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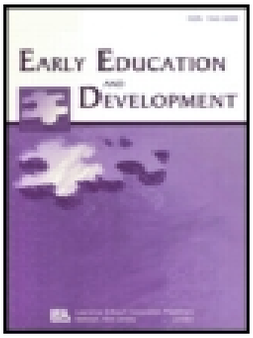

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Structural and Process Quality in Early Childhood Education and Care Provisions in Poland and the Netherlands: A Cross-National Study Using Cluster Analysis

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ABSTRACT

This cross-national study involved 56 toddler classrooms in Poland and the Netherlands. A cluster analysis was conducted to identify classroom profiles based on observed quality and these were compared regarding structural (group size and children-to-teacher ratio) and curriculum (e.g. pre-academics and pretend play) characteristics. In total, 224 video clips were evaluated with the CLASS Toddler and 130 teachers reported on structural and curriculum aspects. *Research Findings*: The findings for both countries showed moderate to high emotional support and low to moderate support for learning; the pattern of self-reported provision of activities was shaped alike. Three quality profiles were distinguished: i) high positive climate and support for learning, ii) overall low quality, iii) high emotional and low educational support. Overall, favorable structural conditions and a balanced curriculum including a broad range of activities were associated with highest process quality. *Practice or Policy*: A variety of different activities and high levels of developmentally stimulating interactions in an overall positive and warm classroom climate can support toddlers' broad development and learning. Professional development and a center's pedagogical policy and vision can play an important role in improving quality and implementing age-appropriate play and activities when an official curriculum is lacking.

A growing number of zero- to four-year old children in Europe is enrolled in different forms of Early Childhood Education and Care (ECEC) provisions (Eurydice, 2015), which makes non-familial educare an increasingly important context for young children's development (Urie, 1979). This trend is reflected in the interest of policymakers and researchers who study ECEC in search of ways to provide cost-effective and high quality ECEC that benefits all children's well-being and development (Garcia, Heckman, Leaf, & Prados, 2016; Slot, 2018a).

Research so far, has shown that ECEC systems of European countries share a common pedagogical foundation. Already in 1996, Tietze, Cryer, Bairrio, Palacios & Wetzel described that ECEC in various European countries developed in similar ways despite some cultural differences between countries. Also, more recent work by Sylva, Ereky-Stevens, and Aricescu (2015) highlighted that national or local ECEC steering documents from eleven European countries share common curricular foundations, including a holistic pedagogical philosophy emphasizing child-centeredness. However, the way these shared principles were translated into actual pedagogical practices varied between countries. A multiple case study of good practices in ECEC across seven of these eleven European countries revealed differences in process quality by means of observed quality of teacher-child interactions as well as differences in the implemented curriculum of activities in balancing support for play and the provision of different age-appropriate

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activities (Slot, Cadima, Salminen, Pastori, & Lerkkanen, 2016), reflecting sociocultural beliefs about young children's developmental needs (Harkness & Super, 2006). Moreover, countries differed in their structural characteristics, for instance group size and children-to-teacher ratio.

Governments set statutory ECEC quality regulations and curriculum frameworks based on the unique interplay of the national, historical, cultural and economic premises, which may restrict the range of variance within a particular country (Penn, 2011). Thus, a cross-national study can provide more insights in children's ECEC experiences in the quality of care they receive and their involvement in play and activities. The case of Poland and the Netherlands are interesting in this regard, since these systems share similarities, but differ in a number of important aspects as well, as will be outlined in more detail in the next section.

The current study adds to the existing knowledge base by investigating the structural characteristics, process quality and the curriculum of provided activities in Polish and Dutch toddler classrooms. In doing so, we explored how classrooms could be clustered into profiles based on observed process quality and how structural classroom features and teacher-reported curriculum activities, in turn, differed depending on these classroom profiles. Quality is typically based on composite scores of broader concepts (e.g. Emotional Support), which may obscure important information on higher order interactions among different quality dimensions. Cluster analysis provides more detailed information on different quality aspects and how these are interrelated, and, as such, can enhance our understanding of particular quality aspects at the classroom level, as studies in pre-K and first grade classrooms have already illustrated (e.g. LoCasale-Crouch et al., 2007; Stuhlman & Pianta, 2009).

Characteristics of Polish and Dutch Early Childhood Education and Care for the Youngest Children

The Polish and Dutch ECEC sector for children below four years of age are at different developmental stages. In the Netherlands, childcare dates back to the '90s and the sector has expanded immensely with the introduction of the Child Care Act in 2005 and the privatization of the market. The Ministry of Social Affairs and Employment is responsible for the childcare sector, but recent developments characterize a growing educational orientation aimed to support children's broad development (Slot, 2018b). ECEC is increasingly viewed as an important vehicle for improving school readiness and addressing educational inequality (Slot, Jepma, Muller, Romijn, & Leseman, 2017). In Poland, non-familial childcare services have a history of almost one hundred years as the first steering document was The Juvenile and Women's Work Law of 2 July 1924, which obligated employers to maintain company crèches if they employed more than 100 women (Stolińska-Pobralska, 2012). However, its educational potential was formally recognized only in 2011 and in that sense the sector may be considered as rather young. Importantly, the new steering regulation, namely the Act of 4 February 2011 on Care for Children up to the age of 3, which has formally obligated provisions to offer children educational experiences in addition to providing care, is extremely underdeveloped in terms of pedagogical guidelines and rather focuses on structural and administrative issues.

The difference between the two countries is also reflected in attendance rate. In Poland this has been significantly growing in the last years (from 2.6% in 2010 up to 13.1% in 2018), but still remains one of the lowest in European countries, whereas in the Netherlands this has been rather stable and on a relatively high level (approximately 80%). This rise in Poland is most likely related to policy changes. Up to 2011 the educare sector was supervised by the Ministry of Health and had to meet all the requirements foreseen for medical facilities. In 2011 it moved to the Ministry of Family, Labor and Social Policy which resulted in a simplification of sanitary and organizational regulations and by doing so decreased costs of establishing settings and thus enhanced their establishment.

The structural features for two and three-year-old children are more favorable in the Netherlands where the maximum number of children per staff member is 7 and the maximum group size is 12 children (Convenant Kwaliteit Kinderopvang, 2008). In Poland the maximum number of children is 8 per teacher and there is no maximum group size[1] (Act of 4 February 2011on Care for Children up to the age of 3).

Despite the mentioned differences between ECEC provisions in the two countries, there are also several similarities. Firstly, the structure of the ECEC system is quite comparable. More specifically, in both countries, kindergarten is the first level of the education system, so educare services for the youngest children precede formal education. Secondly, even though there is strong consensus on the importance of holistic development through play in both countries (Sylva et al., 2015), neither Poland nor the Netherlands has a national ECEC curriculum, leaving a high level of freedom concerning the design and implementation of classroom practices. Also, both countries share the same minimum qualification level for teachers, which is at the level of vocational training. Lastly, the age range of children enrolled is comparable, as both national sectors may involve children up to the age of four.[2]

To summarize, the Polish and Dutch ECEC for the youngest children differ in regard to contextual and some structural aspects, but share some similarities as well, such as general pedagogical goals and the age range of children enrolled. Therefore, a cross-country comparison can shed more light on what process quality and the curriculum of provided activities looks like in two countries that provide different macro contexts and different structural preconditions for realizing classroom practices.

Structural, Process and Curriculum Quality

In general, ECEC quality is viewed as a multidimensional concept and has been described as consisting of two key components (e.g. Slot, 2018a). The first concerns structural features of the classroom, such as group size, children-to-teacher ratio or teacher's education level, which are considered the basic requirements for the second aspect, namely process quality (e.g. Cryer, Tietze, Burchinal, Leal, & Palacios, 1999; Phillipsen, Burchinal, Howes, & Cryer, 1997; Slot, Leseman, Verhagen, & Mulder, 2015). Process quality refers to the actual day-to-day experiences of children and includes the dynamic aspects of the classroom, such as children's relations and interactions with teachers and peers (Cryer et al., 1999; Pianta et al., 2005; Thomason & La Paro, 2009). It is well established that process quality is crucial as it has revealed the strongest effects on child outcomes (e.g. Melhuish et al., 2013; Slot, 2018a). For instance, high process quality has been shown to be positively associated with children's cognitive and socio-emotional development (Garcia et al., 2016; Hall et al., 2013; Mashburn et al., 2008; Melhuish et al., 2013; Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010) and especially teacher's warmth and sensitivity have shown to be associated with children's social functioning (NICHD, 2003). Generally, research has shown that structural aspects, such as smaller group size and more favorable children-to-teacher ratios, were associated with higher process quality (Barros & Aguiar, 2010; Deynoot-Schaub & Riksen-Walraven, 2005; Hulpia et al., 2016; Thomason & La Paro, 2009). However, other studies revealed few associations (Pessanha, Aguiar, & Bairrao, 2007; Vogel et al., 2015), which might be related to the restricted range of variance of these characteristics in some countries due to (national) policy regulations (Slot, 2018a).

Another important aspect of quality, which appears a relatively understudied topic, concerns the *content* of these interactions and experiences (Slot et al., 2015). There is evidence that specific content-focused curricula have positive effects on children's outcomes in the targeted domains, including social-emotional competence, language, literacy, and math skills (Barnett et al., 2008; Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008; Clements & Sarama, 2008; Diamond, Barnett, Thomas, & Munro, 2007; Dickinson & Caswell, 2007; Domitrovich et al., 2009; Fantuzzo, Gadsden, & McDermott, 2011; Jenkins & Duncan, 2017; Lonigan, Farver, Philips, & Clancy-Menchetti, 2011; Preschool Curriculum Evaluation Research Consortium, 2008; Schweinhart & Weikart, 1997). Moreover, evidence revealed that the provision of certain kind of curriculum activities, such as language, pre-literacy, math or science activities, was positively associated with process quality in U.S. preschools (Cabell, DeCoster, LoCasale-Crouch, Hamre, & Pianta, 2013; Howes et al., 2008) and in ECEC provisions in England, Germany, and the Netherlands (Kluczniok & Robach, 2014; Slot, Boom, Verhagen, & Leseman, 2017; Sylva et al., 2007). A large-scale study in England showed that centers in the high range of observed process quality placed a greater emphasis on children's pre-academic learning and provided more opportunities for sustained shared thinking and high-quality conversations, whereas provisions in the mid-range of process quality provided more opportunities for pretend and construction play (Sylva et al., 2007). The aforementioned

multiple case study of good practices in England, Finland, Germany, Italy, the Netherlands, Poland, and Portugal revealed that teachers who reported a slightly stronger emphasis on supporting pre-academics and self-regulation than on the provision of play, showed higher quality interactions in supporting children's development and learning (Slot et al., 2016).

Given the multidimensional nature of ECEC quality it remains an important question as to how these different aspects are interrelated. Thus far, the most emphasis has been placed on regulating structural quality features, such as group size and children-to-teacher ratio, as these aspects are easy to measure and compare (Bowne, Magnuson, Schindler, Duncan, & Yoshikawa, 2017; Layzer & Goodson, 2006); as well as relatively easy to regulate and monitor by means of policy measures and inspection (Slot et al., 2015). In addition, aspects of process quality, such as the quality of teacher-child interactions are increasingly targeted in quality monitoring and inspection (OECD, 2015). However, given the importance of the content of children's interactions and experiences in supporting their development and opportunities for learning it is also essential to gain more insight in this aspect of quality as well, especially when an official curriculum is lacking. This calls for a more comprehensive approach which takes into account all these different quality aspects in identifying how they are interrelated and contribute to high quality experiences for children.

Cluster Analysis

Abundant studies exist into ECEC that focused mainly on deriving composite scores of, for instance, emotional and instructional quality, ignoring the complexity and interrelatedness of different quality dimensions. Cluster analysis is a method that can deal with this complexity and explore how different quality dimensions cluster together in specific profiles (e.g. LoCasale-Crouch et al., 2007; Stuhlman & Pianta, 2009). It is a descriptive approach that captures the complex patterns of quality at the classroom level and, thus, provides more insights into children's experiences within that classroom (Curby et al., 2009).

Previous research using the Classroom Assessment Scoring System Pre-K (CLASS) showed several clusters that differentiated classrooms based on quality dimensions. The findings revealed classrooms of overall high or low quality and three types of more differentiated profiles of positive emotional climate with high and mediocre instructional support, respectively, and a profile of mediocre emotional and low instructional climate (LoCasale-Crouch et al., 2007). Another study in first grade classrooms using the CLASS revealed four different types of classrooms, also illustrating more nuanced grouping than low, mediocre or high levels of quality. To the best of our knowledge, such an approach has not been applied to toddler classrooms as of yet.

Current Study

The aim of this study is to enrich our understanding of ECEC quality by exploring observed process quality, structural characteristics, and the teacher-reported curriculum of activities in Poland and the Netherlands. Process quality was measured with the internationally well-known Classroom Assessment Scoring System [CLASS] Toddler (Slot, 2018b), which includes eight quality dimensions that were used to construct quality profiles and investigate how structural features and the provision of activities were related to these profiles.

Method

Sample

The sample consists of in total 56 classrooms from Poland and the Netherlands (28 in each country). In both countries the focus was on provisions for two- and three-year-old children. A convenience sample was used, but the selection of centers was aimed at recruiting classrooms that represented relevant variation regarding several characteristics, such as size, location of the center, and population of children

that are enrolled, while at the same time targeting centers typical in terms of classroom features like group size, teacher-child ratio, and available toys and equipment. The sample in Poland was recruited in the following way. Firstly, the Directors of the two biggest crèche networks, located in two different regions of the country, were asked to provide structural characteristics of the supervised settings. Secondly, researchers selected crèches providing educare to children with different backgrounds (low vs mid SES, central vs suburb locations, single group settings vs multiple group settings). The Dutch settings taking part in the study were selected to cover regional variation and varying degrees of urbanization. Centers from two out of the four largest cities (Metropolitan areas) were represented as well as centers from four cities, part of the national network of middle- to large sized cities, and centers from smaller towns across the country. These centers represented relevant socioeconomic and cultural variation of children in the Netherlands. All teachers working in the selected classrooms and all parents provided active consent for participation in the study. 84 teachers from Poland (response rate 96%) and 46 from the Netherlands (response rate 90%) who were mostly women (98.8% in Poland and 92% in the Netherlands) completed the questionnaire. The descriptive statistics of the Polish and Dutch teachers and classrooms are presented in Table 1.

Measures and Procedures

The data collection measures and procedures were identical in both countries to ensure comparability. Each participating classroom was visited twice on regular mornings within a period of maximum three weeks. The visits lasted approximately two to four hours a day in which videos of different situations and activities were made for coding purposes (one of the permitted procedures according to the CLASS Toddler manual). The teachers received a questionnaire during the first visit, which was to be returned at the second visit. Additionally, field notes were made for each activity to note the number of children and teachers present during the videotaped activities.

Observations. Process quality was evaluated with the Classroom Assessment Scoring System [CLASS] Toddler (La Paro, Hamre, & Pianta, 2012). The CLASS Toddler has been used in several European countries, such as Belgium, Switzerland and in the Netherlands underscoring the reliability and validity of the tool (Hulpia et al., 2016; Perren, Frei, & Herrmann, 2016; Slot, Boom, et al., 2017). Following the CLASS Toddler Manual two domains of classroom process quality were evaluated: Emotional and Behavioral Support and Engaged Support for Learning. The first one captures the emotional aspects of the classroom interactions. The domain consists of five dimensions: Positive Climate (expression of warmth, respect and, enjoyment), Negative Climate (the overall level of negativity in the classroom), Teacher Sensitivity (awareness of and responsiveness to children's needs), Regard for Child Perspectives (support for children's responsibility and independence) and Behavior Guidance (effective promotion of

Table 1. Descriptive statistics for teacher and classroom characteristics.

	Poland				The Netherlands			
	N	M	SD	Range	N	M	SD	Range
Teacher's Age	74	38.6	9.5	25–57	45	43.5	10.9	24–63
Years of work in ECEC sector	82	12.7	10.5	.75–38	45	15.0	6.7	4–32
Children-to-teacher-ratio	28	8.23	1.16	5.33–10.75	26	7.42	1.82	4–13
Group size (total number)	28	33.54	6.10	16–43	26	15.41	2.96	12–28
Educational level								
Secondary vocational	28	33.3			33	71.7		
Higher vocational	6	7.1			10	21.7		
College/University	50	59.5			2	4.3		
Age composition classroom	*N*	*%*			*N*	*%*		
0 years					4	14.8		
1 year	2	7.1			7	25.9		
2 years	23	82.1			27	100		
3 years	26	92.8			27	100		
4 years	3	10.6			9	33.3		

children's self-regulation skills). The internal consistency of the Emotional and Behavioral Support domain was found to be satisfactory for both countries (PL α =.88, NL α =.77). The second domain is defined by interactions and the provision of play and activities aimed at supporting children's learning and development. The domain Engaged Support for Learning includes three dimensions: Facilitation of Learning and Development (providing children with opportunities to learn and develop knowledge and skills), Quality of Feedback (feedback promoting learning, understanding and expanding children's engagement) and Language Modeling (language development stimulation). The internal consistency of Engaged Support for Learning was the same in Poland and the Netherlands (namely α =.92). All eight dimensions were scored on a 7-point scale, where 1 and 2 reflected a low level on that particular aspect, 3, 4 and 5 meaning that the classroom is in the midrange, and 6 and 7 representing a classroom in the high range.

In Poland one researcher and one research assistant and in the Netherlands one researcher and four research assistants took part in data collection and scoring of the videos. All researchers and assistants involved were trained by a qualified trainer in the CLASS Toddler and successfully passed an online test to use the tool (achieved at least 80% agreement within one scale point with the master code). In both countries the researcher accompanied assistants during their first visit in the centers to fine-tune the procedures. In addition, 20% of the videos were double-coded in each country (a total of 24 videos including 6 randomly selected videos of each type of activity setting- meal, free play, creative, pre-academic). Interrater reliability was calculated using percentage agreement on dimension scores (within one scale point). For Poland the interrater reliability averaged across dimensions was 92,75% and for the Netherlands 82,14%.

Videotaping Procedures. Several video clips were made during both visits in every classroom to capture the naturally occurring situations the best way possible without intervening in the classroom routines. Several different actions were taken in order to minimalize the reactivity of adults and children during the videotaping. Prior to the first visit the teachers were informed in detail about the study objectives and the process of data collection as well as the researchers' interest in the typical activities taking place as part of the regular schedule of the day (no instructions were given as to how to organize these activities). The teachers were asked to inform the children in advance about the visits of the observers who are interested in the way they spend time in the setting. During the visits, children could ask the observers questions and see how the camera worked in order to make them feel comfortable with the situation. The videotaping was initiated only after children lost their interest in the device and/or the observer and continued with their regular routines. The camera was always positioned in a place that would interfere the least with children's activity. The experience was that children and teachers would resume their ordinary activity very quickly after the researchers or assistants had settled in the classroom.

Selection of the Videos for Scoring. Previous research findings revealed variation in the quality assessments that could be attributed to the type of activity setting (Slot et al., 2016). Therefore, in order to maximize comparability across countries we chose to standardize the evaluated situations. Observers were instructed to make videos of four types of commonly provided activities: meal or snack time, free play, pre-academic, and creative activities (arts & crafts or music). The selection of these particular activities has shown to capture relevant variation in process quality (Cabell et al., 2013; Pianta et al., 2005; Slot et al., 2015). Care routines for instance, have shown to be related to lower emotional and educational support (Pianta et al., 2005; Slot et al., 2015). Thus, four videos representing these situations were selected for coding purposes based on the following requirements: representing the desired type of activity (meal or snack time, free play, pre-academic and creative), length of the clip (approximately 15–20 minutes; minimum 10 minutes), technical quality of the video clip (especially sound quality) and presence of children and teacher (active or passive participation in the situation or activity at hand). If there were more clips meeting these requirements, the first videotaped situation of a particular type was selected for coding. If a particular type of activity was not captured (or the videos did not meet the requirements) a randomly chosen video of a different type of activity meeting the requirements was selected for scoring. The quality of all Polish and Dutch classrooms was evaluated based on four videos

representing each type of activity, except for two Dutch classrooms where four videos of three different types of activities were scored as there was no fourth clip meeting all the requirements. More specifically, in one case instead of a free play clip a second creative activity was scored, and in the other case instead of a free play video a pre-academic activity was evaluated.

Teacher Questionnaire. In line with the literature, a broad range of learning experiences and activities were measured with teacher reports, which have been used successfully in previous studies as well (e.g. Charlesworth et al., 1993; Kuger & Kluczniok, 2008; Slot et al., 2015; Walston & West, 2004; Xue & Meisels, 2004) and have reported to provide stable results (Pianta & Hamre, 2009). The questionnaire evaluated the provided curriculum of activities, characteristics of the classroom and the teacher's background. This questionnaire was originally developed for a Dutch study (Slot et al., 2015), then translated into seven languages and carefully checked for cultural sensitivity and applicability, after which it was used in an international cross-country study (Slot et al., 2016). Teachers completed a paper-and-pencil version of the questionnaire.

Self-reported Curriculum of Provided Activities. Teachers reported on the frequency with which they provide children with different types of learning experiences focusing on six areas: pretend play, self-regulation, science, math, language and pre-literacy. Answers were rated on the 7-point scale, ranging from 1 (never/not applicable), 2 (less than twice a month), 3 (2 to 3 times a month), 4 (every week), 5 (2 to 4 times a week), 6 (every day, once or twice) up to 7 (3 or more times a day).

(1) Pretend play (8 items; PL α =.93; NL α =.93) assesses how often the teacher is involved in different aspects of pretend play, such as: planning, demonstrating, initiating or encouraging children to join in pretend play. An example of an item is: "I encourage children to think ahead about which role they would like to play in role play".
(2) Self-regulation (11 items; PL α =.84; NL α =.87) measures the frequency of using everyday situations (for example meal, play or group activities) to promote behavioral self-regulation. An example of an item is: "Before children start their work or an activity, I ask them what their approach or plan is".
(3) Science (7 items; PL α =.86; NL α =.91) refers the extent to which activities address different phenomena of physical and life sciences. An example of an item is: "Playing with the water table and discuss which things float or sink".
(4) Math (12 items; PL α =.93; NL α =.92) measures the frequency to which activities are focused on exploration of numbers, sets and shapes. Examples of items are: "Labeling a triangle, square, circle" and "Sorting objects or pictures in groups which go together, which are all fruits?".
(5) Language (11 items; PL α =.90; NL α =.89) assesses how often children are exposed to opportunities to develop their language skills (production and comprehension). Examples of item are: "Asking children for an explanation, for instance "Why does this happen?", Labeling things in the environment, such as "that is a ball", and things that happen, such as 'the ball rolls away (because it is round) ".
(6) Pre-literacy (6 items; PL α =.73; NL α =.78) measures the frequency with which the activities are aimed at supporting children's pre-literacy skills. An example of an item is: "Reading a (picture) book to the children".

Analysis

The analysis process was divided into three stages. Firstly, the data on the observed classroom quality, curriculum of provided activities and classroom characteristics were aggregated to the classroom level followed by descriptive analyses investigating the average levels of these aspects in both countries. Due to the very limited variation of the Negative climate scores (within as well as

across countries) this dimension was excluded from further analyses. The data were combined for the subsequent analyses to explore classroom profiles and relations with structural and curriculum characteristics. For the combined sample the internal consistency of both CLASS domains, namely Emotional and Behavioral Support and Engaged Support for Learning was found to be satisfactory, respectively α =.88 and α =.94. The internal consistency of all scales reflecting the frequency of providing children with different types of activities was satisfactory as well (Pretend-play α =.94; Self-regulation α =.87; Science α =.89; Math α =.94; Language α =.90; Pre-literacy α =.68).

Secondly, a cluster analysis was performed using the K-mean algorithm with the standardized scores of the seven CLASS Toddler dimensions (Positive Climate, Teacher Sensitivity, Regard for Child Perspectives, Behavior Guidance, Facilitation of Learning and Development, Quality of Feedback Language Modeling) to identify classroom quality profiles. Taking into consideration the small sample size, a two-, three- and four-cluster solution were evaluated to determine the most suitable number of clusters. The results of k-means analysis conducted in SPSS may vary depending on the initial partition of the dataset, which is related to the arrangement of the cases (Sarstedt & Mooi, 2019). Thus, to investigate the robustness and stability of the cluster solutions, these analyses were conducted multiple times with cases sorted in different random orders. The final decision on the number of clusters was taken based on 1) the iteration history reflecting the changes in cluster centers in the tested cluster solutions whether it is possible to identify the ultimate cluster center), 2) significance of the quality dimensions in the cluster solution, 3) the number of classrooms in each cluster (whether it is balanced), 4) the interpretability of the results within the least number of clusters.

As a last step, the different scales on the curriculum of provided activities and classroom features were standardized and used to investigate the differences between the clusters concerning these aspects. To investigate differences between clusters we conducted t-tests across clusters. However, statistical significance depends highly on sample size and by itself does not predict effect size. Therefore, also the effect size was calculated, which is independent of sample size (Sullivan & Feinn, 2012). As the most commonly used measure for effect size, Cohen's *d*, tends to overestimate the effect size in small samples we instead used Hedge's *g* algorithm. Given the small sample size we take a conservative approach in interpreting effect sizes and only report findings indicating medium (0.5) and high (0.8) effects as defined by Cohen (2013).

Results

Observed Classroom Quality, Structural Classrooms Characteristics and the Curriculum of Provided Activities

Assessment of process quality with the CLASS Toddler showed that overall quality in Poland and the Netherlands was comparable with similar patterns of mid- to high levels of Emotional and Behavioral Support and low- to mid-level quality for Engaged Support for Learning. However, Poland scored higher on all dimensions of Emotional and Behavioral Support, except Negative Climate, whereas the Netherlands scored higher on all dimensions of Engaged Support for Learning. The *t*-test results revealed that overall quality scores did not differ significantly between the countries ($t(54) = 1.11$, $p = .27$). However, Emotional and Behavioral support was higher in Poland ($t(54) = -3.65$ $p = .00$), whereas Engaged support for learning was higher in the Netherlands ($t(54) = 4.41$, $p = .00$).

Two structural classroom characteristics were used in this study, namely *group size* and *children-to-teacher ratio*, based on the notes of videotaped situations, which in many cases considerably deviated from the overall classroom group size and ratio reported by teachers. The videotaped situations did not capture all children in all cases, as it also involved small group activities. This could explain the difference in group size and children-to-teacher ratio as reported by the teacher (based on the whole classroom) and the situations that were videotaped.

Concerning the curriculum of provided activities, the results showed that pretend-play was the most commonly provided activity in Poland followed by language and self-regulation activities,

whereas in the Netherlands language and self-regulation activities were the most frequently reported followed by pretend-play. In both countries, math, science and pre-literacy activities were provided the least frequently. Altogether, the Dutch teachers reported a more frequent provision of all types of activities. The smallest difference between countries concerned the provision of science activities and the largest difference concerned the provision of math activities. Descriptive statistics of observed classroom quality, structural characteristics and the curriculum of the provided activities in both countries are presented in Table 2.

Clusters

It appeared feasible to identify the ultimate cluster centers, for a two-, three-, and four- cluster solution, in which all seven dimensions were significant, and the number of classrooms assigned to each cluster was satisfactory. Therefore, the interpretability of the cluster solution was decisive and, as a result, the three-cluster solution was found to be the most informative. This solution was reflected by groups of 22, 19 and 15 classrooms, respectively.

Comparison of Observed Quality between Clusters

The first cluster included classrooms scoring above the standardized sample means on all CLASS dimensions, namely Positive Climate (PC) $M = .55$, $SD = .90$; Teacher Sensitivity (TS) $M = .25$, $SD = .73$; Regard for Child Perspectives (RCP) $M = .22$, $SD = .63$; Behavioral Guidance (BG) $M = -.04$ $SD = .94$; Facilitation of Learning and Development (FLD) $M = .96$, $SD = .55$; Quality of Feedback (QF) $M = .96$, $SD = .67$; Language Modeling (LM) $M = .82$, $SD = .65$. The second cluster involved classrooms scoring below the standardized sample means on all CLASS dimensions (PC $M = -.88$, $SD = .77$; TS $M = -1.00$, $SD = .66$; RCP $M = -.91$, $SD = .87$; BG $M = -.74$, $SD = .62$; FLD $M = -.47$, $SD = .67$; QF $M = -.56$, $SD = .65$; LM $M = -.36$, $SD = .78$). The third cluster concerned classrooms scoring above the standardized sample means on Emotional and Behavioral Support dimensions (PC $M = .31$, $SD = .56$; TS $M = .90$, $SD = .48$; RCP

Table 2. Descriptive statistics on the observed process quality, the provided curriculum of activities and classroom characteristics per country.

	M		SD		Range		N	
	PL	NL	PL	NL	PL	NL	PL	NL
CLASS								
Overall quality	4.31	4.45	0.46	0.47	3.32–5.19	3.45–5.30	28	28
Emotional and Behavioral Support	5.79	5.33	0.49	0.45	4.60–6.50	4.30–6.30	28	28
Positive Climate	5.77	5.57	0.75	0.99	3.00–7.00	3.00–7.00	28	28
Negative Climate (reversed scale)	6.87	6.90	0.39	0.29	5.00–7.00	6.00–7.00	28	28
Teacher Sensitivity	5.9	5.31	0.95	0.82	3.00–7.00	3.00–7.00	28	28
Regard for Child Perspectives	5.05	4.29	1.27	1.09	2.00–7.00	2.00–6.00	28	28
Behavioral Guidance	5.35	4.57	0.95	0.91	3.00–7.00	2.00–7.00	28	28
Engaged Support for Learning	2.84	3.57	0.63	0.61	1.83–4.33	2.25–4.75	28	28
Facilitation of Learning and Development	3.06	3.87	1.1	1.09	1.00–6.00	2.00–6.00	28	28
Quality of Feedback	2.5	3.17	0.92	0.89	1.00–6.00	1.00–5.00	28	28
Language Modeling	2.95	3.68	1.05	0.98	1.00–6.00	1.00–6.00	28	28
Provided activities								
Pretend-play	4.63	5.30	1.08	1.09	2.00–6.33	3.25–7.00	28	27
Self-regulation	4.41	5.35	1.17	1.03	2.00–6.67	2.64–6.64	28	27
Science	2.78	3.39	0.90	1.16	1.00–4.00	1.57–5.43	28	27
Math	3.04	4.61	1.27	1.14	1.00–5.33	1.91–6.40	28	27
Language	4.50	5.42	1.16	0.85	2.00–6.30	3.55–6.73	28	26
Pre-literacy	2.44	3.14	0.70	0.96	1.44–3.67	2.00–5.43	28	26
Structural features								
Ratio	5.13	5.30	1.03	2.00	2.96–7.13	2.13–13.00	28	28
Group size	10.12	6.99	2.48	2.46	6.25–15.5	3.50–13.00	28	28

PL- Poland; NL- the Netherlands;
CLASS and Activity scores are expressed on a 7-point scale.

M =.84, *SD* =.63; BG *M* =.99, *SD* =.55) and below the standardized sample mean on Engaged Support for Learning (FLD *M* = −.76, *SD* =.68; QF *M* = -,70, *SD* =.55; LM *M* = −.75, *SD* =.82).

Analysis of variance showed that there are significant differences between the clusters on all CLASS dimensions, namely PC $F(2, 53) = 18.73$, $p = .00$; TS $F(2, 53) = 38.68$, $p = .00$, RCP $F(2,53) = 26.44$, $p = .00$; BG $F(2, 53) = 22.22$, $p = .00$; FLD $F(2, 53) = 42.40$, $p = .00$; QF $F(2, 53) = 41.79$, $p = .00$; LM $F(2, 53) = 23.62$, $p = .00$.

Turkey's post hoc test indicated that three of four dimensions reflecting Emotional Support, namely Teacher Sensitivity, Regard for Child Perspectives and Behavioral Guidance varied significantly from another across clusters and showed the same pattern, with the highest scores occurring in the third cluster, followed by the first cluster and with the lowest results in the second cluster. The scores of the Positive Climate followed a different pattern. More specifically, the scores in the first and the third clusters did not vary significantly, but they were both significantly higher than the score in the second cluster. In regard to the dimensions included in the Engaged Support for Learning domain (Facilitation of Learning and Development, Quality Feedback, Language Modeling), scores followed the same pattern, namely results of the second and the third cluster did not differ significantly. However, they were both significantly lower than in the first cluster. The mean standardized CLASS dimensions scores for all three clusters are shown in Figure 1. Classroom characteristics and the curriculum of provided activities by cluster are presented in Table 3.

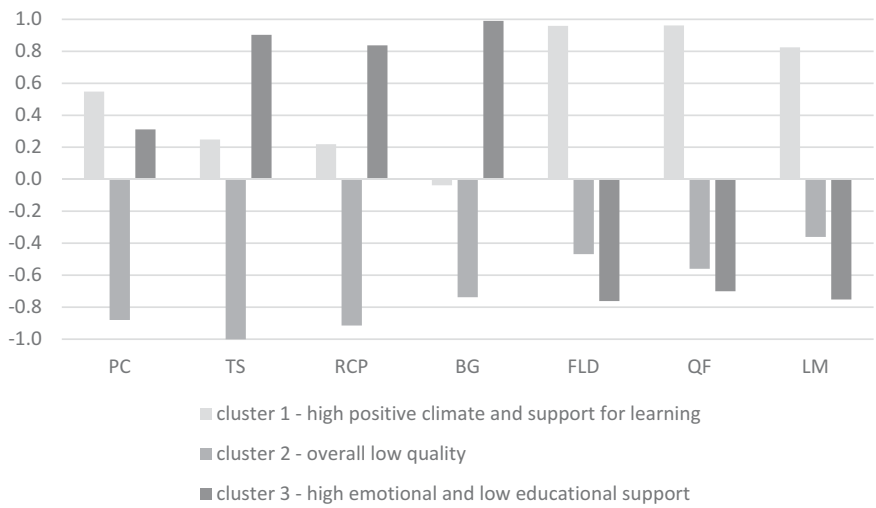

Figure 1. The mean standardized CLASS dimension scores for the three clusters.

PC- Positive Climate; TS- Teacher Sensitivity; RCP- Regard for Child Perspective; BG- Behavioral Guidance; FLD- Facilitation of Learning and Development; QF- quality Feedback; LM- Language Modeling.

Table 3. Classroom characteristics and the curriculum of provided activities by cluster.

	Cluster 1 high positive climate and support for learning	Cluster 2 overall low quality	Cluster 3 high emotional and low educational support
Structural features			
Group size	−.28 (1.02)[a]	.12 (0.98)	.26 (0.73)[a]
Children-to-teacher-ratio	−.12 (0.66)	.27 (1.40)	−.17 (0.77)
Provided activities			
Pretend-play	.00 (0.98)[b]	.40 (0.87)[c]	−.52 (1.00)[bc]
Self-regulation	.29 (0.78)[d]	.11 (1.06)[e]	−.55 (1.04)[de]
Science	.04 (1.11)	.19 (0.85)[f]	−.29 (1.01)[f]
Math	.10 (0.96)	.12 (1.06)	−.29 (0.98)
Language	.10 (0.79)[g]	−.21 (0.98)[h]	−.40 (1.21)[gh]
Pre-literacy	.12 (1.24)	−.14 (0.82)[i]	−.33 (0.82)[i]

Superscript letters indicate differences between clusters based on a medium or large effect size.

Taking into account quality characteristics of each cluster they were labeled as follows: the first cluster- *High positive climate and support for learning*, the second cluster- *Overall low quality*, the third cluster- *High emotional and low educational support*. Below the three quality profiles are described in more detail including differences between classroom structural characteristics and the curriculum of provided activities.

Cluster 1- High Positive Climate and Support for Learning

This largest cluster included 22 classrooms (39%). In this cluster both structural features are below the sample mean; in regard to the group size almost one third of the standard deviation (the most favorable result of all clusters) and in terms of the children-to-teacher ratio over one tenth. Thus, in general the structural conditions may be considered most favorable in cluster 1. With regard to the curriculum of provided activities, teachers in cluster 1 provided pretend play the least often of all type of activities, whereas self-regulation activities are provided the most. The focus on self-regulation, as well as the provision of language and pre-literacy activities was the highest in comparison to the other clusters.

Cluster 2 – Overall Low Quality

This cluster consists of 19 classrooms (34%). On average, they are characterized by the least favorable children-to-teacher ratio across all clusters (almost one third of standard deviation above the sample mean) and a group size slightly above the sample mean. In regard to the curriculum of provided activities, language and pre-literacy activities are provided the least frequently and pretend play the most often of all activities in this cluster. Pretend play, science and math activities are organized more often in classrooms included in cluster 2 than in the other clusters.

Cluster 3- High Emotional and Low Educational Support

This is the least prevalent cluster including 15 classrooms (27%). Classrooms in this cluster are defined by the least favorable group size and the most favorable children-to-teacher ratio, being respectively over a quarter of standard deviation above and about one fifth below the sample means. Children in classrooms of this cluster are provided with all types of activities noticeably less often than those in the other two clusters. In these classrooms the most frequently organized activities are science and math, whereas pretend-play and self-regulation receive less attention.

Comparison of Structural and Curriculum Quality between Clusters

For the structural classroom features, the comparison between clusters 1 and 2 as well as 2 and 3 did not reveal any medium or large-sized differences. The comparison between clusters 1 and 3 revealed a medium-sized difference in group size ($p = .09$, $g = 0.58$), favoring cluster 1.

Regarding the curriculum of provided activities, a comparison of clusters 2 and 3 revealed large-sized difference between the provision of pretend play ($p = .01$, $g = 0.97$) as well as medium-sized one related to the provision of self-regulation ($p = .08$, $g = 0.61$), science ($p = .14$, $g = 0.51$), language ($p = .11$, $g = 0.55$) and pre-literacy ($p = .10$, $g = 0.57$) activities. The results indicate a stronger emphasis on all types of these activities in classrooms of cluster 2 compared to cluster 3. For the comparison between cluster 1 and 3, medium-sized differences related to the provision of pretend play ($p = .13$, $g = -0.51$) and language ($p = .14$, $g = -0.50$) activities and large-sized difference concerning the focus on fostering children's self-regulation ($p = .01$, $g = -0.92$) were found. The results indicated that all types of the activities were provided more often in classrooms of cluster 1.

Discussion

The importance of high quality ECEC for children's development, well-being and learning has been well established. ECEC quality is a multidimensional concept that has shown to consist of structural aspects (e.g. group size or children-to-teacher ratio), process quality (e.g. teacher-child interactions)

and curriculum (e.g. provision of play and developmentally appropriate activities) and that are interrelated and jointly affect children's day-to-day experiences. The current study investigated these aspects and the relations between them using a cluster analysis to enhance our understanding of quality profiles of Polish and Dutch classrooms.

Aspects of Quality in Poland and in the Netherlands

The overall observed process quality did not differ between Poland and the Netherlands, but the results illustrated that Polish and Dutch teachers emphasize different components of teacher-child relations. Polish ECEC is characterized by higher levels of emotionally supportive interactions, whereas the quality of developmentally stimulating interactions was lower, which may reflect different views on the way of supporting the socio-emotional and cognitive development of the youngest children by teachers in both countries. In the Netherlands this reflects recent developments toward strengthening the educational role of ECEC (Slot, Jepma, et al., 2017; Slot, 2018b), while in Poland it may be related to a considerably recent change of legislation adding an educational role to ECEC services for 0–3 years old children (Act of 4 February 2011on Care for Children up to the age of 3).

Given the differences in the national Polish and Dutch regulations regarding children-to-teacher ratio and group size, we expected to find noticeable differences on these aspects within observed activities. Yet, only the group size varied significantly between countries being less favorable in Polish ECEC classrooms. This may be caused by a common Polish pedagogical approach to arrange the available space in such a way that it enhances activates in small groups (Standardy jakości opieki i wspierania rozwoju dzieci do lat 3, 2012). In addition, these small groups often spend time in different rooms (some of the visited centers had up to 5 rooms available per group, e.g. playroom, bedroom, dining room, music room, and a hall, all of which were used throughout the day for different activities). This tendency to divide children into smaller groups in classrooms with a large overall group size was also found in a multiple case study of good ECEC practices in seven European countries (Slot et al., 2016). Altogether it can be considered a pedagogical choice to maximize the quality of children's experiences and it illustrates how organizational arrangements and space conditions have the potential to mitigate hindering policy regulations regarding structural aspects at least to some extent.

The teacher-reported patterns of provision of activities showed high similarity across countries. Considering the lack of an official curriculum in Poland and the Netherlands, this supports previous findings indicating a shared understanding of the role ECEC can play in fostering children's development in western industrialized societies (Broekhuizen, Leseman, Moser, & van Trijp, 2015; Sylva et al., 2015; Tietze, Cryer, Bairrio, Palacios, & Wetzel, 1996). At the same time all types of activities were reported to be provided more often by the Dutch teachers, which seems to reflect the current state of affairs in these countries at least to some extent. In the Netherlands, the focus on the provision of pre-academic activities has received growing attention as the ECEC sector is increasingly viewed as educational setting that supports children's school readiness (Slot, Jepma, et al., 2017), especially for children considered to be at-risk due to a disadvantaged family background. In Poland, even though the importance of the educational role of ECEC setting was recognized at the legislation level (Act of 4 February 2011on Care for Children up to the age of 3) it is still considered by the teachers as less important in comparison to social, emotional, physical and personal goals (Wyslowska, 2017). This result suggests that top-down initiatives, such as policy change in itself may not be sufficient in terms of changing pedagogical practices.

Quality Profiles of Classrooms

The current study distinguished three different quality profiles in ECEC classrooms. These distinguished profiles show some similarities to the results of a study conducted with Pre-K classrooms in the U.S. (LoCasale-Crouch et al., 2007), in which five different profiles were identified. In that study one of the profiles was defined by the combination of high emotional climate and high levels of

instructional support, which later appeared to predict children's academic growth; and another profile which showed overall the highest scores on emotional support dimensions, predicted children's social competence (Curby et al., 2009). Currently similar evidence on potential differentiated effects of quality on toddlers' development is lacking. This calls for future research including child outcomes as well.

Also, the results concerning relations between structural characteristics and different quality profiles are to some extent in line with previous findings (e.g. Barros & Aguiar, 2010; Deynoot-Schaub & Riksen-Walraven, 2005; Hulpia et al., 2016; Thomason & La Paro, 2009). Overall, the most favorable structural conditions occurred in cluster 1 characterized by a high positive climate and support for children's learning. Likewise, the least favorable children-to-teacher ratio was evident in the second cluster which showed the lowest quality on all dimensions. However, group size was highest in cluster 3 defined by high emotional, but low educational support. This may suggest that despite the high group size these teachers managed to provide high quality emotionally supportive interactions, but at the expense of supporting children's learning. Possibly, the large group size necessitates teachers to put more emphasis on promoting classroom management and behavior guidance which might increase their awareness of children's individual needs within this large group.

Regarding the curriculum of provided activities, the findings revealed that classrooms included in the cluster 2 (overall low quality) are provided with the least balanced curriculum (i.e. with a narrow focus on only a few types of different activities and opportunities for play), whereas the classrooms in cluster 1 (high positive climate and support for learning) and 3 (high emotional support and low support for learning) showed more balance in the provision of different activities. At the same time, all types of activities occurred noticeably less often in classrooms of cluster 3. Altogether, the results suggest that both a balance in the provision of a wide range of different activities and experiences and a certain frequency at which these activities are provided might be important for high quality care and education. These findings are in line with a recent review on preschool curricula in the U.S. and effects on child outcomes, which reported that *skill-specific curricula*, focusing on specific domains of development, including pre-academic (e.g. literacy, math) and social-emotional skills (e.g. self-regulation, problem solving), showed positive effects in the targeted domains, whereas *whole-child curricula*, defined as curricula emphasizing child-centered and active learning by arranging the classroom environment, did not show any effects on children's social-emotional or pre-academic development (Jenkins & Duncan, 2017; Preschool Evaluation Research Consortium, 2008). Importantly, the provision of a good evidence-based *skills-specific curriculum* does not imply a teacher-directed approach, rather it is characterized by a focus on providing sequential and cumulative learning opportunities within playful small and large group activities. Moreover, developmentally appropriate *skills-focused curricula* did not have detrimental effects on children's socio-emotional outcomes (Duncan et al., 2015). Taking into account that in Poland and the Netherlands there is no national curriculum for the youngest children, it seems relevant to establish such a research-based guideline as it could contribute to enhancing high quality provision.

Limitations and Further Research

There are some limitations of this study: firstly, the small sample size and relatedly the sampling strategy. Therefore, the results of the study cannot be generalized and should be interpreted with caution. Although, the current study used a convenience sample that was small in size, the centers were selected to capture relevant national variation in region, urbanization and socioeconomic and/or cultural background of children enrolled in the center. Future research with larger sample size is needed to investigate whether similar quality patterns emerge. Secondly, the current study did not include child outcome measures that could function as validation for the classroom profiles that emerged from the data. It would, therefore, be important for future research to investigate how different quality profiles relate to children's development. Thirdly, data on structural aspects and process quality were based on observations, whereas information on the provision of activities was taken from teachers' self-reports. In future studies it would be valuable to explore the curriculum of

provided activities by means of observation, for instance by using a snap-shot procedure to capture more details on the activity settings, in order to compare the obtained information on this aspect with the self-reported practices of teachers.

Despite these limitations, the current study provided initial support for differentiated profiles of toddler classroom quality going beyond merely low, mid or high levels of quality by highlighting different constellations of quality aspects. Further, the present study lends support to previous findings showing that favorable structural conditions and a balanced curriculum including a broad range of activities were associated with highest process quality in toddler classrooms. The findings corroborate previous research in preschool and, as such, add information on structural, curriculum and process quality for two- and three-years old children in two European countries.

Some implications for policy and practice can be derived from this exploratory study. Most importantly, given the salience of a balanced provision of play and different activities to provide children with high quality interactions and experiences that can contribute to their broad development, it seems that more thought could be placed to the improvement of the curriculum. The cross-country comparison illustrates that a lack of a (national) curriculum does not necessarily imply similar pedagogical practices. Therefore, in view of a lacking official (national) curriculum, more emphasis could be placed on the center's role and vision in implementing age-appropriate activities that are tailored to the specific needs of their population of children. Also, opportunities for professional development can be used to improve classroom practices and facilitate high quality interactions.

Notes

1. Maximum group size is regulated by the amount of space available for children.
2. In Poland, a child may attend a setting until the age of four if his/her parent provides information about obstacles in initiating kindergarten education and in the Netherlands children start kindergarten on the day of their fourth birthday.

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