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ABSTRACT

This article reports on the development, internal consistency, and reliability of a new preschool and kindergarten classroom observational measure based on NAEYC's Guidelines for Developmentally Appropriate Practices. The Classroom Practices Inventory (CPI) is a 26-item rating scale tapping the curricular emphasis and emotional climate of programs for 4- and 5-year-old children. The scale demonstrates a high degree of internal consistency. Over half the measure's variance is accounted for by a factor tapping encouragement of curiosity, creativity, and provision of concrete materials. In a study of 10 preschool programs, CPI scores correlated significantly with teachers' and parents' educational attitudes. Modest relationships were found between the CPI scores of children's preschools and measures of academic skills, creativity, and anxiety. It is concluded that the CPI appears to be a promising measure for examining developmentally appropriate practices in early childhood education, especially programs providing formal academic learning experiences. The wide range of scores and their association with other school, parent, and child variables indicate that the CPI is sensitive to important differences in curriculum and teaching practices in early childhood programs. (RH)

The Classroom Practices Inventory:

An Observation Instrument Based on NAEYC's Guidelines For Developmentally Appropriate Practices For 4- and 5-Year-Old Children

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Abstract

The controversy over what is an appropriate early childhood curriculum has created a need for research instruments designed to measure classroom practices. This article reports on the development of a new observational measure based on NAEYC's Guidelines for Developmentally Appropriate Practices. The Classroom Practices Inventory (CPI) is a 26-item rating scale tapping the curricular emphasis and emotional climate of programs for 4- and 5-year-old children. The scale demonstrated a high degree of internal consistency. Over half the measure's variance was accounted for by a factor tapping encouragement of curiosity, creativity, and provision of concrete materials. In a study of 10 preschool programs, CPI scores correlated significantly with teachers' and parents' educational attitudes. Modest relationships were found between the CPI scores of children's preschools and measures of academic skills, creativity, and anxiety. The CPI appears to be a promising measure for examining "developmentally appropriate" practices in early childhood education.

The Classroom Practices Inventory:
An Observation Instrument Based on NAEYC's Guidelines
For Developmentally Appropriate Practices
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Since their initial publication in 1986. NAEYC's Guidelines for Developmentally Appropriate Practice (Bredekamp, 1987) have been widely cited and discussed. The National Association for the Education of Young Children developed the Guidelines to publicize and clarify its standards for quality teaching practices in early childhood programs.

NAEYC's first effort at delineating appropriate practices (1986) focused most specifically on programs for 4- and 5-year-olds, because of concerns about the formally academic content of many prekindergarten and kindergarten curricula. A recently expanded version of the Guidelines (Bredekamp, 1987) presents components of appropriate and inappropriate practice for each of 5 age groups: infants, toddlers, 3-year-olds, 4- and 5-year-olds, and primary grade children.

The organization of the Guidelines begins with a general position statement or statement of philosophy concerning developmental appropriateness in programs for children from birth to age 8; the Guidelines then provide a list of specific practices which are designated as "appropriate" or "inappropriate" for each age group. NAEYC defines "developmentally appropriate practice" as including both age appropriateness and individual appropriateness. According to NAEYC, developmentally appropriate teaching practices provide a suitable match between the capabilities and interests of children and the expectations of the curriculum

and teaching methods. Judging from the references cited in the 1987 edition (including Piaget, Erikson, Biber, Elkind, Asher, Rubin, Kamii, and Forman), the content of the Guidelines was strongly influenced by those developmental and educational theories and research findings which emphasize direct experience, adult warmth, concrete materials, child-initiated activity, and social interaction.

Grouped under categories such as "curriculum goals," "teaching strategies," and "cognitive development," each statement of an appropriate practice is paired with a corresponding inappropriate practice. For example, the following pair is found within the category of "teaching strategies" in programs for 4- and 5-year-olds:

APPROPRIATE PRACTICE	INAPPROPRIATE PRACTICE
Children are provided concrete learning activities with materials and people relevant to their own life experiences.	Workbooks, ditto sheets, flashcards, and other similarly structured abstract materials dominate the curriculum.

(Bredekamp, 1987, p. 54)

The Guidelines were intended to be useful to "teachers, administrators, and parents, policy makers, and others involved in programs serving children from birth to age 8, in schools, centers, and homes." (Bredekamp, 1987, p. iv). In addition, they seem potentially valuable to researchers interested in studying the effects of various kinds of early childhood program environments, particularly as they relate to the debate over "miseducation" (Elkind, 1987), "hothousing" (Gallagher & Coche, 1987; Sigel, 1987), and optimal forms of early learning in public and private school settings (Kagan & Zigler, 1987; National Association of State School Boards, 1988).

The purpose of this paper is to present a new, operationalized version of the NAEYC Guidelines for 4- and 5-year-old children, designed for use in direct observations of prekindergarten and kindergarten programs. We will first discuss the background and impetus for the creation of this instrument and then outline the steps used to develop it from the NAEYC materials. Data on the measure's reliability and validity will be presented, and suggestions for its use in other research will be made.

Method

Background of the Development of the Classroom Practices Inventory

The Classroom Practices Inventory was developed as part of a two-year study titled "Academic Environments in Early Childhood: Challenge or Pressure?" (Hirsh-Pasek and Hyson, 1986). The study was designed to trace connections between parents' beliefs or attitudes about early educational experiences (Rescorla, Hyson, Hirsh-Pasek, and Cone, 1989), parents' decisions about early childhood programs and other activities for their 4- and 5-year-old children, parents' interactions with their children (Hyson, Hirsh-Pasek, Rescorla, Cone, and Martell-Boinske, 1988), and various aspects of children's development and behavior, including academic skills, emotional well-being, and creativity (Hirsh-Pasek, Hyson, Rescorla, and Cone, 1989). To carry out this study, 126 middle and upper middle class families were recruited through 11 early childhood programs in Pennsylvania and Delaware. These programs were selected because they had reputations in the community as being either relatively "academic" or relatively "unstructured" or "play oriented."

A number of major research questions guided our thinking. One important question was whether parents with strong attitudes favoring formal educational

experiences for young children would send their children to preschool programs consistent with those attitudes. Second, we asked whether differences in the academic emphasis of a preschool program would influence children's skills and behavior in a number of developmental areas. To answer these questions, it was necessary to measure the "academic emphasis" of the early childhood programs in our study by means of direct classroom observation. Although reviews and anthologies list a large number of classroom observation instruments (Simon & Boyer, 1967; 1970; Soar & Soar, 1982), the aims of this study required a measure that would focus on differences in teacher-directed instruction, in emphasis on structured practice of specific skills, and in early introduction of formal academic lessons. The NAEYC Guidelines for 4- and 5-year-olds provided this emphasis, although they were not developed as a research instrument. Thus, the next step was to operationalize the Guidelines so as to allow them to be used reliably in direct observation of preschool classrooms.

Operationalizing the Guidelines: Initial Decisions

The NAEYC Guidelines for 4- and 5-year old programs contain 46 items grouped into 23 pairs (appropriate vs. inappropriate). Relatively few items could be used exactly as listed. In some cases, the NAEYC Guidelines had combined several key points or standards in one item; other items seemed difficult to assess through direct observation (e.g., "Interactions and activities are designed to develop children's self-esteem and positive attitudes toward learning"). Our rule was to select items that were (a) able to be rated on the basis of several hours of direct observation; (b) specific and discrete (one and only one key point per item); and (c) closely related to the debate in early childhood education between a formally "academic" focus (workbooks, drill, teacher direction) and a "play" emphasis (child

choice, concrete materials). NAEYC items were rephrased as necessary to adhere to these criteria. Our intent was not to develop a general measure of program quality such as the Early Childhood Environment Rating Scale (Harms & Clifford, 1980) or the NAEYC center accreditation observation measure (Bredekamp,1986; Holloway & Reichhart-Erickson,1988). Rather, the measure was designed to investigate certain aspects of early childhood curriculum for 4- and 5-year-old children.

Next, a choice had to be made between a rating scale and a time sampling format. As others have noted (e.g., Kerlinger, 1983; Soar & Soar, 1982), both time sampling and ratings have advantages and disadvantages. Time sampling appears to be more objective, since observers simply note the occurrence of certain activities or behaviors. However, time sampling techniques may fail to capture important but low-occurrence behaviors. Many of the items in the Guidelines are conceptually important although the actual amount of time they consume may be very brief (for example, teachers talking to children about their feelings). On a more immediate level, the classroom observations were planned as one part of a much larger study (the "Academic Environments" project), in which staff visited the schools not only to observe activities, but also to test children individually. Interruptions were inevitable. Thus, although a time-sampling version was developed and piloted[1], in the context of the larger study it was not feasible for observers to do continuous time-sample coding.

Finally, decisions had to be made about the format of the items. Both Harms and Clifford (1980) and the NAEYC Guidelines use a bipolar format, in which the "negative" extreme of a characteristic is one pole of the scale, and the "positive" extreme represents the other pole. For the purposes of this study it seemed

preferable to write separate, independent items for "appropriate" and "inappropriate" characteristics. In theory, a classroom could have both workbooks and concrete, open-ended materials.

Organization and Format of the Classroom Practices Inventory

The final version of the Classroom Practices Inventory appears in Appendix A. As can be seen, the CPI contains a total of 26 items. The first 20 are grouped under the heading of "Program Focus" and are based on the NAEYC Guidelines for 4- and 5-year-olds. Items were selected and, where necessary, adapted and reworded using the rules described above. According to NAEYC standards, half of these items (10) would be considered "positive" or "developmentally appropriate" and the rest are what NAEYC terms "inappropriate." The key in Appendix A identifies appropriate and inappropriate items; these labels did not appear on the observation form.

In addition to rating specific curriculum characteristics, the measure assessed the emotional climate of the early childhood program. It seemed unwise to assume that a formal academic emphasis would necessarily be accompanied by an equally formal or negative affective tone. A program's academic emphasis and its affective tone could be independent components, similar to the parenting characteristics of warmth/hostility and autonomy/control, which have been discussed as conceptually independent factors (Baumrind, 1989; Becker, 1964; Schaefer, 1959). Therefore, six items were written for the "Emotional Climate" section. These items were adapted from NAEYC's accreditation criteria for early childhood programs (NAEYC, 1984). As with the "program focus" items, both positively and negatively worded items were included (4 positive and 2 negative). These items tap teachers' warmth,

encouragement, and positive guidance, as well as the overall affective tone of the classroom.

The "positive" and "negative" items were listed in quasi-random order to encourage observers to rate each item independently. Each item was rated on a 5-point Likert-type scale, from "not at all like this classroom" to "very much like this classroom." The form allowed room for examples or explanatory comments under each item. The possible range of scores on this measure was 26 to 130, with high scores indicating more developmentally appropriate practices.

Sample

The Classroom Practices Inventory was used in 207 separate observations of 58 early childhood programs, with a mean of 3.5 observations per program. Those most intensively studied, and discussed in most detail in this article, were ten programs that participated in the "Academic Environments" study described above. Located in Pennsylvania and Delaware, these half-day private preschool programs served middle and upper middle class families. All were four-year-old or "prekindergarten" programs. The remaining observations, used to increase the sample size for the psychometric analyses of the measure reported below, were conducted in a wider spectrum of programs, including half day preschools, laboratory schools, day care centers, and public and private kindergartens in Pennsylvania and Delaware. These programs had been observed by university students in early childhood education in connection with course work.

Observation Procedures

Staff from the "Academic Environments" project observed ten of the preschools in that study, visiting each program on at least 2 occasions within a two-week period during the spring. These observers had training and experience in child

psychology and/or early childhood education. Before beginning their school visits, observers conducted pilot observations in a university laboratory preschool. After their first visit to each program, the observers were asked to complete a tentative version of the CPI, and then to complete the final rating form after the end of their last day at the program. This procedure appeared to help observers identify items which might have been overlooked during the first visit, or about which observers were initially uncertain. Teams of two observers visited each program; observers' ratings were made independent of one another so that interobserver reliability could be assessed.

For the additional observations (used for the psychometric analyses), early childhood education students had been required to spend at least 2 1/2 hours observing in each classroom. Schools were informed that students were visiting to observe differences in early childhood curriculum and teaching methods. The student observers had read and discussed the complete NAEYC Guidelines before doing the observations. They were asked to complete the rating forms as soon as possible after visiting each program.

Results

An examination of programs' mean ratings on the CPI shows a wide range of existing classroom practices. With a mean value of 1 representing consistently "inappropriate" practices and 5 representing highly appropriate practices, the 205 observations yielded a range for the total scale of 1.13 to 5.00, with a mean of 3.99 (SD .91). Turning to scores on specific subscales within the Classroom Practices Inventory, we see that mean ratings on the "Appropriate Program" items (the 10 positively worded items) varied from 1.22 to 5.00 (M = 3.88, SD .98); the range for the "inappropriate" program items was similarly wide although with a

lower mean (1.00 to 5.00, M 2.07, SD 1.00). The 6 items in the "emotional climate" section received a mean rating of 4.08 (SD .96), with a range of 1.00 to 5.00, suggesting relatively positive affective environments within the programs observed.

Internal Structure of the Classroom Practices Inventory

Using observations of the preschools in the "Academic Environments" study and the additional observations described above (N = 207), the psychometric properties of the Classroom Practices Inventory were examined through correlational and factor analyses.

Internal consistency of individual scales. Within the measure, reliabilities were computed for each of 4 subscales of the Classroom Practices Inventory, and for the total measure, using Cronbach's alpha. The scales and their reliabilities were:

Appropriate Program items: the 10 positively worded items (.92)

Inappropriate Program items: the 10 negatively worded items (.93)

Total Program: all 20 "program focus" items, with scoring for negative items reversed, so that a higher score always reflects more "developmentally appropriate" practices. (.96)

Emotional Climate: all 6 emotional climate items, with the scoring for the two negative items reversed. (.88)

Total Appropriateness (whole scale: 26 items) (.96)

This analysis indicated a high degree of coherence among each of the individual subscales and within the measure as a whole.

Intercorrelations of scales. Relationships among the subscales were investigated with correlational analyses. Scores for each subscale were correlated with the

other subscales and with the "Total Appropriateness" scale. As seen in Table 1, all intercorrelations were highly significant.

Insert Table 1 about here

Looking first at the two "program" subscales, we see that the appropriate and inappropriate program items are strongly negatively correlated (r -.82). If a program was rated highly on items such as "Children select their own activities from among a variety of learning areas" [appropriate item], it was very unlikely to be also rated highly on items like "Children used workbooks, ditto sheets, flashcards . . . ." [developmentally inappropriate item].

Concerning the issue of associations between the classroom's program (or academic) focus and its emotional climate, Table 1 indicates that the emotion items correlate significantly with each of the program subscales and with the "total program" score. Programs rated more highly on positive affective characteristics and positive guidance of children were significantly more likely to offer a high degree of child choice, concrete materials, and open-ended questioning in their curriculum.

Factor analysis. To further explore the characteristics of the Classroom Practices Inventory, the structure of the measure was explored through factor analysis with varimax rotation. Data for this analysis were scores on each of the 26 CPI items from the full set of 207 classroom observations, with scoring reversed on the negative items. A 4-factor solution accounted for 69% of the variance, with all factors having eigenvalues above 1. Table 2 displays the items loading most strongly on each factor.

Insert Table 2 about here

The first rotated factor accounts for 53% of the variance. 18 of the 26 items have loadings of >.30 on this factor. As can be seen in Table 2, this factor loads most heavily on items that tap encouragement of curiosity and creativity through provision of concrete, open-ended materials and divergent teacher questions.

The next 3 factors together account for an additional 16% of the variance in the measure. Factor 2 (6.1% of the variance), loads most strongly on those items having to do with workbooks, drill, and emphasis on isolated skills. Factor 3, accounting for 5.4% of the variance, loads highly on all the "emotional climate" items. Finally, Factor 4, accounting for 4.5% of the variance, has particularly high loadings on those items that rate the amount of physical activity and child choice available in the classroom.

As seen in Table 2, a number of separate and interpretable factors can be identified in the measure. However, the fact that over half of the variance is accounted for by the first factor, the substantial loadings of most of the items in the CPI on this factor, and the presence of a number of cross-loadings between items from Factor 1 and other factors, suggest that "developmental appropriateness" may be legitimately conceptualized as a single factor.

Interobserver Reliability of the CPI

As described earlier, pairs of observers had rated each of the 10 preschools visited as part of the Academic Environments study. Comparing ratings of the 26 items on the CPI, exact interobserver agreement (to the same scale point) averaged 64%. Agreement within 1 scale point was 97.7%. Total CPI scores

correlated .86 across pairs of raters. Because of the demands of other aspects of this study, the observers were not always in the classroom at the same time, and therefore had somewhat different opportunities to observe activities and interactions. Thus the level of interobserver reliability suggests that the CPI is able to assess fairly general, consistent patterns of program focus and emotional climate. Because individual observers saw somewhat different events and because interobserver agreement was good, ratings on each item were averaged across pairs of observers for use in subsequent data analyses.

Relationships Between CPI Scores and Program, Staff, Family, and Child Characteristics

The results of the correlational and factor analyses provided supportive evidence concerning the internal coherence of the Classroom Practices Inventory. The interobserver reliability we obtained was encouraging. Next, in order to examine its concurrent and predictive validity, "developmental appropriateness" scores as measured by the CPI were examined in relationship to a number of conceptually related variables from the "Academic Environments" study.

CPI scores and programs' community reputations. As described earlier, the 10 preschool programs observed in the Academic Environments study had been selected for inclusion because 5 of them were reputed in the community to be more "academic" and 5 were reputed to be more play-oriented or "unstructured." (These opinions were informally derived from conversations with community residents; the degree of awareness and consensus was striking among these informants.) Figure 1 displays the scores for all 10 schools (averaged across observers as noted above), with higher scores being more developmentally appropriate.

Insert Figure 1 about here

As can be seen, there was a strong tendency for schools which had "play" or "nonacademic/unstructured" reputations to be rated as more developmentally appropriate in independent observations using the Classroom Practices Inventory. The difference between the scores of the 5 reputedly "high" academic and the 5 "low" academic programs was highly significant, t (8) = -4.11, p <.01. For the reputedly "high academic" group, the mean CPI score was 2.24; the mean for the "low academic" group was 3.94 on the 1 to 5 scale.

Mothers' educational attitudes and CPI scores. One of the hypotheses in the "Academic Environments" study was that parents would choose preschool programs which matched the parent's educational values. The 126 mothers in this study had been given the Educational Attitude Scale (Rescorla, 1987). As described in Rescorla, Hyson, Hirsh-Pasek, and Cone, (1988), the EAS is a 32-item Likert-type questionnaire, with all items scored on a 6-level scale ranging from "strongly agree" to "strongly disagree." It taps parents' attitudes about early experiences in the domains of academic skills, athletics, and the arts, as well as parental views about early socialization experiences. Scores within each domain are summed to yield a total score. High scores on the EAS reflect a strong emphasis on adult teaching of skills (e.g., "Parents should help their preschool children to practice writing letters"), children's effort (e.g., "I think my preschool child should work at playing an instrument"), and practice (e.g., "I think preschoolers are old enough to practice at sports"). Total scores on the measure reflect higher levels of parental

expectations for, and more favorable attitudes toward, early formal learning and adult instruction.

Mothers' scores on the Educational Attitude Scale correlated -.41 ($p < .001$) with the Classroom Practices Inventory scores of the schools to which these parents had chosen to send their children. In other words, mothers with higher expectations for formal academic work and adult instruction were significantly more likely to enroll their children in preschool programs which were less developmentally appropriate as measured by the CPI. Those programs tended to emphasize teacher-directed learning, paper-and-pencil academic activities, and focused practice in school-related skills.

Teachers'/directors' educational attitudes and CPI scores. Staff members at the 10 early childhood programs in the Academic Environments project also completed an educational attitude measure. This measure (the Teacher Educational Attitude Scale) was identical in content and format to the parent EAS just described, except that some items were reworded (e.g., instead of "My preschool child," an item would read "Preschool children" or "The children in my class"). As with the parent version, higher scores reflect attitudes in favor of early academic instruction and adult-directed learning. Scores were averaged across the staff in each school, and those scores were correlated with the CPI score for that school. Again, there was strong consistency between direct observations of the "developmental appropriateness" of the program and the self-reported educational attitudes of the staff. (Spearman r (10) = -.66, $p < .001$).

Relationships between CPI scores and children's characteristics. Are children who attend more "developmentally appropriate" early childhood programs different in any important ways? This is a question of keen interest in early childhood

education and a singularly difficult one to answer, especially in nonexperimental research. Many of the socioeconomically advantaged parents in the Academic Environments study had selected their child's preschool because it reflected their own educational priorities. Thus the effects of program differences are difficult to disentangle from differences in parents' attitudes, which led them to select those programs in the first place. Despite these complicating factors, scores on the Classroom Practices Inventory yielded significant associations with a number of aspects of children's development and behavior. The following section provides examples of the use of the CPI to examine relationships between preschool program differences and three sets of child characteristics: academic skills, creativity, and anxiety[2].

Academic skills. Children in the study were given several academic and cognitive measures, described more fully in Hirsh-Pasek, Hyson, Rescorla, and Cone, 1989. At age 4, there was a weak negative relationship ($r = -.18$, $p < .05$) between CPI scores and children's academic skills (using a measure tapping knowledge of letters, numbers, geometric shapes and so on; items were selected from the Cognitive Skills Assessment Battery, Boehm & Slater, 1981). This zero-order correlation suggests that socioeconomically advantaged children in more formally academic preschool programs have a slight edge in academic skills at age 4. However, multiple regression analyses showed that both the child's age in months and the mother's Educational Attitude Scale scores were better predictors of academic skills than the nature of the child's preschool program. A subsample of children from the Academic Environments study were followed up at the end of kindergarten ($n = 65$). By that time, the modest academic skills differences had disappeared. Virtually all children in the study, regardless of the academic

emphasis of their preschool program, performed in a highly competent fashion on the follow-up academic skills measure, which was actually designed for first grade children.

Creativity. Two primary measures of creativity were obtained for children in the "Academic Environments" study: teacher ratings, using items from the Classroom Behavior Inventory (Schaefer, Edgerton, & Aaronson, 1978); and scores on Torrance's measure "Thinking Creatively in Action and Movement" (1981), which asks children to demonstrate or describe "how many different ways" they can perform each of a series of tasks. Aggregate creativity scores were derived using standardized scores on each of the measures. This aggregate creativity score correlated .33 ($p < .001$) with the Classroom Practices score of the program the child had attended the previous year, indicating that children in "developmentally appropriate" programs tended to be rated as more creative both by teachers and by experimenters. In a hierarchical regression analysis, CPI scores contributed a significant increment in R^2 even after mothers' educational attitudes (also significant predictors of creativity) had been entered.

Anxiety in a testing situation. In the spring of the child's preschool year, children had been individually tested by project staff. At the end of this session, the staff completed ratings of a number of aspects of children's responses to the assessment procedure. One of these was a 7-point anxiety scale, with the low end representing nervousness and anxiety during the testing session, and the high end indicating relaxation and confidence. To assess reliability, pairs of experimenters scored 20% of the children on this measure; raters' scores correlated .92. Classroom Practices scores of the children's preschools were modestly but significantly correlated with ratings of anxiety ($r = -.22$, $p < .01$); the less relaxed

children tended to be from programs scoring lower in developmental appropriateness on the CPI. Again, this relationship held up in regression analyses even after parental academic expectations had been entered into the equation.

"Developmentally appropriate" programs as buffers of mothers' high academic expectations. Despite the significant correlation between mothers' educational attitudes and Classroom Practices scores, not all parents with high academic expectations chose to send their children to highly academic preschool programs. To investigate whether a developmentally appropriate preschool might serve to "buffer" the potentially negative impact of family academic expectations, two groups of children were identified. One group (n = 20) had mothers with particularly high academic expectations (more than one-third of a standard deviation above the group mean on the Educational Attitude Scale) and had been enrolled in one of the 5 preschools with the lowest or least "developmentally appropriate" CPI scores. The second group (n = 18) had mothers with similarly high EAS scores but were sent to one of the 5 preschools with high CPI scores ("developmentally appropriate").

Within this subsample of children with especially high parental academic expectations, children attending the more developmentally appropriate preschools were rated as significantly less anxious in a testing situation, $t = 2.89$, $p < .01$. Furthermore, those children who attended a more developmentally appropriate preschool had significantly more positive attitudes toward later schooling, as assessed by a pictorial measure, the MYCATS (Van Trieste, 1989) at the end of their kindergarten year, $t\ (63) = 2.40$, $p < .05$. The two groups did not differ in academic skills.

Discussion and Implications

The Classroom Practices Inventory appears to be a promising measure with which to investigate characteristics of programs for 4- and 5-year-old children, especially those related to formal academic learning in early childhood. The wide range of scores, and their association with other school, parent, and child variables, indicate that the CPI is sensitive to important differences in curriculum and teaching practices in early childhood programs. The measure demonstrated excellent internal consistency and good levels of interobserver reliability, even when observers were not present at exactly the same times.

An important theoretical and practical issue is whether "developmental appropriateness" is a unitary construct; that is, whether the various components of developmental appropriateness go together in coherent fashion. As operationalized by the CPI, they appear to do so. The results of the correlational and factor analyses suggest that the "developmental appropriateness" construct has considerable coherence, and justifies using total scores rather than individual scale or factor scores in analyzing relationships between the Classroom Practices Inventory and other variables of interest.

In further development of the instrument, it might be useful to do independent ratings of the various scales, particularly the "emotional climate" and the "program focus" items. Having different observers rate different aspects of a program would help to further validate relationships among these components.

The "Academic Environments" study shows a number of associations between CPI scores and other parent, school, and child variables, supporting the measure's concurrent and predictive validity. Few ofthese relationships are straightforward,

but all are interesting. The finding that parents tend to send their children to preschools with similar educational values underlines one of the many ways in which parental "belief systems" (Sigel, 1985) may influence children's development. The educational attitudes of preschool staff were also found to be relatively consistent with scores on the CPI. Where discrepancies existed between staff attitudes on the EAS and classroom observations, they tended to occur in the "high academic" or less appropriate programs, in which teachers sometimes reported a belief in more child-centered, concrete curriculum than the CPI scores actually revealed. In at least one case, discussion with a teacher unveiled a conflict between the kind of curriculum the director wanted (seemingly driven by parents' wishes for a "good start" in academics) and what the classroom teacher actually wished to implement.

The CPI measure was also able to identify differences in preschool practices which were significantly related to differences in children's abilities and behavior. However, neat causal relationships cannot be identified on the basis of these data. What appear at first to be "school effects" may well be effects mediated through parental choice of a particular school and through the impact of other related parental characteristics and behavior. Nevertheless, the results show that preschool characteristics do make a difference in some areas of children's development, even when family effects are controlled for or removed. Further investigation of some of these areas, with larger and more socioeconomically diverse samples, is certainly needed.

A number of other research questions might be pursued with the Classroom Practices Inventory, either in its present form or with modifications. First, it would be a useful instrument for straightforward, systematic surveys of existing

classroom practices in prekindergarten and kindergarten programs. Although the present study collected data from 58 different programs, they were not selected to be representative. Secondly, some states are beginning to reexamine classroom practices in public kindergartens and are modifying curriculum guidelines in the direction of more concrete, play-oriented approaches. Repeated observations with the CPI might identify changes over time, and might allow study of the effects of variations in training and support upon those changes.

In terms of effects on children, the CPI could be used to identify program differences which could then be related to concurrent differences in children's behavior in the classroom, including frequency of social interaction, emotional responses, and exploratory behavior. The question here is what difference "developmental appropriateness" makes in terms of children's day to day experiences in preschool and kindergarten.

Moving beyond the 4- and 5-year-old age group, the CPI could be adapted to assess developmental appropriateness in programs for younger or older children, again using the NAEYC criteria. Of particular interest would be adaptation of the measure for use in the primary grades, to which the NASBE report (1988) and others have recently directed attention.

Finally, the measure may be of value to those interested in teacher education and in-service training. Direct observation of classrooms has long been a part of early childhood teacher education; the CPI has been successfully used to guide student observations in an early childhood curriculum course taught by one of the authors, in which students observe three programs and write a paper discussing their observations in terms of the NAEYC Guidelines. The instrument serves to

focus their perceptions on relevant components of classroom practices and provides good raw material for their papers.

The Classroom Practices Inventory is not the only possible measure for the observational study of these issues. As reflected in recent NAEYC conference sessions (Charlesworth, 1988; Jensen, 1987), a number of investigators are using the NAEYC Guidelines to guide the development of tools appropriate for research and for teacher education (Hart, Hernandez, Mosley, Kirk, & Burts, 1988; Jensen & Chevalier, 1987; Caruso & Oakes, 1988). The next few years should see the further refinement of existing instruments and the development of others. Collaborative efforts will speed this process.

In summary, the Classroom Practices Inventory appears to be a reliable, valid measure of developmental appropriateness. It is able to differentiate programs in meaningful ways and yields data that can be related to other parental, staff, and child variables of interest. As the debate over the most desirable models of prekindergarten and kindergarten education continues, observational research using conceptually meaningful, reliable instruments will be increasingly needed.

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Appendix A.

Inventory of Classroom Practices

Key: A = Appropriate Practice for 4 and 5 year old children
I = Inappropriate Practice for 4 and 5 year old children

(Note: Key would not be provided on the rating form. Rating scale would appear beside each item.)

Rating Scale:

1 = Not at all like this classroom
2 = Very little like this classroom
3 = Somewhat like this classroom
4 = Much like this classroom
5 = Very much like this classroom

Items

Part 1: Program/Activity Focus

1. Children select their own activities from among a variety of learning areas the teacher prepares, including dramatic play, blocks, science, math, games and puzzles, books, recordings, art, and music. (A)

2. Large group, teacher directed instruction is used most of the time. Children are doing the same things at the same time. (I)

3. Children are involved in concrete, three-dimensional learning activities, with materials closely related to children's daily life experiences. (A)

4. The teacher tells the children exactly what they will do and when. The teacher expects the children to follow her plans. (I)

5. Children are physically active in the classroom, choosing from activities the teacher has set up and spontaneously initiating many of their own activities. (A)

6. Children work individually or in small, child-chosen groups most of the time. Different children are doing different things. (A)

7. Children use workbooks, ditto sheets, flashcards, and other abstract or two-dimensional learning materials. (I)

8. Teachers ask questions which encourage children to give more than one right answer. (A)

9. Teachers expect children to sit down, watch, be quiet, and listen, or do paper and pencil tasks for major periods of time. (I)

10. Reading and writing instruction emphasizes direct teaching of letter recognition, reciting the alphabet, coloring within the lines, and being instructed in the correct formation of letters. (I)

11. Teachers use activities such as block building, measuring ingredients for cooking, woodworking, and drawing to help children learn concepts in math, science, and social studies. (A)

12. Children have planned lessons in writing with pencils, coloring predrawn forms, tracing, or correct use of scissors. (A)

13. Children use a variety of art media, including easel and finger painting, and clay, in ways of their choosing. (A)

14. Teachers expect children to respond correctly with one right answer. Memorization and drill are emphasized. (I)

15. When teachers try to get children involved in activities, they do so by stimulating children's natural curiosity and interest. (A)

16. The classroom environment encourages children to listen to and read stories, dictate stories, notice print in use in the classroom, engage in dramatic play, experiment with writing by drawing, copying, and inventing their own spelling. (A)

17. Art projects involve copying an adult-made model, coloring predrawn forms, finishing a project the teacher has started, or following other adult directions. (I)

18. Separate times or periods are set aside to learn material in specific content areas such as math, science, or social studies. (I)

19. Children have daily opportunities to use pegboards, puzzles, legos, markers, scissors, or other similar materials in ways the children choose. (A)

20. When teachers try to get children involved in activities, they do so by requiring their participation, giving rewards, disapproving of failure to participate, etc. (I)

Part 2: Emotional Climate

21. Teachers show affection by smiling, touching, holding, and speaking to children at their eye level throughout the day, but especially at arrival and departure. (A)

22. The sound of the environment is marked by pleasant conversation, spontaneous laughter, and exclamations of excitement. (A)

23. Teachers use competition, comparison, or criticism as guidance or discipline techniques. (I)

24. Teachers talk about feelings. They encourage children to put their emotions (positive and negative) and ideas into words. (I)

25. The sound of the environment is characterized either by harsh noise or enforced quiet. (I)

26. Teachers use redirection, positive reinforcement, and encouragement as guidance or discipline techniques. (A)

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Footnotes

[1]A copy of the time-sampling version of the Classroom Practices Inventory may be obtained from the first author.

[2]A more detailed discussion of these and other child outcomes, with emphasis on parents' contributions, appears in Hirsh-Pasek, Hyson, Rescorla, and Cone, 1989.

Table 1

Intercorrelations Among Classroom Practices Inventory Subscales and Total Score

	Subscales and Total Score				
	1	2	3	4	5
1. Approp. Program Focus Items		-.82	.95	.79	.91
2. Inapprop. Program Focus Items			-.95	-.75	-.90
3. Total Program Focus Items (scoring reversed for Inapprop. items)				.81	.95
4. Emotional Climate (scoring reversed for neg. items)					.95
5. Total Appropriateness Score (scoring reversed for neg. items)					

N = 205; all ps < .001.

Table 2

Summary of Classroom Practices Inventory Items with Highest Loadings on Each Factor

FACTOR 1 (53% of variance): CHOICE, CONCRETENESS, CREATIVITY

Item #	Content of Item
8.	Teachers ask questions which encourage children to give more than one right answer. (.69)
13.	Children use a variety of art media, including easel and finger painting, and clay, in ways of their choosing. (.68)
15.	When teachers try to get children involved in activities, they do so by stimulating children's natural curiosity and interest. (.66)
16.	The classroom environment encourages children to listen to and read stories, dictate stories . . . engage in dramatic play, experiment with writing . . . (.65)
11.	Teachers use activities such as block building, measuring ingredients for cooking . . . to help children learn concepts in math, science, and social studies. (.64)
19.	Children have daily opportunities to use pegboards, puzzles, legos . . . in ways the children choose. (.60)
24.	Teachers talk about feelings. They encourage children to put their emotions (positive and negative) and ideas into words. (.57)

FACTOR 2 (6.1%): ROTE LEARNING, ISOLATED SKILLS, EXTRINSIC REWARDS

Item #	Content of Item
10.	Reading and writing instruction emphasizes letter recognition, reciting the alphabet . . . . (.79)
18.	Separate times or periods are set aside . . . in content areas such as math, science, or social studies. (.74)
7.	Children use workbooks, ditto sheets, flashcards, or other abstract or two dimensional learning materials. (.72)
12.	Children have planned lessons in writing with pencils, coloring predrawn forms, tracing, or correct use of scissors. (.66)

14. Teachers expect children to respond correctly with one right answer. Memorization and drill are emphasized. (.65)

20. When teachers try to get children involved in activities, they do so by requiring their participation, giving rewards, disapproving of failure to participate, etc. (.55)

4. The teacher tells the children exactly what to do and when. The teacher expects the children to follow her plans. (.50)

FACTOR 3: (5.4%): POSITIVE EMOTIONAL CLIMATE AND POSITIVE DISCIPLINE

(Note: Negative items were scored in reverse, as indicated.)

Item #	Content of Item
25.	The sound of the environment is [NOT] characterized either by harsh noise or enforced quiet. (.80)
26.	Teachers use redirection, positive reinforcement, and encouragement as guidance or discipline techniques. (.71)
23.	Teachers [DO NOT] use competition, comparison, or criticism as guidance or discipline techniques. (.68)
21.	Teachers show information by smiling, touching, holding, and speaking to children at their eye level throughout the day, but especially at arrival and departure. (.65)
22.	The sound of the environment is marked by pleasant conversation, spontaneous laughter, and exclamations of excitement. (.64)
24.	Teachers talk about feelings. They encourage children to put their emotions (positive and negative) and ideas into words. (.57)

FACTOR 4 (4.5%): PHYSICAL ACTIVITY AND INDIVIDUALIZED LEARNING

Item #	Content of Item
6.	Children work individually or in small, child-chosen groups most of the time. Different children are doing different things. (.77)
2.	Large group, teacher directed instruction is [NOT] used most of the time. Children are [NOT] doing the same things at the same time. (.77)
5.	Children are physically active in the classroom . . . . (.68)

1. Children select their own activities from among a variety of learning areas the teacher prepares . . . . (.63)

3. Children are involved in concrete, three-dimensional learning activities, with materials closely related to their daily life experiences. (.51)

Note: Within each factor, items are listed in descending order, with those with the highest loadings listed first. Only items with loadings > .50 are listed; loadings appear in parentheses after each item.

Figure Caption

Figure 1. Classroom Practices Inventory scores for programs reputed to be "high" and "low" in formal academic emphasis.