# Revisiting the Two Faces of Child Care Quality: Structure and Process

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## Abstract:

While child care quality has been examined in numerous studies, the definition of quality and specifically, the concepts of structural and process quality, have not been adequately explored. In this qualitative analysis of the constructs of process and structural quality, a content analysis of the Early Childhood Environment Rating Scale-Revised (ECERS-R), a commonly used measure of process quality, was conducted to investigate its use as a measure of process quality. Through constant comparative analysis of the ECERS-R at the indicator level, definitions of structure and process were formulated. Results show that over half of the indicators of the ECERS-R are measuring structural quality rather than process quality. Further examination of quality as a dynamic exchange between individuals and context is needed to advance research in the area of early childhood program quality.

**Keywords:** Education | Early Childhood | Child Care | Quality

## Article:

The quality of care and education that young children receive in child-care settings has been the focus of much research. Quality of child-care settings is of interest in our society because of the critical impact of early care and education on children's development. For example, the NICHD Study of Early Child Care reports that children's pre-academic and language skills were predicted by the quality of early child care they experienced (NICHD Early Child Care Network, 2002). The Cost, Quality, and Child Outcomes Study (Peisner- Feinberg et al., 2001) also reports that children who were enrolled in higher quality child care had better language and math scores in their early elementary school years. While researchers and policy-makers seem convinced of the positive effects of high quality child care, there is far less certainty about how to best measure the construct of "quality." The present qualitative study contributes an in-depth analysis of the definition of quality and of a frequently used instrument to measure quality.

Early research on child-care quality primarily focused on global assessments of the overall program. Phillips and Howes (1987) described several distinct approaches that have been used to measure global quality. The first approach was to divide programs into high and low quality

based on ratios, caregiver training, and turnover. Children in these high and low quality programs were then assessed to determine the impact of quality on child outcomes. Another approach was to use a measure of global classroom quality, often the Early Childhood Environment Rating Scale (ECERS) (Harms & Clifford, 1980) or the Infant/Toddler Environment Rating Scale (ITERS) (Harms, Cryer, & Clifford, 1990). The scales contain multiple subscales assumed to measure the various dimensions of quality and its impact on child outcomes. Subsequent research has made the distinction between global quality and two subordinate categories known as structural and process quality (Phillips & Howes, 1987). It has been assumed that global quality is determined by the combination of structural and process quality. Whether it is appropriate to combine structural and process quality is debatable because neither theory nor research has answered the question of whether global quality is equal to or, due to the dynamic synergy of underlying elements, greater than the sum of its parts. In addition, it may be unwise to assume that structural and process quality are the only two components of quality. On a more practical level, researchers do not fully understand the separate and distinct contributions of the characteristics of child care settings on global quality. Therefore, despite common reference to the terms *structure* and *process*, the definitions and measurement of these concepts are varied and imprecise.

*Defining Structure and Process Quality*

In an early examination of the definitions of process and structural quality, Phillips and Howes (1987) described structural aspects of quality such as group composition and staff qualifications and process quality as the "dynamic environment that captures children's actual experiences in child care" (p. 9). More recently, Vandell and Wolfe (2000) described process quality as "actual experiences that occur in child care settings, including children's interactions with caregivers and peers and their participation in different activities" (p. 3). They elaborate further on the definition of process quality to include a more comprehensive definition that "combines experiences across several areas that include health and safety provisions, interactions with caregivers, and age-appropriate materials" (p. 3). Most definitions of process quality target specific interactive activities or experiences, including teacher-child interactions and language stimulation by teachers while structural characteristics refer to dimensions of quality that include features such as teacher-child ratios, group size, caregiver formal education, and caregiver specialized training related to children (Vandell & Wolfe, 2000).

Historically, structural indicators of quality were labeled "regulatable" indicators. That is, they were considered to be factors that could be easily regulated via the state regulatory or licensing process (Howes, Phillips, & Whitebook, 1992). For example, teacher-child ratios and group sizes can be mandated as part of licensing regulations. However, the term "structural" seems to better capture the full scope of these variables. For example, although teacher salaries are not regulated in child care, they could potentially be regulated since teacher salaries in public schools are regulated in the U.S. as well as in child care facilities in Germany and Australia (Phillipsen, Burchinal, Howes, & Cryer, 1997). The definition of what is regulatable can be culturally determined (Dahlberg, Moss, & Pence, 2003) and is being somewhat more broadly defined than in the past. The structural dimensions of quality are also influenced by macrosystem factors, including government regulations, center policies, and economic climate (Phillipsen et al., 1997). Structural characteristics are therefore typically considered to be more distal indicators of child-

care quality with less direct impact on child outcomes. However, Phillipsen and colleagues (1997) argue that structural indicators of quality can affect quality at the program or center level and at the classroom level. Factors at the program level such as program policies affect the child indirectly while classroom quality factors such as group size may have a more immediate and direct impact on child outcomes.

*Relationship between Structure and Process*

It has been long assumed by policy analysts and state regulatory personnel that structural aspects of quality are strongly related to process quality measures and are valid and reliable indicators of child care quality. Indeed, moderate relationships between structure and process variables have been documented in many studies (Howes et al., 1992; NICHD Early Child Care Research Network, 1996; Phillipsen et al., 1997; Roupp, Travers, Glanz, & Coelen, 1979; Whitebook, Howes, & Phillips, 1989), but it is still arguable whether or not structural indices can be readily substituted for process quality measures (Scarr, Eisenberg, & Deater- Deckard, 1994). Of the structural indicators, wages and teacher education seem to be the best indicators of process quality (Helburn, 1995; Howes et al., 1992; Scarr et al., 1994).

It has been posited that structural indicators provide the foundation for process indicators but are not direct influences on the quality of care and education that children receive. For example, high quality interactions between teachers and children are more likely to occur in classrooms where teacher/child ratios are low and teachers have higher levels of education (Howes, Whitebook, & Phillips,1992; NICHD Early Child Care Research Network, 1996, 2000a). Vandell and Wolfe (2000) provide a summary of the research demonstrating the relationship between structural and process quality. They report that most research findings in the child-care quality literature have indicated a significant relationship between structural characteristics and process quality. For example, Phillipsen et al. (1997) report that process quality was higher in states with more stringent facility standards, including teacher education, higher wages, moderately experienced teachers, and more experienced directors. However, Scarr, Eisenberg, and Deater-Deckard (1994) reported only modest to moderate correlations between process and structural variables.

The relationship between structural and process quality and child outcomes has also been well documented in the literature. Howes et al. (1992) describe a model wherein the relationship between child outcomes (social competence) and structural quality is mediated by both process quality and children's relationships with teachers. Process quality (ECERS) was mediated by children's relationships with adults and peers rather than having a direct relationship on children's social competence. Burchinal, Cryer, Clifford, and Howes (2002) examined the associations between caregiver education (structural quality) and caregiver sensitivity (process quality) utilizing the Early Childhood Environment Rating Scale – Revised (ECERS-R) (Harms, Clifford, & Cryer, 1998) and Caregiver Interaction Scale (CIS) (Arnett, 1989) scores. Classrooms with teachers who had a Bachelor's degree scored significantly higher on the ECERS-R and CIS than classrooms with teachers with less education. Moreover, children in these classrooms showed significantly better language skills than did children in classrooms with teachers with less education. The NICHD Early Child Care Research Network (2002) also documented associations between structural and process quality and child outcomes. In this large-scale study, the authors found that structural quality directly affected process quality, and

process quality in turn influenced children's outcomes. The results revealed positive associations between caregivers' training, child-staff ratio, and the quality of care-giving behaviors (e.g., sensitivity, stimulating, etc.). Care-giving quality was found to be related to children's cognitive competency.

Because of these well documented relationships, many states (e.g., North Carolina and Tennessee) have recently adopted the use of instruments that are considered to be process measures as part of their regulatory system. The inherent assumption in the adoption of such a scale is that structural and process quality are distinct constructs that must be assessed independently and one cannot be used as a proxy for the other. The environment rating scales developed by the Frank Porter Graham Child Development Research Institute (ECERSR, ITERS-R, FDCRS, & SACERS) are being used as either a mandatory or an optional piece of the regulatory system. The scales are also used widely for quality enhancement projects nationally and internationally. They are currently described as either a global measure of quality or more often as a measure of process quality (Frank Porter Graham Child Development Institute, 2003). However, our experiences with the ECERS-R led us to believe that it contained both structural and process aspects of quality and that it would be appropriate to analyze it in an effort to bring clarity to these definitions.

The goals of the present study were to (a) develop more precise definitions of structure and process quality and (b) conduct a content analysis of the indicators of the ECERS-R (Harms et al., 1998). Despite the numerous studies that have been conducted and the variety of definitions that have been presented, *process* and *structure* have not been explicitly defined. The lack of precision in defining and measuring the constructs makes it difficult to differentiate their impact on children's development, and limits ensuing recommendations that might inform research and policy.

**Method**

Utilizing the constant comparative method, the authors had two goals, (a) to develop explicit definition for the terms *structure* and *process* that can be generalized with future empirical and theoretical application and (b) based on the analysis and completed definitions to examine the proportion of structural- and process-oriented indicators of the ECERS-R (Harms et al., 1998). The constant comparative method is a qualitative approach in grounded theory to code data while simultaneously creating definitions through analysis (Glaser & Strauss, 1967). Glaser (1992) describes this procedure as leading to *saturation* or explicit clarification between concepts (i.e., "structure" or "process") that enable universal understanding.

We went through several steps of analysis were conducted to develop definitions for *structure* and *process* and then to analyze the ECERS-R. The procedure included developing preliminary conceptualizations that evolved and were modified over time into the current definitions. During this procedure, the ECERS-R indicators were coded as *structure* or *process*, compared, analyzed, re-coded, and again compared while revising and enhancing the definitions. This process allowed for emergent definitions to become clearly articulated. Finally, upon reaching consensus on both codes and definition, the data were analyzed to determine the proportion of structure and process measured within the ECERS-R at the indicator, item, subscale, and comprehensive levels.

*Initial Conceptualization*

Initially, the authors met over several months, engaging in comprehensive discussion of the concepts of structure and process and how they are used in the literature. During these discussions the use of the ECERS-R as a pure process measure was questioned. The inconsistency between the scale's description and its actual use for measurement was hypothesized to be a result of the lack of definition around the concepts of structure and process. It is important to note that all of the authors have been trained to reliability on the ECERS-R and have had extensive experience assessing classroom environments.

*Initial Coding*

Once some common ideas about structure and process were discussed, the next step involved applying these initial conceptualizations to the ECERS-R and individually coding each indicator as either structure or process. The ECERS-R contains a total of 469 indicators making up 43-items and requires a 3 to 4 hour observation and teacher interview. To score the scale using the 1 to 7 Likert rating an assessor must first score indicators that are anchored to the 1 (Inadequate), 3 (Minimal), 5 (Good), and 7 (Excellent) ratings. Each indicator is scored "yes," "no," or "not applicable." The compilation of indicator scores leads to the rating of each item from one to seven.

Based on the initial discussions about structure and process, we individually attempted to code each of the 469 indicators of the ECERS-R. Because definitions were not yet comprehensive we were unable to code several indicators as either process or structure. Subsequently, during this phase of coding, questions emerged, resulting in further modification of the definitions.

*Emerging Definitions*

As we compared our level of agreement, clarified differences, worked on definitions, and re-coded, we were able to shape a collective definition for each concept over time that was inclusive of all the ECERS-R indicators as either structure or process. We developed definitions based on 100% consensus. Consensus was achieved following disagreements by discussing the intent of the ECERS-R indicators and how they would be scored given certain classroom situations. For example, item 23 indicator 7.2 states, "Different activities done with sand and water (Ex. Bubbles added to water, material in sand table changed, e.g., rice substituted for sand)" (Harms et al., 1998, p. 31). Initially some of us coded this as process because "activities done" might imply that a teacher be involved in the activity with children. However, when further discussing the intent of this indicator or, in other words, how it is scored by a trained observer, no human interaction between teacher and child is required. For a "yes" on this indicator evidence of materials changed in a sand or water table (e.g., colored noodles, food coloring added to water, shredded paper, corn starch and water, etc.) is sufficient. The only requirement to receive credit for this indicator is that materials are provided (e.g., soapy water instead of blue water), therefore this indicator represents a structural variable because it is scored solely on materials and is independent of any human interaction between teachers and children at the time of observation. During negotiations, upon reaching consensus, new ideas about each concept were recorded as they became collectively accepted to be inclusive of indicators that were in question. For example, when referring back to item 23, indicator 7.2, we noted that the use of the word "activities" in the ECERS-R did not necessarily mean there was human interaction. These records are recognized in the constant comparative method as *memos* and are

an integral procedure to shaping the analysis and developing definitions (Charmaz 2000; Glaser, 1992).

The development of definition through inductive procedures facilitated by the constant comparative method requires creativity and innovative conceptualization, described by Glaser (1978, 1992) as *theoretical sensitivity.* Theoretical sensitivity was critical to our procedures in order to move beyond the commonly held examples of structure and process found in the literature and to formulate comprehensive and distinct definitions that can be generalized, applied, and further tested. For example, the term *activities* is frequently considered an indicator of process, but we make the distinction that *activities* used only to refer to materials is a structural variable while a teacher-child interaction within *activities* is a process variable. As the definitions of structure and process emerged, we were required to move beyond commonly cited examples and address classroom practices that were both inclusive and reflective of the definitions.

*Application of Emerging Definitions*

Upon coding the ECERS-R several times and comparing consistency and clarifying differences, we reached consensus on each indicator, leading to new insights into the definitions. Finally, we once again tested the definitions by individually coding each indicator to ensure consistency in application of the definitions and reaching 100% consensus. During this procedure, conceptualization of structure and process was further articulated and transformed into the current definitions that follow.

*Process Quality* requires human interaction among individuals. Process quality includes an adult being actively involved with the children using materials, participating in activities, or supervising children. It also includes interaction between children (child-child interactions) between children and the adults in the classroom (teacher-child interactions) or between adults (adult-adult interactions), including parents and teachers. The types of interactions can be relational (e.g., holding a child, etc.) and/or teaching (e.g., talking to children about why they decided to group certain objects together), and/or meeting an individual child's needs. Process quality also includes modeling particular behaviors, extending activities, facilitating activities, or taking an active role to allow (through some flexibility in plans or schedule) a behavior or activity to occur. Process quality refers to actions between or among individuals but is not an adult or child acting independently on an object.

*Structural Quality* is characteristic of the environment that is independent of human interaction between individuals. Structural quality includes materials, equipment, schedules, procedures, rules, and guidelines (e.g., teacher qualifications, adult-child ratios). Terms such as *materials available* or *materials accessible* or *provision of* do not imply adult presence or interaction and are, therefore, structural quality. For example, a posted daily schedule is either present or not and would be considered structural quality. Also, health procedures or sanitary conditions may be considered structural quality if they are either present or not and do not require ongoing and active participation from the teacher. Structural quality does not focus on "how" the guidelines were developed or the thinking process behind setting up materials or defining a schedule, instead it is the presence or absence of the materials or documents that is the primary

consideration. Structural quality includes the presence of materials and equipment, and a child's or adult's actions on objects.

As defined, these dimensions of quality clearly differentiate between relationships among individuals and relationships between the child or adult and objects. Process quality requires an element of human interaction between individuals whereas structural quality is independent of human interaction, for example, the provision of materials and equipment. The rationale for these definitions is that *objects* can be easily regulated or counted and in and of themselves influence structural quality but they may not impact the process quality of the environment. For example, materials or activities set up for children to access do not require interaction between teachers and children. A child may interact with the same objects in a high- and low-quality facility resulting in the same benefit for the child. However, adult intervention with those materials and the child can be vastly different in a high- and low-quality setting. Therefore, materials, equipment, and activities seem to fit more readily with other structural factors that are easily regulated, although in most research they are typically included in the definition of process quality. For example, whether or not a certain number of a particular type of blocks, math activities, and dramatic play materials are available can be easily determined by regulatory personnel. Many states do regulate the kinds and amount of materials available within a classroom. However, how these materials are used by the teacher with the children demands an observational assessment by a well-trained and knowledgeable observer and is more difficult to regulate. For example, it would be quite difficult without extended observation to determine whether or not materials are used by a teacher in a developmentally appropriate manner. Thus, the teacher/adult role is critical in differentiating process and structural quality.

## Results

The Constant Comparative Analysis described above led to the definitions of structure and process that were used in the analyses. The inductive nature of analysis led to the eventual coding of all of the indicators in the scale. Each indicator ($N$ = 469) was ultimately categorized as structure or process and agreed upon by all of the authors. According to our definitions 56% (262 indicators) of the ECERS-R indicators are structural quality and 44% (207 indicators) are process quality. Once the indicators were coded as structure or process we were able to make comparisons of the items and subscales of the ECERS-R.

### *Items and Subscales*

In order to examine the distribution of structure and process indicators across individual items, we calculated the proportion of indicators that were process. For example, if there were 10 indicators in an item and 6 were coded as structure and 4 were coded as process, then the proportion of process indicators was .40. Out of 43 items on the ECERS-R, 9 items had indicators that were all process and 13 items had indicators that were all structure. The remaining items (N = 21) contained indicators that were both process and structure. As shown in Table 1, there was also a wide range in the proportion of indicators that were structure or process in each of the subscales. For example, virtually all of the indicators of the first subscale, Space and Furnishings, represent structural quality (only 2.5% were considered to be process). Most of the indicators in this subscale relate to space, furniture, equipment, and room arrangement—all of which are easily regulatable. Indeed, only 2 of the 81 indicators in this subscale represent process

quality. These two indicators include the wording, "children are allowed" in reference to the use of private spaces in the room. This wording implies the need for active teacher intervention in order for these indicators to be scored positively. These indicators were considered process quality. Of the remaining subscales, one was primarily structure (Activities; 80% structure) and one was primarily process (Interaction; 98% process). The other four subscales showed greater variety with both structure and process indicators.

Within the Activities subscale there was wide variation in the proportion of process across the items. As seen in Table 1, four of the items were viewed as entirely structure (Fine Motor, Blocks, Sand/water, and Dramatic play). The remaining items contained some process indicators and some structural indicators. For example, item 25 (Nature/Science) had 3 indicators coded as process. These indicators involved teachers encouraging children to bring and share natural things, using everyday events to learn about nature and science, and providing more interactive experiences in nature and science. These items required active teacher involvement with the children. The remaining 7 indicators centered on whether the science materials were available and accessible and were therefore coded as structure. A second example in this subscale, item 28 (Promoting Acceptance of Diversity), also illustrates the interweaving of structure and process across the indicators. For this item, three indicators were considered process since they address interactions that illustrate prejudice or that promote acceptance of diversity. Seven indicators were considered structural since they focused on the presence of racial and cultural diversity within materials (e.g., dolls and pictures) and activities (e.g., music from different cultures).

*Level of Quality*

In addition to examining differences across subscales, we were also interested in the proportion of structural versus process indicators that existed at each level of quality. Since the 7-point Likert scale used in the ECERS-R is anchored at the 1 (Inadequate), 3 (Minimal), 5 (Good), and 7 (Excellent) levels it is possible to compare the proportion of process to structure at each level. Interestingly, the percentage of the indicators across the quality anchors was fairly consistent, with a higher proportion of structure than process at each of the levels. That is, 48% of the indicators at the "1-inadequate" level were process quality; 39.8% of the indicators at the "3-adequate" level were process; 43.8% of the indicators at the "5-good" level were process; and 46.2% of the indicators at the "7-excellent" level were process.

**Table 1.** Proportion of Process Quality Indicators

| **Subscales and Items of the ECERS-R** | **Process Quality Indicators (%)** |
|---|---|
| *Space and Furnishings* | |
| 1. Indoor space | 0 |
| 2. Furniture for routine care, play and learning | 0 |
| 3. Furnishings for relaxation | 0 |
| 4. Room arrangement | 0 |
| 5. Space for privacy | 28.6 |
| 6. Child-related display | 0 |
| 7. Space for gross motor | 0 |
| 8. Gross motor equipment | 0 |
| Total percentage of process quality for this | 2.5 |

| | |
|---|---|
| subscale | |
| *Personal Care Routines* | |
| 9. Greeting/departing | 100 |
| 10. Meals/snacks | 55.6 |
| 11. Nap/rest | 50 |
| 12. Toileting/diapering | 35.7 |
| 13. Health practices | 54.5 |
| 14. Safety practices | 30 |
| Total percentage of process quality for this subscale | 55 |
| *Language-Reasoning* | |
| 15. Books and pictures | 27.3 |
| 16. Encouraging children to communicate | 55.6 |
| 17. Using language to develop reasoning skills | 100 |
| 18. Informal use of language | 100 |
| Total percentage of process quality for this subscale | 69 |
| *Activities* | |
| 19. Fine motor | 0 |
| 20. Art | 44.4 |
| 21. Music/movement | 40 |
| 22. Blocks | 0 |
| 23. Sand/water | 0 |
| 24. Dramatic play | 0 |
| 25. Nature/science | 30 |
| 26. Math/number | 30 |
| 27. Use of TV, video, and/or computers | 27.3 |
| 28. Promoting acceptance of diversity | 30 |
| Total percentage of process quality for this subscale | 20 |
| *Interaction* | |
| 29. Supervision of gross motor activities | 100 |
| 30. General supervision of children | 100 |
| 31. Discipline | 91.7 |
| 32. Staff-child interactions | 100 |
| 33. Interactions among children | 100 |
| Total percentage of process quality for this subscale | 98 |
| *Program Structure* | |
| 34. Schedule | 36.4 |
| 35. Free play | 30.0 |
| 36. Group time | 40.0 |
| 37. Provisions for children with disabilities | 92.9 |
| Total percentage of process quality for this | 53 |

| | |
|---|---|
| subscale | |
| *Parents and Staff* | |
| 38. Provisions for parents | 69.2 |
| 39. Provisions for personal needs of staff | 0 |
| 40. Provisions for professional needs of staff | 0 |
| 41. Staff interaction and cooperation | 100 |
| 42. Supervision and evaluation of staff | 100 |
| 43. Opportunities for professional growth | 66.7 |
| Total percentage of process quality for this subscale | 55 |
| Overall total percentage of process quality for scale | 44 |

*Structure and Process in Factor-Based Scales*

Although this descriptive information on the subscales and the items provides insights into the composition of the scale, we were also interested in whether a select group of items could be used to meaningfully measure structure and process quality more directly. A recent factor analysis completed on a large sample of child-care facilities in North Carolina (Cassidy, Hestenes, Mims, Hestenes, & Hegde, in press) revealed two distinct factors for the ECERSR. Factor 1 (Activities/Materials) included 9 items (items 3, 5, 15, 19, 20, 22, 24, 25, 26) and Factor 2 (Language/Interactions) included 7 items (items 17, 18, 30, 31, 32, 33, and 36). Based on the definitions for structure and process as defined in the current study, 83% of the indicators of the items in Activities/Materials factor-based scale were structural quality and 90% of the indicators on the Language/Interactions factor-based scale were process quality.

**Discussion**

The goals of the present study were to better define the constructs of structural and process quality and to examine, based on these definitions, a commonly used measure of process quality, the ECERS-R. The definitions emerged through continual review of how the terms have been defined in the past, literal definitions of the terms, and most importantly the notion of what aspects of quality are easily regulatable and what aspects require a more educated and experienced eye to directly observe. It became readily apparent that the constructs of structure and process lacked clarity in most research. The ECERS-R has routinely been referred to as a measure of process quality (e.g., Howes et al., 1992; Peisner-Feinberg et al., 1999; Vandell & Wolfe, 2000) with an expressed assumption that the designation was appropriate. For example, in the report "The Children of the Cost, Quality, and Outcomes Study Go to School" (Peisner-Feinberg et al., 1999) the ECERS was described as a measure of "child care practices (or process quality)" (p. 9). Similarly, Vandell and Wolfe (2000) described the scale as a "well-known process measure" (p. 4). In many large scale studies, additional measures of process quality including the Caregiver Interaction Scale (CIS) (Arnett, 1989) and the Adult Involvement Scale (AIS) (Howes & Stewart, 1987) have been used (Helburn, 1995; Whitebook et al., 1989) with moderate correlations between the ECERS and other process measures. It became quite apparent as we engaged in this research process that the ECERS-R contained both structural and process dimensions. Although structure and process are clearly both important in the measurement of

quality, our analyses also led us to question the contribution of each dimension to children's development and well-being.

*Subscale Comparisons*

Of interest in the current study was the apparent inconsistency, at least based on our definitions, in the scale in measuring items in the Activities subscale. It was expected that items such as blocks and math and science would be written in similar ways with regard to process and structure. However, this was not the case. As described in the Results section, four of the items in this subscale were entirely structure while the remaining indicators were a mixture of process and structure. It would seem that all activities would equally involve the teacher for facilitation and implementation, but the wording of the items does not consistently describe an active role or expectations for the teacher. Often the absence or presence of materials is all that is required for scoring the items in this subscale. It must be noted that often process may be added to the scale through an individual's interpretation of the item, but it is not specifically described in the scale items, indicators, or additional notes. This inconsistency lends credence to the argument that process and structure have been fuzzy constructs that lack consistency in usage and interpretation. This lack of clarity has led to less precision in delineating the correlates of high quality child care. Further evidence of this lack of clarity of definitions was found when examining the percentage of process indicators across the 1, 3, 5, and 7 anchors. It was anticipated that as scores increased from 1 to 7 there would be an increased level of process. Materials (structure) would provide the foundation for a basic level of quality or the lower scores, but higher scores would be achieved with greater teacher involvement (process). However, as reported, the highest level of process was found at the 1 and 7 anchors. Although we speculated there would be increasing process with higher scores this was not the case. This may indicate that the relationship between structure and process is more dynamic than linear and that a dynamic assessment of the interaction between structure and process as it occurs over time might be a more appropriate model.

*Relationship Between Structure and Process*

The analogy of children as passengers in a luxury and an economy car will perhaps assist in explaining the definitions and the relationship between structure and process quality that emerged through this study. To a child riding in the backseat of a car, given that the vehicle is in reasonable operating order, it does not really make a significant difference whether or not that car was purchased for $14,000 or $50,000. The relative safety and wellbeing of the child can be provided for in both cars—the basic structure for their well-being is provided in either case. It can be easily regulated that the automobiles meet minimum safety requirements, including the type of car seat needed. However, once that vehicle begins to move, the skill of the driver is most critical in determining the quality of a child's experience in the vehicle. Although the driver must have the basic components present in the car in order to ensure safety, (e.g., the brakes and windshield wipers must work), the driver's ability to navigate the vehicle with other cars on the road and in adverse weather conditions, as well as the interaction with the child, differentiates the quality of the ride for the child. It is likely that most parents would probably prefer to have their child in an economy car with a well-qualified driver than in a luxury car with a driver with a revoked license. In the same manner, although structural quality (reasonable amounts of materials and equipment; a safe and clean facility) is necessary and in fact can influence the morale of the staff, process quality—the skill of the teacher and the relationships among human

beings in the structural environment—is most critical to truly differentiate quality in child care. According to Scarr and colleagues (1994), "What actually happens in classrooms of small children and one or two caregivers is not adequately captured by most variables one can legislate and regulate" (p. 49).

*Why Do Definitions of Quality Matter?*

Why do precise definitions of structure and process quality really matter? If researchers are measuring quality, regardless of the dimensions, can we not rest assured that children are thriving in child care settings that receive high scores on scales of quality, such as the ECERSR? Unfortunately, this is not the case. The relationship between quality scores and child outcomes tend to be moderate at best, with much of the variance unaccounted for in the models. It is clear that a multitude of factors within the environment as well as factors associated with each individual child and his/her family are complexly interwoven into this dynamic system. In order to understand this system we need to tease apart the contributions of each of these factors. Studying specific aspects of process quality in conjunction with the individual characteristics of children and teachers within the specified context will provide greater insights into the aspects of quality that matter the most.

Blau (2000) cautions that projected associations between process and structural quality may be caused by factors that are confounded with the structural and caregiver characteristics. Indeed, researchers have called for inclusion of additional variables to explain the complete picture of quality (Blau, 2000; Buell & Cassidy, 2001; Cassidy, Buell, Pugh-Hoese, & Russell, 1995; Phillips et al., 2001; Whitebook, Sakai, Gerber, & Howes, C. (2001)). They argue that these confounding factors might include center policies, curriculum, directors' leadership skills, staff morale and stability, characteristics of children in the centers, regulatory and financial aspects of care, staff cohesiveness, and overall teacher education. For example, Whitebook and colleagues (2001) report that teacher turnover is affected by the number of teachers within a program who have higher levels of education. Teachers leave their positions if there are not other teachers who jointly construct a stimulating learning environment for them as well as for the children. Further, if teacher turnover is high the overall quality of care and education is lower. Phillips et al. (2001) suggest that little is known about the relative contribution of various structural factors to overall quality. That is, there may be some that are "powerful and consistent predictors of children's experiences in childcare" (p. 476) and there may be some factors that are far less critical.

One way to examine process quality more specifically may be to use the Language/ Interaction factor of the ECERS-R defined by Cassidy and colleagues (in press) or other scales that focus specifically on relational aspects of quality. This would provide clearer differentiation between process and structure. Based on the present findings, states that have added the ECERS-R to their existing measures of structural quality (teacher/child ratios, group sizes, staff education, etc.) are actually measuring vastly more structural quality than process quality. Because more than one-half of the ECERS-R indicators measure structural quality, which is in addition to the existing measures of structural quality in most states, process quality is being vastly under-measured and weighted far less than structural quality. Of key importance then is determining how much of the process dimension must be measured and how much structure must be measured in order to accurately measure the aspects of quality that are most important for positive child outcomes.

Furthermore, perhaps our thinking has been constrained with regard to what can be regulated in child care in this country. Structural quality can be relatively easily mandated, which could provide an opportunity to increase the focus on the more difficult- to-identify construct of process quality. The curriculum materials that are available to young children, the presence or absence of health guidelines or parent policies in a child care environment can be regulated and easily determined and should be considered structural and regulated as such. Additional measures of various aspects of quality need to be identified. For example, Talan and Bloom (2004) recently introduced the Program Administration Scale (PAS) that is structured similarly to the ECERS-R (7-point Likert scale anchored at 1, 3, 5, & 7) and measures leadership and management within child care programs. It covers ten domains (human resources development, personnel cost and allocation, center operations, child assessment, fiscal management, program planning and evaluation, family partnerships, marketing and public relations, technology, ant staff qualifications) not extensively included in the ECERS-R and may provide insight about additional variables that may account for differences in process and structural quality. According to the constant comparative method, after concepts are clearly articulated it is critical to extend the definitions through further research by both researchers and practitioners. This step is described as *theoretical sampling* and is necessary in formalizing definitions and applying them across contexts (Charmz, 2000; Glaser & Strauss, 1967). We are hopeful that the current definitions will provide a clearer and more concise picture of structural and process quality that can be investigated in future research. The future research should attempt to measure in far greater depth process quality and the additional factors that may account for the unexplained variance in child care quality studies, including individual and contextual variables. Only additional research will determine if the definitions and the content analysis of the ECERS-R in the current study are credible and have made a meaningful contribution to the study of child care quality and the well-being of young children in child care settings.

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