Adams & Rohacek, 2002; Adams, Synder, & Tout, 2003). Welfare-receiving families decreased their use of Head Start, which was attributed to the part-day, part-year structure of the program

that is not conducive to full-time work (Chang et al., 2007). Similarly, part-day pre-k programs targeting children's developmental needs ignore problems with transportation and the need for parents to arrange alternative or wrap-around child care to cover their full-day work schedules (Barnett, 2004).

Unreliable, low-quality child care has negative implications for both parents and employers. First, the time spent locating care costs both families and businesses (Glass & Estes, 1997). Once found, child care arrangements are often unstable; in one study, nearly 30% of parents reported a breakdown in their child care arrangements within the previous three months (Bond, Galinsky, & Swanberg, 1998). Estimates of missed days due to breakdowns in child care range from 5 to 9 days per year (Carrillo, 2004; Emlen & Koren, 1984).

**Table 3.** *Impacts of Employer-Supported Early Care and Education Initiatives on Parent Productivity*

Reference	Study Description	Child Care/School Effects on Work-family Conflict
Abt Associates (2000)	An evaluation of the American Business Collaborative's (ABC) \$125 million effort to improve the quality of dependent child and elder care. 1,483 employees at the 21 participating companies were surveyed.	Employees reported that use of employer-supported child care increased their productivity at work. 40% of users felt less stressed about work-family conflict and spent less time at work worried about their families. 35% were better able to concentrate, and 30% left work less often to deal with family responsibilities.
Bond, Galinsky, & Swanberg (1998)	The 1997 National Study of the Changing Workforce, conducted every 5 years by the Families and Work Institute, surveys a nationally representative sample of employed workers.	Almost 30% of employed parents had experienced a breakdown in their child care arrangement within the prior 3 months, which was associated with employee absenteeism, tardiness, and reduced concentration at work.
Bond, Thompson, Galinsky, & Protas (2002)	The 2002 National Study of the Changing Workforce, conducted every 5 years by the Families and Work Institute, surveys a nationally representative sample of employed workers.	70% of employees at companies with progressive work-family policies are committed to their employers, compared to 23% of employees at companies with fewer work-family supports.
Carrillo (2004)	A review of the research on employer-supported backup child care conducted by the Work Options Group.	As children move from child care to elementary school, the average number of work days missed by a working parent increases from 9 to 13.
Circadian Technologies (2003)	A cost-benefit analysis of one firm's employer-provided, extended-day child care.	Extended-hours child care decreased employee absentee costs by \$300 annually and decreased employee turnover to 7.7% from 9.1%. The center paid for itself in 5 years.
Elswick (2003)	A cost-benefit analysis of a back-up child care program, conducted by WFD Consulting.	For every \$1 invested in back-up child care, employers can expect a return between \$3 and \$4 in increased productivity and reduced turnover.
Emlen & Koren (1984)	A survey of 8,121 employees from 33 companies in the Portland, OR area, examining the effects of child care on the workplace.	An average employee misses 8 days of work each year due to breakdowns in child care arrangements.
Friedman (1986)	A review of 3 national surveys of employers with child care programs for their employees' children.	54% of employers reported that on-site child care reduced employee absenteeism by 20% to 30%.
Halpern (2005a)	Used data from the 1997 National Study of the Changing Workforce to test the effects of time-flexible work policies.	The availability of time-flexible work policies was associated with greater employee commitment, fewer reported symptoms of stress, and reduced costs to employers due to employees' tardiness and absenteeism.

Unscheduled absences cost employers an average of \$610 per employee per year (CCH Unscheduled Absences Survey, 2004), and businesses lose billions of dollars annually due to employees' caregiving obligations (Friedman, 1986; MetLife, 1997; Shellenback, 2004). Moreover, even when their nonparental care arrangement is stable but not of high quality, worrying about children can reduce concentration and alertness at work (Abt Associates, 2000; Glass & Estes, 1997). It should be noted that the common approach to estimating the costs to businesses is somewhat debatable, as employees may not be paid for missed days or may make up missed work, or co-workers may compensate. However, the magnitude of these effects indicates a general direction of impacts, and until more methodologically rigorous studies are conducted, we rely on these estimates.

Few U.S. public policies address work-family balance and employers typically do not offer much flexibility and work-family support (Gornick & Meyers, 2003; Kimmel, 2006). However, there is evidence that employer-supported child care and time-flexible work policies promote gender equality and improve workplace productivity through decreased stress, absenteeism, and turnover (Abt Associates, 2000; Circadian Technologies, 2003; Friedman, 1986; Goff, Mount, & Jamison, 1990; Halpern, 2005a; OECD, 2005; Shellenback, 2004). Table 3 presents several studies that examined the effects of child care on productivity and worker retention. When parents are satisfied with their child care arrangements, there are fewer conflicts and breakdowns and thus fewer absences (Abt Associates, 2000; Goff et al., 1990). Carillo (2004) found that when the children of working parents shifted from child care to elementary school, the number of missed work days actually increased from 9 to 13 days per year (Carillo, 2004). This phenomenon was attributed to the mismatch between the traditional hours of elementary school and typical nine-to-five jobs, whereas child care is designed to match parents' work hours.

Work-family policies can also combat employee turnover by increasing employees' commitment and influencing their decisions to remain at their current company (Bond et al., 2002; Friedman, 1986; Glass & Estes, 1997; Kossek & Nichol, 1992). With employee turnover estimated to cost between 75 and 150% of the employee's wages<sup>2</sup>

(Phillips & Reisman, 1992), retention strategies can save firms considerable amounts of money. Even companies with low-wage employees find it economically viable to invest in expanding the supply of child care, especially for parents on shift work during non-traditional child care hours (Circadian Technologies, 2003; ConAgra investment as described in Mitchell, Stoney, & Ditcher, 2001). One company's evaluation of an extended-hours on-site child care center found it decreased employee turnover from 9.1% to 7.7% and paid for itself after 5 years (Circadian Technologies, 2003).

Increasing the availability and affordability of child care for children of all ages can increase maternal labor force participation with important societal impacts, specifically higher taxable income and increased productivity. Indeed, the comprehensive child care policies in Scandinavia and Eastern Europe were primarily motivated by a labor shortage during industrialization (Lamb, 1998). Gornick and Meyers (2003) estimated that reducing child care fees by 10% would lead to an increase of 3 to 4% in the probability of maternal employment in the U.S. Cost-benefit analyses of the Abecedarian program, a comprehensive full-day early childhood program, found significant long-term increases in maternal earnings as a result of children's program participation (Barnett & Masse, 2007; Masse & Barnett, 2002). For parents planning to re-enter the workforce after the birth or adoption of a child, employer-provided child care benefits can encourage parents to return to work earlier (Glass & Estes, 1997). Investing in ECE can benefit older generations as well. Most nations studied by the Organisation for Economic Co-operation and Development (OECD) are confronting decreasing fertility rates at a time when the aging population is growing, and they recognize the importance of the quantity and quality of younger workers to support social security systems. Lynch (2004) has shown how increased investment in early childhood would also improve the sustainability of the U.S. Social Security program. However, the U.S. lags behind other OECD nations in its public ECE and workplace policies (Gornick & Meyers, 2003).

Finally, work-family policies that encourage both fathers and mothers to address family needs can help decrease the gender gap in financial and occupational attainment (Glass & Estes, 1997; Gornick & Meyers, 2003; Halpern, 2005a; Kimmel, 2006). Because the time spent having young children is relatively short, the investment in child care may be short-lived but result in increased productivity and long-term effects on

<sup>2</sup>Phillips & Reisman (1992) estimated the replacement cost to be 75% of the wages for non-exempt employees and 150% for exempt employees, which have become the standard figures in the field. Carillo (2004) argued that replacement costs could be as high as 250% for exempt employees.

career trajectories for mothers (Crittenden, 2001; Halpern, 2005b; Kimmel, 2006).

### Microsystem: Human Development

To parents, the reliability, availability, and affordability of care appear primary, but for children, the quality and content of care is paramount (Cryer & Burchinal, 1997; Meyers & Jordan, 2006). Recent developments in research, specifically of brain development, highlight the importance of high-quality experiences in the early years (Shonkoff & Phillips, 2000; Shore, 1997). Longitudinal studies of child development programs such as the Chicago Child-Parent Centers (Reynolds et al., 2002; Temple & Reynolds, 2007), the Perry Preschool program (Belfield et al., 2006), the Abecedarian project (Barnett & Masse, 2007; Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Masse & Barnett, 2002), Head Start (Garces et al., 2002), and state pre-k programs (Gormley et al., 2005; Henry et al., 2003) demonstrate how the experiences provided by high-quality ECE programs can positively impact children's cognitive and social development. In the short-term, participation in high-quality early childhood programs results in increased child IQ, school achievement, and improved behavioral and social outcomes (Barnett & Masse, 2007; Belfield et al., 2006; Campbell et al., 2002; Gilliam & Zigler, 2001; Gormley et al., 2005; Henry et al., 2003; Masse & Barnett, 2002; Reynolds et al., 2002). Some of these benefits "fade out" over time, particularly gains in IQ, though this has been attributed to the poor-quality elementary and middle schools that early intervention participants typically attend (Lamb, 1998; Lee & Loeb, 1995). Despite these fade-out effects, many long-term benefits from ECE programs persist, particularly in the social and behavioral domains. Adults who participated in early childhood programs as children are more likely to have graduated high school, be employed, earn higher wages, and are less likely to be involved in criminal activities than those who did not participate (Barnett & Masse, 2007; Belfield et al., 2006; Garces et al., 2002; Reynolds et al., 2002). These benefits translate to monetary savings. Cost-benefit analyses of early childhood programs show positive returns on program investments through: decreased use of special education services; decreased grade retention rates; improved health outcomes; increased employment rates and taxable earnings; and decreased arrest rates and welfare use later in life (Barnett & Masse, 2007; Belfield et al., 2006; Heckman & Masterov, 2004; Lynch, 2004; Reynolds et al., 2002; Temple & Reynolds, 2007; see Barnett & Ackerman, 2006, for a review).

These evaluations of early child development programs are touted as evidence for increased investment in pre-k (CED, 2002, 2004; Grunewald & Rolnick, 2005; Heckman & Masterov, 2004; Rolnick & Grunewald, 2003). However, there are stark contrasts in the quality and quantity of programming and the populations served between contemporary pre-k programs and the comprehensive early childhood programs that have been evaluated (Barnett, 2004; Galinsky, 2006). The evaluated child development programs employed well-paid, college-educated teachers and offered low class sizes and child-staff ratios (Galinsky, 2006). In contrast, the majority of contemporary pre-k programs do not require teachers to have 4-year degrees, pay relatively low teacher salaries, and vary widely in class size and child-staff ratios (Barnett et al., 2005). Curricula used at the evaluated ECE programs were strong, flexible, and balanced between cognitive and social-emotional domains (Barnett, 2004; Galinsky, 2006); the curricula and quality of services offered at public and private preschool programs are highly variable, with many programs deemed "educationally weak" (Barnett, 2004, p. 6). Although they varied regarding the quantity and specific services they provided, the comprehensive child development programs included components in addition to early education, such as home visiting and medical services, which are not typically included in pre-k programs (Barnett, 2004). Finally, the evaluated programs targeted minority children and those from low-income families but ranged widely in the ages they served; the Perry Preschool Program included 3- and 4-year-olds only while the Abecedarian program served children as young as six weeks (Barnett & Masse, 2007; Belfield et al., 2006; Campbell et al., 2002; Galinsky, 2006; Masse & Barnett, 2002). Public pre-k programs may be designed for disadvantaged children or accessible to children from all income levels; however, they are by definition limited to preschool-age children, namely 3- and 4-year-olds (Barnett et al., 2005). Together, research indicates that *only* the programs that provided full-day, year-round child care to children beginning in infancy through age five demonstrated permanent effects on IQ, in addition to large, positive effects on academic achievement and school success (Barnett, 2004). By contrast, less intensive interventions that begin later in development (e.g., part-day pre-k) require supplementary programs through the elementary school years (Lamb, 1998).

Table 4 provides general program and study descriptions and the public benefit-cost ratios for three comprehensive child development programs, Perry Preschool, Abecedarian, and

**Table 4.** *Benefits and Costs of Three Comprehensive Early Childhood Programs and Pre-K*

Source	Temple & Reynolds, 2007			Belfield, 2006
	Perry Preschool	Carolina Abecedarian <sup>a</sup>	Chicago Child-parent centers <sup>a</sup>	State Universal Pre-k Programs
Program description	Half-day ECE and home visiting services for high-risk 3- and 4-year-olds and their families during the school year.	Full-day, full-year ECE and medical and nutritional services for high-risk children 6 weeks to 8 years of age.	Half-day ECE and intensive parent involvement, outreach, and health and nutrition programming to low-income children and their families.	Part-day, school-year programming extrapolated to all 3- and/or 4-year-olds in each state. <sup>b</sup>
Study design	Randomized trial of 58 participating children and 65 control group children.	Randomized trial of 111 families.	Quasi-experimental study comparing 1539 participants and a matched comparison group.	Hypothetical extrapolation of the expansion of programs in 3 states.
Age of study participants at economic analysis	27	22	21	Estimates total lifetime savings
Public benefit-cost ratio	7.16 <sup>c</sup>	2.69	6.87	1.11

*Note:* The benefit-cost ratio for the state universal pre-k programs are extrapolated from estimates of costs and benefits in three states (Massachusetts, Wisconsin, and Ohio) under the assumption that non-disadvantaged children would produce lower long-term benefits than disadvantaged children (supported by several studies, e.g., Magnuson et al., 2007). The benefit-cost ratio represents the mean across the three states. A more conservative discount rate of 5% is used to calculate the benefit-cost ratio for universal prekindergarten, as compared to the 3% discount rate used for the other programs.

<sup>a</sup>The benefit-cost ratio for the Abecedarian program is considered a conservative estimate of program impacts because of the health services and community resources available to the control group. The Chicago CPC estimates are also likely to be conservative because participants were selected from the highest-poverty neighborhoods, whereas the comparison group attended randomly-selected schools outside of the CPC neighborhoods.

<sup>b</sup>Both 3- and 4-year-old children are included in the proposed expansion of programs in Massachusetts and Ohio, and only 4-year-old children are included in Wisconsin’s proposed expansion.

<sup>c</sup>The often-cited benefit-cost ratio of 17.07 for the Perry Preschool Program is calculated to age 40.

Chicago Child-Parent Centers, as compared to a hypothetical expansion of universal pre-k in three states. The range in benefit-cost ratios reflects differential program impacts as well as variations in evaluation methods and historical- and community-level factors, as the studies were conducted over a 40-year span in different areas of the country. The relatively low benefit-cost ratio for the Abecedarian program is considered a conservative estimate of impacts, as the comparison group in the study also received medical and nutritional services provided to the participant group (Barnett & Ackerman, 2006; Barnett & Masse, 2007; Galinsky, 2006; Temple & Reynolds, 2007). In addition, it is possible that the comparison group children in the Abecedarian and Chicago Child-Parent Center programs were better-off at the start of the program or had access to more community supports and a better school system than those participating in the programs, further indicating that their estimates are conservative (Barnett & Masse, 2007; Temple & Reynolds, 2007). Belfield (2006) calculated the economic consequences for taxpayers of a hypothetical expansion of existing targeted pre-k programs in three states, Ohio, Massachusetts, and Wisconsin. Because his analysis

includes the assumption that the benefits of pre-k for non-disadvantaged children will be lower than those for disadvantaged children and uses a higher discount rate (5% vs. the 3% used in most economic benefit-cost analyses), it is no surprise that the benefit-cost ratio is estimated to be lower for universal pre-k as compared to the child development programs. Although the benefit-cost ratios cannot be directly compared, the magnitude of the differences between the economic benefits of the ECE programs and universal pre-k (returns 2.5 to 7 times larger for ECE programs) suggests that, while they required higher initial investments, the three more educationally intensive programs are more economically effective.

Because research has found that the most disadvantaged children display the largest benefits from ECE programs (e.g., Magnuson et al., 2007), some economists have called for pre-k programs targeted to at-risk children rather than the entire population (Grunewald & Rolnick, 2005; Heckman & Masterov, 2004; Lynch, 2004). However, the focus on serving only disadvantaged children overlooks the smaller but significant benefits for middle-income children (Gormley et al., 2005; Henry et al., 2003; Magnuson et al., 2007), the

high administrative costs of targeting programs (Barnett, 2004), and the findings that universal programs are more politically and economically sustainable than targeted programs (Barnett, 2004; Barnett, Brown, & Shore, 2005). Thus, a universal approach available to children from all income levels, as opposed to a program targeted at a subgroup of the population, would maximize economic returns (Barnett, 2004; Kammerman, 2001b).

### Discussion

In summary, the above analysis supports our hypothesis that a comprehensive approach to early childhood policy that takes into account the ecology of human development results in greater economic benefit than investments focused only on prekindergarten. First, by limiting investments to part-day services available to a small segment of the population, pre-k programs miss out on the broader economic development benefits to the macrosystem provided by the ECE sector in its entirety. Second, at the level of the exosystem, full-time child care is necessary for the many working parents of young children, and high-quality care can decrease stress, improve productivity, and encourage greater labor force participation (e.g., Kimmel, 2006; OECD, 2005; Shellenback, 2004). Finally, at the microsystem level, child development research indicates that experiences throughout the early years of life are important in setting the stage for long-term outcomes (Barnett & Masse, 2007; Campbell et al., 2002; Masse & Barnett, 2002; Shonkoff & Phillips, 2000; Shore, 1997); thus, interventions throughout childhood would likely prove more effective than those limited to preschool age (Barnett, 2004; Masse & Barnett, 2002).

### Barriers to a Cocomprehensive Approach

If comprehensive ECE programs produce greater economic and societal returns than pre-k, why does current public policy remain primarily centered on pre-k? Both financial and ideological reasons help explain the narrow focus. First, full-day child care and work supports such as parental leave are much more expensive in the short-term than part-day pre-k (Phillips & Adams, 2001). Designing a comprehensive ECE system requires consideration of the needs of children and parents from birth to school entry (Stoney et al., 2006), which may include the provision of supports for parents and informal relative, friend, and neighbor caregivers in addition to formal out-of-home

solutions like prekindergarten, center care, and regulated family child care.

Fundamental value conflicts in American society comprise another reason for the narrow focus on formal pre-k. Harrington (1999) argues our national reluctance to address family policy in the U.S. stems from our support of the privacy of family and the notion that failures in care are moral failings rather than structural problems in the economy. As previously discussed, the American public traditionally dichotomizes education and care, viewing education as a public responsibility and care, particularly for infants and toddlers, as a private responsibility (Bales, 1998; Lakoff & Grady, 1998). These values have led to a public, universal K–12 education system and private, piecemeal solutions for early care and education, and most child care continues to take place in private homes (Sonenstein et al., 2002). Our values, policies, and educational structure reflect our earlier single-breadwinner, agrarian society, but industrialization and dramatic increases in maternal employment over the past few decades require a change in the provision of care for young children (Lamb, 1998). Even as states have worked to expand early childhood programs, most have limited these expansions to preschool children and implemented a part-day, school-year model (Barnett et al., 2005) as opposed to a full-day, full-year model that mirrors the work hours of most parents. An updated system for early child care requires the recognition of the broader context in which families live, including the competing demands of work and caregiving (Stoney et al., 2006).

In contrast to the U.S., many European countries have early childhood programs that serve infants and toddlers, including paid parental leave and publicly-supported ECE (Gornick & Meyers, 2003; Kimmel, 2006; OECD, 2005). Whereas the U.S. spends half of a percent of its Gross National Product on ECE, European countries spend between 1.1 and 6% (Kammerman, 2001a; OECD, 2005). Parents shoulder approximately 75% of the costs of their children's ECE in the U.S. compared to 11% in Sweden (OECD, 2005). Although the values and policy goals in the U.S. often differ from those in Europe, remaining an outlier in ECE policies may contribute to lost ground in the competitive global economy. Part-day pre-k policies forego the large economic returns of increased labor supply and local economic development produced by full-time child care (e.g., Barnett, 2004; Warner, 2006; Warner & Liu, 2005, 2006). Furthermore, recent research points to rising stress among working parents and the need to design labor force policy that supports, rather than penalizes, working parents for their dual role in order to promote productivity

(Halpern, 2005b). Parent stress can negatively affect children's development (NICHD ECCRN, 2002), which may also impact the future workforce.

A third reason for the narrow policy focus comes from the neoclassical economic models used to justify these pre-k investments. Most economic models divide the economy into two worlds: the formal economy, counted and modeled at the national and regional scales, and family care, which is typically ignored or undervalued (Folbre, 1994, 2006). Folbre (2001) discusses how the two are intrinsically linked; family care acts as an "invisible heart," providing the foundation that enables the rest of the economy to function. The traditionally separate early education and child care literatures and policies mirror this economic dichotomy. The movement to combine these separate worlds under the ECE umbrella term attempts to dispel the view of child care as a custodial, private responsibility and pre-k as education in order to address early childhood policy in its entirety (Brauner et al., 2004). The sector as a whole, including care and educational services for infants and school-age children, must be included when analyzing its impacts on parent employment and the regional economy (Warner, 2006).

Finally, the human capital and neoclassical economics approaches ignore the structure of the complex ECE market, which includes public and private auspices, formal and informal care. The market challenges of low profitability, high turnover, lack of economies of scale, low quality, and inadequate effective demand in the ECE sector (Lombardi, 2003) could be addressed with economic development policy if the sector were "seen" as part of the formal economy (Warner et al., 2004).

### Conclusions and Policy Implications

Using an ecological framework that incorporates impacts on the regional economy, working parents, and long-term human development, the economic benefits of comprehensive ECE programs are as great or greater than those from pre-k alone. These effects are conceptually additive; unfortunately, we do not yet have the methodology to add them empirically. More research is needed to calculate and compare the actual costs and returns of various early childhood initiatives. However, it is imperative that human development scholars insist that economists take a broader ecological approach. As this article demonstrates, policies that disregard the nested and interactive effects of children, families, and communities may have negative unintended consequences. This article calls attention to policies and programs whose components may be in opposition, e.g., child care work force supports and part-day

pre-k, and proposes increased communication and coordination between social programs, educational programs, and workplace policies to create more economically-effective and seamless service provision. Only policies that take context into account will maximize economic returns. Moreover, economic benefits are only one of the many practical, ideological, and moral reasons for investing in young children. In light of these findings, more attention to the full spectrum of care for families with children is needed.

A comprehensive approach does not require a single program to address all of its aspects; an effective ECE system can be built on multiple programs. A diversity of ECE programs, offering a range of operating hours and settings for children from infancy through school-age, can address both children's developmental needs and allow parents to choose which option works for their employment and other needs. Investment in pre-k is an important first step in the system-building process. In addition to the direct provision of ECE services, demand-side subsidies can enhance parents' ability to pay for the high costs of child care. Quality standards, quality rating systems, and tiered reimbursement strategies can promote high-quality services in centers, prekindergarten programs, and family child care homes (Stoney, 2004). Other family policies common in other industrialized countries such as paid family leave and flexible work schedules can help address issues of infant and sick-care (Gornick & Meyers, 2003). Tax mechanisms to redistribute the costs of ECE across society or across the lifespan would be effective in alleviating the sudden and substantial financial burden of ECE for parents (Stoney et al., 2006).

A comprehensive ECE system cannot be created overnight. However, the current enthusiasm for pre-k runs the risk of blinding policymakers to the broader need for a comprehensive approach to ECE policy. This analysis serves to both praise pre-k efforts and caution against viewing them as a single solution for education, poverty, and crime. Although investments in pre-k are important and should be continued, the needs of the rest of the early childhood population and their families must also be addressed. A more coordinated response that includes comprehensive economic, fiscal, workplace, and family policies is needed to maximize economic and developmental returns.

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