3 Psychometric Properties of the Family Child Care PQA

Study Sample

Two studies were conducted in order to test the reliability and validity of the Family Child Care PQA. The first, in 2004–2005, included 30 homes from 9 counties in the southeastern region of Michigan. For this project, 33% of the homes were registered as family child care homes and 67% were licensed as group-care homes. A second study was conducted in 2006–2007, and the results are presented below. Both studies were funded by the Michigan Department of Education. The second sample included 132 homes from 38 counties across the state of Michigan, with no more than 10% of the sample coming from any one county. Registered family child care homes made up 42% of the sample, while 58% were licensed as group-care homes. Once a provider agreed to participate, homes in the second study were randomly selected into two groups. One group of 30 homes were visited twice, one time for purposes of inter-rater reliability (two data collectors) and a second time for a follow-up reliability retest (one data collector). The homes in the second group were visited once (two data collectors). For purposes of validity the Family Day Care Rating Scale (FDCRS; Harms & Clifford, 1989), the Teaching Styles Rating Scale (TSRS; McWilliam, Scarborough, Bagby & Sweeney, 1998), and the Arnett Caregiver Interaction Scale (CIS; Arnett, 1989) were collected along with the Family Child Care PQA.

Score Distributions

The Family Child Care PQA is designed to measure the quality of care in home settings (i.e., family and group care). It is designed to measure quality over a broad range, from low- to high-quality settings. If, for example, the scales were designed only to measure settings with high levels of quality, it would not be useful to differentiate between the various levels of quality and would be an ineffective way of helping providers identify areas for improvement and growth. Also, for research purposes, a certain amount of variance is necessary in order for the scores to be useful for data analysis.

Table 1 presents score distributions for the Family Child Care PQA. The mean scores across the four subscales suggest that the items are systematically arranged and capture the variety of quality in settings included in this study. The potential range of scores on this measure is 1–5, with 5 being the highest. Three of the four mean scores are near the middle of the range (3.23–3.51); the exception is "safe and healthy environment," with a mean score of 4.26. Although this mean score is high, it is not surprising because many of the items measured on this scale are related to licensing regulations, and a provider must meet or exceed the state guidelines in order to operate. This quality construct demonstrated the least amount of variance, but is a critical part of measuring quality and should be included in order to comprehensively measure quality in family child care.

Reliability

To assess the reliability of the Family Child Care PQA, analyses were conducted to establish levels of inter-rater reliability and internal consistency on each of the instrument's four subscales. Inter-rater reliability was calculated for the four subscales of the Family Child Care PQA using paired raters (N = 30 homes). Each observer independently scored the rows for

Table 1. Score Distributions for Family Child Care PQA Scales

		Score Distributions (*N* = 132)			
		Mean	*SD*	Min	Max
Family Child Care PQA	I. Daily Schedule	3.25	0.57	1.36	4.63
	II. Learning Environment	3.23	0.63	2.02	4.85
	III. Provider-Child Interaction	3.51	0.77	1.49	4.86
	IV. Safe and Healthy Environment	4.26	0.54	2.13	5.00
	Total Score for Subscales I–IV	3.56	0.53	1.79	4.68

Note: Scores have a potential range of 1 to 5, with 5 being the highest.

items (Daily Schedule, 8 items; Learning Environment, 9 items; Provider-Child Interaction, 12 items; Safe and Healthy Environment, 7 items) using the five-point scale. Row scores for each item were then averaged together to generate an item score, and the subscale scores are the average of item scores within each subscale. Generally, observations took place in the morning, beginning between 8 and 9 a.m. and lasting for three to three-and-a-half hours. Table 2 presents the percentage of exact and close agreement for each of the subscales for the Family Child Care PQA. Trained observers reached exact agreement (same

Table 2. Percentage of Exact and Close Agreement by Section for Inter-rater Reliability Using the Family Child Care PQA

		Percentage of Agreement (*N* = 30)	
		Exact	Close
Family Child Care PQA	I. Daily Schedule	74	96
	II. Learning Environment	68	96
	III. Provider-child Interaction	65	91
	IV. Safe and Healthy Environment	75	95

score) 65% to 75% of the time and close agreement (same or adjacent scores) 90% of the time across the four subscales.

Intraclass correlation coefficients were calculated to examine the inter-rater reliability at the subscale level. The coefficients were: Daily Schedule = .71, Learning Environment = .81, Provider-Child Interaction = .61, Safe and Healthy Environment = .74, and total Family Child Care PQA score = .79. Three of the four subscale coefficients are within an acceptable range (levels approaching .70 or above) for good inter-rater reliability. The fourth, Provider-Child Interaction, is slightly below the acceptable range, indicating that this subscale may need more focus during training or that additional examples and notes for clarification are necessary. Of the four subscales, the Provider-Child Interaction scale may be the most difficult to observe, given that the information is collected in real time and one observer may have seen or heard a particular event while the other observer did not have the opportunity to because of space constraints in homes or activities happening on more than one level of a home.

Test–Retest Reliability

A test-retest reliability assessment was also conducted to examine the stability of the Family Child Care PQA over time. In the 30 sites where inter-rater reliability was conducted, an observer returned approximately two weeks (mean = 15.9 days) after completing the initial observation. With a few exceptions, one of the two initial observers was assigned to complete the second observation, therefore alleviating the potential for less stable results by introducing a new observer. Table 3 presents the percentage of exact and close agreement for each of the four Family Child Care PQA subscales. Observers reached exact agreement (same score) 66% to 83% of the time and close agreement (same or adjacent scores) 90% or more across the four subscales. Although these results are acceptable, observers often found that the enrollment of children changed from the first observation to the second — in some homes children were enrolled as "drop-ins" and attended the family child care on days when slots were available. In some cases assistant providers also changed from day one to day two, possibly accounting for the lower percentage of agreement for the provider-child interaction subscale. In some homes observers also reported that the daily schedule was altered to accommodate for nice weather outside, and many activities that might have normally taken place indoors were moved to outside, or outside free-play time was extended.

Table 3. Percentage of Exact and Close Agreement by Section for Test-Retest Reliability Using the Family Child Care PQA

		Percentage of Agreement (*N* = 30)	
		Exact	Close
Family Child Care PQA	I. Daily Schedule	75	94
	II. Learning Environment	82	97
	III. Provider-child Interaction	66	90
	IV. Safe and Healthy Environment	83	95

Evidence of Internal Consistency

Internal consistency describes the extent to which items in the same subscale are related to one another and how each uniquely captures a different dimension of quality. For this analysis, a total of 132 cases (observation days where Family Child Care PQA information was collected by a single observer) have been included. Cronbach's alpha was calculated for each subscale and the results are presented in Table 4. All subscales demonstrate acceptable levels of internal consistency, meeting the criteria of .70 or above. As noted at the bottom of Table 4, four items have been excluded from this analysis. Observers were often not present during outside time (scheduled in the afternoon) and for arrivals and departures and all but four of the homes had children whose first language is English. The healthy pets item was also excluded because more than 20% of the homes we visited did not have a pet.

Validity

Concurrent Validity

Concurrent validity for the study was measured using three instruments, including the Family Day Care Rating Scale (FDCRS), which measures overall environmental quality of family child care homes. Additionally, the Teachers Styles Rating Scale (TSRS) and Arnett Caregiver Interaction Scale (CIS) were collected to enhance information related to process quality. The TSRS specifically targets interactional behavior and affective characteristics of early childhood teachers (the word *teachers* in this case is a general term used to refer to adults working with young children). The CIS measures the emotional tone, discipline style, and responsiveness of the caregiver.

Table 5 presents the Pearson correlation coefficients between subscales of the Family Child Care PQA and the FDCRS. For this analysis, the sample size is 92; unfortunately, 10 FDCRS cases had substantial amounts of missing information and therefore were excluded. The Family Child Care PQA is positively and significantly correlated with the FDCRS, .76 overall. Strong associations are found in expected areas, where subscales across the two instruments measure similar things. For example, Family Child Care PQA Learning Environment and FDCRS Learning Activities were correlated at .75 and Family Child Care PQA Safe and Healthy Environment and FDCRS Basic Care were correlated at .61. Somewhat puzzling, however, is the strong correlation between the Family Child

Table 4. Internal Consistency of Family Child Care PQA

		Cronbach's Alpha (*N* = 132)
Family Child Care PQA	I. Daily Schedule	.80
	II. Learning Environment	.82
	III. Provider-child Interaction	.89
	IV. Safe and Healthy Environment	.81
	Total Score Family Child Care PQA	.93

Note: Items I-G, Outside play; III-A, Supportive arrivals and departures; III-D., Support for non-English speakers; and IV-F, Healthy animals and pets have been excluded from this analysis because more than 20% of the data is missing.

Table 5. Concurrent Validity Using the FDCRS and Family Child Care PQA

		Family Child Care PQA				
		Daily Schedule	Learning Environment	Provider-Child Interaction	Safe and Healthy Environment	Total Score FCCPQA
Family Day Care Rating Scale	Space and Furnishings	.46**	.59**	.34**	.57**	.54**
	Basic Care	.51**	.49**	.43**	.61**	.57**
	Language and Reasoning	.56**	.69**	.58**	.59**	.70**
	Learning Activities	.64**	.75**	.55**	.57**	.72**
	Social Development	.51**	.61**	.59**	.64**	.67**
	Total Score FDCRS	.65**	.75**	.58**	.69**	.76**

Note: ** = $p \leq .01$

Care PQA Learning Environment and the FDCRS Language and Reasoning subscales.

To further assess validity of the Provider-Child Interaction subscale of the Family Child Care PQA, correlations between this subscale and the TSRS and CIS instruments were calculated. Both were highly correlated with the Provider-Child Interaction subscale of Family Child Care PQA (.86 and .61, respectively).

Construct Validity

Both construct and concurrent validity were assessed for the Family Child Care PQA. Construct validity refers to whether a scale measures or correlates with a theorized psychological construct. Factor analysis is used to see if items that were originally placed into subscales actually appear in the data when the instrument is used. As can be seen in Table 6, three factors clearly emerged, accounting for 54% of the variance. Although the fourth factor, daily schedule, is less clear, this is an important component of the family child care setting and bears consideration when looking at quality of care. It may be that the daily schedule is confounded by other components, for example, space and materials available.

Summary

The findings presented in this manual suggest that the Family Child Care PQA produces meaningful information for providers, supervisory agencies, and researchers. Quality constructs have demonstrated their capacity to generate scores across the intended range of family child care setting features. Reliability scores across raters have demonstrated consistency, and internal consistency is strong. The items that make up the scales and subscales group together, supporting a sound theoretical base. Further, other quality assessments were positively and significantly associated with the Family Child Care PQA constructs.

Table 6. Factor Analysis of Family Child Care Program Quality Assessment

		Factor			
Quality Construct and items		1	2	3	4
Daily Schedule	Consistent daily schedule	.434	.478		
	Child-initiated activities	.792			
	Adult-initiated activities		.423		
	Clean-up			.447	
	Snacks and Meal				.646
	Child Planning		.454		.575
Learning Environment	Space for play		.690		
	Logically located interest areas		.401		
	Outside space, equipment materials				
	Materials stored and labeled		.797		
	Materials accessible to children	.413			.558
	Materials appeal to multiple senses		.688		
	Materials are plentiful		.640		
	Materials reflect human diversity		.713		
	Adult- and child-made displays		.564		
Provider-Child Interaction	Warm and caring atmosphere	.711			
	Encourage and support child language	.837			
	Adults as partners in play	.817			
	Support for learning/group activities	.657			
	Opportunities for child exploration	.755			
	Acknowledgment of child efforts	.629			
	Encouragement for peer interactions	.654			
	Solve problems with materials	.552			.487
	Conflict resolution	.446			
	Use of television and computers		.440	.452	
Safe and Healthy Environment	Free of physical hazards			.605	
	Healthy hand washing routines			.634	
	Toileting and diapering routines			.696	
	Food preparation is healthy and safe			.702	
	Napping routines are safe			.675	
	Emergency equipment		.468		

Note: N = 132. All factor scores lower than 0.4 have been excluded. Variance explained = 54%.
Items I-F., Outside play; I-G., Nap, rest, or quiet time; III-A., Supportive arrivals and departures; III-D., Support for non-English speakers; and IV-F., Healthy animals and pets have been excluded from this analysis because more than 20% of the data is missing.

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