How do activity settings, preschool teachers’ activities, and children’s activities relate to the quality of children’s interactions in preschool? Findings from Austria

Wilfried Smidt & Eva-Maria Embacher

To cite this article: Wilfried Smidt & Eva-Maria Embacher (2020) How do activity settings, preschool teachers’ activities, and children’s activities relate to the quality of children’s interactions in preschool? Findings from Austria, European Early Childhood Education Research Journal, 28:6, 864-883, DOI: 10.1080/1350293X.2020.1836586

To link to this article: https://doi.org/10.1080/1350293X.2020.1836586
How do activity settings, preschool teachers’ activities, and children’s activities relate to the quality of children’s interactions in preschool? Findings from Austria

Wilfried Smidt and Eva-Maria Embacher

Department of Psychosocial Intervention and Communication Studies, University of Innsbruck, Innsbruck, Austria

ABSTRACT
Research on the predictivity of activity settings, preschool teachers’ activities, and children’s activities for interaction quality is inconsistent and cannot be transferred easily to specific national preschool contexts. The present study addresses this issue by assessing the interaction quality of 185 children aged 3–5 years attending 61 preschools in Austria using the Individualized Classroom Assessment Scoring System (inCLASS). Activity settings and activities were captured using a time-sampling method. Having included control variables, regression analyses revealed that scaffolding was positively related to children’s interactions with teachers, free choice was positively related to interactions with peers, and ‘high-yield’ activities were positively related to interactions with peers and task orientation. Teacher-led activities and scaffolding were negatively related to interactions with peers, and ‘low-yield’ activities were negatively related to interactions with peers and task orientation. Effect sizes ranged from small to medium. The findings indicate that opportunities to support children remain untapped.

KEYWORDS
Interaction quality; activity settings; preschool teachers’ activities; children’s activities; Austria

Introduction

The present study aims to examine how activity settings, preschool teachers’ activities, and children’s activities are related to interaction quality in Austrian preschools. The quality of non-familial institutions such as day care centers and preschools has been investigated for many years (Vandell and Wolfe 2000; Clarke-Stewart and Allhusen 2005; Viernickel et al. 2016). When conceptualizing quality, research often relies on the ‘structure-process model of quality’ (Kluczniok and Roßbach 2014, 147) which comprises structural quality (e.g. teacher–child ratio), preschool teachers’ beliefs (e.g. educational goals), cooperation with families (e.g. counseling services), and process quality (e.g. quality of interactions among children and preschool teachers, also called ‘interaction quality’, e.g. Schmidt et al. 2018) (Kluczniok and Roßbach 2014). This paper...
refers to interaction quality which has been shown to predict the development of children’s competencies (e.g. Tietze et al. 1998; NICHD ECCRN 2006; Burger 2010; Ulferts, Wolf, and Anders 2019), and has been referred to as the central component of educational quality (Tietze et al. 1998).

Many studies have investigated predictors of interaction quality, including structural variables, preschool teachers’ characteristics, and child-related variables (e.g. Essa and Burnham 2001; Kluczniok and Roßbach 2014). Research has also stressed that interactions are influenced by activity settings (e.g. free choice, Chien et al. 2010), preschool teachers’ activities (e.g. scaffolding, Bodrova and Leong 2005), and children’s activities (e.g. cognitive stimulating ‘high-yield’ activities, Kontos and Wilcox-Herzog 1997; Smidt 2012). Information on the latter can improve understanding of the dependency of the quality of interaction in educational contexts (Booren, Downer, and Vitiello 2012) and some studies, mostly from the US and UK, have been carried out on this topic (e.g. Sylva et al. 2007; Chien et al. 2010; Booren, Downer, and Vitiello 2012; Acar, Hong, and Wu 2017). Previous studies conducted outside Austria offer information on the relationship between activity settings, preschool teachers’ and children’s activities and interaction quality; however, they are limited in their transferability to other country contexts because of varying preschool systems with different educational mandates and approaches, as well as differences in the degrees of training for pedagogical staff (Love et al. 2003; Scheiwe and Willekens 2009). Therefore, the present study aims to widen the knowledge of how activity settings, preschool teachers’ activities, and children’s activities relate to interaction quality in preschools in Austria, as there have been no studies exploring this area, thus far.

Interaction quality, activity settings, preschool teachers’ activities, and children’s activities – conceptualization and previous findings

Interaction quality

With ecosystemic approaches (e.g. Bronfenbrenner and Morris 2006) it can be argued that children and preschool teachers are involved in preschool classes in different patterns of activities and interactions, which have been considered ‘the primary engines of development’ (Bronfenbrenner and Morris 2006, 798). In addition, based on constructivist and social-constructivist approaches (e.g. Piaget 1978; Bodrova and Leong 2012), domain-specific theories (e.g. Carey and Spelke 1993; Gelman and Noles 2011), and best practice standards (Copple and Bredekamp 2009), developmentally appropriate interactions with peers and preschool teachers covering various domains (e.g. math and fine motor skills) are considered highly important in promoting child development. Against this background, good interaction quality comprises developmentally appropriate educational practices; a facilitative role of preschool teachers; a variety of stimulating activities and tasks for children to engage with; positive interactions and relations among children, their preschool teachers, and their peers; and the promotion of health and safe care (Tietze et al. 1998; Cryer 1999; Schmidt et al. 2018).

This definition has been further specified in standardized rating instruments for observing and assessing interaction quality. For instance, some measures capture interaction quality in a broad sense, including the arrangement and availability of space and
learning materials (e.g. Early Childhood Environment Rating Scale, ECERS-R, Harms, Clifford, and Cryer 2015). Conversely, other instruments focus more narrowly on the interactional processes of children and preschool teachers, without rating the arrangement and availability of space and learning materials (e.g. Classroom Assessment Scoring System, CLASS, Pianta, La Paro, and Hamre 2008; Individualized Classroom Assessment Scoring System, inCLASS, Downer et al. 2010). Another differentiating characteristic is that some instruments measure interaction quality at the preschool class level (e.g. ECERS-R, CLASS), whereas others measure interaction quality at the individual child level (e.g. inCLASS) (Halle, Vick Whittaker, and Anderson 2010; Kluczniok and Roßbach 2014; Schmidt et al. 2018).

Research has shown that interaction quality in preschools is influenced by a number of structural variables, such as teacher–child-ratio, group size, equipment of the preschool class with play and learning materials, and personal variables of the preschool teachers such as educational beliefs and vocational qualifications (Vandell and Wolfe 2000; Lamb and Ahnert 2006; Smidt 2012; Kluczniok and Roßbach 2014; Manning et al. 2019). Child-related variables such as age (Vitiello et al. 2012), language competencies (Cabell, Bohlmann et al. 2013), and socio-economic status (Lamb and Ahnert 2006) have also been identified as predictive.

Activity settings

Although there is no single definition of an ‘activity setting’, and studies differ in this regard, overall, activity settings can be considered as dynamic, interrelated contexts (e.g. free choice, mealtime, small group, and whole group), which are intentionally implemented by preschool teachers to organize the preschool day and to support children’s learning (Booren, Downer, and Vitiello 2012). With regard to study findings, Booren, Downer, and Vitiello (2012) reported better quality of interactions with teachers during teacher-led activities than other settings, like free choice and recess. A study by Cabell, DeCoster et al. (2013) showed that the quality of instructional interactions and literacy-focused interactions was generally higher in large groups (considered to be directed by preschool teachers) than free choice, meals, and routines. Wildgruber et al. (2016) found that during teacher-led-activities, interaction quality was higher in terms of emotional support (when compared with free choice, meals, and reading), classroom organization (when compared with free choice and meals), and instructional support (when compared with free choice, meals, and the garden). There are also studies with different findings. Chien et al. (2010) found that children clustered in the profile ‘free play’ (children spent much time engaging in free choice) attended preschool classes with higher overall interaction quality than those belonging to the ‘group instruction profile’ (children spent much time in whole and small groups) and the ‘individual instruction profile’ (children spent much time alone). Booren, Downer, and Vitiello (2012) found higher interaction quality among peers during child-oriented activities (when compared with large group). Acar, Hong, and Wu (2017) suggested that positive peer interactions were more likely to occur during child-directed activities than during teacher-directed activities, and were more likely to occur during child-directed and teacher-directed activities than during routines and transitions. Negative peer interactions most likely occurred when preschool teachers were absent, and were more likely to occur in child-directed activities than during routines and transitions.
**Preschool teachers’ activities**

Theoretical work on basic forms of educational activities in which pedagogues are typically involved (e.g. advising, arranging, informing, teaching; e.g. Giesecke 2013) can provide a basic framework for the conceptualization of preschool teachers’ activities. More specifically, Vygotsky’s social-constructivist approach of ‘scaffolding’ refers to the supporting role of preschool teachers who are actively involved interaction partners for children (Bodrova and Leong 2005, 2012). In addition, preschool teachers are also involved in non-pedagogical activities (e.g. Smidt 2012). With regard to research, older findings from Lera (1996) indicate that a structuring role of preschool teachers was associated with better quality of preschools. Additionally, several studies indicate positive effects of a teacher’s scaffolding on interaction quality (Sylva et al. 2007; Chien et al. 2010; Smidt 2012; Acar, Hong, and Wu 2017). Positive effects have been also found for ‘direct teaching’ (e.g. questioning, instruction) and ‘social conversation’ (engaging in conversation with the child not related to its activity). In addition, the level of monitoring and physical caring was negatively associated with interaction quality (Sylva et al. 2007).

**Children’s activities**

According to guidelines referring to a developmental-psychological view, supporting preschool children’s cognitive, language-literacy, socio-emotional, and physical development by providing a wide range of different activities children shall be involved in can be regarded an important task for preschool teachers (Copple and Bredekamp 2009). In fact, research has shown that preschool children are involved in many such activities throughout the day, such as role play, blocks/construction, caretaking routines, fine and gross motor activities, and transitions (e.g. Early et al. 2005, 2010; Smidt 2015). With regard to connections with interaction quality, Howes and Smith (1995) found that creative activities, such as role play and open-ended art were positively related with interaction quality. Another finding was that manipulatives (e.g. puzzles and table toys) had a negative influence on interaction quality. Similarly, Wishard et al. (2003) reported that creative activities were positively related with interaction quality. Furthermore, didactic activities (e.g. teacher-directed drill and practice) and routine activities (e.g. meals) were negatively related with interaction quality. In another study, Sylva et al. (2007) found that higher proportions of numeracy and literacy activities and games, as well as activities led by caregivers, corresponded with better interaction quality. In addition, higher proportions of role play, puzzles, construction, art/music activities, and being unoccupied were related with lower quality. Smidt (2012) referred to cognitively stimulating ‘high-yield’ activities (Bruner 1980) and found positive relations between ‘high-yield’ activities (e.g. role play, blocks, and construction) and an increase in interaction quality over time. Cabell, DeCoster et al. (2013) found that the quality of instructional support was highest during science activities and shared reading, and lowest during esthetic activities and ‘no learning activities’. The quality of literacy-focused interactions was highest during literacy activities and lowest during ‘no learning activities’.

**The Austrian preschool system**

Preschools in Austria are funded by public and private sponsors and have attendance rates of around 93% for children aged 3–5 years. Since 2009, the final preschool year
is compulsory (Smidt 2018). Somewhat in contrast to debates about professionalization and academization of preschool teachers (Smidt et al. 2017) and findings on moderate positive relations between preschool teachers’ formal level of vocational education and interaction quality (Manning et al. 2019), the standard occupational qualification of the educational staff is still non-academic (Smidt 2018), although some courses in early childhood education have been introduced since 2018 (Hartel et al. 2019). Compared to other countries, where preschool teachers are often academically qualified (Oberhuemer, Schreyer, and Neuman 2010; Hartel et al. 2019), this situation presents a low level of formal qualification. An educational plan with pedagogical principles (e.g. developmentally appropriate practices and co-construction) and domains (e.g. emotions and social relationships, language, and communication) was introduced in 2009 (Ämter der Landesregierungen der österreichischen Bundesländer, Magistrat der Stadt Wien, and Bundesministerium für Unterricht, Kunst und Kultur 2009). Regarding a programmatic orientation, Austrian preschools may reflect what has been considered as a ‘work-care-reconciliation model’ (Scheiwe and Willekens 2009, 13) emphasizing non-academic skills, such as care and supervision, rather than the acquisition of academic skills. This suggests a strong separation between preschool education and elementary school education (Smidt 2018).

Study aims

Previous research provides information on how activity settings, preschool teachers’ activities, and children’s activities are related with interaction quality in preschools. However, differences in the definition and operationalization of relevant constructs reduce the comparability of the findings. Since all studies have been conducted outside Austria, their transferability to other country contexts may also be limited. It is therefore important to conduct country-specific research that addresses the potential lack of transferability of international research by providing reliable findings. The present study aims to expand knowledge with regard to Austria by addressing three research questions:

1. How do activity settings relate to interaction quality in preschool?
2. How do preschool teachers’ activities relate to interaction quality in preschools?
3. How do children’s activities relate to interaction quality in preschools?

Methodology

Participants

The study is part of the longitudinal project ‘Quality of Children’s Interactions in Preschool’ funded by the Austrian Science Fund (FWF). The analyses refer to the first wave, at the end of the children’s first preschool year, from April to June 2019. The sample comprised 261 children (131 girls) attending 81 preschool classes (from 81 preschools) in Tyrol, a federal state of Austria. Preschool classes and children per preschool class were randomly sampled. The children were, on average, aged 49.54 months (SD = 4.25; range = 36.76–58.28). Overall, 19% of the children had an immigration background (family language other than German), which is a representative sample distribution of
children with immigration background in preschools in Tyrol (Amt der Tiroler Landesregierung 2019). A total of 81 preschool teachers participated and 71 completed the questionnaire. Participation was voluntary and the anonymity of the participants during data processing was assured. Participants were provided with information regarding the research prior to their participation; furthermore, they signed an informed consent (parents representative for their children).

**Measures**

**Interaction quality**

Interaction quality was assessed using the Individualized Classroom Assessment Scoring System (inCLASS, Downer et al. 2010). Based on research (Downer et al. 2010, 2012) where a four-factor structure was identified, the following domains are used (see Table 1 for descriptive statistics and intercorrelations): teacher interactions (α = .81 comprising positive engagement with the teacher and teacher communication), peer interactions (α = .89 comprising peer sociability, communication, and assertiveness), task orientation (α = .63 comprising task engagement and self-reliance), and conflict interactions (α = .57 comprising teacher and peer conflict, and behavior control [reverse coded]). Internal consistencies range from acceptable to good (Nunnally 1978). The lower internal consistency of ‘conflict interactions’ is due to the small variance of the dimension ‘teacher conflict’ (M = 1.04; SD = 0.14) (see von Suchodoletz, Gunzenhauser, and Larsen 2015 for similar findings). According to the manual (inCLASS Technical Manual 2010), three to four observation cycles can be performed in one morning on up to four children on a rotating basis (over approximately four hours). One observation cycle lasts 15 min, with 10 min for observation and coding of predefined observation criteria, followed by a section of 5 min in which the level of the interaction quality previously observed is assessed on a 7-point scale (1–2 = low level, 3–5 = intermediate level, and 6–7 = high level). For statistical analyses, the rating scores of all cycles were averaged in each dimension. The observations were carried out by student assistants who had to pass a two-day training and a reliability test. To examine inter-rater reliability 8.80% of the inCLASS observations (85 observation cycles) were double coded. Intraclass correlation coefficients (ICCs) of the four domains ranged between .88 and .96, which indicates an excellent inter-rater agreement (Cicchetti 1994).

**Activity settings, preschool teachers’ activities, and children’s activities**

Activity settings, preschool teachers’ activities, and children’s activities were captured with the time-sampling-instrument Zielkindbeobachtung (Target Child Observation, ZiKiB, Kuger, Pfleger, and Roßbach 2006). The ZiKiB has proven to be sufficient with regard to scientific criteria (Smidt 2012; Riedmeier 2019). Activity settings of the children observed are captured through nursing routines, free choice, meal time, planned and led activity (by the preschool teacher), and transitions. Preschool teachers’ activities include activities with the children observed: observing, informing, scaffolding (consisting of supportive/corrective and encouraging), and controlling/punitive. Moreover, the activities also included ‘further educational activities’ (educational activities not related to the children observed) and non-educational activities (e.g. office work). Based on previous studies (Bruner 1980; Hadeed 1994; Horgan and Douglas 1995; Kontos and Wilcox-
Table 1. Descriptive results and intercorrelations between study variables.

| n  | M   | SD  |
|----|-----|-----|
| 20 | 0   | 8   |
| 19 | 1   | 6   |
| 18 | 2   | 3   |
| 17 | 3   | 2   |
| 16 | 4   | 1   |
| 15 | 5   | 0   |
| 14 | 6   | -   |
| 13 | 7   | -   |
| 12 | 8   | -   |
| 11 | 9   | -   |
| 10 | 10  | -   |
| 9  | 11  | -   |
| 8  | 12  | -   |
| 7  | 13  | -   |
| 6  | 14  | -   |
| 5  | 15  | -   |
| 4  | 16  | -   |
| 3  | 17  | -   |
| 2  | 18  | -   |
| 1  | 19  | -   |

Note: n = sample size, M = mean, SD = standard deviation, Pearson's correlations were computed. 1 = Teacher interactions, 2 = Peer interactions, 3 = Task orientation, 4 = Conflict, 5 = High-yield activities, 6 = Moderate-yield activities, 7 = Low-yield activities, 8 = Planned and led activity, 9 = Transitions, 10 = Children's age (in months), 11 = Child-teacher-ratio, 12 = Child, 13 = Time spent on activities (in minutes), 14 = Quality of interactions, 15 = Number of interactions, 16 = Number of interactions with children, 17 = Total interactions, 18 = Total interactions with children, 19 = Language competencies (T-value), 20 = Children's gender, 21 = Adequate equipment.
Herzog 1997; Hadeed and Sylva 1999; Layzer, Goodson, and Brown-Lyons 2007; Smidt 2012), children’s activities are distinguished into cognitively stimulating ‘high-yield’ (role playing, construction games, art, natural science, oral language, use of print materials, and school preparation), somewhat less cognitively stimulating ‘moderate-yield’ (puzzles, music, and sand/water), and least stimulating ‘low-yield’ activities (transitions/being unoccupied, napping/cuddling, caretaking routines, dance games/group or circle games, parlor and board games, and movement games). The frequency of occurrence of the categories was captured by maintaining the methodological structure of the inCLASS (10-minute-sections of observation and coding). The total time the children spent in each category (e.g. nursing routine) was computed and converted into a percentage value (see Table 1). Observers had to pass a training with a reliability test. To examine inter-rater reliability 8.28% of the ZiKiB observations (80 observation cycles) were double coded. ICCs of the observed categories ranged between .61 and .99, which indicates a good to excellent inter-rater agreement (Cicchetti 1994).

Control variables
Based on previous research (e.g. Vandell and Wolfe 2000; Lamb and Ahnert 2006; Smidt 2012; Vitiello et al. 2012; Cabell, Bohlmann et al. 2013; Kluczniok and Roßbach 2014; Smidt, Embacher, and Kluczniok 2020), children’s language competencies and age, child–teacher-ratio, and adequate equipment were used as control variables. Language competencies were measured with a mean score (T-value) of three subtests (understanding sentences, morphological rule formation, and phonological working memory) of the Sprachentwicklungstest für drei- bis fünfjährige Kinder (SETK 3–5; Grimm 2015). Children’s ages were confirmed through telephone interviews with their parents. Adequate equipment (seven items on adequacy of equipment in the preschool class, e.g. role playing materials, drawing, and writing materials) used in the German BiKS-study (based on the Home Observation for Measurement of the Environment, Caldwell and Bradley 1984), and child–teacher-ratio were both captured via preschool teacher questionnaires (see Table 1).

Statistical analyses
Multiple regression analyses were conducted to address the research questions. Activity settings, preschool teachers’ activities, and children’s activities served as independent variables, and teacher interactions, peer interactions, task orientation, and conflict interactions served as dependent variables. Children’s language competencies, children’s ages, child–teacher-ratio, and adequate equipment were used as control variables. As children were nested in preschool classes, robust standard errors were computed (Williams 2000). To examine the practical significance, the beta coefficients were transformed into correlation coefficients (Peterson and Brown 2005; Lenhard and Lenhard 2017), with thresholds for small ($r = .10$), medium ($r = .30$), and large ($r = .50$) effect sizes (Cohen 1988). Due to missing values for language skills ($n = 243$), adequate equipment ($n = 231$) and child–teacher-ratio ($n = 200$), complete data were available for 185 children from 61 preschool classes.
Results

Interaction quality ranges between a low and medium level, with the mean value for task orientation being the highest. Confictive interactions of children were rarely observed (Table 1).

Activity settings

The findings indicate that almost all regression models were significant \((p < .05)\) and that the total amount of explained variance \((R^2)\) ranged from 6\% to 14\% (Table 2). Free choice was positively related to children’s interactions with peers \((\beta = .24 \text{ transformed into correlation coefficient: } r = .29)\), and the effect size was small. In contrast, preschool teachers’ planned and led activities were negatively related to children’s interactions with peers \((r = −.30, \text{ medium effect size})\). Furthermore, nursing routine was related to task orientation \((r = .23)\) and tended to predict the quality of children’s interactions with preschool teachers \((r = .20)\). Both effect sizes were small.

Preschool teachers’ activities

Except for one, all models were significant \((p < .05)\) and the total explained variance \((R^2)\) ranged from 6\% to 17\% (Table 3). Scaffolding was negatively related to children’s interactions with peers \((r = −.21)\) and positively related to children’s interactions with preschool teachers \((r = .33)\). The effect sizes ranged from small to medium. Non-educational activities \((r = −.24)\) were negatively related to children’s interactions with teachers. Preschool teachers’ activity of ‘informing’ \((r = −.21)\) and further educational activities \((r = .24)\) proved to be predictors. The effect sizes were small. Controlling and punitive activities \((r = .33, \text{ medium effect size})\) were positively related to the children’s conflict interactions.

Children’s activities

All models were significant \((p < .05)\), the range of explained variance \((R^2)\) was from 7\% to 16\% (Table 4). Children’s ‘high-yield’ activities were positively related to their interactions with peers \((r = .24)\), and task orientation \((r = .22)\). ‘Moderate-yield’ activities were also positively related to task orientation \((r = .20)\) and tended to predict children’s interactions with teachers \((r = .17)\). In contrast, ‘low-yield’ activities were negatively related to children’s interactions with peers \((r = −.24)\) and task orientation \((r = −.29)\). All effect sizes were small.

Control variables

Language competencies were positively related to task orientation (ranges from \(r = .25\) to \(r = .30\)), and negatively related to children’s conflict interactions (ranges from \(r = −.20\) to \(r = −.21\)). The effect sizes are small with a tendency toward medium. Adequate equipment predicted interactions with preschool teachers (ranges from \(r = .36\) to \(r = .40\)) and task orientation (ranges from \(r = .26\) to \(r = .32\)). The effect sizes are mainly medium. Children’s age and child–teacher-ratio tend only to predict interactions with peers (Table 2-4).
Table 2. Prediction of interaction quality through activity settings.

| Predictors                  | Teacher Interactions | Peer Interactions | Task Orientation | Conflict Interactions |
|-----------------------------|----------------------|-------------------|------------------|----------------------|
|                             | $B$      | SE    | $\beta$ | $B$      | SE    | $\beta$ | $B$      | SE    | $\beta$ | $B$      | SE    | $\beta$ |
| Nursing routines            | .02     | .01   | .15*$g$ | -.00    | .01   | -.00    | .02     | .01   | .18*$   | -.00    | .00   | -.02    |
| Control variables           |         |       |         |         |       |         |         |       |         |         |       |         |
| Language competencies       | .01     | .01   | .10    | .01     | .01   | .13    | .02     | .01   | .23**   | -.01    | .00   | -.15*$g$|
| Children's age              | -.02    | .02   | -.10   | -.02    | .02   | -.12*$g$| .00     | .03   | .02     | .02     | .02   | .15     |
| Child-teacher-ratio         | .04     | .04   | .12    | -.05    | .03   | -.15*$g$| .02     | .03   | .02     | .02     | .02   | .15     |
| Adequate equipment          | .70     | .21   | .33**  | -.23    | .23   | -.11   | .42     | .15   | .22**   | -.07    | .10   | -.09    |
| $F / R^2$                   |         |       |         | 3.37**  | .14   | 2.26*  | .57***  | .14   | 3.25*   | .08     |       |         |
| Free choice                 | .00     | .00   | .06    | .01     | .00   | .24**  | .00     | .00   | .08     | -.00    | .00   | -.01    |
| Control variables           |         |       |         |         |       |         |         |       |         |         |       |         |
| Language competencies       | .01     | .01   | .12*$g$| .02     | .01   | .16*$g$| .02     | .01   | .25**   | -.01    | .00   | -.15*$g$|
| Children's age              | -.03    | .02   | -.13   | .03     | .02   | .12*   | .01     | .02   | .07     | -.00    | .01   | -.03    |
| Child-teacher-ratio         | .04     | .04   | .11    | -.04    | .03   | -.10   | .00     | .03   | .01     | .02     | .02   | .15     |
| Adequate equipment          | .73     | .22   | .35**  | -.12    | .23   | -.05   | .46     | .18   | .24*    | -.07    | .10   | -.09    |
| $F / R^2$                   |         |       |         | 2.82*   | .11   | 5.73***| .12     | 3.77**| .11     | 3.11*   | .08   |         |
| Meal time                   | -.00    | .01   | -.03   | -.01    | .01   | -.07   | -.01    | .01   | -.10    | .00     | .00   | .05     |
| Control variables           |         |       |         |         |       |         |         |       |         |         |       |         |
| Language competencies       | .01     | .01   | .11    | .01     | .01   | .13    | .02     | .01   | .24**   | -.01    | .00   | -.15*$g$|
| Children's age              | -.03    | .02   | -.13   | .03     | .02   | .12*   | .01     | .02   | .07     | -.00    | .01   | -.03    |
| Child-teacher-ratio         | .04     | .04   | .10    | -.05    | .03   | -.14*$g$| .00     | .03   | .00     | .02     | .02   | .14     |
| Adequate equipment          | .70     | .22   | .34**  | -.12    | .23   | -.11   | .42     | .16   | .22*    | -.07    | .10   | -.09    |
| $F / R^2$                   |         |       |         | 2.72*   | .11   | 7.39***| .07     | 3.65**| .11     | 2.79*   | .08   |         |
| Planned and led activity    | -.00    | .00   | -.03   | -.01    | .00   | -.25***| -.00    | .00   | -.07    | .00     | .00   | .01     |
| Control variables           |         |       |         |         |       |         |         |       |         |         |       |         |
| Language competencies       | .01     | .01   | .12*$g$| .02     | .01   | .16*$g$| .02     | .01   | .24**   | -.01    | .00   | -.15*$g$|
| Children's age              | -.03    | .02   | -.12   | .03     | .02   | .14*   | .01     | .02   | .08     | -.00    | .01   | -.03    |
| Child-teacher-ratio         | .04     | .04   | .10    | -.04    | .03   | -.11   | .00     | .03   | .00     | .02     | .02   | .15     |
| Adequate equipment          | .72     | .22   | .34**  | -.12    | .22   | -.05   | .45     | .17   | .23*    | -.08    | .10   | -.09    |
| $F / R^2$                   |         |       |         | 2.72*   | .11   | 7.39***| .12     | 3.36*  | .11     | 2.65*   | .08   |         |
| Transitions                 | -.01    | .01   | -.14*$g$| .00     | .01   | .02    | -.01    | .01   | -.08    | -.00    | .00   | -.03    |
| Control variables           |         |       |         |         |       |         |         |       |         |         |       |         |
| Language competencies       | .01     | .01   | .11    | .01     | .01   | .13    | .02     | .01   | .23**   | -.01    | .00   | -.15*$g$|
| Children's age              | -.03    | .02   | -.13   | .03     | .02   | .12*   | .01     | .02   | .07     | -.00    | .01   | -.03    |
| Child-teacher-ratio         | .04     | .03   | .11    | -.05    | .03   | -.15*$g$| -.00    | .03   | -.00    | .02     | .02   | .15     |
| Adequate equipment          | -.01    | .01   | .34**  | -.23    | .23   | -.11   | .43     | .16   | .22*    | -.07    | .10   | -.09    |
| $F / R^2$                   |         |       |         | 3.13*   | .13   | 2.32*  | .06     | 3.20*  | .11     | 3.25*   | .08   |         |

Note. $N = 185$; $B =$ unstandardized regression coefficient; SE = clustered robust standard error; $\beta =$ standardized regression coefficient; $^g p < .10$, $^*$ $p < .05$, $^{**} p < .01$, $^{***} p < .001$. 
Table 3. Prediction of interaction quality through preschool teachers’ activities.

| Predictors                          | Teacher Interactions | Peer Interactions | Task Orientation | Conflict Interactions |
|-------------------------------------|-----------------------|-------------------|------------------|-----------------------|
|                                     | B SE β                | B SE β            | B SE β           | B SE β               |
| Observing                           | −.01 .01 −.08         | .01 .01 .12       | .00 .00 .01      | −.00 .00 −.00        |
| Control variables                   |                       |                   |                  |                       |
| Language competencies               | .01 .01 .10           | .01 .01 .14       | .02 .01 .24**    | −.01 .00 −.15*       |
| Children’s age                      | −.03 .02 −.12         | .03 .01 .11^      | .01 .02 .07      | −.00 .01 −.03        |
| Child-teacher-ratio                 | .03 .04 .09           | −.05 .03 −.13     | −.00 .03 −.01    | .02 .02 .15          |
| Adequate equipment                  | .67 .23 .32**         | −19 .23 −.09      | .42 .17 .22**    | −.07 .10 −.09        |
| F / R²                              | 3.82** / .12          | 2.61* / .08       | 3.76** / .10     | 2.74* / .08          |
| Informing                           | .00 .00 .07           | −.00 .00 −.07     | −.01 .00 −.16*   | −.00 .00 −.00        |
| Control variables                   |                       |                   |                  |                       |
| Language competencies               | .01 .01 .11           | .01 .01 .13       | .02 .01 .24**    | −.01 .00 −.15^       |
| Children’s age                      | −.03 .02 −.14         | .03 .02 .13^      | .02 .02 .10      | −.00 .01 −.03        |
| Child-teacher-ratio                 | .03 .04 .09           | −.05 .03 −.14^    | .00 .03 .01      | .02 .02 .15          |
| Adequate equipment                  | .65 .21 .31**         | −19 .23 −.09      | .52 .17 .27**    | −.07 .11 −.09        |
| F / R²                              | 2.73* / .12           | 3.06* / .09       | 4.69** / .12     | 2.72* / .08          |
| Scaffolding                         | .02 .00 .28**         | −.01 .00 −.16*    | .00 .00 .01      | −.00 .00 −.07        |
| Control variables                   |                       |                   |                  |                       |
| Language competencies               | .01 .01 .13^          | .01 .01 .12       | .02 .01 .24**    | −.01 .00 −.16*       |
| Children’s age                      | −.03 .02 −.10         | .02 .01 .10       | .01 .02 .07      | −.00 .01 −.03        |
| Child-teacher-ratio                 | .03 .04 .10           | −.05 .03 −.15^    | .00 .03 .01      | .02 .02 .15          |
| Adequate equipment                  | .64 .21 .31**         | −20 .24 −.09      | .42 .16 .22*     | −.07 .10 −.08        |
| F / R²                              | 6.20*** / .17         | 3.64** / .09      | 3.89** / .10     | 3.02* / .09          |
| Controlling and punitive            | −.00 .03 −.01         | .02 .03 .07       | −.04 .02 −.12^   | .04 .02 .28*         |
| Control variables                   |                       |                   |                  |                       |
| Language competencies               | .01 .01 .11           | .01 .01 .14       | .02 .01 .21**    | −.00 .00 −.10        |
| Children’s age                      | −.03 .02 −.13         | .03 .02 .12^      | .01 .02 .06      | −.00 .01 −.01        |
| Child-teacher-ratio                 | .04 .04 .10           | −.06 .03 −.16^    | .00 .03 .01      | .02 .02 .11          |
| Adequate equipment                  | .70 .22 .33**         | −24 .23 −.11      | .43 .16 .22*     | −.08 .10 −.10        |
| F / R²                              | 2.67* / .11           | 2.26^ / .07       | 3.81** / .11     | 4.24** / .15         |
| Further educational activities      | −.01 .01 −.11         | .00 .00 .09       | .01 .00 .19*     | .00 .00 .04          |
| Control variables                   |                       |                   |                  |                       |
| Language competencies               | .01 .01 .12^          | .01 .01 .12       | .02 .01 .22**    | −.01 .00 −.16*       |
| Children’s age                      | −.03 .02 −.15         | .03 .02 .14^      | .02 .02 .10      | −.00 .01 −.02        |
| Child-teacher-ratio                 | .03 .04 .09           | −.05 .03 −.14^    | .00 .03 .00      | .02 .02 .15          |
| Adequate equipment                  | .65 .22 .31**         | −20 .24 −.09      | .50 .17 .26**    | −.07 .11 −.08        |
| F / R²                              | 2.91* / .12           | 2.45^ / .07       | 4.60** / .13     | 2.85* / .08          |
| Non-educational activities          | −.01 .00 −.19**       | .00 .01 .02       | −.00 .00 −.06    | −.00 .00 −.00        |
| Control variables                   |                       |                   |                  |                       |
| Language competencies               | .01 .01 .11^          | .01 .01 .13       | .02 .01 .24**    | −.01 .00 −.15^       |
| Children’s age                      | −.02 .02 −.10         | .03 .02 .12       | .02 .02 .08      | −.00 .01 −.03        |
| Child-teacher-ratio                 | .04 .03 .11           | −.05 .03 −.15^    | −.00 .03 −.01    | .02 .02 .15          |
| Adequate equipment                  | .69 .22 .33**         | −23 .23 −.11      | .42 .16 .22*     | −.07 .10 −.09        |
| F / R²                              | 3.92** / .15          | 2.64* / .06       | 4.25** / .11     | 2.73* / .08          |

Note. N = 185; B = unstandardized regression coefficient; SE = clustered robust standard error; β = standardized regression coefficient; ^ p < .10; * p < .05; ** p < .01; *** p < .001.

Discussion

Relations between activity settings and the quality of children’s interactions

Previous research indicates positive relations between teacher-led activities and interaction quality (Booren, Downer, and Vitiello 2012; Wildgruber et al. 2016) as well as free choice and interaction quality (Chien et al. 2010). In addition, activity settings with an emphasis on child-directed activities, were positively related to the quality of
interaction with peers (Booren, Downer, and Vitiello 2012; Acar, Hong, and Wu 2017). The present study connects to the latter findings, indicating that free choice can boost the quality of children’s interaction with peers. However, other studies have also raised concerns that preschool teachers tend not to be sufficiently involved in enriching interactions with children during free choice (Winton and Buysse 2005; Cabell, DeCoster et al. 2013). In fact, given the lack of connections between free choice and interactions with preschool teachers found in the present study, a low involvement of preschool teachers in interactions with children during free choice seems to be the case.

The lack of positive relations between teacher-led activities and children’s interactions with preschool teachers and task orientation is somewhat in contrast to previous research (Booren, Downer, and Vitiello 2012; Wildgruber et al. 2016). Preschool teacher-led activities can provide a setting for stimulating interactions between children and preschool teachers (Winton and Buysse 2005; Booren, Downer, and Vitiello 2012) and a reduction in children’s off-task behavior (Rimm-Kaufman et al. 2005), and have also been shown to be positively associated with the development of children’s academic competencies (de Haan, Elbers, and Leseman 2014; Goble and Pianta 2017). This indicates that besides free choice, teacher-directed settings are also important (Goble and Pianta 2017; Reynolds and Candee 2019). With regard to Tyrol/Austria, the results of this study can be interpreted as follows: the potential of ‘planned and led activities’ to facilitate elaborate interactions between children and preschool teachers, as well as to encourage children’s task orientation, does not seem to have been achieved in the preschool classes investigated. To put it pointedly, this pattern of findings possibly reflects something that has been considered as an ‘early childhood error’ (Bredekamp and Rosegrant

| Table 4. Prediction of interaction quality through children’s activities. |
|-------------------|-----------------|--------------|-----------------|-----------------|-----------------|-----------------|
| Predictors        | Teacher Interactions | Peer Interactions | Task Orientation | Conflict Interactions |
|                   | B     | SE   | β    | B     | SE   | β    | B     | SE   | β    | B     | SE   | β    |
| High-yield activities | -.00  | .00  | -.02 | .01  | .00  | .19* | .00  | .00  | .17* | .00  | .00  | .04  |
| Control variables |                   |                |           |     |     |     |     |     |     |     |     |
| Language competencies | .01  | .01  | .11* | .01  | .01  | .11  | .02  | .01  | .21** | -.01  | .00  | -.16* |
| Children’s age     | -.03  | .02  | -.13 | .03  | .01  | .12* | .01  | .02  | .07  | -.00  | .01  | -.03  |
| Child-teacher-ratio | .03  | .04  | .10  | -.05  | .03  | -.14* | -.00  | .03  | .00  | .02  | .02  | .15*  |
| Adequate equipment | .70  | .22  | .33** | -.24 | .23  | -.11  | .42  | .15  | .22** | -.07  | .10  | -.09  |
| F / R²             | 2.84* / .11 | 3.58* / .10 | 3.24* / .13 | 3.18* / .08 |
| Moderate-yield activities | .01  | .01  | .12* | .00  | .01  | .04  | .01  | .01  | .15* | -.00  | .00  | -.00  |
| Control variables |                   |                |           |     |     |     |     |     |     |     |     |
| Language competencies | .01  | .01  | .11  | .01  | .01  | .13  | .02  | .01  | .22** | -.01  | .00  | -.15* |
| Children’s age     | -.03  | .02  | -.12 | .03  | .02  | .12* | .01  | .02  | .07  | -.00  | .01  | -.03  |
| Child-teacher-ratio | .04  | .03  | .11  | -.05  | .03  | -.15* | -.00  | .03  | -.00  | .02  | .02  | .15  |
| Adequate equipment | .69  | .21  | .33** | -.24 | .22  | -.11  | .40  | .16  | .21* | -.07  | .10  | -.09  |
| F / R²             | 3.43** / .13 | 2.42* / .07 | 4.13** / .13 | 2.65* / .08 |
| Low-yield activities | -.00  | .00  | -.05 | -.01  | .00  | -.19* | -.01  | .00  | -.24** | -.00  | .00  | -.04  |
| Control variables |                   |                |           |     |     |     |     |     |     |     |     |
| Language competencies | .01  | .01  | .11  | .01  | .01  | .10  | .02  | .01  | .20** | -.01  | .00  | -.16* |
| Children’s age     | -.03  | .02  | -.13 | .03  | .01  | .12* | .02  | .02  | .08  | -.00  | .01  | -.03  |
| Child-teacher-ratio | .04  | .04  | .10  | -.05  | .03  | -.14* | .00  | .03  | .00  | .02  | .02  | .15  |
| Adequate equipment | .70  | .21  | .33** | -.25 | .22  | -.12  | .40  | .14  | .21** | -.08  | .10  | -.09  |
| F / R²             | 2.75* / .11 | 3.08* / .10 | 3.75** / .16 | 3.27* / .08 |

Note. N = 185; B = unstandardized regression coefficient; SE = clustered robust standard error; β = standardized regression coefficient; # p < .10, * p < .05, ** p < .01, *** p < .001.

EUROPEAN EARLY CHILDHOOD EDUCATION RESEARCH JOURNAL
1992, 3), postulating that preschool teachers may provide quite appropriate framework conditions (such as suitable materials), but tend to be less actively involved in the educational activities (see also Smidt 2012).

Findings regarding the other activity settings are mixed. In the context of suggestions to make better use of activity settings such as meals or transitions to support children’s interactions and engagement in learning activities (Early et al. 2010), the results of this study imply that major potentials may remain untapped. Finally, activity settings do not play a role in the intensity of children’s conflictual interactions, which were rarely observed anyway.

**Relations between preschool teachers’ activities and the quality of children’s interactions**

Preschool teachers’ scaffolding relates positively to the quality of children’s interactions with preschool teachers. This is in line with previous research (Sylva et al. 2007; Chien et al. 2010; Smidt 2012; Acar, Hong, and Wu 2017), and underlines the importance of a supportive, actively participatory, and structuring role of preschool teachers for quality child–teacher-interactions (Bodrova and Leong 2005). Two other findings seem worthy of discussion. First, preschool teachers’ scaffolding was negatively related to the quality of peer interactions, indicating that a preschool teacher’s scaffolding behavior hinders elaborate interactions of children with their peers, instead of – as has been shown and discussed (Acar, Hong, and Wu 2017) – supporting children’s peer interactions. Second, the lack of relations between scaffolding and task orientation indicates that preschool teachers do not support children’s task orientation and learning activities as suggested by social-constructivist theories and related research (Winsler and Carlton 2003; Bodrova and Leong 2005; National Association for the Education of Young Children 2009, Bodrova and Leong 2012).

Regarding the other activities it seems obvious that preschool teachers’ non-educational activities (e.g. office work) will not have a positive impact per se on children’s interactional quality. In addition, providing children with information is a basic part of educational activities (Giesecke 2013) and a necessary component of everyday preschool life; however, it is considered to be less preferable in supporting interaction quality than scaffolding practices (Early et al. 2010). Furthermore, preschool teachers’ observations of children provides a basis for the evaluation of children’s needs to implement educational activities to support them (National Association for the Education of Young Children 2009). However, just observing children is not enough. Given the findings on scaffolding and teacher-led activities, there seems to be a lack of factual implementation of educational activities. All in all, these findings may be somewhat contradictory to social-constructivist theories (Bodrova and Leong 2012) and the guidelines of the Austrian educational plan, (Ämter der Landesregierungen der österreichischen Bundesländer, Magistrat der Stadt Wien, and Bundesministerium für Unterricht, Kunst und Kultur 2009), according to which preschool teachers are expected to support children in a co-constructive manner.

Finally, the results of (rarely observed) preschool teachers’ controlling and punitive behaviors are plausible. The reaction to children’s conflictual interactions may correspond with an interruption of children’s task orientation (only significant by trend).
Relations between children’s activities and the quality of children’s interactions

Children’s activities were classified according to their potential to stimulate their ‘cognition, concentration, and perseverance at a given task’ (Hadeed 1994, 310). The involvement in cognitively stimulating ‘high-yield’ activities such as role playing, blocks/construction games, early literacy (Kontos and Wilcox-Herzog 1997; Hadeed and Sylva 1999; Layzer, Goodson, and Brown-Lyons 2007; Smidt 2012) were positively related to the quality of children’s interactions with peers and their task orientation. This is partially in line with previous studies (e.g. Howes and Smith 1995; Wishard et al. 2003; Smidt 2012; Cabell, DeCoster et al. 2013). However, potential for improvement seems to be present with respect to the quality of interactions with preschool teachers, where no relations to ‘high-yield’ activities were found. Rather, the findings suggest positive relations (only significant by trend) between the quality of children’s interactions with preschool teachers and ‘moderate-yield’ activities (playing with sand, puzzles, and music), which have been attributed to inheriting a somewhat lower potential to stimulate children’s cognitive development (Hadeed 1994; Hadeed and Sylva 1995; Kontos and Wilcox-Herzog 1997; Horgan and Douglas 1995). The importance of these limited stimulating activities is also obvious in the positive relations to the quality of children’s task orientation.

Furthermore, the findings of the present study reveal that children’s ‘low-yield’ activities (e.g. transitions, caretaking routines, and gross motor activities), which are considered to have a low potential to sup their cognitive development (Hadeed 1994; Hadeed and Sylva 1995; Horgan and Douglas 1995; Kontos and Wilcox-Herzog 1997), are negatively related to their interactions with their peers and their task orientation. Partially similar patterns of results, that is, negative relations between activities one would consider ‘low-yield’ and interactions with peers and task orientation, have been reported in previous research (e.g. Wishard et al. 2003; Sylva et al. 2007; Cabell, DeCoster et al. 2013). With regard to Tyrolian preschools, these patterns of findings indicate that preschool teachers tend to be insufficiently involved in supporting children’s cognitively stimulating ‘high-yield’ activities. Although ‘low-yield’ activities are a necessary part of the preschool day to support specific parts of children’s development (e.g. physical development with gross motor activities; Copple and Bredekamp 2009), the high proportion of these activities in Tyrolian preschools (on average around 56% of the observation time) should be critically reflected upon in light of their limited cognitive stimulating potential.

Control variables

The relations between activity settings, preschool teachers’ activities, and children’s activities to the quality of children’s interactions in preschools hold after controlling for children’s language competencies, children’s age, child–teacher-ratio, and adequacy of equipment. These variables have been shown to be related with the quality of care and interaction quality (e.g. Vandell and Wolfe 2000; NICHD ECCRN 2002; Smidt 2012; Vitiello et al. 2012; Cabell, Bohlmann et al. 2013; Acar, Hong, and Wu 2017; Smidt, Embacher, and Klucznik 2020). The results of the present study indicate that the adequacy of equipment and children’s language competencies predict children’s interaction quality, whereas their age and child–teacher-ratio were hardly related to interaction quality.
Study limitations and implications for educational practice

This study has several limitations. First, it was conducted in the federal state of Tyrol in Austria, and cannot readily be transferred to the other eight Austrian federal states, because although there is an Austrian-wide educational plan for preschool education – the main elements of the preschool system are regulated by law at the federal state level (Smidt 2018). Second, it examines only the first preschool year. It is necessary to examine whether and how relations between activity settings, preschool teachers’ activities, and children’s activities change with respect to the quality of children’s interactions in the second and third years in preschool. Longitudinal findings from Germany (with quite a similar preschool system) suggest that moderate changes can be expected (Smidt 2012, 2015). Third, differences in methodological aspects and the operationalization of interaction quality, activity settings, and activities reduces the comparability of the study’s findings. This is particularly true with regard to ‘high-yield’, ‘moderate-yield’, and ‘low-yield’ activities, which are defined differently in some studies (e.g. pretend play as a ‘high-yield’ and ‘moderate-yield’ activity, respectively; Hadeed 1994; Kontos and Wilcox-Herzog 1997). Fourth, activity settings, preschool teachers’ activities, and children’s activities were each coded in a mutually exclusive manner (i.e. only the predominant category was coded per one-minute interval), and the time sampling interval was relatively long. As with other time-sampling-measures, only a limited number of categories could be coded (Mann et al. 1991). This may have led to an underestimation of activity settings and activities. Fifth, the internal consistency of ‘conflict interactions’ was quite low because of low item variances; however, the small number of items must be taken into account (Cortina 1993).

Given the small-to-medium effect sizes corresponding with some practical relevance there are three issues that should be considered. First, teacher-directed activity settings should be better used to support children’s meaningful interactions and task orientation. It is not enough to rely on child-initiated activity settings, teacher-led activities are important to support children in a goal-oriented manner (Goble and Pianta 2017; Reynolds and Candee 2019). Other activity settings such as meals, routines, or transitions should be also better used to support children’s interactions and engagement in learning tasks (Early et al. 2010). Second, in accordance with developmental appropriate practices (National Association for the Education of Young Children 2009), and other scholarly work (e.g. Winsler and Carlton 2003; Early et al. 2010; Bodrova and Leong 2012) preschool teachers should make better use of the potential of ‘scaffolding’ in terms of awakening a child’s interest in a task, supporting the child, following goals associated with specific tasks, highlighting task-related aspects that the child may fail to see alone, and helping the child manage disappointment and failure (Wood 1980; Wood and Wood 1996). Scaffolding should be used to support children’s peer interactions (Acar, Hong, and Wu 2017). Third, preschool teachers should frequently involve children in cognitively stimulating ‘high-yield’ activities and in activities with a moderate potential to support their elaborate interactions with preschool teachers and peers as well as their task orientation. The amount of less stimulating ‘low-yield’ activities, however, which are nonetheless a necessary part of the preschool day, should be evaluated critically.

How can these suggestions be implemented? Given that Austrian preschools may reflect a programmatic orientation with a tendency toward care and supervision, rather than on the acquisition of academic skills (Smidt 2018), it seems difficult to trigger change. The
implementation of these issues in the regular training and advanced training courses for preschool teachers could be a possible route. Since 2018, some study of courses in early childhood education have been introduced to enhance preschool teachers’ qualifications (Hartel et al. 2019). Implementing strategies on teacher-directed activity settings, scaffolding, and cognitively stimulating activities in these study programs may help improve educational practices in Tyrolian preschools in the medium term.

**Disclosure statement**

No potential conflict of interest was reported by the author(s).

**Funding**

This work was supported by the Austrian Science Fund (FWF) under Grant P 30598.

**ORCID**

Wilfried Smidt  http://orcid.org/0000-0002-8289-1577

**References**

Acar, I. H., S.-Y. Hong, and C. Wu. 2017. “Examining the Role of Teacher Presence and Scaffolding in Preschoolers’ Peer Interactions.” *European Early Childhood Education Research Journal* 25 (6): 866–884. doi:10.1080/1350293x.2017.1380884.

Amt der Tiroler Landesregierung. 2019. “Statistik der Kinderbetreuungseinrichtungen in Tirol 2018/2019.” [Statistics of Childcare Institutions in Tyrol 2018/2019]. Accessed July 22, 2020. https://www.tirol.gv.at/fileadmin/themen/statistik-budget/statistik/downloads/KG_2018.pdf.

Ämter der Landesregierungen der österreichischen Bundesländer, Magistrat der Stadt Wien, Bundesministerium für Unterricht, Kunst und Kultur. (Eds.).2009. *Bundesländerübergreifender BildungsRahmenPlan für elementare Bildungseinrichtungen in Österreich* [Cross-State Educational Plan for Preschools in Austria]. Accessed July 22, 2020. https://www.ris.bka.gv.at/Dokumente/Landesnormen/LWI40004982/Anlage_2.pdf.

Bodrova, E., and D. J. Leong. 2005. “High Quality Preschool Programs: What Would Vygotsky Say?” *Early Education and Development* 16 (4): 437–446. doi:10.1207/s15566935eed1604_4.

Bodrova, E., and D. J. Leong. 2012. “Scaffolding. Self-Regulated Learning in Young Children: Lessons From Tools of the Mind.” In *Handbook of Early Education*, edited by S. Sheridan, R. C. Pianta, L. Justice, and W. Barnett, 352–369. New York: Guilford Press.

Booren, L. M., J. T. Downer, and V. E. Vitiello. 2012. “Observations of Children’s Interactions with Teachers, Peers, and Tasks Across Preschool Classroom Activity Settings.” *Early Education and Development* 23 (4): 517–538. doi:10.1080/10409289.2010.548767.

Bredekamp, S., and T. Rosegrant. 1992. *Reaching Potentials: Appropriate Curriculum and Assessment for Young Children*. Washington, DC: National Association for the Education of Young Children.

Bronfenbrenner, U., and P. A. Morris. 2006. “The Biological Model of Human Development.” In *Handbook of Child Psychology. Theoretical Models of Human Development*, edited by R. M. Lerner, 793–828. Hoboken, NJ: John Wiley & Sons.

Bruner, J. S. 1980. *Under Five in Britain*. London: Grant McIntyre.

Burger, K. 2010. “How Does Early Childhood Care and Education Affect Cognitive Development? An International Review of the Effects of Early Interventions for Children From Different Social Backgrounds.” *Early Childhood Research Quarterly* 25 (1): 140–165. doi:10.1016/j.ecresq.2009.11.001.
Cabell, S. Q., N. Bohlman, L. M. Booren, J. DeCoster, and A. P. Williford. 2013. “Variation in Children’s Engagement in Conversational Exchanges with Teachers and Peers Across Preschool Classroom Settings.” Poster presented at the biennial meeting of the Society for research in child development, Seattle.

Cabell, S. Q., J. DeCoster, J. LoCasale-Crouch, B. K. Hamre, and R. C. Pianta. 2013. “Variation in the Effectiveness of Interactions Across Preschool Classroom Settings and Learning Activities.” Early Childhood Research Quarterly 28 (4): 820–830. doi:10.1016/j.ecresq.2013.07.007.

Caldwell, B. M., and R. H. Bradley. 1984. Home Observation for Measurement of the Environment. Little Rock: University of Arkansas.

Carey, S., and E. Spelke. 1993. “Domain-Specific Knowledge and Conceptual Change.” In Development in Context. Acting and Thinking in Specific Environments, edited by R. H. Wozniak, and K. W. Fischer, 169–199. Hillsdale: Lawrence Erlbaum.

Chien, N. C., C. Howes, M. Burchinal, R. C. Pianta, S. Ritchie, D. M. Bryant, R. M. Clifford, D. M. Early, and O. A. Barbarin. 2010. “Children’s Classroom Engagement and School Readiness Gains in Prekindergarten.” Child Development 81 (5): 1534–1549. doi:10.1111/j.1467-8624.2010.01490.x.

Cicchetti, Domenic. 1993. “What Is Coefficient Alpha? An Examination of Theory and Applications.” Journal of Applied Psychology 78 (1): 98–104. doi:10.1037/0021-9010.78.1.98.

Clarke-Stewart, K. A., and V. D. Allhusen. 2005. What We Know About Child Care. Cambridge, MA: Harvard University Press.

Cohen, J. 1988. Statistical Power Analysis for the Behavioral Sciences. 2nd ed. Hillsdale, NJ: Lawrence Erlbaum.

Copple, C., and S. Bredekamp, eds. 2009. Developmentally Appropriate Practice in Early Childhood Programs. Serving Children From Birth Through Age 8. Washington, DC: National Association for the Education of Young Children.

Cortina, J. M. 1993. “What Is Coefficient Alpha? An Examination of Theory and Applications.” Journal of Applied Psychology 78 (1): 98–104. doi:10.1037/0021-9010.78.1.98.

Cryer, D. 1999. “Defining and Assessing Early Childhood Program Quality.” The Annals of the American Academy of Political and Social Science 563 (1): 39–55. doi:10.1177/0002716299563001003.

de Haan, A. K. E., E. Elbers, and P. P. M. Leseman. 2014. “Teacher and Child-Managed Academic Activities in Preschool and Kindergarten and Their Influence on Children’s Gains in Emergent Academic Skills.” Journal of Research in Childhood Education 28 (1): 43–58. doi:10.1080/02568543.2013.851750.

Downer, J. T., L. M. Booren, B. K. Hamre, R. C. Pianta, and A. P. Williford. 2012. The Individualized Classroom Assessment Scoring System (inCLASS) Pre-K Coding Manual. Charlottesville, VA: Center for Advanced Study of Teaching and Learning (CASTL), University of Virginia.

Downer, J. T., L. M. Booren, O. K. Lima, A. E. Luckner, and R. C. Pianta. 2010. “The Individualized Classroom Assessment Scoring System (inCLASS). Preliminary Reliability and Validity of a System for Observing Preschoolers’ Competence in Classroom Interaction.” Early Childhood Research Quarterly 25 (1): 1–16. doi:10.1016/j.ecresq.2009.08.004.

Early, D. M., O. A. Barbarin, D. M. Bryant, M. Burchinal, F. Chang, R. M. Clifford, G. M. Crawford, et al. 2005. “Pre-Kindergarten in Eleven States: NCEDL’s Multi-State Study of Pre-Kindergarten & Study of State-Wide Early Education Programs (SWEEP)” Preliminary Descriptive Report. Accessed April 01, 2020. https://fpg.unc.edu/sites/fpg.unc.edu/files/resources/reports-and-policy-briefs/NCEDL_PreK-in-Eleven-States_Working-Paper_2005.pdf.

Essa, E., and M. Burnham. 2001. “Child Care Quality: A Model for Examining Relevant Variables.” In Advances in Early Education and Day Care: Early Education and Care, and Reconceptualizing Play, edited by S. Reifel, and M. Brown, 59–113. Oxford: Elsevier Science.
Gelman, S. A., and N. S. Noles. 2011. “Domains and Naïve Theories.” WIREs Cognitive Science 2 (5): 490–502. doi:10.1002/wcs.124.

Giesecke, H. 2013. Pädagogik als Beruf [Education as Occupation]. Weinheim: Beltz.

Goble, P., and R. C. Pianta. 2017. “Teacher–Child Interactions in Free Choice and Teacher-Directed Activity Settings: Prediction to School Readiness.” Early Education and Development 28 (8): 1035–1051. doi:10.1080/10409289.2017.1322449.

Grimm, H. 2015. Sprachentwicklungstest für drei- bis fünfjährige Kinder (SETK 3-5) [Language Development Test for Three- to Five-Year-Old Children (SETK 3-5)]. Göttingen: Hogrefe.

Hadeed, J. 1994. “The Effects of Preschool Experience on Some Aspects of Child Development in Bahrain.” Thesis submitted for the degree of Ph.D., University of London. Accessed April 07, 2020. https://discovery.ucl.ac.uk/id/eprint/10019086/7/265816_Redacted.pdf.

Hadeed, J., and K. Sylva. 1995. “Behavioral Observations as Predictors of Children’s Social and Cognitive Progress in Day Care.” Paper presented at the Fifth European Conference on Early childhood education, EECERA, Paris, September.

Hadeed, J., and K. Sylva. 1999. “Behavioral Observations as Predictors of Children’s Social and Cognitive Progress in Day Care.” Early Child Development and Care 154 (1): 13–30. doi:10.1080/0030443991540102.

Halle, T., J. E. Vick Whittaker, and R. Anderson. 2010. Quality in Early Childhood Care and Education Settings: A Compendium of Measures. Washington, DC: U.S. Department of Health and Human Services.

Harms, T., R. M. Clifford, and D. Cryer. 2015. Early Childhood Environment Rating Scale. New York, NY: Teachers College Press.

Hartel, B., L. Hollerer, W. Smidt, C. Walter-Laager, and M. Stoll. 2019. “Elementarpädagogik in Österreich. Voraussetzungen und Wirkungen elementarer Bildung” [Early Childhood Education in Austria. Conditions and Effects of Early Childhood Education]. In Nationaler Bildungsbericht Österreich 2018, Band 2. Fokussierte Analysen und Zukunftsperspektiven für das Bildungswesen [National Education Report for Austria 2018, Vol. 2. Specific Analyses and Future Perspectives of the Educational System], edited by S. Breit, F. Eder, K. Krainer, Ch. Schreiner, A. Seel, and Ch. Spiel, 183–224. Graz: Leykam.

Horgan, M. A., and F. G. Douglas. 1995. “Intellectual Development and Early Childhood Education in the Republic of Ireland.” Curriculum 17 (2): 102–116.

Howes, C., and E. W. Smith. 1995. “Relations Among Child Care Quality, Teacher Behavior, Children’s Play Activities, Emotional Security, and Cognitive Activity in Child Care.” Early Childhood Research Quarterly 10 (4): 381–404. doi:10.1016/0885-2006(95)90013-6.

inCLASS Technical Manual. 2010. Accessed March 31, 2020. http://www.inclassobservation.com/research/inCLASSTechnicalManual.6.25.12.pdf.

Kluczniok, K., and H.-G. Roßbach. 2014. “Conceptions of Educational Quality for Kindergartens.” Zeitschrift für Erziehungswissenschaft 17 (6): 145–158. doi:10.1007/s11618-014-0578-2.

Kontos, S., and A. Wilcox-Herzog. 1997. “Influences on Children’s Competence in Early Childhood Classrooms.” Early Childhood Research Quarterly 12 (3): 247–262. doi:10.1016/s0885-2006(97)90002-8.

Kuger, S., K. Pflieger, and H.-G. Roßbach. 2006. Handbuch zur ZiKiB [Manual for ZiKiB]. Unpublished document.

Lamb, M., and L. Ahnert. 2006. “Nonparental Child Care: Context, Concepts, Correlates, and Consequences.” In Handbook of Child Psychology. Child Psychology in Practice, edited by K. A. Renninger, and I. Sigel, 950–1016. Hoboken, NJ: John Wiley & Sons.

Layzer, J. I., B. D. Goodson, and M. Brown-Lyons. 2007. “National Study of Child Care for Low-Income Families Care in the Home: A Description of Family Child Care and the Experiences of the Families and Children That Use It: Final Report.” Accessed April 07, 2020. https://www.acf.hhs.gov/sites/default/files/opre/a_description_of_family_child_care_and_the_experiences_of_the_families.pdf.

Lenhard, W., and A. Lenhard. 2017. “Computation of Effect Sizes.” Accessed April 07, 2020. https://www.psychometrica.de/effektstaerke.html.
Lera, M.-J. 1996. “Education Under Five in Spain: A Study of Preschool Classes in Seville.” European Journal of Psychology of Education 11 (2): 139–150. doi:10.1007/bf03172720.

Love, J. M., L. Harrison, A. Sagi-Schwartz, M. H. van IJzendoorn, C. Ross, J. A. Ungerer, H. Raikes, et al. 2003. “Child Care Quality Matters: How Conclusions May Vary with Context.” Child Development 74 (4): 1021–1033. doi:10.1111/1467-8624.00584.

Mann, J., T. Ten Have, J. W. Plunkett, and S. J. Meisels. 1991. “Time Sampling: A Methodological Critique.” Child Development 62 (2): 227–241. doi:10.2307/1130999.

Manning, M., G. T. W. Wong, C. Fleming, and S. Garvis. 2019. “Is Teacher Qualification Associated With the Quality of the Early Childhood Education and Care Environment? A Meta-Analytic Review.” Review of Educational Research 89 (3): 370–415. doi:10.3102/0034654319837540.

National Association for the Education of Young Children. 2009. “Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth Through Age 8.” Accessed April 07, 2020. https://www.naeyc.org/sites/default/files/globaly-shared/downloads/PDFs/resources/position-statements/PSDAP.pdf.

National Institute of Child Health and Human Development, Early Child Care Research Network (NICHD ECCRN). 2002. “Child-Care Structure, Process, Outcome: Direct and Indirect Effects of Child Care Quality on Young Children’s Development.” Psychological Science 13 (3): 199–206. doi:10.1111/1467-9280.00438.

National Institute of Child Health and Human Development, Early Child Care Research Network (NICHD ECCRN). 2006. “Child-Care Effect Sizes for the NICHD Study of Early Child Care and Youth Development.” American Psychologist 61 (2): 99–116. doi:10.1037/0003-066x.61.2.99.

Nunnally, J. C. 1978. Psychometric Theory. 2nd ed. New York: McGraw-Hill.

Oberhuemer, P., J. Schreyer, and M. Neuman. 2010. Professionals in Early Childhood Education and Care Systems: European Profiles and Perspectives. Opladen: Barbara Budrich.

Peterson, R. A., and S. P. Brown. 2005. “On the Use of Beta Coefficients in Meta-Analysis.” The Journal of Applied Psychology 90 (1): 175–181. doi:10.1037/0021-9010.90.1.175.

Piaget, J. 1978. Das Weltbild des Kindes [The Child’s Conception of the World]. Stuttgart: Klett-Cotta.

Pianta, R. C., K. M. La Paro, and B. K. Hamre. 2008. Classroom Assessment Scoring System – CLASS. Baltimore, MD: Paul H. Brookes Publishing Co.

Reynolds, A. J., and A. J. Candee. 2019. “Dimensionality and Predictive Validity of the Classroom Learning Activities Checklist in Prekindergarten.” Educational Assessment, Evaluation and Accountability 31 (4): 381–407. doi:10.1007/s11092-019-09306-7.

Riedmeier, M. 2019. “Standardisierte Verfahren zur Erhebung zielkindbezogener Prozessqualität in der Frühpädagogik. Ein vergleichender Überblick” [Standardized Target Child-Related Instruments for the Measurement of Process Quality in Early Childhood Education: A Comparative Overview]. Frühe Bildung 8 (3): 144–152. doi:10.2621/2191-9186/a00426.

Rimm–Kaufman, S. E., K. M. La Paro, J. T. Downer, and R. C. Pianta. 2005. “The Contribution of Classroom Setting and Quality of Instruction to Children’s Behavior in Kindergarten Classrooms.” The Elementary School Journal 105 (4): 377–394. doi:10.1086/429948.

Scheiwe, K., and H. Willekens. 2009. “Introduction: Path-Dependencies and Change in Child-Care and Preschool Institutions in Europe – Historical and Institutional Perspectives.” In Child Care and Preschool Development in Europe: Institutional Perspectives, edited by K. Scheiwe, and H. Willekens, 1–22. Hampshire: Palgrave Macmillan.

Schmidt, Th., W. Smidt, K. Klucznik, and M. Riedmeier. 2018. “Interaktionsqualität in Kindertageseinrichtungen - Eine vergleichende Betrachtung standardisierter gruppen- und zielkindbezogener Erhebungsverfahren.” [Interaction Quality in Preschools – A Comparative Consideration of Standardized Instruments on Classlevel and Target-Child-Level] Diskurs Kindheits- und Jugendforschung 13 (4): 459–476. doi:10.3224/diskurs.v13i4.06.

Smidt, W. 2012. Zielkindbezogene pädagogische Qualität im Kindergarten. Eine empirisch-quantitative Studie [Target Child Related Educational Quality in Preschools. A Quantitative Study]. Münster: Waxmann.

Smidt, W. 2015. “Educational Processes in Early Childhood Education: Activities of Target Children in Preschools.” In Multidisciplinary Research on Teaching and Learning, edited by W. Schnotz, A. Kauertz, H. Ludwig, A. Müller, and J. Pretsch, 3–18. Basingstoke: Palgrave Macmillan.
Smidt, W. 2018. “Early Childhood Education and Care in Austria: Challenges and Education Policies.” *Early Child Development and Care* 188 (5): 624–633. doi:10.1080/03004430.2017.1403431.

Smidt, W., L. Burkhardt, V. Endler, S. Kraft, and B. Koch. 2017. “Professionalisierung des pädagogischen Personals in Kindertageseinrichtungen in Österreich – Modelle, Befunde, Desiderate” [Professionalization of Educational Staff in Day Care Centers in Austria – Models, Findings, Desiderata]. *Zeitschrift für Pädagogik* 62 (3): 121–138.

Smidt, W., E.-M. Embacher, and K. Kluczniok. 2020. “Gleich oder anders? Geschlechtsspezifische Befunde zur kindlichen Interaktionsqualität im Kindergarten in Österreich.” [Same or Different? Gender-Specific Findings on Children’s Interaction Quality in Preschools in Austria]. *Diskurs Kindheits- und Jugendforschung* 15 (1): 21–37. doi:10.3224/diskurs.v15i1.03.

Sylvia, K., B. Taggart, I. Siraj-Blatchford, V. Totsika, K. Ereky-Stevens, R. Gilden, and D. Bell. 2007. “Curricular Quality and Day-To-Day Learning Activities in Pre-School.” *International Journal of Early Years Education* 15 (1): 49–65. doi:10.1080/09669760601106968.

Smidt, W., L. Burkhardt, V. Endler, S. Kraft, and B. Koch. 2017. “Professionalisierung des pädagogischen Personals in Kindertageseinrichtungen in Österreich – Modelle, Befunde, Desiderate” [Professionalization of Educational Staff in Day Care Centers in Austria – Models, Findings, Desiderata]. *Zeitschrift für Pädagogik* 62 (3): 121–138.

Vandell, D. L., and B. Wolfe. 2000. “Child Care Quality: Does It Matter and Does It Need to Be Improved?” Accessed March 21, 2020. https://www.irp.wisc.edu/publications/sr/pdfs/sr78.pdf.

Wildgruber, A., M. Wertfein, C. Wirts, M. Kammermeier, and E. Danay. 2016. “Situative Unterschiede der Interaktionsqualität im Verlauf des Kindergartenalltags” [Variation in Teacher-Child Interactions Across Time and Activity Settings in German ECEC Classrooms]. *Frühe Bildung* 5 (4): 206–213. doi:10.1026/2191-9186/a000283.

Winton, P., and V. Buysse, eds. 2005. “NCEDL Pre-Kindergarten Study.” *Early Developments* 9 (1): 1–32. Accessed April 07, 2020. https://fpg.unc.edu/sites/fpg.unc.edu/files/resources/early-developments/FPG_EarlyDevelopments_v9n1.pdf.

Winsler, A., and M. P. Carlton. 2003. “Observation of Children’s Task Activities and Social Interactions in Relation to Teacher Perceptions in a Child-Centered Preschool: Are We Leaving Too Much to Chance?” *Early Education and Development* 14 (2): 155–178. doi:10.1207/s15566935eed1402_2.

Wishard, A., E. M. Shivers, C. Howes, and S. Ritchie. 2003. “Child Care Program and Teacher Practices: Associations with Quality and Children’s Experiences.” *Early Childhood Research Quarterly* 18 (1): 65–103. doi:10.1016/s0885-2006(03)00007-3.

Wood, D. J. 1980. “Teaching the Young Child: Some Relationships Between Social Interaction, Language, and Thought.” In *The Social Foundations of Language and Thought*, edited by D. R. Olson, 280–296. New York: W. W. Norton & Company.

Wood, D., and H. Wood. 1996. “Vygotsky, Tutoring and Learning.” *Oxford Review of Education* 22 (1): 5–16. doi:10.1080/0305498960220101.