



Center-based early childhood care and education program quality: A South African study



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ARTICLE INFO

Article history:

Received 20 May 2013

Received in revised form 3 January 2016

Accepted 9 January 2016

Keywords:

ECCE

Program quality

Early childhood development

South Africa

ABSTRACT

We report on the first representative sample survey of Early Childhood Care and Education (ECCE) program quality to be conducted in South Africa ($n = 242$ ECCE centers). The Early Childhood Environmental Rating Scale—Revised (ECERS-R) and Infant–Toddler Environmental Rating Scale—Revised (ITERS-R) were used to assess ECCE quality. A Center Management Quality measure based on South African center licensing requirements was constructed and administered to center supervisors. We found that classes for both younger and older children fall just above the ‘minimal’ quality level on both measures. Regression analyses were conducted to establish determinants of center quality. Predictors included: licensing and subsidy status, teacher information (age, highest qualification and years in ECCE), presence of a Reception Year class in the center, teacher–child ratio, weekly fees, management quality, center support and parent involvement. Outcome measures were ITERS-R and ECERS-R total scale scores. Fees charged and center management capacity were predicted the quality of the care and learning environment. The relationship between level of child deprivation in the community (as an indicator of child poverty) and ITERS-R and ECERS-R total scores was examined separately. A significant negative relationship was observed between program quality and the level of child deprivation in the area served by the center. Implications for improving center quality for disadvantaged children in South Africa are discussed.

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1. Introduction

Since democratic government in South Africa was achieved in 1994, access to early childhood services of different kinds has been promoted as both a human resource capacity building strategy and a means to achieving equity for poor children. This mirrors a trend in many low- and middle-income countries, strengthened by international evidence for the value of early intervention (Engle et al., 2007, 2011), and commitment to Education for All Goals. Between 1994 and 2013, a number of policies and plans have been piloted for the expansion of Early Childhood Care and Education (ECCE) services.

ECCE services for children under five years of age fall under the auspices of an interdepartmental committee including the National Departments of Social Development, Basic Education and Health. Each of the nine provincial governments is responsible

for regulating provision of services. An Integrated Early Childhood Development Programme of Action provides the policy framework for services to children at home, in the community, and in ECCE centers. The South African Government’s Medium Term Strategic Framework for 2009–2014 (Government of South Africa, 2009) prioritizes access to quality ECCE center services and White Paper 5: Early Childhood Development (Department of Education, 2001a) provides for a universal reception (pre-primary) year for five year olds as part of the schooling system. In 2013, 91% of Grade-1 children were reported to have attended a formal reception class (Department of Basic Education, 2015a).

Increasing concern about poor schooling outcomes has fueled political support for ECCE services in South Africa. In 2014, average achievement at Grade 3 on the Annual National Assessments was a mark of 56% for literacy and 56% for mathematics, with greatest underachievement in the poorest areas (Department of Basic Education, 2014). Measures to address this include attention to early childhood services as well as interventions in the schooling system. National Early Learning Development Standards were introduced in 2009 (Department of Education, 2009) and a

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National Curriculum Framework for Children from Birth to Four (Department of Basic Education, 2015b) which was piloted in 2015.

Evidence to support policy is emerging. Recent South African studies have indicated an association between preschool attendance and better schooling outcomes. A study conducted under the auspices of the Southern African Consortium for Monitoring Educational Quality (Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ), 2011) found that children with longer durations of preschool had higher scores in reading and mathematics at Grade 3. Two years greatly increased scores compared with one but after this, tended to level off. National Income Dynamics Study data (Gustafsson, 2010) also indicate that children who have received pre-primary schooling perform better than those who have not. The finding is most robust in rural contexts and is independent of home background.

Approximately 35% of children in South Africa attended a formal ECCE facility or program including crèches, day-care centers, playgroups, and pre-primary schools in 2014 (Statistics South Africa, 2015). However, only 20% of children in the bottom two income quintiles (applies to 58% of 0–4 year olds) access any form of ECCE (Harrison, 2012). The sector of the population that is most in need of quality support for early learning is least likely to access it. A significant barrier is cost. Improving the quality of ECCE centers through registration/licensing with provincial governments, expanded government subsidies for centers serving poor children, and an extensive training program to improve staff qualifications remains the major focus of government plans for younger children (Biersteker, 2011; Department of Public Works, 2011; Government of South Africa, 2009), and is driven by recognition that services must be of high quality if they are to place children on a better educational trajectory and improve the quality of learning in formal schooling (Department of Basic Education, 2010; Gustafsson, 2010; Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ), 2011). The quality imperative has also been reaffirmed as part of the Early Childhood Care and Education agenda for action of Education for All (UNESCO, 2010) to which South Africa is a signatory.

1.1. The South African approach to quality ECCE

The model of quality espoused by the Government of South Africa and ECCE training institutions, follows universal views of quality ECCE as promoted in the USA, United Kingdom, and by international ECCE bodies, such as the Asia-Pacific Regional Network for Early Childhood (Profeta, 2012; Department for Education, 2014; International Step by Step Association (ISSA), 2011; Copple & Bredekamp, 2009). From this perspective high-quality care provides children with a wide variety of age-appropriate activities to support development across domains: a focus on language; a balance of free choice and teacher-directed activities; and warm teacher–child interaction that promotes learning. In keeping with international practice, and of particular importance in South Africa, are the acceptance of cultural diversity and the inclusion of local as well as global materials and content in the program. The South African National Curriculum Framework promotes playful pedagogy for the delivery of the curriculum and, as far as possible, mother tongue as the medium for learning and teaching. However the guiding framework and ECCE program regulations are no different from what might be found in many other ECCE settings around the world.

1.2. Question of quality

While the definition of quality is relative and complex, international evidence indicates that children who attend high-quality programs have better outcomes in several developmental domains.

For example, Burchinal et al. (2000) found that higher-quality child care related to higher measures of cognitive and language development and communication skills over time for infants 6–36 months even after adjusting for certain child and family characteristics. Love, Harrison, Sagi-Schwartz, van Ijzendoorn, and Ross (2003) report that Early Head Start found positive cognitive, language and socio-emotional development gains for children enrolled in a center program that provided high levels of good quality care. The National Institute of Child Health and Development (NICHD) Early Child Care Research Network (ECCRN) study found high quality care to be related to better cognitive outcomes, less impulsivity, and better social competence at 4.5 years (NICHD Early Child Care Research Network, 2003; NICHD Early Childhood Care Research Network, 2005).

Better quality ECCE predicts better school outcomes. Higher-quality early child care of children 6–54 months promotes mathematics and reading achievement of low income children in middle childhood (Dearing, McCartney, & Taylor, 2009). Sylva et al. (2006) found that the educational quality of ECCE classrooms is related to enhanced cognitive and language development. While most of the evidence is from higher-income country studies, findings from low- and middle-income countries in the Global South are emerging. This study seeks to contribute to the body of evidence.

For example, Aboud (2006) found that low-income preschool children in Bangladesh had significantly higher school readiness test scores than children who had not attended preschools. They also performed better on vocabulary and verbal and non-verbal reasoning. Classroom quality was significantly associated with group cognitive score. In Kenya, Mwaura (2009) found Madrassa Resource Center preschools to be of higher quality than conventional community preschools. Children who had attended Madrassa centers performed significantly better on measures of language and cognition than children who had had no preschool intervention or had attended community preschools (Mwaura, Sylva, & Malmberg, 2008). In South India, Rao (2010) demonstrated the influence of preschool quality on the development of 4 year old children from poor rural families. In a Cambodian study, Rao et al. (2012) found that children who had attended state preschools with better-trained staff and more educational resources performed better on developmental measures than children in either community preschools or home programs. They note that even where programs might be regarded as being of poorer quality by standards used in higher income countries, children in disadvantaged circumstances benefitted. Consistent with findings from higher-income countries, where program quality was better, child outcomes were improved. A South African evaluation of interventions to improve ECCE, Dawes, Biersteker, and Hendricks (2012) found that children in poor rural and peri-urban communities who had attended preschools where teachers had received training and support significantly outperformed children who had no preschool experience when they entered reception classes at age five.

1.3. Predictors of ECCE quality

The definition and measurement of quality indicators for ECCE settings is complex and contested, given variable resources in different contexts and differing cultural values placed on children developing particular attributes and skills (Myers, 2006; Nsamenang, 2006; Penn, 2005; Tobin, 2005). However, dimensions commonly focused upon include structural variables such as the physical setting, teacher–child ratio, group size, teacher qualifications, learning materials, and process variables including classroom interactions.

There is broad agreement that elements such as a holistic curriculum, active child play with concrete materials, and sensitive, mediated caregiver/child interaction contribute to better child

outcomes. For example, [Montie, Xiang, and Schweinhart \(2006\)](#), using data from 10 countries, found significantly better language outcomes at age 7 from children who had attended preschools where free-choice activities predominated, and their cognitive performance was better if they spent less time in whole-group activities and where they had access to many and varied materials. [Sylva et al. \(2006, 2007\)](#) demonstrated the positive effects of teacher–child interaction and the nature of teaching and learning activities in English pre-schools on children's cognitive and social development at the start of primary school. Pedagogy that incorporated adult led 'teaching,' the provision of instructive learning environments, and 'sustained shared thinking' to extend children's learning was found to be most effective ([Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2004](#)).

Starting Strong III ([OECD, 2012](#)), reviewing current evidence, also concludes that combining child-initiated with teacher-initiated content and activities maximizes learning, development and social outcomes. In sum, a balance of many free choice activities with carefully selected materials, engagement with peers, and interactions with teachers in adult-led group activities, as well as engagements based on child initiated activities are associated with better child learning outcomes.

There is less consensus on ratios and class size. For example, while [Burchinal et al. \(2000\)](#) found that classes meeting US professional standards for adult-child ratios tended to have more favorable language outcomes, [Montie et al. \(2006\)](#) found group size to be unrelated to language outcomes at age 7 leading to the conclusion that relationships between group size, adult-child ratio, and process characteristics are a function of cultural practice. Likewise [Siraj-Blatchford and Wong \(1999\)](#) and [Tobin \(2005\)](#) have pointed out that teacher–child ratios and class sizes considerably in excess of those approved by United States standards can achieve excellent outcomes.

Teacher training is generally used as a quality indicator. [Fukkink and Lont's \(2007\)](#) review of specialized training interventions suggests a causal link between caregiver training, caregiver competencies, and child behavior. [Phillips, Mekod, Scarr, McCartney, and Abbott-Smith \(2000\)](#) found that teacher training linked to higher-quality classroom processes as have other studies ([Love, Schochet, & Meckstroth, 2002](#); [Tarullo, 2002](#)). But in seven major ECCE studies, using teacher qualifications to predict classroom and academic outcomes for children, [Early et al. \(2007\)](#) found largely null and contradictory findings. Evaluations in South Africa ([Department of Education, 2001b](#); [Dlamini, Ebrahim, Ntshingila, & Soobrayan, 1996](#)) have also indicated that qualification levels do not necessarily link to better quality programs. In different country contexts, larger groups did not predict poorer outcomes and likewise better qualifications did not necessarily predict better child performance or quality classrooms.

There is limited research on the role of management variables as contributors to quality ([Muijs, Aubrey, Harris, & Briggs, 2004](#)). However, governance and management, including staff support ([Britto, Yoshikawa, & Boller, 2011](#); [OECD, 2001](#)), and working conditions ([Phillips et al., 2000](#)) have recently received attention. [Britto et al. \(2011\)](#) observe that though leadership and management is critical to quality, they are not often considered in assessments of quality. In centers, these variables likely affect access to resources and how these are allocated. Management quality is likely to influence responsiveness to staffing issues, supervision, and organizational climate. Management and administration standards are often a component of requirements for licensing and accreditation. For example, the [Association for Childhood Education International \(2006\)](#) includes a category of "Accountability, supervision and management" of ECCE programs in its Global Guidelines on Quality.

This, among other aspects, includes professionalization, compliance with government policy, and partnership with parents. South African guidelines for early childhood services also include a focus on management and administration ([Department of Social Development, 2006](#)).

Research on management of ECCE services has tended to focus on professional leadership aspects including ECCE qualifications of directors ([Ackerman, 2008](#); [Fowler, Bloom, Talan, Beneke, & Kelton, 2008](#); [McCormick Center for Early Childhood Leadership, 2008, 2010](#); [Phillips et al., 2000](#)). The 'Effective Leadership in the Early Years Sector' (ELEYS) study ([Siraj-Blatchford & Manni, 2008](#)), showed that effective early years programs were almost always characterized by strong leadership, low staff turnover, and consistency of approach, especially in relation to the curriculum and pedagogy.

Studies using the Program Administration Scale ([Talan & Bloom, 2004](#)) have produced evidence for a relationship between quality of administrative practices and early childhood classroom quality ([Ackerman, 2008](#); [Dennis, 2010](#); [Lower & Cassidy, 2007](#); [McCormick Center for Early Childhood Leadership, 2010](#)). Facilities that provide better working conditions have been observed to provide better care and education ([Litjens & Taguma, 2010](#)), and managers of ECCE centers are a key factor in providing favorable working conditions for their staff ([OECD, 2012](#)). Some aspects of professional support include providing opportunities for professional development, regular staff meetings, and good working relationships ([OECD, 2012](#)).

Observations of ECCE centers in countries which have some demographic similarities with South Africa using the Infant and Toddler Rating Scale (ITERS) or Early Childhood Environmental Rating Scale (ECERS) suggest that quality is generally inadequate to minimal rather than good to excellent. For example, a study of infant classes in six Brazilian cities ([Verdisco & Perez Alfaro, 2010](#)) found minimal infrastructure quality, adequate teacher–child Interaction, and inadequate ratings on the Activities subscale (study means are not comparable with others as the authors used a 10 point rather than a 7 point scale for scoring). In preschool classes (over 30 months), ECERS scores in Kenyan centers were in the minimal range for Infrastructure and Activities but good for Interaction ([Mwaura, 2009](#)). [Aboud's \(2006\)](#) study of 22 preschools in rural Bangladesh found that they were inadequate on Infrastructure, Care Routines, Activities and Programme Schedule, but in the minimal range for Interactions which were friendly and respectful. Even in high-income countries, there is evidence that the scores can be low. Composite ITERS scores in the Netherlands were 3.4 ([Vermeer et al., 2008](#)) and Canada ([Goelman et al., 2006](#)) respectively. And studies in less wealthy but developed Portugal ([Pessanha, Aguiar, & Bairrao, 2007](#)) and Greece ([Petrogiannis, 2002](#)) have rendered composite ITERS scores of 2.6 (inadequate) and 3.5 (minimal) respectively. Across the studies, scores on the Activities subscale tend to be low.

Integration of care and education is widely recognized to be an indicator of a good quality program—including health and nutrition elements which are so important to address in low-income settings ([Engle et al., 2007](#); [UNESCO, 2007, 2010](#)). Recently, integration has also come to mean service provision beyond the center including the ability to make referrals (e.g. for health services), and to work with social, health, and adult education authorities. [OECD \(2001\)](#) and the South African National Integrated Plan for Early Childhood Development ([Department of Education, 2005](#)) make provision for integration as a quality dimension. [Ang \(2012\)](#) notes the significance of integrated and multiagency working as a factor which influences leadership of early childhood centers and impacts on professional practice.

1.4. Studies of ECCE quality in South Africa

Little is known about the quality of ECCE centers in South Africa. A nationwide audit was conducted by the Department of Education (2001a), but did not comprehensively assess the quality of the program being offered to children. Since then, two studies in which neither standardized nor comparable measures were used have been conducted. De Witt's (2010) small-scale study of the quality of ECCE classes provided by non-profit organizations in low-income, rural communities showed that few centers had basic resources for teaching. Access to clean water on site and sanitation were lacking in many cases. Prior to training and provision of equipment, there were no regular music or art activities and no activities to develop perceptual and logical skills. The University of the Witwatersrand School of Education (2009) studied the quality of public Reception Year classes in a largely urban province. Only half the teachers used language to extend learning, classes tended to be overly formal rather than using a free-play approach, and there was little evidence of music and movement or early science activities.

Both these studies therefore indicate that programs were generally of poor quality. A recent South African public expenditure tracking study included an assessment of service quality in over 600 Reception Year classes and ECCE facilities for younger children (Department of Basic Education, 2010). A purpose-designed rather than standardized classroom quality index was used. Indicators included: Infrastructure, Learning and Teaching Support Materials (furniture, toys, books and art materials), Daily Program (free play, language and creative activities, large and fine motor development), and records of children's work. Program quality was found to be better in schools located in the top three income quintiles (a classification used by the Department of Basic Education), indicating that children from financially advantaged backgrounds received the better service.

1.5. The present study

The Department of Social Development of the Western Cape Provincial Government in South Africa (the sponsor) contracted the Human Sciences Research Council (www.hsrc.ac.za) to undertake a study to establish the quality of ECCE in the Province. The HSRC in turn subcontracted the current authors to design and conduct the study and report on the findings. The sponsor assisted with the construction of the sampling frame for participant selection (based on their administrative records) and facilitated entry to ECCE centers selected for participation. The sponsor played no further role, but has approved the submission of this paper for publication. The study also provided a baseline assessment of the extent to which centers met national norms and standards for ECCE services (Department of Social Development, 2006).

While providing a practical tool to inform initiatives to improve ECCE provisioning and programming, the study adds to other research investigating quality of centers in low- and middle-income countries. The two central objectives were to describe the quality of a representative sample of ECCE centers in the Western Cape Province, and to develop an understanding of factors contributing to levels of care and education provided. In addition to a basic assessment of the quality of the space, program, activities, routines, caregiver interaction, the role of factors such as management quality, income through fees charged and subsidies received, licensing, teacher qualifications and experience, and child-teacher ratios are examined so as to establish their influence on the quality of the classroom environment.

2. Method

2.1. Participants

The study was undertaken in one of South Africa's nine provinces, the Western Cape, which according to the 2011 Census, has a population of 5.82 million. Sixty four per cent (3.73 Million) are residents in Cape Town, and the balance is spread across much smaller towns and rural settlements (Statistics South Africa, 2012). The 0–4 years (inclusive) population is 564 801. Of this age group, 39% are estimated to participate in some form of out of home care, including attendance at a crèche (group care for children under 24 months) preschool or community playgroup, or being looked after by a child minder (Statistics South Africa, 2013). Participation for the country as a whole is 35%. Due to the framing of the Statistics South Africa survey question, it is not possible to know the proportion attending a facility that is accredited to provide an early learning program.

2.2. Sample

A probability proportionate to size, three-stage sampling procedure was employed to derive a final sample of 240 centers that would permit the results to be generalized with a confidence level of 95%. First, the total number of centers in the Western Cape was established at 2,293. Of these, 1523 (66.42%) were located in the City of Cape Town, and 770 (33.58%) in smaller towns and rural communities, ('Rural-based' centers for present purposes). Random samples of both city and rural centers were then constructed, with rural centers over-sampled to achieve equal representation and take account of the more limited resources and support to centers in rural areas. The resulting samples consisted of 121 (49.58%) rural and 119 (50.42%) city-based centers (10.47% of the provincial center population). Second, and for the city and rural areas, the number and proportions of centers in the province for three categories of interest were established: (a) registered (licensed with the government) and subsidized, (b) registered but not subsidized, and (c) neither registered nor subsidized. For the city and rural areas, random samples proportional to the provincial totals for each of these categories were drawn. Finally, centers in each of the three registration and subsidization categories were stratified by provision of classrooms for two age groups: (a) children aged less than 36 months, and (b) children aged 36–50 months. Samples of each proportional to the number of classes in each registration category in the province were drawn. A breakdown of the city and rural-based samples is provided in Table 1.

An additional sixty randomly selected centers were held in reserve should replacements be required. Forty-four replacements were necessary: 22 centers refused to participate; 10 had closed; supervisors of five could not be contacted and did not appear to be operating; seven were no longer offering a service to children in the target age group.

2.3. Measurement of the quality of the ECCE classroom environment

Instruments were required to be reliable, valid, and widely used, and cover domains relevant for South African norms and standards for ECCE facilities (Department of Social Development, 2006). In order to enable international comparison, measures of the classroom environment had to be the same as those commonly used in other countries. They included: The Infant and Toddler Environmental Rating Scale—Revised (ITERS-R) (Harms, Cryer, & Clifford, 2006) and the Early Childhood Environmental Rating Scale—Revised (ECERS-R; Harms, Clifford, & Cryer, 2005).

Table 1
Samples.

Stratifications	ECCE center city-based sample			ECCE center rural-based sample		
	Populations: city n (%)	Samples: city n (%) ^a	% final sample	Populations: rural n (%)	Samples: rural n (%) ^b	% final sample
Totals	1523 (100.00%)	119 (7.98%)	66.42%	770 (100.00%)	121 (15.71%)	33.58%
Registered & subsidized: 0–35 m	263 (17.27%)	21 (7.69%)	11.34%	158 (20.52%)	25 (15.82%)	6.89%
Registered & subsidized: 36–59 m	260 (17.07%)	20 (7.58%)	5.76%	213 (27.66%)	33 (15.49%)	9.29%
Registered not subsidized: 0–35 m	132 (8.67%)	10 (7.59%)	6.32%	71 (9.22%)	11 (15.49%)	3.10%
Registered not subsidized: 36–59 m	145 (9.52%)	11 (7.98%)	15.31%	94 (12.21%)	15 (15.96%)	4.10%
Not registered & not subsidized: 0–35 m	351 (23.05%)	28 (7.80%)	16.22%	95 (12.34%)	15 (15.79%)	4.14%
Not registered & not subsidized: 36–59 m	372 (24.43%)	29 (7.98%)	11.47%	139 (18.05%)	22 (15.83%)	6.06%

^a Percentages refer to proportions of City-based ECCE centres for each stratification in the final sample; e.g., the 119 ECCE City-based centers make up 7.98% of all 1523 city-based centers.

^b Percentages refer to proportions of Rural-based ECCE centres for each stratification in the final sample. e.g., the 121 ECCE Rural-based centers make up 15.71% of all 770 rural centers.

Developed and widely used in the United States of America, the ECERS-R has been translated into several languages and used in developing countries (sometimes with adaptations to local context), including East Africa (Mwaura, 2009), Brazil (Verdisco & Perez Alfaro, 2010), Chile (Herrera & Mathiesen, 2005; Villalon, Suzuki, Herrera, & Mathiesen, 2002). This study is the first from South Africa. Both the ITERS-R and the ECERS-R are observational tools with well-established reliability. Each has 7 subscales covering equivalent areas adapted according to age appropriateness. In the ITERS-R and ECERS-R manuals, each item is scored on a seven-point scale of quality. Total scores are classified as inadequate (1–2), minimal (3–4), good (5–6) and excellent (7) (Harms et al., 2005, 2006). Each subscale is accorded equal weight in determining the ITERS-R or ECERS-R total score. Scales such as *Space and Furnishings* are heavily reliant on infrastructure which is known to be a challenge in provisioning in South Africa. Others such as *Parents and Staff*, and aspects of *Personal Care Routines* are not necessarily within the control of the classroom teacher. A breakdown by subscale is helpful in determining which aspects of the program require most attention when the intention is to improve services.

Careful consideration was given to whether the ITERS-R and ECERS-R measures were appropriate for the South African situation as it is recognised that they have been developed around child development goals and practices widely accepted in the developed countries. For example high scores on the educational program depend largely on opportunities for free play in a resource rich environment (Fenech, 2011; Layzer & Goodson, 2006). Factors such as multilingualism and linking of children to health and social services, which are important indicators of program quality in South Africa, are not included. So while there might be universal elements of quality there are likely to be regional- or population-based specificities (Lambert et al., 2008). After consultation with a local reference group of practitioners and government officials, it was agreed that in general, the measures align well with local ECCE center licensing requirements and the dimensions of quality that inform accredited teacher training programs. For the policy-makers, a key purpose of the study was to provide a benchmarking of where ECCE facilities were in relation to these as a basis for improvement. Items such as language use and linking children to broader services to support their holistic development were provided for in the management and administration checklist.

As shown in Table 4, ITERS-R subscales showed good reliability ranging from 0.68 to 0.88, with an overall scale reliability of 0.95. Similarly, the ECERS-R showed sound overall good reliability was observed for the two instruments ranging from 0.68 to 0.92, with an overall scale reliability of 0.95 for ITERS-R and 0.97 for ECERS-R. Experienced trainers of early childhood teachers familiar with criterion-referenced assessment methods were recruited and trained over five days to undertake center visits and

classroom assessments. Training included a general introduction, instruction on using the measures, video observations, and discussions on the rating system. Training on the ITERS-R and ECERS-R included practice in classroom observation accompanied a trainer who had experience administering the instruments. Trainees independently completed observations followed by an item by item debriefing with the experienced trainer and others in their group after which inter-rater agreement was determined. For the ITERS-R and the ECERS-R, there was 70% agreement on all items rated and 83% within one point of the 7-point scale. Assessors who did not fall within this range were not retained.

2.4. Assessment of center management quality

As noted in the introduction, management quality is likely to influence responsiveness to staffing issues, supervision, and organizational climate, and in South African ECCE policy, certain management standards need to be met for licensing purposes. Also, Myers (2001) has established that center management capacity contributes to the quality of the care and learning environment. Given that one of the goals of this study was to develop an understanding of factors that might enhance or detract from the quality of the teaching and learning environment, an indicator-based Center Management Quality Questionnaire was constructed and administered to the supervisor (head) of the center. The instrument may be obtained from the first author.

Selection of indicators was informed by South African ECCE policies and norms and standards in particular (Department of Social Development, 2006), and indicators proposed by Myers (2001). Those used in this study are presented in Table 2. Each indicator score is summed to provide a total Center Management Score (maximum possible = 44). Internal consistency was $\alpha = 0.85$. Additional information collected during the interview with the supervisor included data on enrolments, fee amount charged, teacher qualifications, class sizes and teacher child ratios, and whether or not the center received support visits from the Department of Social Development. Two separate items assessed the licensing (known as *Registration* in South Africa) and subsidy status of the center. Registration with the provincial government is a requirement, but many centers—particularly those recently established may not be licensed and this is a threat to management and program quality. Licensed centers that serve children living in households below a certain income threshold are eligible for a small government subsidy (ZAR15.00 US\$1.40) per eligible child per day. The subsidy is intended to cover food (50%), staff (25%) and other costs (25%).

Each center visit included a classroom observation lasting several hours, and an interview with the head of the center (hereafter the supervisor). Following completion of the fieldwork, three focus group feedback meetings with assessors provided qualitative feed-

Table 2
Management quality indicators.

Indicators	Definition and scoring
1: Constitution	The presence of a constitution outlining governance practices. Scoring based on the extent to which the constitution fulfils legal requirements (maximum = 3)
2: Management committee	The center has a committee that is charged with overseeing center management and finance. Scoring based on the extent to which the committee functions as required (maximum = 4)
3: Policies	Policies for fees, health and safety; admissions; HIV and AIDS; child abuse; and financial management. Scoring: 1 point for each (maximum = 6)
4: Human resources records	Job descriptions; employment contracts; salary advice slips; staff attendance register; disciplinary and grievance procedures; leave application forms; performance appraisals. Scoring: 1 point for each (maximum = 7)
5: Child records	Application form; admission form; medical records; accident/incident book; medicine administration book; attendance register; child progress reports; all records are securely stored. Scoring: 1 point for each (maximum = 8)
6: Financial records	Bank account; receipt book; fees register; petty cash book; monthly budget; annual budget; financial reports; requisition for payment; annual financial statement; inventory; stock records. Scoring: 1 point for each (maximum = 11)
7: Fundraising	The extent to which the center targets parents, local community resources formal funding agencies. Scoring: 1 point for each (maximum = 3 points)
8. Year plan	Evidence of a business plan; a plan for key events in the year. Scoring is based on detail and feasibility (maximum = 2)

back on the observations and interviews with center supervisors. This was helpful in providing a more nuanced account of quality and is adopted in reporting the results of this study. Approval to conduct the study was received from the Human Sciences Research Council Research Ethics Committee (13-05-2009). Participating centers provided informed consent.

2.5. Data analysis

Protocols were checked and where incorrect entries or missing data were evident, these were followed up and corrected. All assessors kept observation notes and provided details to justify scores to avoid over- and under-rating on the ITERS-R and ECERS-R. Data were captured using the Statistical Package for the Social Sciences (SPSS) version 22 (IBM Corp., 2013). Data were screened and descriptive statistics calculated.

We attempted to identify predictors of center quality through multiple linear regression analyses (simultaneous entry) in which total scores for the ITERS-R and ECERS-R were treated as outcome variables, and predictors were as defined in Table 4 (right hand side). Predictors selected for analysis were based on research evidence and informed by variables of interest to the provincial government that sponsored the study.

Sample statistics of variables used in the study and results of the modeling are presented in Table 4. Multiple regression analyses are somewhat prone to capitalize on chance, so we tested the model error (for each of the models) with 100 repetitions of 5 fold cross-validation. The observed model errors were generally within 5–15% of the model errors computed in the cross validation exercise, suggesting that the model is fairly stable. Finally, and as noted previously, we were interested in whether children living in more deprived areas were or were not disadvantaged in terms of ECCE center quality. In order to investigate this, centers were geocoded and plotted on small area maps (known as datazones) for each of which there is a composite deprivation score for the child population known as the South African Index of Multiple Deprivation for Children (SAIMDC) (Barnes, Noble, Wright, & Dawes, 2009; Wright, Barnes, Noble, & Dawes, 2009). Deprivation scores were correlated with ECERS-R and ITERS-R total scores.

3. Results

3.1. Descriptive findings on program quality

Results for infant and toddler and early childhood (Pre-K) classes are reported separately as the ITERS-R and ECERS-R are not calibrated. In what follows, mean subscale scores are reported together with observation notes provided by assessors. These are

not intended to be representative, but rather to provide a sense of commonly observed conditions.

3.1.1. Infant and toddler classes

On average, total ITERS-R scores fall within the *minimal* range—a score of 3–4 ($M = 3.28$; $SD = 1.32$; $n = 111$ classes). Only one subscale (*Interaction*), which covers supervision of play and learning, peer interaction, staff-child interaction, discipline and provision for children with disabilities, comes close to the good range ($M = 4.88$; $SD = 1.74$). Assessor comments indicated that interactions were positive despite frequently poor resources. For example: “A center with not much equipment but a good carer”; and “(staff are) mostly illiterate but doing their best, there is a lot of nurture, care and love.” However this commonly did not extend to playing with children and extending their learning through appropriate activities.

The *Activities* subscale goes to the heart of the learning program and measures exposure to a range of activities that are important in scaffolding development. Findings indicate very inadequate quality stimulation of infants and toddlers ($M = 2.24$; $SD = 1.31$). Scoring on this subscale depends both on the availability for substantial portions of the day of a range of different play materials for each type of play and free choice. Where equipment is limited (as was the case in this sample), scores will be lower. The quality of *Space and Furnishings* was found to be borderline minimal ($M = 3.28$; $SD = 1.63$) reflecting very limited resources on average.

Stimulation of language in this age group is captured in the *Listening and Talking* subscale which assesses the extent to which children are assisted to use and understand language including through exposure to books. Findings indicate low minimal provision ($M = 3.53$; $SD = 1.64$). ITERS-R items. Lack of sufficient suitable books was a widespread problem in the classes observed, but particularly among those in poor communities.

Activities and interactions with young children take place within a *Program Structure*, and where this is not well designed or adhered to, quality may be compromised. This subscale includes the schedule (or daily program), free play, group times and provision for children with disabilities, and in this study, quality was found to be borderline minimal but quite variable ($M = 3.41$; $SD = 2.00$). In low scoring classes, assessors reported that there were many examples of children having to wait for a long time for meals, activities, or toilet routines.

The *Personal Care Routines* subscale assesses items such as arrival and departure, meals, toilet, and health. On this subscale, the average score for the sample is in the *minimal* range ($M = 3.85$; $SD = 1.78$). Assessors flagged a number of problems, for example, many instances when hands were not washed after changing nappies or wiping noses. A lack of soap and shared towels was a problem in many centers. These failings constitute considerable

risks to child health. At rest time and in centers housed in shack buildings in poorer communities, several babies might share a mattress.

Finally, the *Parents and Staff* subscale rates provisions for parents, personal and professional needs of staff, staff interaction and cooperation (where there were more than one in a classroom), supervision and evaluation of staff and opportunities for professional growth. Provision falls within the *inadequate* range ($M = 2.95$; $SD = 1.27$). This may well be a function of items relating to professional development and opportunities and the capacity of supervisors for program supervision which is very limited for this age group in South Africa (ETDP SETA, 2013; Richter et al., 2012). In sum, this analysis of classes for infants and toddlers no ITERS-R subscale exceeds minimal quality with two (*Activities* and *Parents/Staff*) falling within the inadequate range.

3.1.2. Early childhood classes

These would classify as 'PreK' in the North American context and cater for children from age 3 to 5 years, although in many centers in poor communities they also accommodate younger and older children. On average, and similar to the findings for younger children, ECERS-R average total scores fall within the *minimal* range—a score of 3–4 ($M = 3.87$; $SD = 1.55$; $n = 122$ classes). While the instruments for assessing the younger and older children are not strictly comparable, a similar pattern of quality to emerges across age groups. Once more, provision for stimulation (*Activities*) and language (*Language and Reasoning*) was within the *minimal* range ($M = 3.01$; $SD = 1.56$ and $M = 3.83$; $SD = 1.90$ respectively). Given the particular importance of these areas in enabling readiness to learn in school (O'Carroll & Hickman, 2012; School Development Unit (UCT) and WordWorks, 2013), the result is of considerable concern. Once again, the quality of *Interaction* was rated highest of all subscales in this age group and falls within the good range ($M = 5.05$; $SD = 1.82$). While there were very few children identified as having disabilities in the classes observed, assessors commented on instances where children with special needs had been assisted.

Space and Furnishings ($M = 4.07$; $SD = 1.84$), *Personal Care Routines* ($M = 4.38$; $SD = 1.80$), *Program Structure* ($M = 4.05$; $SD = 2.08$), and *Parents and Staff* ($M = 4.05$; $SD = 2.08$) fall within the *minimal* range. Assessors reported that a number of centers lacked space and were very over-crowded with no space for children to move freely. Several did not have outdoor play areas either because they were too unsafe to use (e.g. there was no fence; there was glass or rubble and tin lying around; presence of violent crime) or there was no space. Even if there were windows, assessors often reported that these were kept closed and that ventilation was inadequate. Vandalism by older children was a concern for many centers in poor communities.

As in those catering for infants and toddlers, few centers catering for older children were able to provide a separate area for staff to have a break away from the children. Assessors observed that often their 'break' was in the classroom while children were sleeping. Supervisors rarely provided for evaluation and regular monitoring and support for staff. In sum, for classes with children aged from 36 to 50 months assessed on the ECERS-R, teacher–child interaction is good on average. However, all other subscales fall within the minimal quality range. Table 3 presents the proportion of centers within each level of quality. It is evident that a greater proportion of programs for the older age group can be classified as 'good' (39%) as against only 18% for infants and toddlers.

3.2. Predictors of center quality

We attempted to identify predictors of center quality through multiple linear regression analyses (simultaneous entry) in which total scores for the ITERS-R and ECERS-R were treated as out-

come variables, and predictors were as defined in Table 4 (right hand side). Table 4 shows the results of the modeling. Weekly fees and center management quality dominated the two models. Although variables reflecting level of ECCE training, years of experience, and teacher/child ratio were sometimes predictive of total scores (see the correlations shown in Table 4), their partial coefficients were usually rendered small, and non-significant when entered alongside the dominant predictors. The models for the ITERS and ECERS total scale scores were both reasonably good in terms of overall fit, with R^2_{adj} coefficients of 0.36 and 0.37, respectively. Individual regression coefficients for the two main predictors were statistically significant, and their standardized coefficients were of substantial size in both models (0.52 and 0.28 for the ITERS model, and 0.35 and 0.39 for the ECERS model). We tested for interactions between predictors and receipt of a subsidy (a dichotomous variable) in a follow up regression analysis. None of the interactions were significant, but the interaction between weekly fee charged, and subsidy receipt was marginally significant ($b = -0.009$, $S.E. = 0.005$, $t = -1.89$, $p < 0.07$). However, even in this analysis, the main effect for weekly fee remained significant ($b = 0.005$, $S.E. = 0.001$, $t = 3.82$, $p < 0.001$), although main effects may be difficult to interpret in the presence of interactions. Multiple regression analyses are somewhat prone to capitalize on chance, so we tested the model error (for each of the models) with 100 repetitions of 5 fold cross-validation. The observed model errors were generally within 5–15% of the model errors computed in the cross validation exercise, suggesting that the model is fairly stable.

Finally, and as noted previously, we were interested in whether children living in more deprived areas were or were not disadvantaged in terms of ECCE center quality. In order to investigate this, centers were geocoded and plotted on small area maps (known as datazones) for each of which there is a composite deprivation score for the child population known as the South African Index of Multiple Deprivation for Children (SAIMDC; Wright et al., 2009). The SAIMDC value for the datazone within which each center was located was correlated with its ECERS-R and ITERS-R total scores. There was a significant and negative relationship between program quality on both measures and the level of child deprivation in the area in which the center was located (ITERS-R $r = -0.228$, $p < 0.05$; ECERS-R $r = -0.334$, $p < 0.01$). This is related to the fact that even those centers who qualify for a poverty targeted per child subsidy, have to charge fees to meet running costs and poor parents can afford to pay less than richer parents.

4. Discussion

The present research is the first representative study to in South Africa to describe ECCE program quality and its predictors. Regarding the first objective, the results showed that both facilities for younger and older children fall just above the level interpreted as '*minimal*' quality on both the ITERS-R and ECERS-R (scores of 3–4), indicating adequate custodial care including some form of program activities. This is in many respects the minimum that the South African Guidelines for Early Childhood Development Services (Department of Social Development, 2006) require.

These findings are by no means unique to South Africa as studies conducted in the Netherlands (Helmerhorst, Riksen-Walraven, Gevers Deynoot-Schaub, Tavecchio, & Fukkink, 2015; Vermeer et al., 2008), North Carolina (La Paro, Williamson, & Hatfield, 2014), Canada (Goelman et al., 2006), Kenya (Mwaura, 2009), Greece (Petrogiannis, 2002) and Portugal (Pessanha et al., 2007). In the Portuguese study, and identical to our research, ECCE quality was predicted principally by the amount of fees charged and by center management quality. In our study, training, years of experience, and teacher/child ratio contributed to center quality, but fees

Table 3
Levels of centre quality.

Infants and toddlers: ITERS-R subscale scores			
Subscale	Inadequate (1–2) n (%)	Minimal (3–4) n (%)	Good (5–7) n (%)
Space and furnishings	42 (38%)	41 (27%)	28 (35%)
Personal care	31 (28%)	38 (34%)	42 (38%)
Listening and talking	38 (34%)	35 (32%)	38 (34%)
Activities	79 (71%)	24 (22%)	8 (7%)
Interaction	13 (12%)	27 (24%)	71 (64%)
Programme structure	39 (35%)	40 (36%)	32 (29%)
Parents and staff	45 (40%)	54 (49%)	12 (11%)
Children >36 months: ECERS-R subscale scores			
Subscale	Inadequate (1–2) n (%)	Minimal (3–4) n (%)	Good (5–7) n (%)
Space and furnishings	30 (25%)	34 (28%)	58 (47%)
Personal care	24 (20%)	35 (29%)	62 (51%)
Language and reasoning	39 (32%)	28 (23%)	55 (45%)
Activities	52 (43%)	48 (39%)	22 (18%)
Interaction	18 (15%)	19 (16%)	84 (69%)
Programme structure	38 (31%)	31 (26%)	53 (43%)
Parents and staff	38 (31%)	31 (26%)	53 (43%)

Table 4
Linear regression analyses.

Descriptive statistics												
	Alpha (items)	M	SD	Inadeq. n (%)	Min. n (%)	Good n (%)	Predictors	M	SD			
ECERS total (n = 111)	0.97 (43)	3.87	1.55	31 (25%)	44 (36%)	47 (39%)	ECCE qualification	0.63	0.82			
ITERS total (n = 122)	0.95 (39)	3.28	1.32	34 (31%)	56 (51%)	20 (18%)	Years ECCE experience	7.10	7.36			
							Child/teacher ratio (ECERS)	9.30	5.67			
							Child/teacher ratio (ITERS)	13.09	7.33			
							Weekly fee	88.31	106.81			
							Management quality	26.46	11.31			
							Grade R class present (ECERS)	n = 44; Y = 78				
Predictors	ITERS						ECERS					
	1	2	3	4	5	6	1	2	3	4	5	6
1. ECCE training	–						–					
2. ECCE years experience	0.08	–					0.08	–				
3. Child/teacher ratio	0.07	0.12	–				–0.23*	–0.10	–			
4. Weekly fee	–0.12	0.16*	0.35**	–			–0.12	0.16*	0.20*	–		
5. Management quality	0.20*	0.11	–0.11	0.10	–		0.20*	0.11	–0.19*	0.10	–	
6. Grade R class present	–	–	–	–	–	–	0.05	–0.03	–0.12	0.03	0.29**	–
7. Total scale score	0.25**	0.06	–0.14	0.30**	0.54**	0.15	–0.13	0.23*	–0.04	0.47**	0.43**	0.20*
Multiple Regression models												
	ITERS						ECERS					
	B	S.E.	t				B	S.E.	t			
Intercept	1.79	0.32	5.67**				1.73	0.45	3.82**			
ECCE qualification	0.23	0.15	1.58				–0.10	0.14	–0.72			
Years ECCE experience	–0.03	0.02	–1.92				0.02	0.01	1.72			
Child/teacher ratio	–0.01	0.02	–0.58				–0.10	0.02	–0.48			
Weekly fee	0.01	0.001	3.45**				0.01	0.01	4.79**			
Management quality	0.06	0.01	6.20**				0.05	0.01	4.52**			
Grade R class present	–	–	–				0.33	0.25	1.33			
Overall model statistics	F = 13.68** df = 5,105 r ² _{adj} = 0.37 MS _E = 1.10						F = 12.18** df = 6,121 r ² _{adj} = 0.36 MS _E = 1.55					

* p < 0.05.

** p < 0.001.

and management quality subsumed other variables in the model. Poverty (which influences fee payment) and management quality, were also identified in the South African Public Expenditure Tracking Study as probable underlying factors contributing to program quality (Department of Basic Education, 2010).

Fees charged is a proxy for other factors that contribute to quality including the ability to employ and retain suitably qualified staff, purchase materials, and provide facilities and infrastructure. Also as we found, centers in poorer areas tended to be of poorer quality. Phillips et al. (2000) showed the contribution of teacher

wages and fees to the quality of classroom processes, and that teacher wages were more strongly associated with classroom quality than other structural dimensions, including adult-child ratios, group size, and staff qualifications. Similarly Torquati, Raikes, and Huddleston-Casas (2007) found that compensation significantly predicted global observed quality measured by the ITERS and ECERS-R. In our study, center management quality was also strongly associated with overall and each ITERS-R and ECERS-R subscale scores. It was also the only significant predictor of quality in centers charging the lowest category of fees (<\$ 6 per week).

In South Africa, ECCE centers have to register as a non-profit organization if they wish to solicit donations. Registration and satisfaction of licencing standards is also required to access the poverty-targeted per-child-per-day subsidy. The norms include governance and administration standards. The aspects of management measured in this study focus on governance practices, policies, staff and child records, planning and fiscal matters or largely on what Kagan and Hallmark (2001) refer to as administrative leadership. These partially overlap with items of the Program Administration Scale of Talan and Bloom (2004). So, for example, Lower and Cassidy (2007) found that program administration was significantly related to classroom global quality in Head Start Programs.

The McCormick Center for Early Childhood Leadership (www.cecl.nl.edu) notes that most early childhood administrators were promoted to their current positions because of leadership ability and that few have had specialised training in program leadership and management. This is also the position in South Africa (ETDP SETA, 2013). Educational levels of center managers in our study were not high (only a quarter had degrees and diplomas, 60% had not completed secondary schooling and 43% had no training in ECCE). Observations from the field indicate that where center managers do not have an understanding of ECCE, they made it difficult for trained teachers to implement what they had learned as found in other contexts (Ackerman, 2008).

An element not directly measured in this study but one likely to be influenced by both fees and management practices is organizational climate. Dennis (2010) found that organizational climate including opportunities for professional development, fair rewards, and supportive physical environment were significantly correlated with classroom quality scores on the ECERS-R Activities subscale. In terms of other factors associated with quality on particular subscales, the positive association of the presence of a Reception year class with higher quality in early childhood classrooms on the Activities and Program Structure subscales is likely to be associated with availability of resources, which are provided to Reception classes by the Provincial Department of Education. Regarding low Listening and Talking scores in classes on the ITERS-R relative to those for the older children, this may be due to reduced capability of teachers in the former classes. South African experience is that better trained and capable teachers tend to move to classes for older children. Why higher teacher training levels should be associated with higher parent and staff scores for centers with infant and toddler classes is not clear. Both these findings require further exploration.

Our finding that program quality is related to the level of deprivation in the surrounding community is of particular concern, as children in such areas are in need of programs to address risks to their health and development, and to improve their readiness to learn in school. Poor program quality for children in poverty compounds inequality as has been noted in other studies in Namibia and South Africa (Penn, 2013).

4.1. Limitations and issues for further research

This study was conducted in one province and cannot be regarded as representative of ECCE for South Africa. Our experience in the field suggests however, that it is likely to be reflective of the national situation. A limitation of the study is that ECCE center supervisors decided on classes to be assessed. A selection effect is therefore possible, in which the better classes were enrolled resulting in positive bias in the findings on the quality of the care and learning environment. Management quality scores would not have been affected as centers were randomly selected. Furthermore, classroom quality was rated on a single observation and classroom practice may vary somewhat from day to day.

Regarding issues for further research, certain questions have not been addressed in this study. We found that management quality is strongly associated with quality scores but the mechanisms for this need further investigation, particularly as the scale did not measure the professional leadership aspects of management often associated with higher-quality centers in other studies, though it may be that center supervisors who employ good governance and administration practices also provide better overall professional support and leadership and deploy existing funding in support of the learning program. Links between both management and fees paid and organizational climate also bear further exploration.

Of particular importance for South Africa if ECCE quality is to be improved will be to further investigate the relationship between program quality and ECCE licencing standards and subsidization. We did not find a significant association between licencing and quality. A possibility that has not been investigated as yet is that licencing processes do not take sufficient account of program quality standards because these are not sufficiently explicit. Furthermore personnel responsible for center and program licencing are social service professionals and are not trained in early childhood education. Future research on these issues is indicated.

The subsidy payable for poor children is widely recognised as a critical income source that is intended improve the level of services offered and provide nutrition. We found no link between the subsidy and program quality scores as measured by the ECERS-R and ITERS-R. This is not unexpected as the amount toward staffing and materials is insufficient to substantially improve program quality. Research is required to determine the cost of a subsidy that would be sufficient to enhance program quality for the poorest children.

5. Conclusion

The findings indicate the need to improve the quality of learning environments in areas of South Africa studied, and particularly for children in poor communities most at risk for loss of potential and intergenerational poverty (Richter et al., 2012). A focus on improved provision of educational activities, scaffolding of learning, and attention to language stimulation is required. Particular attention is needed to improve quality for infant and toddler classes, which were of consistently lower standard than those for older children. The study indicates that increasing of financial resources to centers coupled with interventions to improve center management and administration are routes to improving quality. This research is an example of an engagement between researchers and policy makers in government in the interests of improving ECCE services to economically disadvantaged children in a middle-income developing country (Petersen, 2006, 2011). As important perhaps is the contribution of engagements such as this to demonstrating to decision-makers, the importance of using of research evidence to inform social policy and programming in South Africa and elsewhere in the Global South.

Attention to quality is becoming increasingly important as it is now well established that access must be coupled to quality if early childhood programs are to improve child outcomes, particularly in low-income settings. Goal three of the Sustainable Development Goals (<http://unsdsn.org/resources/publications/indicators/>), requires nations to: “Ensure Effective Learning for All Children and Youth for Life and Livelihood”, and by 2030, to reach the target of “all children under the age of 5 reach their developmental potential through access to quality early childhood development programs and policies.” Studies such as that reported here can be used to monitor the progress of nations in improving the quality of their early learning services.

Disclosure

The Western Cape Provincial Government contracted the Human Sciences Research Council of South Africa (HSRC) to undertake the study. That institution subcontracted the authors to conduct the research. Neither the HSRC nor the authors have relationships of any kind with any party that could constitute a conflict of interest and lead to bias.

Acknowledgements

The authors are most grateful to the centre managers and teachers who gave their time to participate in this study. We are also grateful to the Editor and reviewers for their most helpful comments on previous versions of this article. These have assisted us to improve the quality of this contribution.

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