

Research Summary: Evaluating the Impact of the Program for Infant/Toddler Care

Regional need and study purpose

The study tests the effect of the Program for Infant/Toddler Care (PITC), a professional development strategy designed to improve both the quality of childcare services and the cognitive, linguistic, and social development of infants and toddlers. Developed by WestEd in 1985 in partnership with the California Department of Education, PITC promotes responsive, relationship-based care for young children. Caregivers learn to understand children's vulnerabilities and competencies and to facilitate their cognitive, linguistic, social, physical, and emotional development in the context of children's community, culture, and language. In addition, training is provided on policy, operations, and environmental arrangements.

The theoretical model underlying the intervention holds that when caregivers are trained in the structures and processes that facilitate child learning and development (language, social, and cognitive skills) childcare quality will also improve (environment, caregiver responsiveness, learning activities), with positive outcomes for children, including school readiness. The PITC approach to caring for and educating infants and toddlers emphasizes the development of intellect, language, and self-regulation—areas key to children's school readiness.

Preliminary research on the PITC has found it to be associated with significant increases in program quality, including improvements in caregiver-child interactions and language and learning activities. These effects have been documented through pre-post comparisons of childcare environments and care-giving quality. This experimental study rigorously tests the impact of PITC training on the quality of infant and toddler childcare and on child learning and development. Two research questions guide the study:

- What is the effect of the PITC on childcare quality, particularly on caregiver-child interactions and learning environment?
- What is the impact of the PITC on children's linguistic, cognitive, and behavioral skills?

The findings of the impact analysis will identify effects across different dimensions of childcare quality and child development, as well as across different types of care. These findings may be used to inform policymakers and to guide PITC developers in strengthening components or targeting certain training approaches to more effectively address identified needs.

This study is the first randomized trial examining the effect of the PITC on improving childcare quality and child learning and development; however, the design has several limitations. Because of limited sample sizes, differences in program impacts for child

subgroups can be examined only in an exploratory manner. In addition, the long-term impacts of the PITC will not be explored beyond the second measurement point. Future work of this type could continue to extend measurement into the school-age years to assess long-term cognitive impacts of childcare arrangements.

Intervention description

Based on research, theory, and practice on child development, the PITC is a responsive, relationship-based approach to infant and toddler care. Its philosophy relies on policies in six areas: primary care, small groups, continuous care, individualized schedules and routines, inclusion, and culture. The PITC curriculum is divided into four modules—social and emotional growth; group care; learning and development; and culture, family, and providers—delivered through reading materials, group instruction and discussion, audiovisual presentations, and individualized consultation and feedback.

Over a period of 14–16 months, program sites receive support from a PITC infant-toddler specialist:

- *Group training.* Program sites receive 64 hours of group training. Caregivers learn to understand children's vulnerabilities and competencies and to facilitate their cognitive, linguistic, social, physical, and emotional development in the context of their community, culture, and language. Emphasis is placed throughout on ensuring that the interactions between children and adults are responsive and reciprocal.
- *Coaching and support.* In addition to providing group training, PITC specialists visit each program to model techniques, observe programs, and provide feedback to guide program improvement. Specialists also conduct reflective action planning sessions in which providers reflect on progress and set goals. Each childcare center receives 40 hours of support, including observations, meetings with the director, and reflective action planning. Each family childcare program receives six hours of observation and 12 hours of reflective action planning. In addition, written feedback on papers is provided for those receiving academic units.

PITC trainers are experienced practitioners with bachelor's degrees who have participated in two 7-day trainer institutes (each covering two PITC modules). During the intervention trainers work with childcare providers to develop a customized program improvement plan consistent with the curriculum modules and review progress toward the plans; programs must demonstrate progress to receive credit for each curriculum module. Trainers tailor their teaching strategies to the learning styles, preferences, needs, and culture of the caregivers. They are also assigned, to the extent possible, to caregivers based on their shared linguistic and cultural backgrounds.

Study design

This study is a cluster-randomized experimental trial, targeting both center- and home-based childcare services in Arizona and California that serve children under age 3. The study extends from June 2006 through January 2011. Childcare centers and family

childcare homes were recruited on a rolling basis between October 2007 and July 2008 and were randomized separately. Impact analyses will be conducted separately for the two groups.

The study sample consists of around 1,000 children in 92 childcare centers and 159 family childcare homes in southern Arizona and California. Between 35 percent (homes) and 39 percent (centers) of the participating facilities are in Arizona. Among families participating in the study, 55 percent are Hispanic, and between 17 percent (centers) and 25 percent (homes) speak primarily Spanish in the home. Among parents whose children were in childcare homes, 25 percent reported having a high school degree or less, and 30 percent a college degree. In childcare centers 31 percent reported having a high school degree or less, and 34 percent a college degree. And in both types of facilities about 80 percent of parents reported that their children attend the facility 30 or more hours a week. Key design features, including sample characteristics, appear in the box below.

Box. Key study features

Study design Cluster-randomized trial; single cohort, multiple ages under age 3			
Unit of assignment Childcare sites			
Sample characteristics The study sample comprises 1,009 children in 92 childcare centers and 159 family childcare homes.			
Statistical power estimates For Type 1 error = 0.05, 80 percent or higher power to detect a mean difference effect size between 0.29 and 0.36 standard deviation at the child level and between 0.35 and 0.46 standard deviation at the program level, assuming an intraclass correlation coefficient of 0.20.			
Implementation begins Rolling dates, after baseline data collection and random assignment, starting in early 2008.			
Data collection			
Outcome measure	October 2007 to July 2008 (Baseline)	January 2009 to October 2009 (13-14 months after random assignment)	September 2009 to June 2010 (22-23 months after random assignment)
<i>Program outcome measures</i>			
Program assessments	X	X	
<i>Child outcome measures</i>			
Child assessments	X	X	

With 92 childcare centers (with an average 8 children per center) and 159 family childcare providers (with an average 1.9 children each), projected sample sizes are sufficient for detecting changes in child outcomes between 0.29 and 0.36 standard deviation and changes in program outcomes between 0.35 and 0.46 standard deviation. Effect sizes of this magnitude are equivalent to expected intervention-control differences of 11–14 percentile ranks for child outcomes and 15–18 percentile ranks for program outcomes (U.S. Department of Education 2008).

Key outcomes and measures

At the program and classroom levels, impacts are estimated on the childcare environment, caregiver interactions with children, program structure, cultural responsiveness, and caregiver knowledge and beliefs. At the child level, impacts on children's cognitive and linguistic development and behavior are estimated. Several program and caregiver questionnaires and observational instruments are used to measure program characteristics and quality. Similarly, child outcomes are measured using several well developed and widely used instruments (see table below).

Table. Outcomes of primary impact analysis by source

Outcome	Baseline			13–14 months			22–23 months
	Program observation	Program survey	Parent survey	Program observation	Program survey	Child assessment and parent survey	Child assessment and parent survey
<i>Program level</i>							
Caregiver-Child interactions	Program Assessment Rating Scale—Quality of Caregiver Interaction			Program Assessment Rating Scale—Quality of Caregiver Interaction			
	Infant-Toddler/Family Child Care Environmental Rating Scale—Interaction			Infant-Toddler/Family Child Care Environmental Rating Scale—Interaction			
	Infant-Toddler/Family Child Care Environmental Rating Scale—Listening and Talking			Infant-Toddler/Family Child Care Environmental Rating Scale—Listening and Talking			
Learning environment	Infant-Toddler/Family Child Care Environmental Rating Scale—Activities			Infant-Toddler/Family Child Care Environmental Rating Scale—Activities			
<i>Child level</i>							
Cognitive development						Bayley Scales of Infant Development, Third Edition—Cognitive Scale	
							Bracken School Readiness Assessment

Outcome	Baseline			13–14 months		22–23 months	
	Program observation	Program survey	Parent survey	Program observation	Program survey	Child assessment and parent survey	Child assessment and parent survey
Linguistic development						Preschool Language Scale—4 Expressive Language Scale	Preschool Language Scale—4 Expressive Language Scale
Behavior						Bayley Scales of Infant Development, Third Edition—Behavior Observation Inventory	
						Infant Toddler Social Emotional Assessment—Externalizing, Internalizing, Dysregulation, and Competence	Infant Toddler Social Emotional Assessment—Externalizing, Internalizing, Dysregulation, and Competence

Source: Authors' compilation. Assessments are from Mangione et al. 2006; Harms, Cryer, and Clifford 2006, 2007; Bayley 2005; Panter 2000; Zimmerman, Steiner, and Pond 2002; and Briggs-Gowen and Carter 2002.

Data collection approach

All baseline and outcome data are collected through program observations, surveys, and child assessments (see table). Program-level baseline data were collected before random assignment. Follow-up program and child outcome data are collected 13–14 months after random assignment, and for child outcome data again 22–23 months after random assignment. Specific data sources include the following:

- A baseline survey of providers and their staff.
- A baseline observation of infant-toddler care settings (up to two classrooms per provider).
- A baseline survey of program directors and infant-toddler staff in enrolled classrooms.
- A baseline survey of parents (completed as part of the consent process).
- At 13–14 months after random assignment, follow-up observations of infant-toddler care settings (up to two classrooms per provider).
- At 14 months after random assignment, follow-up survey of program directors and infant-toddler staff in enrolled classrooms.
- Also at 14 months after random assignment, follow-up assessment of all infants and toddlers who were enrolled at the providers at the time of random assignment and whose parents consented (conducted at home and in person).
- At 22–23 months after random assignment, a second follow-up assessment of children (conducted at home and in person).
- Parent survey and interviewer observations conducted in conjunction with both child assessments (13–14 and 22–23 months).

Analysis plan

Intervention impacts are estimated by comparing outcomes for intervention programs and children who were enrolled in intervention programs with outcomes for their control counterparts. The effect of the PITC is analyzed using hierarchical regression models to account for the clustering of the data by program (Goldstein 1987; Raudenbush and Bryk 2002; Murray 1998). Impact analyses include program-, classroom-, and child-level covariates collected before random assignment to improve the estimates' statistical precision and reduce the likelihood that impact estimates are affected by random sampling variation.

In addition to examining the main effects of PITC impacts on program and child outcomes, exploratory analyses examine program impacts for subgroups at the program and child levels. Program-level impacts are estimated for subgroups by state, type of setting, baseline program quality, and primary language spoken in the program. Child-level impacts are estimated for subgroups by primary language spoken at home, gender, age, and parents' education level. Impacts on secondary outcome measures such as program structural variables and child health are also estimated.

Implementation and participation analyses are conducted to measure fidelity of treatment and child exposure. Data on staff and program participation, and on changes in children's childcare arrangements, are used for these analyses.

The procedures described by Schochet (2008) are used to account for multiple hypothesis tests involving the outcome variables assessed in the study. Four primary outcome measures are being developed, two at the program level and two at the child level. The primary program measures are composite measures of caregiver-child interactions and learning environment. Composite measures at the child level combine cognitive and language measures and sociobehavioral measures. These composite measures are subject to psychometric testing to ensure their validity. Multiple comparison procedures are used to reduce the probability of finding statistically significant program impacts that are due to chance alone. Multiple comparison procedures are not used in the exploratory analyses.

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This summary is also available at:
http://ies.ed.gov/ncee/edlabs/projects/rct_90.asp?section=ALL

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