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Child Engagement in Inclusive Preschools: Contributions of Classroom Quality and Activity Setting

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ABSTRACT

Preschool process quality and activity setting are considered important aspects influencing child engagement. As such, it is important to understand how educational settings can promote engagement, particularly for children with disabilities and/or at risk. This observational study describes process quality and activity setting in inclusive preschools, analyzing its predictive role for child engagement. Participants were 184 children attending 39 preschools. Three groups of children, nested within classrooms, were considered: with disabilities ($n = 45$), at risk ($n = 59$), typically developing ($n = 80$). Child Observation in Preschool assessed engagement and activity setting; Classroom Assessment Scoring System assessed quality of teacher–child interactions. *Research Findings:* Results from multilevel regressions show that classroom emotional support and organization and more time in free play were positively predicting child engagement, whereas more time in whole group was a negative predictor of engagement. Besides these main effects, an interaction effect between child developmental functioning and activity settings was found. For at-risk children, more time in whole-group activities had greater negative effects on child engagement. For children with disabilities, more time in free-play had greater positive effects on child engagement. *Practice or Policy:* Results contribute to inform teachers regarding the importance of individualizing interactions and planning activity settings to promote engagement and participation in inclusive preschools.

Convention on the Rights of the Child (United Nations General Assembly, 1989) encourages and supports the right of young children with disabilities to be cared for and educated in inclusive classrooms, along with their typically developing peers. Accordingly, over the past years, several laws were designed to ensure that young children with disabilities and/or at risk are given opportunities to develop and learn in the least restrictive environments, particularly in educational settings. Additionally, numerous researches on preschool inclusion has shown the importance of high-quality inclusive early childhood intervention (ECI) for the development of young children with disabilities (Boyd, Odom, Humphreys, & Sam, 2010).

In fact, high-quality inclusive environments have found to be related to positive outcomes for all young children, including those with and without disabilities (Camilli, Vargas, Ryan, & Barnett, 2010; Guralnick, 2001; Pianta, Barnett, Burchinal, & Thornburg, 2009; Strain & Bovey, 2011). It is widely acknowledged among policy makers, researchers, and educators that children with and without disabilities benefit from high-quality inclusive settings (Odom, Buysse, & Soukakou, 2011; Soukakou, 2012; Strain & Bovey, 2011; Warren, Martinez, & Sortino, 2016). Research has shown high-quality settings can enhance all young children's early experiences, leading to more effective learning and development (Burchinal, Vandergrift, Pianta, & Mashburn, 2010; Pelatti, Dymia, Logan, Justice, & Kaderavek, 2016; Warren et al., 2016). However, the literature stresses that more research

is still needed on the quality of inclusive classrooms and on the impact of preschool inclusion in different child outcomes (Barton & Smith, 2015; Warren et al., 2016).

Child Engagement

The inclusion statement of the Division for Early Childhood (DEC)/National Association for the Education of Young Children (NAEYC) (2009) includes participation as a key aspect for the quality of inclusion in educational settings, highlighting the need of access to appropriate support to ensure that all children participate in their natural physical and social environments. According to the DEC/NAEYC (2009), participation comprises high quality instructional and intervention approaches designed to promote children's engagement and sense of belonging in their natural environments.

Although the definition of *participation* in educational settings is not universal, authors agree that this is a health-related, multidimensional construct portraying proximal processes that are crucial for all children's high-quality inclusive experiences, development, and learning (Almqvist, 2006; Coster & Khetani, 2008; Dunst, Bruder, Trivette, & Hamby, 2005; Granlund, 2013; Imms et al., 2017; Roper & Dunst, 2003; Simeonsson, Carlson, Huntington, McMillen, & Brent, 2001). In accordance, the World Health Organization (WHO; 2001), defines *participation* as "involvement in life situation" (p. 18), highlighting child engagement in everyday life experiences to be considered as an outcome related to the quality of inclusive experiences and participation in natural environments.

Engagement is thus an important dimension of the concept of participation, and research provides wide evidence of the relevance of targeting engagement in preschool as a core outcome for children with and without disabilities (Aydođan, Farran, & Sagsöz, 2015; Chien et al., 2010; Fredricks, Blumenfeld, & Paris, 2004; Williford, Maier, Downer, Pianta, & Howes, 2013). The definition of *engagement* includes children's appropriate interactions – active and positive – with adults, peers, and materials in their immediate developmental contexts (e.g., Downer, Rimm-Kaufman, & Pianta, 2007; McWilliam & Bailey, 1995; Odom & Bailey, 2001; Pinto, 2006). This is in line with the definition of *proximal processes* provided by the bioecological model (Bronfenbrenner & Morris, 2006), which are considered the main mechanisms of human development. As such, engagement is considered crucial for child development and is influenced by the dynamic transactions occurring between the child and the components of daily environment (e.g., Aydođan et al., 2015; McWilliam & Casey, 2008).

The malleability features of engagement are highlighted in literature, as individual and contextual characteristics can contribute to altering child engagement. Several child characteristics have been associated with engagement. For instance, at the individual level, developmental status, temperament, and self-regulation skills were found to be aspects affecting the children's ability to profit the most from the classroom experiences, by engaging actively and positively with teachers, peers, and tasks (e.g., de Kruif, McWilliam, Ridley, & Wakely, 2000; Grande & Pinto, 2009; McWilliam & Bailey, 1995; Vitiello, Booren, Downer, & Williford, 2012). Studies comparing the engagement of children with and without disabilities have found that children with disabilities tend to spend more time nonengaged or showing lower levels of engagement than their typically developing peers (e.g., Eriksson, Welander, & Granlund, 2007).

In addition to child characteristics, literature also identifies environmental aspects playing a significant role in intentionally supporting engagement in preschool, for children with and without disabilities (Aydođan et al., 2015; Williford et al., 2013). Particularly in inclusive settings, several environmental factors can be associated with child engagement, for instance, the type of activity (e.g., Booren, Downer, & Vitiello, 2012; Kemp, Kishida, Carter, & Sweller, 2013; Tsao et al., 2008), the accessibility and adequacy of the materials (e.g., Almqvist, 2006; McWilliam & Bailey, 1995), the quality of social interactions (e.g., Almqvist, 2006; Grande, 2013; Kemp et al., 2013; McWilliam & Bailey, 1995; Reszka, Odom, & Hume, 2012), and the quality and style of teacher-child interactions

(e.g., Almqvist, 2006; Grande & Pinto, 2009; Mahoney & Wheeden, 1999; Sjöman, Granlund, & Almqvist, 2016).

Preschool Process Quality

Preschool classroom quality is a broad term that encompasses many inter-related dimensions (Bryant, 2011; Phillips & Howes, 1987). Two broad dimensions of preschool quality have been extensively described in literature, namely, structural quality and process quality (e.g., Phillips & Howes, 1987; Pianta et al., 2005; Zaslow, Martinez-Beck, Tout, & Halle, 2011). The structural quality dimension refers to features of the preschool infrastructure or design and includes, for instance, aspects that are usually regulated such as adult:child ratios, group size, teacher education, classroom physical space (Barnett, Robin, Hustedt, & Schulman, 2003; La Paro, Sexton, & Snyder, 1998). Process quality is not regulated, thus more variable, and includes dynamic aspects such as teacher–child interactions and child–child interactions (e.g., Burchinal, Roberts, Nabors, & Bryant, 1996; Pelatti et al., 2016; Pianta, La Paro, & Hamre, 2008).

Regardless of the importance of structural characteristics, largely documented in literature, the role of process quality is particularly relevant, as interactive processes such as teacher–child interactions, are fundamental for child development. Interactions in natural contexts, also called proximal processes, are the key mechanisms of development as children learn and develop through continuous and frequent interactions with teachers, peers, and all the elements of their social and physical environments (Bronfenbrenner & Morris, 2006). Accordingly, process quality is especially underlined because of its direct links with children’s outcomes (Mashburn et al., 2008; Pelatti et al., 2016).

Aspects of process quality such as emotional support, classroom organization, and instructional support have been recently used to characterize interactions between children and teachers in the preschool learning environments (Mashburn et al., 2008). Some studies suggest that some dimensions of quality of teacher–child interactions in inclusive classrooms tend to be higher than in noninclusive environments (Grisham-Brown, Cox, Grivil, & Missall, 2010; Hestenes, Cassidy, Shim, & Hegde, 2008; Pelatti et al., 2016). For instance, Pelatti et al. (2016) found that inclusive preschool classrooms tend to show higher levels of teacher emotional support; however noninclusive classrooms showed significantly higher levels of teacher instructional support.

Research also suggests that promoting high-quality interactions in educational settings is a challenge for teachers, and that this challenge can be even higher in inclusive settings, as teachers need to be responsive to a wider span of children’s needs (Pelatti et al., 2016). For example, Soukakou (2012) found that teachers in inclusive classrooms seldom used high-quality feedback. Nevertheless, reports on inclusive classroom quality and results on differences between inclusive and noninclusive classroom quality are still inconsistent (Hestenes et al., 2008; Pelatti et al., 2016). Moreover, more needs to be explored on the linkages between inclusive classrooms quality and child outcomes (Pelatti et al., 2016).

Some studies highlighted the crucial role of teacher’s interactions and behaviors in promoting the engagement of children with disabilities (e.g., Almqvist, 2006; Grande & Pinto, 2009; Mahoney & Wheeden, 1999), as these children often need more support to get and maintain active and positive engagement in different activities in the educational settings. For instance, research results show that teacher interactive styles are related to higher levels of engagement and participation of children with disabilities (e.g., de Kruif et al., 2000; Grande & Pinto, 2009; Mahoney & Wheeden, 1999; McWilliam, Scarborough, & Kim, 2003), with teacher responsiveness and emotional tone influencing the levels of engagement of children with disabilities.

Classroom Activity Setting in Preschool

Recent research has highlighted the relevance of activity setting for children’s development and learning experiences in preschool by showing that it can play a significant role in shaping the

interactions occurring in such settings (Booren et al., 2012; Carta & Greenwood, 1985; Early et al., 2010; Goble & Pianta, 2017; Kontos & Keyes, 1999; Layzer & Goodson, 2006). Three main activity settings are usually described according to studies conducted by the National Center for Early Development and Learning (NCELD) (Early et al., 2005, 2010), namely, child directed/chosen activities, including free-play settings; teacher directed activities, including whole-group or small-group activity settings; and routine activities, including transitions and meal-time activity settings.

In early education inclusive contexts, some studies have approached activity setting by focusing on the relations between child engagement and type of classroom activities. For instance, studies analyzing teacher-directed activities, such as whole-group or small-group, or children's initiated activities, such as free-play, report a positive relation between engagement of children with disabilities and the degree of child activity initiation/choice (e.g., Reinhartsen, Garfinkle, & Wolery, 2002; Reszka et al., 2012; Tsao et al., 2008). Similarly, other studies suggest that children engage more, and in more sophisticated interactions, during child-initiated activities such as centers/free-play time (Kemp et al., 2013; Kontos, Burchinal, Howes, Wisseh, & Galinsky, 2002; Reszka et al., 2012).

Considering this, the amount of time that children spend in different activity settings (e.g., time spent in structured teacher lead activities vs. time spent in free-play chosen by children) may constitute an important feature of preschool learning environments related to children's engagement levels (Fuligni, Howes, Huang, Hong, & Lara-Cinisomo, 2012; Kemp et al., 2013; Reszka et al., 2012). Although the literature underlines the importance of having opportunities to engage in different activity settings throughout the day, no indications have been specified on the appropriate amounts of time children should spend on each activity setting (Fuligni et al., 2012).

The NCELD studies found that children, in general, spent nearly 29% of time in free play and 37% of time in teacher-led activities such as whole-group or small-group activities, with time spent in whole-group being negatively associated with classroom process quality (Chien et al., 2010; Early et al., 2010). However, research is not consistent regarding how different activity settings are related to the classroom quality experienced by children. For instance, Fuligni et al. (2012) found no differences in process quality for different activity settings in preschools serving low-income communities, whereas Chien et al. (2010) found that classrooms where children spent more time in free play presented higher levels of global quality, as assessed by the Early Childhood Environment Rating Scale (ECERS; Harms, Clifford, & Cryer, 1998), than classrooms with a more instructional, teacher-led, profile. To our knowledge, no studies analyzing the intersection of process classroom quality and activity setting in inclusive preschools have been conducted, and information is lacking on the potential role of process quality on the relations between activity setting and child engagement in inclusive settings.

In inclusive classrooms, studies have focused, separately, on relations between classroom quality and engagement in children with disabilities (e.g., Grande & Pinto, 2009; Mahoney & Wheeden, 1999), and on relations between activity setting and engagement in children with disabilities (e.g., Kemp et al., 2013; Reszka et al., 2012). To our knowledge, research on the relations between activity settings, process quality and child engagement for children with and without disabilities attending the same classrooms, has not yet been conducted.

Research connecting these three aspects can inform on how to better address children's individual needs in inclusive settings through teacher actions regarding the activity setting organization and the quality of teacher-child interactions. Exploring how classroom quality and activity settings can interact to promote engagement in children with different developmental characteristics in inclusive settings can contribute to inform teachers on how to better plan preschool routines, namely, the planning of time distribution per activity settings, and the quality of their interactions with children. Moreover, studying context variables, namely, quality of teacher-child interactions and activity setting characteristics, in relation to child engagement in inclusive contexts, can contribute to better portraying the quality of the inclusion processes and to identify aspects through

which the contexts can enhance development and participation in children with disabilities or at risk in early inclusive education settings.

The Present Study

This study analyzes inclusive preschool process quality and activity setting and examines relations between those variables and engagement in children with and without disabilities. Specifically we aim to (a) analyze relations between classroom activity setting, quality of teacher–child interactions, and child engagement in inclusive preschools; (b) analyze differences in engagement – overall and by activity setting – between children with disabilities, at risk, and with typical development; (c) to investigate influences of classroom activity setting and process quality on child individual engagement; (d) to analyze interactive effects of activity setting and child developmental status (being at risk or having disabilities), on child engagement. Based on the presented literature, it is hypothesized that classroom quality and activity settings influence all children’s engagement, playing a more prominent role particularly for children with disabilities and at risk, as these two groups of children might be more vulnerable to influences of classroom characteristics (e.g., Luthar, Crossman, & Small, 2015).

Method

Participants

Participants were 184 preschool age children ($M_{\text{months}} = 47.06$, $SD = 6.77$) attending 39 classrooms from the Porto district, Portugal, selected 6 months before classroom observations at Time 1 (T1). Following a random list of numbers, classrooms from the list of preschools identified at the Ministry of Education website for the referred district were contacted. Directors were contacted until 42 inclusive preschool classrooms agreed to participate. Overall, 80 early childhood education institutions were contacted, and 26 did not agree to participate. Additionally, 11 were excluded once they did not meet the following criteria: being an inclusive classroom with at least one child eligible for ECI or special education (SE) support services attending. In each classroom, four to seven children were selected. Of these, one child was automatically selected for the study as that child was previously identified as receiving support from the ECI/SE services. The criterion for selection of the other children in the classroom was based on the teacher’s assessment of children’s developmental functioning level. Teachers completed a short-version of the Matrix for Assessment of Activities and Participation (MAAP; Castro & Pinto, 2013) measure for all children whose families consent to participate in the study (for details see Coelho, Cadima, Pinto, & Guimarães, 2018).

Three groups of children were considered for this study: (a) children with disabilities eligible for SE or ECI services, (b) at-risk children, and (c) typically developing children. The group of children with disabilities was automatically selected as they had been previously identified as eligible for SE or ECI. At least one child with disabilities was selected in each classroom; in 12 classrooms two children with disabilities were selected. In each classroom, the MAAP short-version scores were used to select the groups of children at risk and children with typical development: two children with the lowest scores in the MAAP short-version, for the group at risk; and three children randomly selected among the children with the highest scores in the MAAP short-version, for the typical development group. This selection procedure allowed to capture the diversity of children’s developmental functioning characteristics in each classroom, as all pairs from the three group of children were found to present significant differences in the MAAP short-version measure, $F(2, 243) = 226.19$, $p < .001$, $\eta^2 = .65$.

Overall, initial selection included 54 children eligible for SE/ECI support due to identified disabilities; 78 children considered at risk, and 115 typical development children. Diagnosis categories included in the group of children with disabilities were diverse: 20 children were identified

with global developmental delay, 17 children were identified with autism spectrum disorders, four children were identified with cerebral palsy, three children were identified with Down syndrome, two children were identified with language delays, two children were identified with hyperactivity, one child was identified with a cardiac condition, one child was identified with hearing deficit, and four children were identified with rare syndromes such as Kabuki syndrome, Costello syndrome and Cri-du-chat syndrome.

The three groups of children – with disabilities, at risk, and typically developing – were similar regarding their age, $F(2, 234) = 38.89, p = .44$. However, and similarly to previous studies (e.g., Grande, 2013; Lai, Tseng, Hou, & Guo, 2012) the group of children with disabilities included a much higher number of boys (82% in the group children with disabilities, 65% in the group children at risk, 52% in the group typically developing children). For more details see AUTHORS (2018).

At data collection points (T1 and T2) the overall number of observed children in each classroom dropped from the initially selected. This was mainly due to the fact that not all recruited children in each classroom were attending the school during the observation day. In those situations, the criteria to proceed with the observation were (1) having at least 50% of the selected children in the classroom and (2) having at least one child from each group – with disabilities, at risk and typically developing – attending.

At T1, children observed in the three groups – with disabilities, at risk, and typically developing – continued to be similar regarding age, $F(2,195) = 0.180, p = .84$ ($M_{\text{months}} = 53.45, SD = 6.98$; $M_{\text{months}} = 52.67, SD = 6.99$; and $M_{\text{months}} = 53.12, SD = 6.57$, respectively). The group of children with disabilities included 78.7% of boys, the group of children at risk had 63.3% of boys, and 53.8% typically developing boys were observed. No significant differences regarding children's age or gender, $t(243) = 0.681, p = 0.95$; $\chi^2(1) = .007, p = .93$, respectively, were registered between the children that continued in the study and the ones that drooped out. Significant differences were still found on the MAAP short-version measure, $F(2,182) = 110.82, p < .001, \eta^2 = .55$ between the three groups of participant children at T2, thus supporting that the children's initial distribution for the three groups during the participants selection was maintained.

Overall, 184 children were observed at T1 and T2, from 39 classrooms, including 45 children with disabilities, 59 children at risk, and 80 children with typical development. Classrooms had on average 20.42 children ($SD = 2.49$). The number of children with disabilities per classroom varied between one and four ($M = 1.58, SD = 0.68$). Teachers were all female with ages ranging between 27 and 59 years ($M = 49.49, SD = 6.88$). All teachers had, at least, a degree in preschool education, with an average of 16.06 years of formal education ($SD = 0.42$). Their experience as preschool teacher was diverse, varying between 2 and 36 years ($M = 25.23, SD = 7.16$). Similarly, teachers' experience in inclusive classrooms presented a wide range, with a minimum of 1 year, and a maximum of 30 years ($M = 10.86, SD = 8.40$).

The Portuguese National Data Protection Authority and the Committee for Monitoring Studies in Educational Settings of the General Direction of the Ministry of Education approved all measures and data collection procedures for the study (authorization no. 16785/2015 and no. 0535000001, respectively); informed consent was obtained from the preschools' directors, teachers, and families.

Measures

Child Observation in Preschool

Child Observation in Preschool (COP; Farran & Anthony, 2014) was used to assess child engagement (T1 and T2) and proportion of observation in different activity settings (T2). The measure consists of an observation system that captures children's behavior in preschool settings, throughout a typical day, using a systematic behavior-sampling procedure, to collect information on (a) children's listening and (b) verbal behaviors, (c) schedule, (d) proximity to and (e) interaction state, (f) activity and tasks demands, (g) materials and (h) focus of activities, and (i) level of involvement. Procedures recommend for each child to be observed over 20 snapshots, or sweeps, across the preschool day. In each sweep,

each child must be observed for 3 seconds and all categories coded immediately after. COP has been used in several studies that report its validity in diverse samples, including typically developing children and children with disabilities (e.g., Fuhs, Farran, & Nesbitt, 2013; Lillvist, 2010; Luttrupp & Granlund, 2010; Nesbitt, Farran, & Fuhs, 2015). COP dimensions can be used independently or combined (e.g., Fuhs et al., 2013; Nesbitt et al., 2015).

This study analyzes data from the involvement and the schedule dimensions. In the involvement category, child engagement is coded in a 5-point scale, where 1 means *low engagement* (e.g., totally out of task, not paying attention to the activity, sitting quietly; fiddling with another child's hair or clothing, eyes not focused on ongoing activity); 2 means *medium-low engagement* (e.g., looking at teacher and/or material inconsistently, flat affect, looking bored, visible attention going in and out, visible lack of persistence); 3 means *medium engagement* (e.g., on task, maintaining eye contact with teacher, participating but may briefly look around but immediately comes back to task); 4 means *medium-high engagement* (e.g., eager expression, relevant self-talk during tasks, volunteering response with positive affect, looking at material throughout entire time; leaning forward, showing persistence); and 5 means *high engagement* (e.g., intense focus, serious persistence and pursuit of activity, very difficult to be distracted from the activity, seeming oblivious to noise and the behaviors of the other children that are not related to the task). This dimension score is computed by averaging the values of all observation sweeps for each child.

The schedule dimension of COP allows collecting data about the classroom activity setting. Based on the 3-second observation, observers must choose the adequate activity setting code, among the following possibilities: whole-group, small-group, centers/free-play, simultaneous small-group and centers/free-play, special activities (i.e., activities normally occurring in a different class and with a different teacher), transitions, meal-time, playground, gross motor, or none. This dimension can be computed at child and classroom level as multiple target children were observed in all classrooms, including typical developing children, at-risk children, and children with disabilities. In this study we use data at the individual level, which indicates the proportion of observation that each child was observed in each activity setting (e.g., whole-group activities, centers/free-play activities, transitions, small-group activities). At individual level, the dimension score is obtained by dividing the number of sweeps the child was observed in each activity setting code by the total number of observed sweeps for the child.

Observers collecting data received theoretical and practical training on the COP, including with video coding and discussion, and in-context observation of children with and without disabilities, for inter-observer reliability. During data collection, for reliability purposes, interobserver agreement was checked for 25.05% of observed children, at T1 and T2. Engagement category had an exact interobserver agreement of 74.51% at T1 and 85.20% at T2. Agreement within one point of difference was 98.47% at T1 and 99.50% at T2. Weighted kappa was .74 at T1 and .84 at T2, showing good reliability. Schedule achieved an exact agreement of 98.7% at T2; Cohen's kappa was .98.

Classroom Assessment Scoring System

Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) was used to measure the quality of interactions between teachers and children in preschool settings at T2 of data collection. The measure consists of three dimensions – emotional support, classroom organization and instructional support. It was developed based on development theories and recommended early childcare practices.

The emotional support dimension was designed to capture teacher–children's emotional connection, absence of expressed negativity, teacher's awareness and responsiveness to children, and teachers' respect for children's interests, motivations, and points of view. The classroom organization dimension provides information on how the teacher manages children's behavior, instruction time, and routines to get children involved in learning activities. The instructional support dimension refers to the classroom quality in terms of the promotion of children's development of concepts and knowledge, quality of teacher's feedback to children, and quality of language stimulation.

According to the CLASS procedures, observers must weigh the behaviors of all adults in the classroom during the observation period, and then score all items on a 7-point Likert-type scale, from *low* (1, 2), to *middle* (3, 4, 5), to *high* (6, 7). The manual includes specific behavioral indicators and useful guidelines for each dimension, providing extensive examples. The CLASS was developed in the US and has been used in several European countries, with studies showing that this is a reliable, valid measure in different sociocultural contexts (e.g., Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008; Cadima, Verschueren, Leal, & Guedes, 2016; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). The measure was also used in inclusive classrooms and show adequate validity in such settings (e.g., Cadima, Aguiar, & Barata, 2018; Pelatti et al., 2016).

Observers collecting data received adequate training in the measure (before data collection) and reached the authors training standards (at least 80% of within one point agreement with a master coder). Two independent observers simultaneously coded 25% of the CLASS observations during T2 data collection. Exact agreement was 67.25. Within one point agreement was 99.50. Weighted kappa was .66, indicating good reliability. Cronbach's alpha was .89 for the emotional support dimension, .77 for the classroom organization, and .69 for the instructional support.

Data Collection

Data was collected in two different moments, separated by a 6-month interval. For each time point, measures were completed within a 3-hour observation in the classroom during a typical preschool morning. For the COP measure, an average of 20.48 ($SD = 2.58$) sweeps per child were collected at T1 to obtain scores for child engagement; and an average of 21.25 ($SD = 3.72$) sweeps per child were collected at T2 to gather information on child engagement and proportion of observation in different activity settings. For the CLASS measure, four observation cycles of 20 minutes were conducted, per classroom, during the morning at T2. Both measures – COP and CLASS – were completed during the same morning by two independent observers at T2.

Data Analyses

Descriptive analyses were conducted to characterize child engagement, classroom quality dimensions, and activity setting characteristics. Classroom-quality dimensions descriptive data is only presented globally because it was measured at the classroom level and children from the three groups were nested in the same classrooms. As the three groups of children were exposed exactly to the same classroom quality levels, differences regarding classroom quality dimensions between the groups of children could not be determined. Results on engagement and activity setting are presented for the overall group of participants and for each group of children (with disabilities, at risk, and typically developing) as these variables were measured at the individual level.

Pearson's correlations were then computed to explore relations between classroom quality and activity setting. Considering the three groups of participants in the present study, ANOVA was used to analyze differences between the groups regarding engagement and proportion of observation in different activity settings. Correlations between classroom quality, activity setting, and child engagement, by group of children, were also explored.

Lastly, multilevel regressions were conducted using MPlus Version 7 (Muthén & Muthén 1998-2015). Multilevel models are used to address the hierarchical nature of the data, given that children were nested within classrooms. These models deliver a single framework combining information from within and between levels, contributing to more accurate estimations of outcomes. As such, multilevel models take into account the nonindependence of data by estimating parameters at two levels, individual level (children within classrooms) and classroom level (variation across classrooms). Multilevel models weight the estimator for each classroom based on the relations that exist on the overall sample, thus improving estimation of individual effects. Moreover, cross-level effects can be modeled accounting for the dependence among individual child data within the same

classroom, by taking the variability of random effects into account in estimating standard errors (Bryk & Raudenbush, 1992; Snijders & Bosker, 1999).

A series of multilevel models were tested. For predicting children's engagement in inclusive classrooms, activity setting, namely, proportion of observation in whole-group and proportion of observation in free play were entered in at Level 1 (individual level). Child development status was also entered at Level 1, as separate dummy variables (reference group = typically developing children). At Level 2 (classroom level) the quality of emotional support, classroom organizational and instructional support were entered, one at each time, in the model. First, we examined main effects of activity setting, child group belonging to the at-risk or to the disabilities groups, and process quality variables. Then we examined the interaction terms of activity setting (whole-group and free play) with the child developmental status (at risk; with disabilities). Engagement levels observed 6 months before (T1) were entered as covariate (individual level).

Results

Descriptive statistics for all study variables are summarized in Table 1. Overall, scores on the quality of teacher-child interactions were in the midrange for the CLASS emotional support and classroom organizational dimensions. However, low values were found for the CLASS instructional support dimension. Regarding activity setting, results showed that the most prevalent observed classroom activity setting was whole group (47% of observation period). Free play was observed for 4% of observations collected. Transitions were observed for nearly 11%, and small-group activities were observed for 6%. For the overall group of children, engagement presented medium levels, at T1 and T2 ($M = 3.03$, $SD = 0.46$ and $M = 3.08$, $SD = 0.42$, respectively).

Table 2 presents associations between classroom quality dimensions and activity setting. All classrooms quality dimensions were highly correlated. Instructional support was negatively correlated with proportion of observation in free play, and positively correlated with proportion of observation in whole-group. Classroom organization was also negatively associated with proportion of observation in free play. Emotional support and classroom organization were positively correlated

Table 1. Descriptive of child global engagement, classroom quality, and activity setting.

	<i>n</i>	Scale	<i>M</i> (<i>SD</i>)	Range
Emotional support T2	39	1 – 7	4.83 (.65)	3.25 – 6.31
Classroom organization T2	39	1 – 7	3.97 (.65)	2.25 – 5.58
Instructional support T2	39	1 – 7	2.48 (.70)	1.25 – 5.42
Proportion of observation whole-group T2	184	0 – 1	.47 (.21)	0 – 1.00
Proportion of observation small-group T2	184	0 – 1	.06 (.10)	.00 – .35
Proportion of observation free-play T2	184	0 – 1	.04 (.08)	.00 – .41
Proportion of observation small-group/free-play T2	184	0 – 1	.19 (.18)	.00 – .60
Proportion of observation transition T2	184	0 – 1	.11 (.07)	.00 – .40
Child overall engagement T1	218	1 – 5	3.02 (.46)	1.43 – 3.90
Child overall engagement T2	184	1 – 5	3.07 (.43)	1.44 – 4.00

Table 2. Correlations between classroom quality and proportion of observation in each activity setting.

	1.	2.	3.	4.	5.	6.	7.	8.
1. Emotional support	—	—	—	—	—	—	—	—
2. Classroom organization	.84**	—	—	—	—	—	—	—
3. Instructional support	.75**	.78**	—	—	—	—	—	—
4. Whole group	.12	.02	.25**	—	—	—	—	—
5. Small group	.01	.03	.09	-.07	—	—	—	—
6. Free play	-.12	-.27**	-.19*	-.27**	-.29**	—	—	—
7. Small group/Free play	-.03	.11	-.12	-.55**	-.31**	.07	—	—
8. Transitions	.19*	.18*	.06	-.40**	-.13	.14	.02	—

* $p < .01$, ** $p < .001$.

with proportion of observation in transitions. No statistically significant correlations were found between emotional support and proportion of observation in free play or whole group.

When comparing the three groups of children – with disabilities, at risk, and typically developing – no significant differences were found on time spent in each activity setting (Table 3). Significant differences between the groups were found on overall engagement scores, $F(2, 182) = 11.08, p < .001, \eta^2 = .11$, and on engagement in whole-group activities, $F(2, 182) = 8.17, p < .001, \eta^2 = .08$). The two groups of children, with disabilities and at risk, presented significant lower levels of overall engagement and engagement in whole-group activities, when compared to the typically developing group of children.

To analyze influences of classroom process quality and activity setting on child individual engagement in children with disabilities, at risk, and with typical development, associations between variables for each group of children were also computed (see Table 4), and then, multilevel regression models were conducted. Standardized coefficients (β) and their standard errors (SEs) are presented in Table 5. The first model shows that, besides previous levels of engagement and belonging to the group of children with disabilities, the proportion of observation in whole-group activities had a negative effect on child engagement and, conversely, the proportion of observation in free-play contributed positively for engagement levels. Additionally, classroom quality dimensions, namely, emotional support and classroom organization are significant predictors of child engagement in inclusive settings. No effect of the instructional support dimension was found.

Besides the main effects of process quality dimensions and activity setting on engagement, the second and third models explored interaction effects of child developmental functioning –

Table 3. Differences between groups for engagement and proportion of observation in each activity setting.

	With disabilities (<i>n</i> = 45)	At risk (<i>n</i> = 59)	Typically developing (<i>n</i> = 80)	<i>F</i>	η^2
	M (SD)				
<i>Proportion of observation in activity setting</i>					
Whole-group	.44 (.20)	.46 (.20)	.50 (.22)	1.34	.015
Small-group	.06 (.10)	.08 (.12)	.05(.09)	1.22	.011
Free-play	.05 (.09)	.04 (.09)	.04 (.07)	0.35	.004
Small-group/Free-play	.16 (.17)	.15 (.18)	.16 (.18)	0.07	.001
Transitions	.10 (.07)	.12 (.08)	.10 (.07)	2.18	.024
<i>Engagement</i>					
Overall	2.86 (0.52) ^a	3.05 (0.38) ^a	3.21 (0.35) ^b	11.08*	.11
in Whole-group	2.60 (0.66) ^a	2.75 (0.53) ^a	2.98 (0.46) ^b	8.17*	.08
in Small-group	2.84 (0.62)	3.33 (0.75)	3.36 (0.63)	3.08 [†]	.09
in Free-play	3.48 (0.66)	3.80 (0.44)	3.75 (0.43)	1.82	.06
in Small-group/Free-play	3.27 (0.93)	3.52 (0.93)	3.51 (0.50)	0.94	.02
in Transitions	2.77 (0.65) ^a	2.97 (0.51)	3.16 (0.50) ^b	6.62***	.08
Developmental functioning level	3.24 (0.94) ^a	4.37 (0.46) ^b	4.81 (0.30) ^c	110.82***	.55

Note. Different superscript letters indicate significant differences between the groups, according to Tukey HSD post hoc tests.

[†] $p < .06$, *** $p < .001$.

Table 4. Correlations between child engagement, activity setting, and classroom quality by group of participants.

	Overall Engagement			
	Total group	Children with disabilities	At-risk children	Typically developing children
Whole group	-.18*	-.18	-.49**	-.15
Small group	-.16*	-.15	-.06	-.27*
Free play	.16*	.23	.21	.15
Small group/Free play	.24**	.23	.47**	.16
Transitions	.08	.06	.16	.04
Emotional support	.16*	.14	.07	.23*
Classroom organization	.18*	.09	.11	.28**
Instructional support	.01	.05	-.10	.03

* $p < .05$, ** $p < .01$.

Table 5. Individual level and classroom level predictors of child engagement in inclusive preschools.

	Overall engagement					
	Model 1		Model 2		Model 3	
	R^2	β (SE)	R^2	β (SE)	R^2	β (SE)
	.44*		.46*		.46*	
<i>Individual level</i>						
Engagement T1		0.48 (0.07)***				
Time in whole group		-0.31(0.08)***				
Time in free play		0.21(0.08)**				
Time in transition		-0.12 (0.08)				
Children at risk		-0.10 (0.06)				
Children with disabilities		-0.21(0.07)***				
<i>Classroom level^a</i>						
Emotional support	.17	0.42 (0.20)*	.18	0.42 (0.20)*	.14	0.37 (0.20) [†]
Classroom organization	.27	0.52 (0.19)**	.28	0.53 (0.19)**	.22	0.47 (0.20)*
Instructional support	.10	0.32 (0.22)	.10	0.30 (0.22)	.10	0.31(0.22)
<i>Interactions</i>						
Time in whole group x Risk				-0.14 (0.07)*		
Time in whole group x Disabilities				-0.10 (0.07)		
Time in free play x Risk						0.03 (0.08)
Time in free play x Disabilities						0.14 (0.08) [†]

^a Each classroom variable was entered separately in the model.

[†] $p < .07$, * $p < .05$, ** $p < .01$, *** $p < .001$.

with disabilities or at risk – with proportion of observation in different activity settings – whole-group and free-play. Results show that, for the group of at-risk children, a higher proportion of observation in whole-group activities had a greater negative effect on engagement ($\beta = -0.14$, $SE = 0.07$, $p = .049$). No interaction effect was found between proportion of observation in whole-group activities and belonging to the group of children with disabilities. The interaction between belonging to the group of children with disabilities and proportion of observation in free play was a marginally positive significant predictor of engagement, showing that free play can be particularly positive when aiming to foster higher levels of engagement for children with disabilities ($\beta = 0.14$, $SE = 0.08$, $p = .058$).

Discussion

This study analyzed relations between preschool process quality, activity, setting, and children's engagement in inclusive preschools. First we described classroom quality and activity setting characteristics in Portuguese inclusive preschools and then explored relations between these variables. Differences on levels of child engagement for three groups of children – with disabilities, at risk and typically developing – across different activity settings in preschools were also explored. Finally, we investigated possible influences of classroom activity setting and classroom process quality on children's engagement, considering effects of child group belongingness.

Important aspects are highlighted by this study regarding the Portuguese inclusive preschools. First, results show medium levels of global quality of teacher-child interactions, with emotional support receiving higher scores, and teacher instructional support receiving the lowest scores. These results are consistent with previous literature in inclusive and noninclusive environments (e.g., Clawson & Luze, 2008; Pelatti et al., 2016), and with previous Portuguese studies, that alerted legislators for the need to improve preschool quality (e.g., Aguiar, Moiteiro, & Pimentel, 2010; Cryer, Tietze, & Burchinal, 1999; Pinto et al., 2014).

Another important finding relates to the time children were observed in whole-group activities – nearly 50% of the observations during the morning in the present study. Moreover, all groups of children presented lower levels of engagement in this activity setting. Although international and

national standards state that it is important that children experience different types of activity settings, throughout the day, including whole-group time (Fuligni et al., 2012), some studies have found that too much time in whole-group activities can be negative for child engagement (e.g., Powell, Burchinal, File, & Kontos, 2008). In some way, our results support such literature by finding a negative association between child engagement and proportion of observation in whole-group activities, a relation that was even stronger for children at risk, who present significantly lower levels of engagement, in such activity setting, than their typically developing peers attending the same classroom.

The amount of time that children are expected to engage in whole-group activities, found in this study and previously reported in literature (Pianta et al., 2005; Powell et al., 2008), must be acknowledged. In fact this activity setting normally requires a more passive attention behavior from children, more time waiting, and fewer opportunities to interact with teachers and peers (e.g., Powell et al., 2008; Qi, Kaiser, & Milan, 2006), which probably contributed to the lower levels of engagement presented by children at risk and by children with disabilities, when compared to their typically developing peers.

However, in whole-group activities, teachers seem to be focused and thus promote higher levels of instructional support. On the opposite hand, we found that time in free play was associated with lower levels of classroom organization and instructional support. Nevertheless, free play registered the higher levels of average engagement for the three groups of children. These results seem to show that, possibly, teachers are not taking advantage of the full potential of centers/free play as learning opportunities, by building on children's interests and spontaneous engagement. Taking children's interests and spontaneous engagement to build on, by elaborating and intentionally targeting learning competencies is a recommended practice, highlighted by general education (e.g., DEC/NAEYC, 2009; McWilliam et al., 2003; Silva, Marques, Mata, & Rosa, 2016), inclusive education, and ECI models and guidelines (e.g., Guralnick, 2001; McWilliam & Casey, 2008; Pinto et al., 2012).

At last, and in line with other studies in inclusive and noninclusive classrooms (e.g., Emmer & Stough, 2001; Pianta et al., 2008; Pelatti et al., 2016; Rimm-Kaufman et al., 2009) we found, for inclusive classrooms, that quality of teacher-child interactions (emotional support and classroom organization) and activity setting (whole group and free play) predicted child engagement. The quality dimensions of teacher-child interactions and free play positively predicted child engagement, and whole group was a negative predictor. Moreover, being a child with disabilities also contributed, negatively, for engagement in inclusive classrooms.

By considering the engagement of children with disabilities, at risk, and typically developing, attending the same classrooms, we add to the literature on the study of inclusive preschool settings by analyzing how quality of teacher-child interactions and activity setting can have different impacts on child engagement, depending on children's developmental functionality status. We found that whole-group activities had a greater negative effect for at-risk children and that free play was particularly positive for children with disabilities engagement. Such results emphasize the need of individualized, supportive interactions and adequate planning of classroom activity settings particularly in inclusive settings for promoting engagement of children at risk, with disabilities, and with typical development (e.g., Aguiar et al., 2010; Odom et al., 2011; Soukakou, 2012; Strain & Bovey, 2011).

By focusing on preschool process quality, framed within the biopsychological theoretical models, this study underlines the relevance of interactions for child development and learning (e.g., Bronfenbrenner & Morris, 2006). Particularly for children with disabilities and/or at risk, the role of teacher-child interactions and the organization of activity settings, can be even greater as these children often need more support from their environments to get engaged in activities and social interactions and adequately respond to their environments demands (Dunst et al., 2005; Eriksson & Granlund, 2004).

Study Limitations

Results must be interpreted carefully, as some limitations must be acknowledged. First, though a random list of numbers was used in the sampling procedure to select the participating classrooms, some preschools did not answer timely, putting into question a true random selection. Additionally, regardless this study included 184 children, the number of children in each group (with disabilities, at risk, and typically developing) was very discrepant and gender parity was not achieved. It would be important to conduct studies involving a higher number of inclusive classrooms, so the number of children in the group of children identified with disabilities could be increased, once it is uncommon to find more than two children with disabilities in inclusive classrooms.

Then, as the study followed a functioning approach to development, diverse diagnoses characterized the group of children with disabilities, and besides functioning no other risk factors were considered, when selecting children for at-risk group. As so, it would be important to account for other risk factors as well as for families' characteristics in future studies with such population. Finally, even though data on classroom quality and activity setting were collected simultaneously, classroom quality was not assessed by type of activity, not allowing comparing levels of quality between the different activity settings beyond the correlational analyzes presented in this article. Future studies should assess process quality and child engagement by type of activity setting to better understand the relations and developmental processes of children attending inclusive settings.

Conclusion

Despite its limitations, this study contributes to the literature on the effects of the quality of teacher-child interactions on child engagement in inclusive settings. The study results: (1) highlight that quality of teacher interactions and activity setting formats in inclusive preschools influence child engagement levels, for all children; (2) provide evidence of the unbalanced schedule of children in inclusive preschools by showing that classrooms spend approximately 50% of their time in whole-group activities and only 4% in free play, with children spending approximately the same amount of time in each activity setting, regardless of their developmental status; (3) document that whole-group and free-play activities significantly contributed for all children's engagement in inclusive setting, with a higher proportion of observation in whole-group activities being particularly negative for children at risk, and a higher proportion of observation in free play being particularly positive for children with disabilities.

Considering the high amount of time children were observed in whole-group activities, the expected positive outcomes of preschool education for children with and without disabilities can be affected as it negatively influences engagement, a necessary condition for learning and development in early ages. As such, these results can be useful for professionals in inclusive educational settings, by raising awareness on the assumption that engagement is malleable and responsive to changes in the environments and, for that, teachers' decisions on the activity settings throughout the day, and their interactions during such activities can make a difference in levels of child engagement. Mainly in inclusive settings, it is expected that the input from the environments, through teachers' actions, can help to attenuate the negative impact of disability on engagement.

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