

**Table 2**  
**CONCURRENT ASSOCIATIONS BETWEEN CHILD CARE QUALITY AND CHILD DEVELOPMENTAL OUTCOMES**

CITATION <sup>a</sup>	N	AGE	PROCESS QUALITY MEASURE <sup>b</sup>	STRUCTURAL QUALITY MEASURE <sup>b</sup>	FAMILY CONTROLS	CHILD DEVELOPMENTAL OUTCOMES <sup>c</sup>	QUALITY FINDINGS
<b>Burchinal, Roberts, Nabors, &amp; Bryant (1996)</b>	79	12 mos	ITERS	Group Size, C:A Ratio <sup>3</sup> , training experience		MDI: (Cog) SICD-R & CSBS: (Language Skills)	ITERS related to better cognitive development, language & communication skills better C:A Ratio <sup>3</sup> related to higher Bayley scores, more advanced receptive language development & communication skills. Better Educated CG <sup>1</sup> → children higher on expressive lang Better Process Quality → advanced cognitive development Better Structural Quality → advanced language development
<b>Clarke-Stewart, Vandell, Burchinal, O'Brien, &amp; McCartney (2000)</b>	242 @ 15-m 248 @ 24-m 201 @ 36-m	15m – 36m	ORCE CC-HOME	Group size, “points”, CG education, specialized training, recent training	Family income Observed maternal sensitivity	Bayley MDI, Bracken School Readiness, Reynell language, mother & CG report of social competence, mother & CG report of behavior problems	Controlling for income and sensitivity, better process quality (ORCE & CC-HOME) related to better cognitive scores, better language comprehension, and more cooperation. Caregiver education and training was associated with better cognitive and language scores, controlling for family income and education
<b>Dunn (1993)</b>	60	51.85 mos	ECERS Goals, strategies, & guide child's emotional development	Group size, C: A Ratio <sup>3</sup> , CG <sup>1</sup> education, CG <sup>1</sup> center exper <sup>4</sup> , CG <sup>1</sup> field exper <sup>4</sup> , CG <sup>1</sup> age	Child Age, SES <sup>7</sup> , parental age & education, day care history	CBI: (Soc & Intelligence) PBQ: (Soc comp) PSI: (Cog) PPS (soc play) CPS & POS (cog play)	Structural variables (CG <sup>1</sup> w/ less experience in center) → children rated more sociable. Struc & Process vars corr w/ c's intelligence. HMR (controls: child age, DC <sup>6</sup> hist, SES, parent age & education): higher quality (ECERS), CG <sup>1</sup> child major, less exper <sup>4</sup> in the center → higher CBI intelligence
<b>Dunn, Beach, &amp; Kontos (1994)</b>	60	51.85 mos	ECERS Language & reasoning env Physical env & available learning activities	CG <sup>1</sup> education training, certification, experience, C:A Ratio <sup>3</sup> , group size	SES <sup>7</sup>	CBI: (Language) PSI (Cognitive)	Achievement not related to DC <sup>6</sup> quality Higher quality DC <sup>6</sup> (developmentally appropriate activities) → more advanced language HMR controlling for SES <sup>7</sup> : DC <sup>6</sup> quality (developmentally appropriate activities) predicted children language development Children's language development positively correlated quality, but not literacy related activities. HMR literacy environment predicted significant portion children's language development controlling for SES <sup>7</sup>
<b>Elicker, Fortner-Wood, &amp; Noppe (1999)</b>	41	14.8 mos	FDCRS	CG <sup>1</sup> exper <sup>4</sup> caring for infants & toddlers, group size, income		AQS: (Attachment) Adult-Child IRS: (CG-Child Involvement)	Smaller group size & smaller C:A Ratio <sup>3</sup> predicted more infant-CG <sup>1</sup> interactive involvement. Higher global CC <sup>5</sup> quality was related to better infant-CG <sup>1</sup> attachment security. , but not interactive involvement
<b>Goelman (1988)</b>	105	CDC = 50.5 LFDC=38.3 UFDC=39.8	ECERS DCHERS COF			PPVT-R EOWPVT (Language)	Higher global quality in family day care (DCHERS) significantly predicted higher children's PPVT and EOWPVT scores.
<b>Hausfather, Toharia, LaRoche, &amp; Engelsmann (1997)</b>	155	55 mos	ECERS ECOS	ECOS		SCS: (Soc Comp) PBC: (Beh Probs)	Low quality DC <sup>6</sup> significantly contributes to children's anger & defiance. HMR: additive risk for aggressive behavior (early entry to DC <sup>6</sup> , low quality stress in parenting, males, stressful life events). High quality → no relation w/ behavior problems. HMR: high quality, early attendance, favorable family circumstances → children's level of interest & participation Quality of care mediates positive or negative effects of age of entry

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<b>Hestenes, Kontos, &amp; Bryan (1993)</b>	60	52 mos	ECERS Teacher Engagement	C:A Ratio <sup>3</sup> , Group size	Gender SES <sup>7</sup>	BSQ: (Emotional Expression, Temperament)	MR: DC <sup>6</sup> quality predicted measure of affect acting for temperament (controlling for SES <sup>7</sup> & gender). In DC <sup>6</sup> centers w/ more appropriate caregiving the children displayed more positive affect. Neither structural related to affect High level CG <sup>1</sup> engagement → children had higher intensity positive affect. More low level CG <sup>1</sup> engagement → children display more intense negative affect
<b>Holloway, Reichhart-Erickson (1988)</b>	55	53 mos	Early Childhood Observation, Process Composite	Class size, C:A Ratio <sup>3</sup> , # hrs substitute care	SES <sup>7</sup>	SSPS (Soc Prob Solv)	Children in high quality interaction w/ CG <sup>1</sup> → more prosocial responses & mentioned more prosocial categories. In larger classes, children gave more antisocial responses & used more antisocial categories. Children in classes w/ larger C:A ratios <sup>3</sup> spent less time in solitary play. Controlling for SES <sup>7</sup> , most still remained significant.
<b>Howes (1997) Study 1</b>	760	4.25 yrs	CIS, AIS	C:A Ratio <sup>3</sup> , group size, ECE <sup>2</sup> training, CG <sup>1</sup> education		Language, Pre-Academic, Social Development	CG <sup>1</sup> w/ at least AA in ECE <sup>2</sup> → higher PPVT-R scores, children in classes complying w/ C:A Ratio <sup>3</sup> → higher prereading
<b>Howes (1997) Study 2</b>	410		CIS, A IS, T. behs	CG <sup>1</sup> background in ECE <sup>2</sup>		Cognitive play, Peer play	CG <sup>1</sup> w/ BA or Child Development Associate → greater child language, play & most complex play w/ peers, most language activity CG <sup>1</sup> w/ BA ECE <sup>2</sup> → children engaged in most complex play w/ objects & more creative activities
<b>Howes &amp; Olenick (1986)</b>	89	18, 24, 30, & 36 mos		Low qual (higher C:A Ratios <sup>3</sup> , no formally trained CG <sup>1</sup> , < 2 primary CG <sup>1</sup> )		Compliance Control	<b>High quality centers → children more compliant &amp; less resistant, &amp; children more likely to self-regulate. Low quality centers &amp; at home, self-regulation increases w/ age</b> M.R.: for girls compliance best predicted by combination of high quality DC <sup>6</sup> , low life complexity, & low parental involvement. Task-resistance best predicted by combination of low quality DC <sup>6</sup> , high life complexity, & high parent involvement. CC <sup>6</sup> Quality best predicted self-regulation in boys. <i>Low qual care missing dev approp experiences to promote compliance &amp; self-regulation</i>
<b>Howes &amp; Smith (1995)</b>	840	34.07 mos	ECERS, ITERS, AIS, Attachment			Cognitive Activity Scale	HMR: (1) positive social interact w/ CG <sup>1</sup> , attachment, & play activity (2) ECERS or ITERS. Classroom quality did not result in sig R <sup>2</sup> change. Quality → indirect effect
<b>Howes, &amp; Stewart (1987)</b>	55	20.2 mos	Family Day Care Rating Scale, Adult Play w/ Child Scale	C:A Ratio <sup>3</sup> & Group Size	Family Characteristics (nurturance & support, restrict & stress)	Peer Play Scale Play w/ Objects Scale	Girls: controlling for family characteristics (nurturance & support, restrict & stress), higher quality CC <sup>5</sup> → higher level play w/ peers, objects, & adults, Boys: controlling for family characteristics: higher quality care → higher play w/ objects.
<b>Howes, Phillips, &amp; Whitebook (1992)</b>	414	14-54 mos	ECERS Infant-Toddler Envir Rating Scale, Dev approp activ	C:A Ratio <sup>3</sup> , group size		AQS- (Attachment) Peer Play Scale (Soc Orient, Interact w/ peers)	CG <sup>1</sup> who practiced more appropriate caregiving → child more secure with CG <sup>1</sup> CG <sup>1</sup> engaged in more developmentally appropriate activities → children were more socially oriented w/ CG <sup>1</sup> Regulatable quality on social competence mediated through process quality variables & thru childrens relationship w/ adults & peers. Process mediated through children's relationship w/ adults & peers rather than direct influence on peer competence

Table 2, continued

<b>Kontos (1991)</b>	138	53 mos	Overall envir quality, COFAS, ECERS	C:A Ratio <sup>3</sup> , Group Size, CG <sup>1</sup> Training, Child Development Program Eval-Indicator check	Child age Child Care history	Language, Intelligence, Social, Behavior Problems	<b>Higher quality CC→poorer intelligence, &amp; poorer language</b> HMR (child age, CC <sup>5</sup> history controls): quality did not predict language or intellect, Family Background did. HMR (child age, CC <sup>5</sup> history control): higher quality CC <sup>5</sup> (CDPE-IC: structural measure)→children better socially adjusted, & more sociable
<b>Kontos, &amp; Wilcox-Herzog (1997)</b>	114	51.7 mos	CG <sup>1</sup> Responsive Involvement CG <sup>1</sup> Verbal Stimulation		Child Age	Cognitive Competence Social Competence	<b>Controlling for child age, more CG<sup>1</sup> involvement→lower cognitive competence, but not social competence even when controlling for age. Check p.257</b> MR: More contact w/ CG <sup>1</sup> & more CG <sup>1</sup> involvement→higher social competence. Less contact w/ CG <sup>1</sup> & more involvement in high yield activities→higher cognitive competence.
<b>McCartney (1984)</b>	166	36-68 mos	DCEI, ECERS		Child Age, Parent as Educator Interview (values conformity, values social)	PPVT-R, PLAI, ALI, Experimental Communication Task	HMR: Controlling for child age, values conformity, & values social, higher total quality of center care scores (ECERS)→children had higher PPVT, PLAI, ALI scores & performed better on the communication task. Quality of DC <sup>6</sup> →positive effect on language development. Controlling for total # functional utterances by CG <sup>1</sup> to child, family background & group care experience, more verbal interaction w/ CG <sup>1</sup> → higher PLAI, ALI scores & better performance on communication task.
<b>McCartney, Scarr, Phillips, &amp; Grajek (1985)</b>	166	2 years	ECERS, verbal interact w/ CG <sup>1</sup>	C:A Ratio <sup>3</sup>		PPVT-R & ALI: (Intellect, Lang) CBI & PBQ: (Social Skills)	Intervention Center highest quality rating. Intervention Center higher language, IQ, & Social ratings than other centers.
<b>McCartney, Scarr, Rocheleau, Phillips, &amp; Abbott-Shim (1997)</b>	718	Infant=14.7 mos Toddler=27 mos Preschool=47.9 mos	ECERS, ITERS, CG <sup>1</sup> -C Interaction		Mothers education	AQS & Separation-Reunion Quest: (Attachment) CBS Q-sort (Social Behavior, Behavior Problems; Harter: (Competence & Social Accept)	Partial correlations, controlling for mom education, more CG <sup>1</sup> -C interaction related to more social bids (Toddlers & Preschoolers), more solitary play (Preschoolers) & fewer CG <sup>1</sup> ratings of negative separation/reunion for Toddlers. HMR: CG <sup>1</sup> -C interactions not related to child outcomes
<b>NICHD ECCRN (1999-a)</b>	97 118 163 250	6 mos 15 mos 24 mos 36 mos	None	C:A Ratio <sup>3</sup> , observed group size, CG <sup>1</sup> training, CG <sup>1</sup> education	Income to needs, maternal education, concurr single –parent status, child gender, maternal sensitivity	Bayley MDI Bracken School Readiness Reynell Dev Lang CBCL, ASBI (Soc Beh)	Outcomes (cognitive, language, & social) better when children attended classes meeting recommended CA Ratio <sup>3</sup> at 24 mos & CG <sup>1</sup> training & CG <sup>1</sup> education at 36 mos. More standards met, better school readiness, language comprehension, & less behavior problems at 36 mos Older children more likely to be in classes meeting recommended standards.
<b>Peisner-Feinberg, &amp; Burchinal (1997)</b>	757	<u>M</u> = 4.3 yrs	ECERS, CIS, AIS, UCLA ECOF		Mothers education, ethnicity, & child gender	PPVT-R, WJ-R (prereading, pre-math), CBI (Social skills)	Controlling for child & family characteristics, the observed quality index & the STRS CG <sup>1</sup> -child closeness score related to better PPVT-R scores (both quality indices), better WJ-R prereading scores (individually, observed quality index), better CG <sup>1</sup> ratings of child's cognitive/attention skills on CBI (individually CG <sup>1</sup> rating of closeness), and fewer behavior problems (individually, CG <sup>1</sup> rating of closeness), & higher sociability ratings. Higher quality CC <sup>5</sup> → better language, preacademic, sociability, & fewer behavior problems

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<b>Phillips, McCartney, &amp; Scarr (1987)</b>	166	36-68 mos	ECERS, DCEI	C:A Ratio <sup>3</sup> , Directors years experience		CBI, PBQ: (Social dev)	Higher overall quality → higher social competence ratings. Better C:A Ratio <sup>3</sup> → higher social competence ratings, but lower social adjustment (anxious). More CG <sup>1</sup> -C interaction → better social competence ratings
<b>Ruopp, Travers, Glantz, &amp; Coelen, 1979</b>	Natural Study = 64 centers Experiment = 57 centers	3 & 4 yr olds	Observations of staff-child interactions; Observation of child behavior	C:A Ratio, group size, staff education, training	Looked at changes in child performance over time as a function of systematic changes in ratio and staff training	Preschool Inventory (PSI), Peabody Picture Vocabulary Test (PPVT-Revised)	Children had larger gains on the PSI and the PPVT when groups were smaller. Centers with higher proportions of caregivers with child-related training had greater gains on the PSI.
<b>Schliecker, White, &amp; Jacobs (1991)</b>	100	4 yrs	ECERS		SES <sup>7</sup>	PPVT-R (Verbal)	Controlling for SES <sup>7</sup> , higher center quality → higher PPVT Family Structure analyses: <i>2 parent families</i> - Controlling for mom education, mom & dad age, & occupation prestige, children whose fathers have more prestigious occupations & are enrolled in high quality DC <sup>6</sup> have higher PPVT-R scores. <i>1 parent families</i> - Controlling for mom age, mom education, & occupational prestige, children whose mom were older & are enrolled in high quality D <sup>6</sup> have higher PPVT-R scores. Children w/ high vocabulary scores are in high quality care & come from highest SES <sup>7</sup> levels. One parent families, children w/ high vocabulary scores are in high quality DC regardless of SES <sup>7</sup> .
<b>Vernon-Feagans, Emanuel, &amp; Blood (1997)</b>	67	24 mos		Hi & Low quality defined by a composite of C:A ratio, group size, & CG training	All middle income, dual earner, white households	Sequenced Inventory of Communication Development (SICD)	Poor quality child care associated with poorer expressive language scores. Poorest scores were obtained when poor quality care coupled with chronic Otitis Media.
<b>Volling, &amp; Feagans (1995)</b>	36	18-24 mos		C: A Ratio <sup>3</sup> , Group size	Child's Age, Age of entry, Hours/week in care	IBQ: (Temp) TBAQ & Vandell & Powers Quest: (Soc Comp)	Controlling for child's age & age of entry, higher C:A ratios <sup>3</sup> predicted more nonsocial play and less positive adult interactions. Controlling for child's age & hour/week in care, predicted more nonsocial play and less positive adult interactions. Child's temperament (social fear) interacts w/ quality of care. High quality care make act as a buffer for socially fearful children in positive peer interactions & nonsocial play w/ peers.

Note.

<sup>a</sup>Full references are available in reference section.

<sup>b</sup>**QUALITY MEASURES ALPHABATIZED BY ACRONYM:** COF: Child Observation Form; DCEI: Day Care Environment Interview; DCHERS: Day Care Home Environment Rating Scale; ECERS: Early Childhood Environment Rating Scale; ECOI: Early Childhood Observation Instrument; ECOS: Early Childhood Observation Scale; FDCRS: Family Day Care Rating Scale; ITERS: Infant-Toddler Environmental Scale

<sup>c</sup>**CHILD DEVELOPMENTAL OUTCOME MEASURES ALPHABATIZED BY ACRONYM:** AQS-Attachment Q-Set; **Adult-Child IRS**: Howes & Stewart's Adult-Child Involvement Rating Scale; **ALI**: Adaptive Language Inventory; **BSQ**: Behavior Style Questionnaire; **CBI**: Classroom Behavior Inventory-Preschool Form; **CBS Q-Sort**: Child Behavior Survey, Q-Sort version; **CPS**: Cognitive Play Scale; **CSBS**; **EOWPVT**: Expressive One-Word Picture Vocabulary Test; **Harter**: Pictorial Scale of Perceived Competence and Social Acceptance for Young Children; **MDI**: Mental Developmental Index; **PBC**: Preschool Behavior Checklist; **PBQ**: Preschool Behavior Questionnaire; **PLAI**: Preschool Language Assessment Instrument; **POS**: Play with Objects Scale; **PPS**: Peer Play Scale; **PPVT-R**: Peabody Picture Vocabulary Test-Revised; **PSI**: Preschool Inventory-Revised; **SCS**: Social Competence Scale; **SICD**: Sequence Inventory of Communication Development; **SSPS**: Spivack & Shure's Social Problem Solving Skills; **TBAQ**: Toddler Behavior Assessment Questionnaire

<sup>1</sup>CG: Caregiver, <sup>2</sup>ECE: Early Childhood Education, <sup>3</sup>C:A Ratio: Child:Adult Ratio, <sup>4</sup>Exp: Experience, <sup>5</sup>CC: Child Care, <sup>6</sup>DC: Child Development, <sup>7</sup>SES: Socioeconomic Status