

## Chapter 3. Supporting quality early childhood education and care through workforce development and working conditions

*Workforce training and working conditions matter for quality early childhood education and care (ECEC), across age groups and in both centre-based and family daycare settings. In turn, higher process quality is associated with higher levels of child development. This chapter provides an overview on associations between workforce-related characteristics and quality. Research shows relations between staff pre-service and in-service qualifications and training programmes, staff-child interactions and the promotion of young children's development. Staff working conditions, such as staff salaries and well-being, as well as organisational climate, can play a key role in determining staff-child interactions. A few studies also find that in family daycare, staff networking is associated with higher-quality interactions. However, staff years of experience do not appear to predict quality levels. Staff-child interactions and implementation of developmental and educational activities are linked to higher levels of children's emerging literacy and numeracy skills, as well as better behavioural and social skills.*

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

## Introduction

Staff are at the centre of efforts to enhance pedagogical practice and to promote young children's development. Staff pre-service and in-service qualifications and training programmes are common mechanisms in workforce development. Pre-service qualifications refer to the training that staff have engaged in before they begin the job; in-service training refers to additional training they receive while working in the ECEC field.

Highly qualified ECEC staff are better placed to create enriched and stimulating environments and deliver the high-quality pedagogy associated with improved learning and well-being (Britto, Yoshikawa and Boller, 2011<sup>[33]</sup>; Early et al., 2007<sup>[64]</sup>; Litjens and Taguma, 2010<sup>[133]</sup>; Phillipsen et al., 1997<sup>[101]</sup>; Fontaine et al., 2006<sup>[134]</sup>). However, examining these mechanisms and their associations with process quality is a complex task. In-service training is part of the broader concept of professional development together with coaching, mentoring, (video) feedback or other activities, making professional development diverse in terms of not only content, but also implementation methods. Considerable new research and attention has been devoted recently to examining the effectiveness of these aspects (Slot, 2017<sup>[16]</sup>).

Staff working conditions include staff salaries, staff experience, organisational climate and networking, with clear linkages to staff well-being, as well as the sector's ability to attract and retain staff members. Salaries are one of the most relevant factors of working conditions, affecting job satisfaction and teachers' effectiveness in the school literature (Huntsman, 2008<sup>[135]</sup>; Moon and Burbank, 2004<sup>[136]</sup>; Murnane et al., 1990<sup>[137]</sup>) (Moon and Burbank, 2004<sup>[136]</sup>). However, in ECEC, staff salaries show great disparity across countries (see Figure 3.1) and there is evidence that low salaries influence staff behaviour towards children and increase turnover rates (Huntsman, 2008<sup>[135]</sup>). Furthermore, low salaries deter skilled professionals from choosing to work as ECEC staff (Manlove and Guzella, 1997<sup>[138]</sup>).

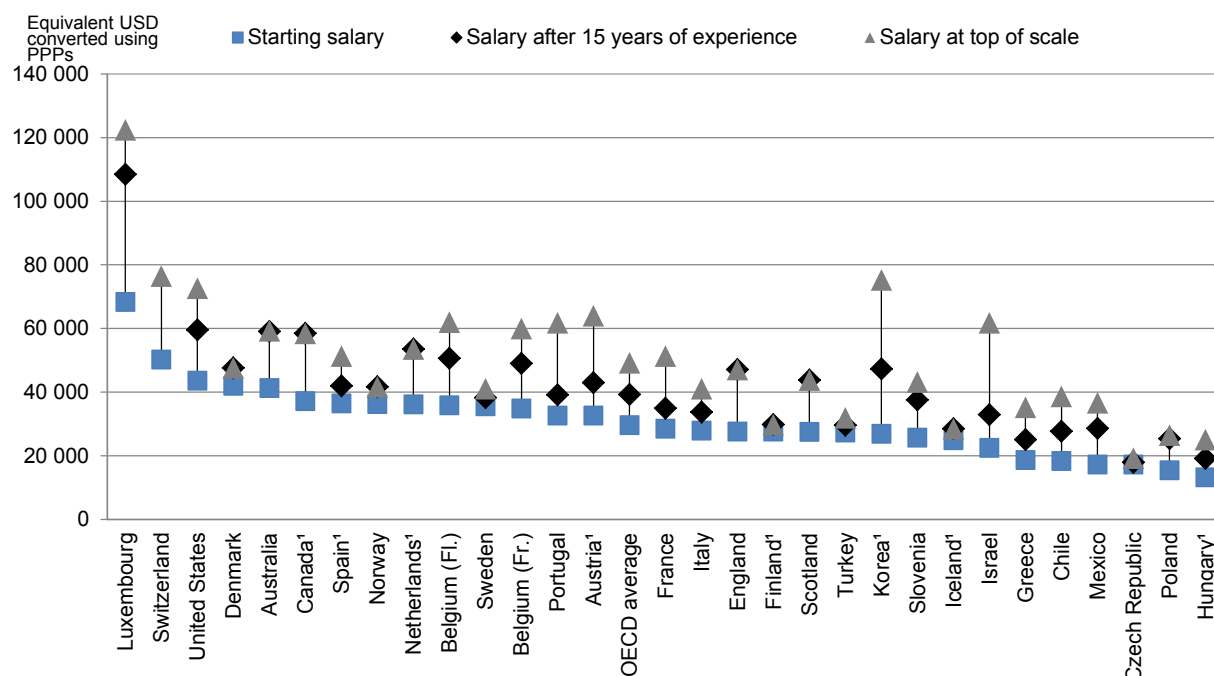
In addition, opportunities for team collaboration and networking affect the extent to which staff feel supported and feel part of the team, and the degree to which there is a joint vision and mission in the organisation, which in turn contribute to staff's practices and thus process quality.

### *Summary of findings*

In analysing workforce development and working conditions, overall higher pre-service qualifications were found to be related to higher-quality staff-child interactions. This particularly applies to settings for children aged 0 to 2, although some studies showed mixed findings. However, higher teacher qualifications were not associated with emerging academic skills or behavioural and social skills. In fact, only staff-child interactions were predictive of children's development and learning. Specifically, children had higher levels of emerging literacy and numeracy skills, as well as better behavioural and social skills, in ECEC centres with more positive and fewer negative staff-child interactions. Associations between staff-child interactions and children's development and learning did not differ significantly for children from predominantly disadvantaged backgrounds, compared to a diverse group of children.

**Figure 3.1. Annual statutory teachers' salaries in pre-primary education (2015).**

Based on typical qualifications, in public settings, in equivalent USD converted using PPPs



*Note:* Countries are ranked in descending order of starting salaries for pre-primary teachers. 1. Year of reference is 2014. Statutory salaries, based on pay scales, are only one component of teachers' total compensation. Education systems also offer additional payments to teachers, such as allowances, bonuses or other rewards. See Education at a Glance 2017 Annex 3 for further notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

*Source:* (OECD, 2017d<sub>[95]</sub>)

Consistent positive associations for all settings examined were found between staff in-service training (or professional development) and staff-child interactions, especially if the training included ECEC content. The number of studies available for settings for children aged zero to 3 was more limited, but the pattern of results is largely consistent.

Regarding family daycare settings, both pre-service qualifications and in-service training appear to have a consistent association with staff-child interactions in family daycare, at least in US and Flemish family daycare settings. Pre-service training was found to be the most commonly researched structural feature in family daycare settings (i.e. in a total of seven studies reporting on the relations with staff-child interactions). It is important to note that two out of the five US studies showed that pre-service education for family daycare provisions was not significant when additional in-service training was added to the equation. Generally, family daycare providers appear to have lower educational qualifications than staff working in centre-based care, both in terms of the level of attainment and the specialisation of the training, as was evident in studies from Australia, Quebec, the Netherlands and the US (Bigras et al., 2010<sub>[139]</sub>; Coley et al., 2016<sub>[77]</sub>; Fuligni et al., 2009<sub>[79]</sub>; Groeneveld et al., 2010<sub>[140]</sub>; Ishimine and Tayler, 2012<sub>[141]</sub>). However, the consistent finding that professional development can contribute to higher-quality staff-child interactions highlights the importance of investing in additional on-the-job training.

For staff's work experience, the findings appeared to be inconsistent. Almost half of the studies reviewed reported no associations between staff's work experience and staff-child interactions, and the remainder showed either positive or negative relations. A similar pattern was summarised for centres for children aged 0 to 2, although more studies reported positive relationships. Overall, work experience was unrelated to staff-child interactions in family daycare settings. Unfortunately, given the limited number of studies available, and the narrow international scope of these studies, it is unclear whether these associations should be expected in other countries or jurisdictions.

Positive associations were found between salaries, the centre's organisational climate, and staff-child interactions, but the number of studies that have included these aspects is somewhat limited. Preliminary evidence suggests that provisions for higher-paid staff and more team collaboration in centres with children from 3 to 6, and for children under the age of 3, provided higher-quality staff-child interactions.

It is important to keep in mind the possible confusion between these characteristics. For instance, a study from China showed that urban centres received full government funding, which provided them with more resources (Hu et al., 2016a<sub>[104]</sub>). It is likely that the working conditions are better in these centres, because urban centres attracted better qualified staff who received higher salaries and because the child-staff ratio was more favourable.

This chapter provides an overview of the evidence linking structural mechanisms in staff workforce development and working conditions to staff-child interactions, as well as to child development, learning and well-being. With the aim of building a solid knowledge base on this subject, it draws on a literature review and a meta-analysis that update the conceptual knowledge, as well as on an empirical evidence base for the strength of these associations, while keeping a cross-national focus. The chapter first summarises these two pieces of research, to discuss the importance of these mechanisms for process quality in ECEC. Each mechanism is examined in turn, integrating the evidence for centres for children aged 3 to 6, centres for children under the age of 3, and finally family daycare settings. Finally, the chapter examines the evidence for the links between quality mechanisms and child development, learning and well-being.

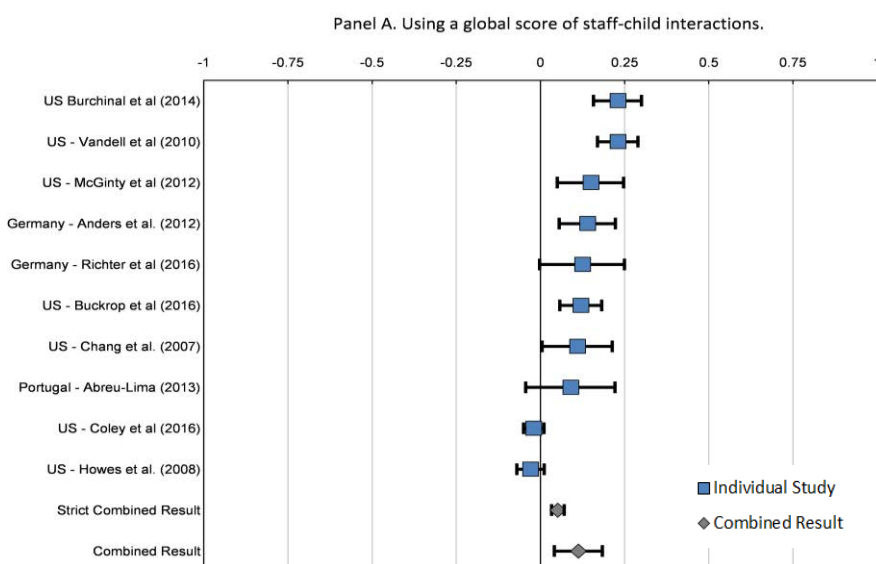
### **What does the research tell us about the importance of workforce development and working conditions for staff-child interactions in early childhood education and care?**

***Positive staff-child interactions predict emerging academic skills, while negative staff-child interactions predict behavioural/social skills.***

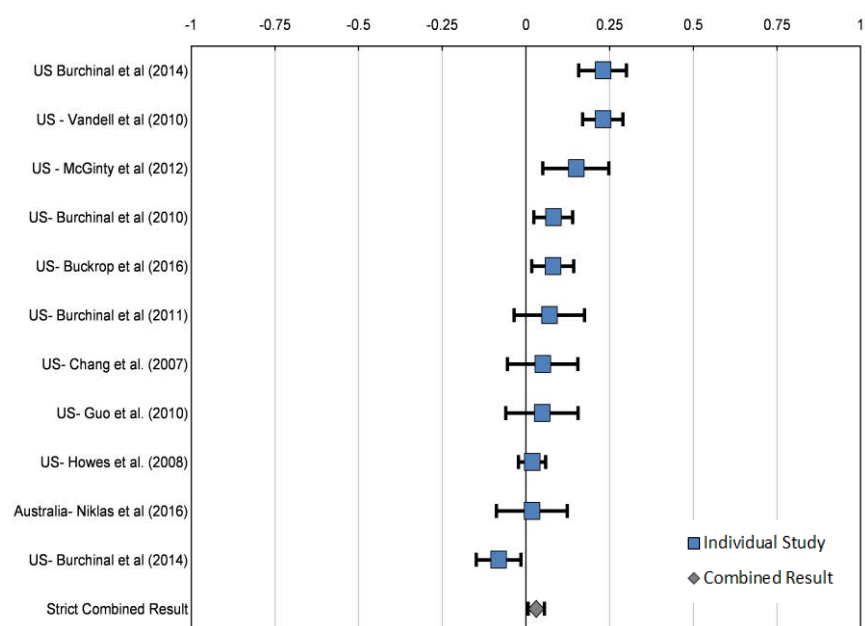
The meta-analysis conducted for this report indicated a consistent positive association between the quality of staff-child interactions and children's literacy and numeracy learning (Figure 3.2, (von Suchodoletz et al., 2017<sub>[17]</sub>)). This association was true when considering an overall staff-child interactions index (Panel A), and also a combined score of staff emotional, instructional and organisation interactions with the children (Panel B).

Conversely, no associations were found between staff-child interactions and children's behavioural/social skills using the overall staff-child interactions index (Figure 3.3, Panel A, (von Suchodoletz et al., 2017<sub>[17]</sub>)). The association between the combined score of staff emotional, instructional, and organisation interactions with the children and children's behavioural/social skills was slightly negative, but not significant (Panel B).

**Figure 3.2. More positive staff-child interactions are associated with higher levels of child emerging academic skills.**



Panel B. Based on a combined score of staff emotional, instructional, and organisational staff-child interactions.



*Note:* Effect sizes are depicted as either blue squares for individual studies or grey diamonds for combined results, each with black lines spanning the lower limit and the upper limit of the 95% confidence interval for each estimated effect. Individual studies, labelled here with the information for country of study, author, and the year of study publication, refer to original studies that provided effect size measures entering into each meta-analysis. These measures are then combined into a summary effect size, which is the average association between two variables. See Box 3.1 for more details on how to interpret the charts.

*Source:* (von Suchodoletz et al., 2017<sup>[17]</sup>).

### Box 3.1. Interpreting the meta-analysis charts

The meta-analysis charts report associations in the form of standardised effect sizes. For the current analysis, effect size is defined as the degree and direction of association, or correlation, between two variables (e.g. between indicators of structural and process quality, and between indicators of structural/process quality and child development and learning).

Effect sizes reported are standardised, such that a measure ranges between -1 to 1. An effect size measure closer to 0 means little association between the two variables represented in the chart, while an effect size closer to either -1 or 1 (i.e. larger absolute value) would indicate stronger association between the variables. An effect size of negative value would mean that an increase in the measure of one variable is associated with a decrease in the measure of the other variable, while an effect size of positive value would mean that both variables increase or decrease in same direction.

Depending on which statistical assumption underlies the process of averaging, a meta-analysis can produce either Combined Result (based on a “fixed-effect model”) or Strict Combined Result (based on a “random-effects model”). The main difference between the two in the present meta-analysis is that the former gives larger weighting to the individual studies based on larger sample size.

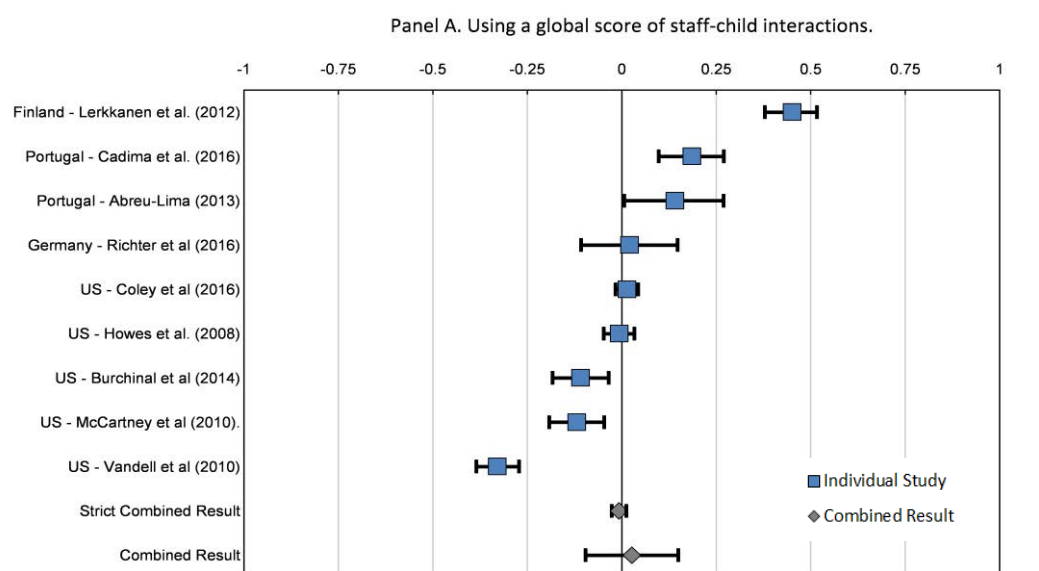
Because of the diversity of measures used in research to assess process quality, meta-analysis results are examined in terms of three indicators:

- Global score of staff-child interactions: an overall index of the interactions between the ECEC staff and the group, irrespective of the type or subdomains of interaction, used when the studies only reported one single score to describe the quality of interactions;
- Combined score of staff-child interactions: an aggregate score of staff-child interactions, including the staff’s positive emotional, instructional, and organisation interactions with children, generally based on a set of domain-specific scores reported in the studies.
- Developmental and educational activities: an aggregate score of the exposure and/or quality of developmental and educational activities provided by staff.

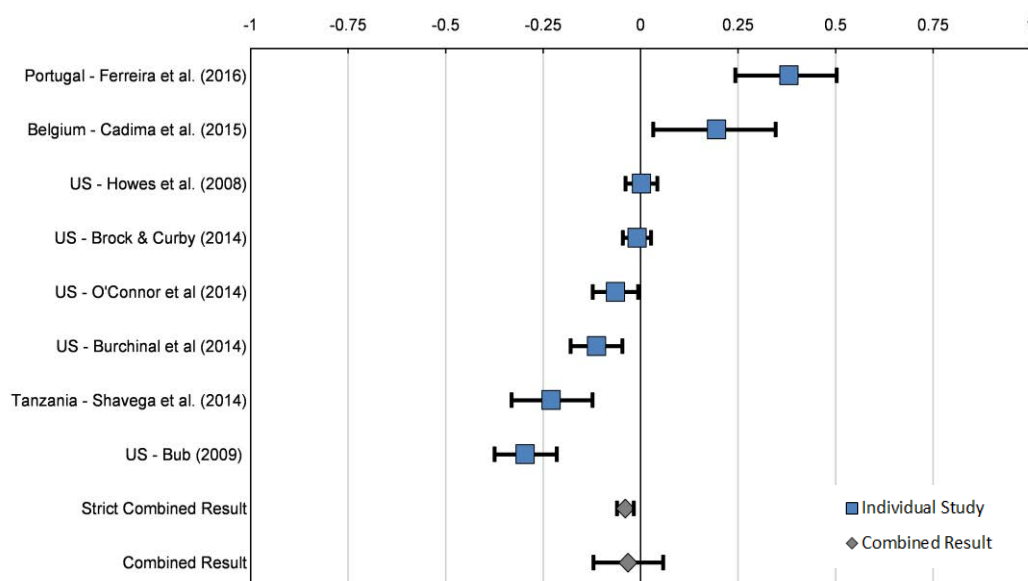
For child data, meta-analysis results are examined in terms of two indicators:

- Emerging academic skills: An aggregate score of early numeracy and literacy skills.
- Combined score of behavioural and social-emotional indicators: an aggregate score of social and behavioural skills, including behaviour regulation, executive function, behavioural problems, and social competence.

**Figure 3.3. Inconsistent associations between positive staff-child relationships and child behavioural/ social skills.**



Panel B. Based on a combined score of staff emotional, instructional, and organisational staff-child interactions.



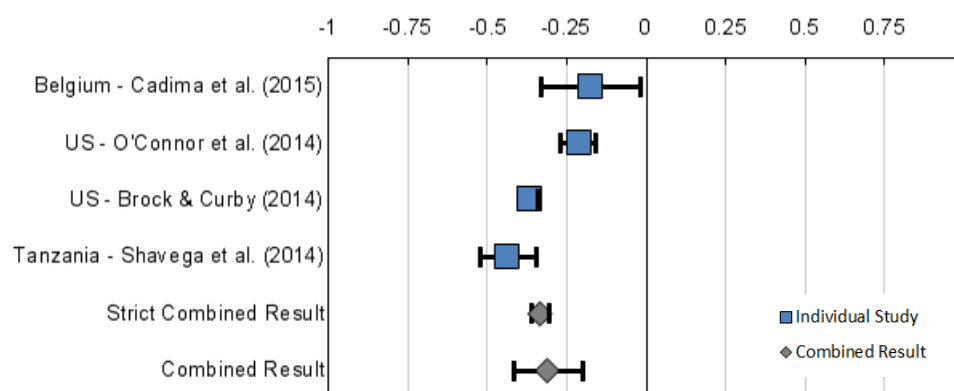
*Note:* Effect sizes are depicted as either blue squares for individual studies or grey diamonds for combined results, each with black lines spanning the lower limit and the upper limit of the 95% confidence interval for each estimated effect. Individual studies, labelled here with the information for country of study, author, and the year of study publication, refer to original studies that provided effect size measures entering into each meta-analysis. These measures are then combined into a summary effect size, which is the average association between two variables. See Box 3.1 for more details on how to interpret the charts. Belgium study took place in the Flemish Community.

*Source:* (von Suchodoletz et al., 2017<sub>[17]</sub>).



The meta-analysis conducted for this report also clearly indicated that negative staff-child interactions are associated with less positive behavioural/social skills of children (see Figure 3.4, (von Suchodoletz et al., 2017<sub>[17]</sub>)).

**Figure 3.4. Negative staff-child interactions are associated with worse behavioural/social skills.**



*Note:* Effect sizes are depicted as either blue squares for individual studies or grey diamonds for combined results, each with black lines spanning the lower limit and the upper limit of the 95% confidence interval for each estimated effect. Individual studies, labelled here with the information for country of study, author, and the year of study publication, refer to original studies that provided effect size measures entering into each meta-analysis. These measures are then combined into a summary effect size, which is the average association between two variables. See Box 3.1 for more details on how to interpret the charts. Belgium study took place in the Flemish Community.

*Source:* (von Suchodoletz et al., 2017<sub>[17]</sub>).

The meta-analysis also indicated that associations between staff-child interactions and children's development and learning did not significantly differ for children from predominantly disadvantaged backgrounds and for a diverse population of children (von Suchodoletz et al., 2017<sub>[17]</sub>).

The mixed pattern of associations between staff-child interactions and children's behavioural/social skills seemed to be determined by geographical differences. Specifically, the meta-analysis conducted for this report indicated that associations between staff-child interactions and children's behavioural/social skills were overall negative in studies conducted in the United States, but overall positive in studies conducted outside the United States. This geographical difference was significant for both the overall staff-child interactions index and the combined score of staff emotional, instructional, and organisation interactions with the children (von Suchodoletz et al., 2017<sub>[17]</sub>). Differences in the direction of associations between the quality of staff-child interactions and children's behavioural/social skills may be due to differences in cultural belief systems (von Suchodoletz et al., 2017<sub>[17]</sub>). Different cultural traditions, values, and beliefs around child development and learning may influence the way ECEC staff perceive and interpret children's behaviour in the class- or playroom which, in turn, affects how they respond to and engage with children. Moreover, children's behavioural and social skills are an important aspect of child attributes and have been suggested to influence interactions between teachers and children. Staff-child interactions are understood as dyadic in nature; in other words, staff-child interactions are shaped by

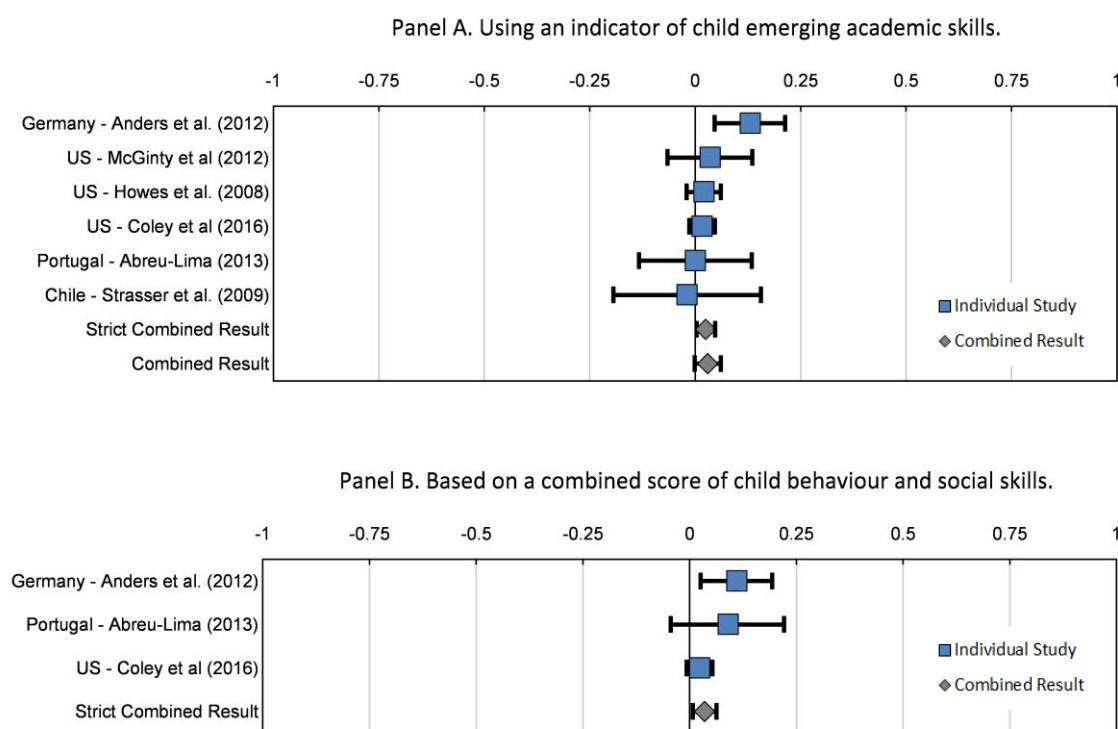


reciprocal processes between teacher and child. No other geographical differences were found.

***Children in class or playrooms with staff providing higher quality or more exposure to developmental and educational activities demonstrate higher levels of emergent skills***

The meta-analysis conducted for this report also analysed the association between staff implementation of developmental and educational activities, a process quality indicator of workforce, and children's emerging academic skills (Abreu-Lima et al., 2013<sup>[142]</sup>; Anders, 2015<sup>[41]</sup>; Coley et al., 2016<sup>[77]</sup>; Howes et al., 2008<sup>[34]</sup>; McGinty et al., 2012<sup>[143]</sup>; Strasser and Lissi, 2009<sup>[144]</sup>), as well as children's behavioural and social skills (Abreu-Lima et al., 2013<sup>[142]</sup>; Anders, 2015<sup>[41]</sup>; Coley et al., 2016<sup>[77]</sup>) (see Figure 3.5, (von Suchodoletz et al., 2017<sup>[17]</sup>)). The results show that children have slightly higher levels of emerging literacy and numeracy skills, as well as better behavioural and social skills, in ECEC centres where staff provide higher quality or more exposure to developmental and educational activities.

**Figure 3.5. Higher quality or exposure to developmental and educational activities is associated with higher levels of children's skills.**



*Note:* Effect sizes are depicted as either blue squares for individual studies or grey diamonds for combined results, each with black lines spanning the lower limit and the upper limit of the 95% confidence interval for each estimated effect. Individual studies, labelled here with the information for country of study, author, and the year of study publication, refer to original studies that provided effect size measures entering into each meta-analysis. These measures are then combined into a summary effect size, which is the average association between two variables. See Box 3.1 for more details on how to interpret the charts.

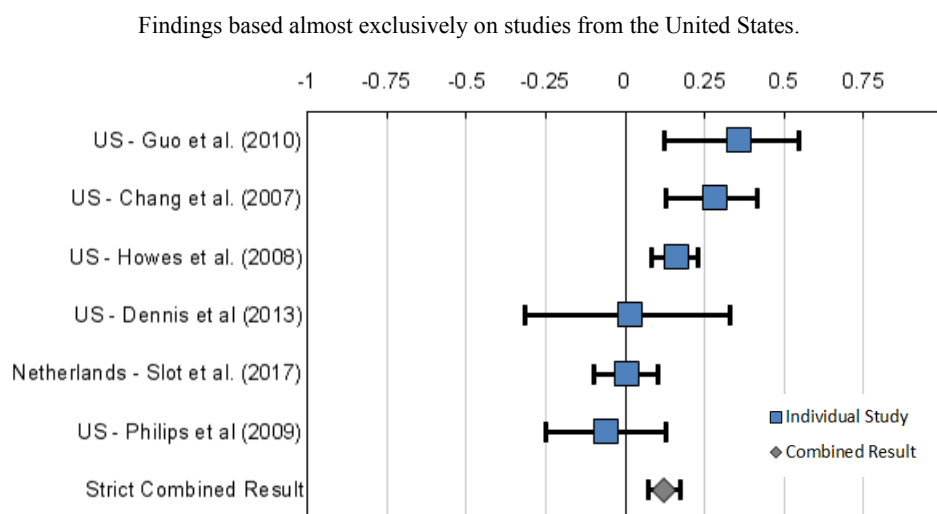
*Source:* (von Suchodoletz et al., 2017<sup>[17]</sup>).

### *Higher pre-service qualifications contribute to better staff-child relationships*

Single country studies show that for centres for children 3 to 6 years old, higher levels of pre-service training, i.e. a bachelor's degree, are associated with better staff-child interactions in Denmark, Portugal, as well as in the United States (Barros and Leal, 2011<sup>[145]</sup>; Guo et al., 2010<sup>[146]</sup>; Pianta et al., 2005<sup>[31]</sup>; Slot et al., 2017b<sup>[63]</sup>). In a comprehensive review, Tout, Zaslow and Berry (2006<sup>[147]</sup>) revealed that pre-service qualifications showed stronger relations with staff-child interactions if the training included ECE content, such as child development.

This positive association was partially confirmed by the meta-analysis conducted for this report (see Figure 3.6). Specifically, higher levels of pre-service qualifications were associated with a higher-quality of staff-child interactions. Although there was some variation across studies in the direction of the association (i.e. some were positive, some were negative), this variation was not directly linked to the level of qualification being studied. Both (Guo et al., 2010<sup>[146]</sup>) and (Philips, Gormley and Lowenstein, 2009<sup>[148]</sup>) looked at differences between having and not having a bachelors' (4-year) degree in ECEC, but only (Guo et al., 2010<sup>[146]</sup>) found positive associations. Remaining studies measured pre-service qualifications as the highest level of completed formal pre-service education attained by teachers with higher values reflecting higher levels, in a variety of scales.

**Figure 3.6. Higher levels of pre-service qualifications are associated with higher quality of staff-child interactions.**



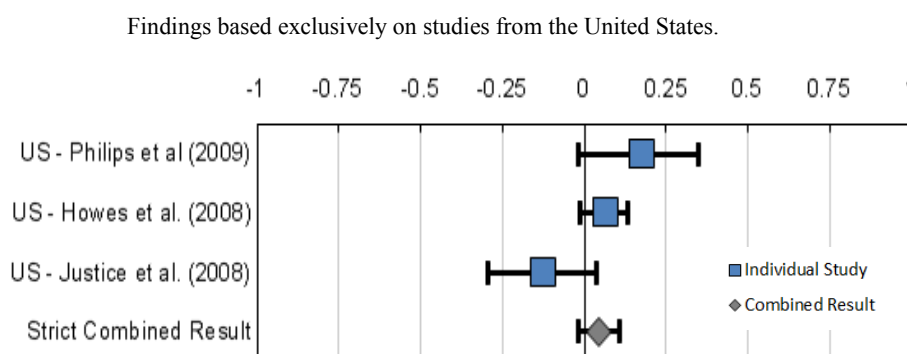
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*Source:* (von Suchodoletz et al., 2017<sup>[17]</sup>).

The meta-analysis also demonstrated that providing higher quality or more exposure to developmental and educational activities (as a process indicator) did not depend on staff education (Figure 3.7, (von Suchodoletz et al., 2017<sup>[17]</sup>)). There was no immediate

association between how pre-service education was described in the studies, and the pattern of results. For example, although (Justice et al., 2008<sub>[124]</sub>) reported the highest of qualification in the participating teachers, with all of the teachers in the study holding a bachelor's degree and 36% holding an additional advanced degree, the quality of language/literacy activities provided in the classroom was very low. However, it is also important to note that this study looked exclusively to publicly funded preschool classrooms serving specifically at-risk pupils, whereas the two other studies looked at state-wide funded pre-Kindergarten classrooms (Howes et al., 2008<sub>[34]</sub>) (Philips, Gormley and Lowenstein, 2009<sub>[148]</sub>).

**Figure 3.7. No association between pre-service qualifications and provision of development and educational activities.**



*Note:* Effect sizes are depicted as either blue squares for individual studies or grey diamonds for combined results, each with black lines spanning the lower limit and the upper limit of the 95% confidence interval for each estimated effect. Individual studies, labelled here with the information for country of study, author, and the year of study publication, refer to original studies that provided effect size measures entering into each meta-analysis. These measures are then combined into a summary effect size, which is the average association between two variables. See Box 3.1 for more details on how to interpret the charts.

*Source:* (von Suchodoletz et al., 2017<sub>[17]</sub>).

In larger scale, cross-state or cross-country studies, results have been mixed. In a multi-site, multi-state study in the United States, Early et al. (2006<sub>[149]</sub>) found that having a degree above the bachelor level was related to higher-quality staff-child interactions, but there were no differences below a bachelor degree. Other studies have reported contradictory or no association between qualifications and staff-child interactions, be it comparing different levels of qualification (i.e. below an associate degree, an associate degree, a bachelor's or above a bachelor's) on a large-scale comparative review in the United States (Early et al., 2007<sub>[64]</sub>), or qualifications and field of education (i.e. holding a BA in ECE, versus holding a BA in another field, or holding an MA) in a large-scale US study (Philips, Gormley and Lowenstein, 2009<sub>[148]</sub>). No clear patterns have been found in other cross-country comparison studies (Cryer et al., 1999<sub>[106]</sub>; Slot, Lerkkanen and Leseman, 2015<sub>[99]</sub>).

***Pre-service qualifications per se may not guarantee better child learning and development***

The evidence on the importance of staff pre-service qualifications for child development, learning and well-being is mixed. In some European studies and a cross-national study, staff with higher qualifications, i.e. Bachelor degrees, were associated with children with higher levels of language (Bauchmüller, Grötz and Rasmussen, 2014<sup>[150]</sup>; Montie, Xiang and Schweinhart, 2006<sup>[110]</sup>) and literacy (Sylva et al., 2004<sup>[13]</sup>) than staff with lower pre-service qualifications, i.e. lower than a bachelor's degree.

However, studies from the United States showed mixed findings. One US study revealed positive associations between having a bachelor's degree (rather than having a lower qualification) and social-emotional skills (Howes et al., 2008<sup>[34]</sup>). However, two studies showed no associations between pre-service qualifications and children's language and literacy skills (Early et al., 2006<sup>[149]</sup>; Mashburn et al., 2008<sup>[44]</sup>). In (Early et al., 2006<sup>[149]</sup>) children with teachers with more than a bachelor's degree scored slightly higher in language and literacy than children with teachers with only an associate degree (i.e. 2-year degree), but this difference was only marginal; in (Mashburn et al., 2008<sup>[44]</sup>) no differences were observed between teachers with or without a bachelor's. Another US study (in which qualification levels were measured as years of education) showed mostly no relations between staff qualifications and children's language and literacy skills, except for decoding skills (such as the ability to read unfamiliar words) for which the association was actually negative (Connor et al., 2005<sup>[61]</sup>).

A recently published meta-analysis revealed null associations between staff's educational qualifications and children's language and math outcomes (Falenchuk et al., 2017<sup>[151]</sup>). However, there was considerable heterogeneity in how staff education was defined across studies, which could at least in part explain the lack of significant findings. For example, it can be defined as total number of years of education, or by categorising teachers according to the level attained, or simply by separating teachers with a bachelor's or without one.

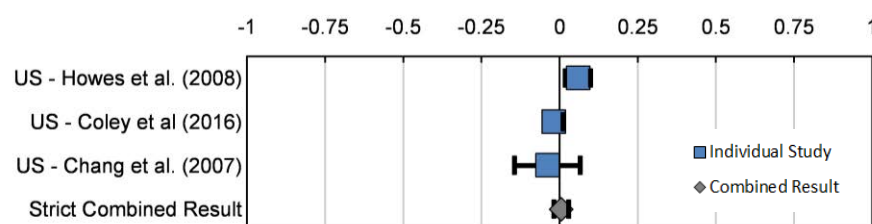
The lack of a consistent association between pre-service qualifications and children's development and learning was confirmed by the meta-analysis conducted for this report (see Figure 3.8, (von Suchodoletz et al., 2017<sup>[17]</sup>)). In particular, higher teachers' qualifications were not associated with emerging academic skills (i.e. literacy and numeracy, Panel A), or behavioural/social skills (Panel B).

In one US study, higher teacher education only influenced children's vocabulary skills indirectly through staff's warmth and responsivity, although with a small (Connor et al., 2005<sup>[61]</sup>).

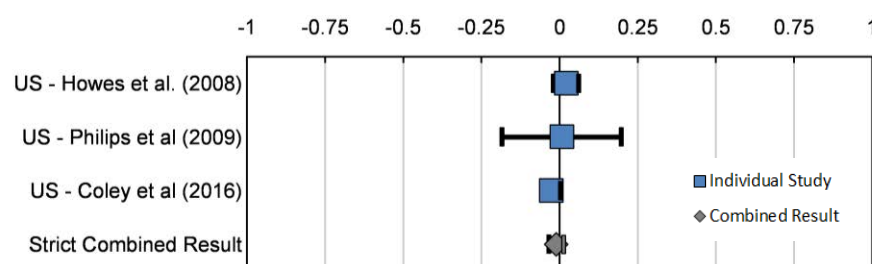
**Figure 3.8. No evidence of consistent association between pre-service qualifications and children's development and learning.**

Findings based on a limited number of studies, and exclusively from the United States.

**Panel A. Using an indicator of child emerging academic skills.**



**Panel B. Based on a combined score of child behaviour and social skills.**



*Note:* Effect sizes are depicted as either blue squares for individual studies or grey diamonds for combined results, each with black lines spanning the lower limit and the upper limit of the 95% confidence interval for each estimated effect. Individual studies, labelled here with the information for country of study, author, and the year of study publication, refer to original studies that provided effect size measures entering into each meta-analysis. These measures are then combined into a summary effect size, which is the average association between two variables. See Box 3.1 for more details on how to interpret the charts.

*Source:* (von Suchodoletz et al., 2017<sup>[17]</sup>).

### ***Pre-service qualifications also matter for staff-child interactions in centre and family daycare settings for younger children***

For centres for children under the age of 3, a recent international meta-analysis of 48 studies showed positive correlations between staff pre-service qualifications, comparing teachers with bachelor's with teachers without, but also more fine-grained distinctions, and aspects of the programme structure, the provision of activities and supportive language and reasoning interactions (Manning et al., 2017<sup>[152]</sup>).

Individual country studies have also documented the importance of staff's qualifications for staff-child interactions in Quebec, the Flemish Community of Belgium, the Netherlands, Portugal and the US (Barros et al., 2016<sup>[39]</sup>; Bigras et al., 2010<sup>[139]</sup>; Castle et al., 2016<sup>[153]</sup>; Hulpia et al., 2016<sup>[73]</sup>; King et al., 2016<sup>[74]</sup>; Slot et al., 2015<sup>[40]</sup>; Thomason and La Paro, 2009<sup>[38]</sup>; Vogel et al., 2015a<sup>[66]</sup>; Vogel et al., 2015b<sup>[67]</sup>). Four studies showed positive associations by looking at the fine-grained associations between

an additional year of pre-service qualifications and process quality (Barros and Leal, 2011; NICHD, 2000; Slot et al., 2015; Thomason and La Paro, 2009), whereas others showed positive relations only from a certain level: either a two-year degree (King et al., 2016; Vogel 2015a) or a bachelor's degree (Barros et al. 2016; Vogel et al., 2015a).

Pre-service qualifications seem to matter for broad, comprehensive aspects of quality, including different aspects of staff-child interactions (Barros et al., 2016<sup>[39]</sup>), as well as for more fine-grained distinctions between emotionally supportive interactions, and more educational and developmentally supportive interactions (Castle et al., 2016<sup>[153]</sup>; Hulpia et al., 2016<sup>[73]</sup>; Slot et al., 2015<sup>[40]</sup>; Thomason and La Paro, 2009<sup>[38]</sup>; Vogel et al., 2015a<sup>[66]</sup>; Vogel et al., 2015b<sup>[67]</sup>). One US study showed that teachers with two- or four-year degrees had higher levels of quality of interactions, particularly language and reasoning (measured with the Infant/Toddler Environment Rating Scale, or ITERS) than teachers without degrees (King et al., 2016<sup>[74]</sup>).

Other studies have found stronger evidence for the impact of pre-service qualifications on emotional support. For example, in infant care in the Netherlands and the Flemish Community of Belgium staff qualifications, i.e. further years of teacher education, were associated with emotional support, but showed little or no relation to staff support for children's development and learning (Hulpia et al., 2016<sup>[73]</sup>; Slot et al., 2015<sup>[40]</sup>). It is important to note that these findings were found for infant care, but not toddler class- or playrooms, although the same levels of teacher education were compared. Finally, one US study in Early Head Start reported only positive associations for staff qualifications with emotional support and no relations with support for development and learning (a Child Development Associates credential; (Vogel et al., 2015a<sup>[66]</sup>)) whereas another US study in Early Head Start reported the opposite pattern (a bachelor's level; (Vogel et al., 2015b<sup>[67]</sup>)).<sup>1</sup>

Similarly to centres for children between 3 and 6 years old, having specialised training in early childhood education, such as a specialised diploma or degree in this area (as opposed to degrees in other areas of content), is related to higher-quality staff-child interactions, as observed in a study of infant class- or playrooms in Quebec (Bigras et al., 2010<sup>[139]</sup>). In US centres for children under the age of 3, teachers with a degree in ECE demonstrated higher staff emotional support, but also support for development and learning (Castle et al., 2016<sup>[153]</sup>).

Finally, two studies also reported no relationship between acquiring a two-year ECEC qualification or lower and process quality in infant class- or playrooms in the United States, measured by the Infant CLASS (Jamison et al., 2014<sup>[65]</sup>) and South Africa measured by the ITERS (Biersteker et al., 2016<sup>[154]</sup>).

In family daycare settings, higher pre-service qualifications were also generally associated with higher-quality staff-child interactions, but the majority of the literature was limited to the US (Colwell et al., 2013<sup>[116]</sup>; Doherty et al., 2006<sup>[132]</sup>; Raikes, Raikes and Wilcox, 2005<sup>[155]</sup>; Schaack, Le and Setodji, 2017<sup>[156]</sup>) and Flemish Community of Belgium (Hulpia et al., 2016<sup>[73]</sup>; Vandenbroeck et al., 2018<sup>[29]</sup>). Some studies looked into fine-grained distinctions across additional years of training and education (Colwell et al., 2013<sup>[116]</sup>; Raikes, Raikes and Wilcox, 2005<sup>[155]</sup>); whereas others examined differences between having a higher level of education or not (Hulpia et al., 2016<sup>[73]</sup>; Vandenbroeck et al., 2018<sup>[29]</sup>).

For example, Flemish family daycare providers with higher pre-service qualifications provided more diverse learning experiences and activities, and also demonstrated more

active involvement and guidance in these activities, when compared to lower-educated family daycare providers (Hulpia et al., 2016<sup>[73]</sup>). This pattern was true for licensed providers, but not registered providers, and for infant but not for toddler provisions (Vandenbroeck et al., 2018<sup>[29]</sup>).

Evidence from the US also demonstrated that pre-service educational qualifications may be able to compensate for lack of other support or regulations. In the United States, providers with teachers with more years of education were able to provide higher-quality care even in the absence of strong state regulations, whereas teachers with fewer years of education provided higher quality only in strongly regulated settings (Raikes, Raikes and Wilcox, 2005<sup>[155]</sup>).

It is important to note that staff educational qualifications tend to be lower for family daycare providers than staff working in centres. In Australia, Quebec, the Netherlands, and the US, this difference is observed for level of attainment and specialisation of the training (Bigras et al., 2010<sup>[139]</sup>; Coley et al., 2016<sup>[77]</sup>; Fuligni et al., 2009<sup>[79]</sup>; Groeneveld et al., 2010<sup>[140]</sup>; Ishimine and Tayler, 2012<sup>[141]</sup>). A European cross-country comparison showed that only Flemish Community of Belgium and the Netherlands require a minimum level of educational training for family daycare care providers, albeit of a low level, whereas in Denmark, France, Germany, Switzerland and the United Kingdom, the formal requirements were limited to a basic course ranging from 18 to 160 hours (Boogaard, Bollen and Dijkers, 2014<sup>[78]</sup>).

***Participation in in-service training (or professional development) is the most consistent predictor of a quality staff-child interactions, and also has direct links to child development and learning***

In-service training has been shown to be beneficial for staff-child interactions in diverse geographic locations, including Denmark, Portugal, China and the US (Fukkink and Lont, 2007<sup>[157]</sup>; Hamre et al., 2012<sup>[158]</sup>; Justice et al., 2008<sup>[124]</sup>; LoCassale-Crouch et al., 2011<sup>[159]</sup>; Slot et al., 2017b<sup>[63]</sup>; Slot, Lerkkanen and Leseman, 2015<sup>[99]</sup>; Zaslow et al., 2010<sup>[160]</sup>), even over and above formal pre-service qualifications (Philips et al., 2000<sup>[100]</sup>).

Effects of in-service training on process quality seem to be restricted to some subdomains, but the evidence is thus far inconclusive. For example, staff participating in in-service training have consistently been found to score higher on language and literacy-specific quality (as measured by the ELLCO), whereas the links to overall quality in ECEC (as measured by the ERS) or staff-child interactions (as measured by the CLASS) are mixed (Egert, 2015<sup>[161]</sup>). A more recent meta-analysis confirmed this pattern. The review showed that in-service training had larger effects on how the class- or playroom environment was designed by staff to promote language and literacy development than on general process quality, although the effects were consistently positive (Markussen-Brown et al., 2017<sup>[162]</sup>). Also, a study has shown that staff participating in in-service training who had pre-service qualifications below a bachelor's degree were still linked to lower quality interactions than staff with bachelor's degrees who had not attended in-service training. (Burchinal et al., 2002<sup>[103]</sup>).

Participation in in-service training was positively linked to staff-child interactions when the training included early childhood education content (Siraj-Blatchford et al., 2005<sup>[163]</sup>; Zaslow et al., 2004<sup>[164]</sup>), offered on-site support (such as mentoring, coaching or consultation), or was of an appropriate length (Egert, 2015<sup>[161]</sup>). For example, a meta-analysis demonstrated that specialised training focusing on staff-child interactions improved staff interaction competence (Fukkink and Lont, 2007<sup>[157]</sup>). Another meta-



analysis demonstrated that interventions where in-service training included coaching were up to three times more effective than interventions with in-service training but no coaching (Egert, 2015<sup>[161]</sup>). A mapping of 66 European studies (Eurofound, 2015<sup>[165]</sup>) also demonstrated that short-term in-service training interventions were shown to be more effective when a feedback component was present in the training. Long-term in-service training interventions proved successful when they were integrated into the centre's practice and participants were actively involved in the centre's improvement processes related to educational practice (Eurofound, 2015<sup>[165]</sup>). Also, a study found that in-service training resulted in higher-quality interactions regardless of staff's pre-service training (Burchinal et al., 2002<sup>[103]</sup>). Moreover, training of 45 to 60 hours was more effective than other periods of training (Egert, 2015<sup>[161]</sup>).

In these studies, it is important to note that some aspects of in-service training are often confused with other structural features, such as implementation of new curriculum and changes in working conditions, which may account for some of the differences in quality (Slot et al., 2017a<sup>[36]</sup>). For example, in China, staff who attended in-service training demonstrated higher-quality staff-child interactions; however, they were also entitled to higher governmental salaries and benefits, and were perceived as having attained higher social status (Hu et al., 2016a). In a study using five European datasets (England [United Kingdom]; Finland, Germany, the Netherlands and Portugal, (Slot, Lerkkanen and Leseman, 2015<sup>[99]</sup>), the results showed that associations varied according to country-specific policies and context. For example, in England (United Kingdom), the type of provision (more care or more educationally oriented) appeared to moderate the relation between staff qualifications and process quality (as measured with the Early Childhood Environment Rating Scale (ECERS-R and ECERS-E). Staff working in educationally oriented settings provided higher quality, compared to their counterparts working in care-type settings, but this difference was larger for less qualified staff. In addition, the working conditions, such as higher salary and more professional development opportunities, tended to be better in educationally oriented settings. Thus, it seems that better working conditions in the settings combining education and care might have compensated for the lower staff qualifications.

The evidence base for in-service training and professional development is also consistent with a positive relationship with children's development and learning. Several recent review studies and meta-analyses showed small-to-medium effects of professional development interventions on children's language and literacy skills (e.g. (Egert, 2015<sup>[161]</sup>; Jensen and Rasmussen, 2015<sup>[166]</sup>; Markussen-Brown et al., 2017<sup>[162]</sup>).

***In-service training (or professional development) is an equally effective measure for services for younger children***

For centres for children under the age of 3, staff receiving in-service training have also demonstrated higher-quality staff-child interactions in the United States and the Netherlands (Burchinal et al., 2002<sup>[103]</sup>; Slot et al., 2015<sup>[40]</sup>), and the same is true for family daycare settings. Several US studies have shown that in-service training was related to better staff-child interactions, e.g. (Raikes, Raikes and Wilcox, 2005<sup>[155]</sup>; Schaack, Le and Setodji, 2017<sup>[156]</sup>), and in fact to be a stronger predictor of staff-child interactions than staff pre-service qualifications (Burchinal, Howes and Kontos, 2002<sup>[76]</sup>; Hallam, Bargreen and Ridgley, 2013<sup>[167]</sup>).

In the Flemish Community in Belgium, staff receiving pedagogical support in the workplace demonstrated higher levels of emotional and educational process quality in

family daycare settings than staff not receiving pedagogical support; these associations were true for infants, but not for toddlers (Hulpia et al., 2016<sup>[73]</sup>).

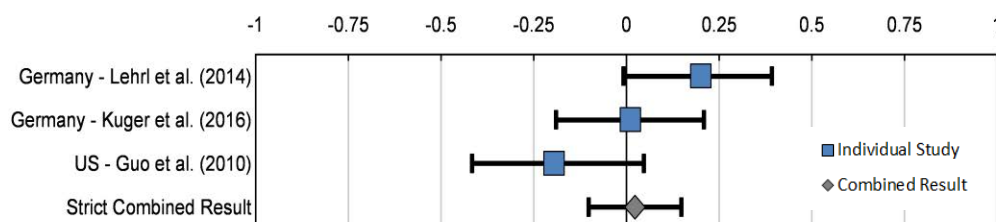
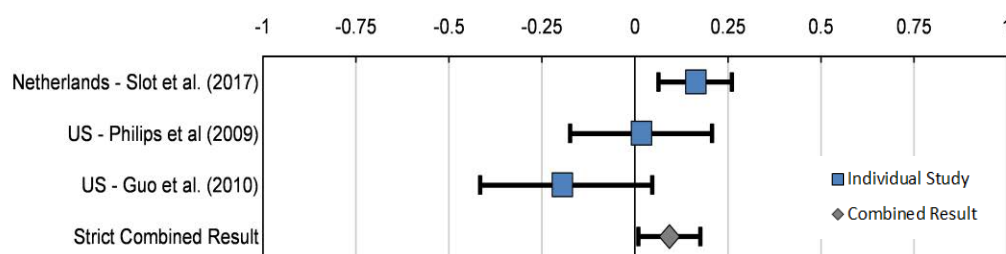
Certain features of in-service training for family daycare settings seem to be positively linked to staff-child interactions, namely whether the staff received individualised support through home visits by a professional (Bromer and Korfmacher, 2017<sup>[168]</sup>), or through video feedback (Groeneveld et al., 2011<sup>[169]</sup>). In a Dutch study, family daycare providers were randomised to receive a video-feedback intervention, or to be part of the control group (i.e. no feedback). The study demonstrated that family daycare providers who received feedback through video demonstrated higher levels of process quality (as measured with a global environmental quality measure), even though there were no differences in their sensitivity during interactions with children, when compared to the control group (Groeneveld et al., 2011<sup>[169]</sup>). Further to the importance of considering different features of training, one US study showed that participation in ongoing training was unrelated to process quality; however, the study did not distinguish between duration, length or topic of the training (Doherty et al., 2006<sup>[132]</sup>). Bromer and Korfmacher (2017<sup>[168]</sup>) have also stressed that in-service training for family daycare settings often lacks a strong conceptual model, which may be key to further success in promoting higher-quality staff-child interactions through in-service training.

It is important to note that overall family daycare providers tend to have fewer opportunities for professional development than centre-based providers [e.g. (Boogaard, Bollen and Dijkers, 2014<sup>[78]</sup>; Fuligni et al., 2009<sup>[79]</sup>)]. In most countries, further professional development is not mandatory, although some exceptions exist in the Flemish Community of Belgium, Switzerland and some German federal states and Danish municipalities, where the number of mandated professional development hours varies greatly, e.g. (Boogaard, Bollen and Dijkers, 2014<sup>[78]</sup>).

### ***Years of work experience do not predict quality of staff-child interactions***

Evidence for the links between staff work experience and process quality has been largely inconsistent for centres for children 3 to 6 years old. Staff with more work experience, when compared to staff with less work experience, have demonstrated higher-quality staff-child interactions in Germany and the US (LoCasale-Crouch et al., 2007<sup>[170]</sup>; Kuger, Pflieger and Rossbach, 2005<sup>[171]</sup>; Kuger et al., 2015<sup>[120]</sup>); but also lower quality staff-child interactions in the United States (Connor et al., 2005<sup>[61]</sup>; Wilcox-Herzog, 2004<sup>[172]</sup>); or no relationship at all between work experience and staff-child interactions in China and the US (Hu et al., 2016a<sup>[104]</sup>; Justice et al., 2008<sup>[124]</sup>; Philips, Gormley and Lowenstein, 2009<sup>[148]</sup>; Pianta et al., 2005<sup>[31]</sup>). Cross-country comparison studies have shown similar patterns of mixed findings across countries (Cryer et al., 1999<sup>[106]</sup>; Slot, Lerkkanen and Leseman, 2015<sup>[99]</sup>).

These mixed results were confirmed by the meta-analysis conducted for this report (see Figure 3.9, (von Suchodoletz et al., 2017<sup>[17]</sup>)). Specifically, more work experience was not associated with the overall staff-child interactions index (Panel A), but was associated with the combined score of staff emotional, instructional and organisation interactions with the children (Panel B). Because the evidence summarised in this meta-analysis differed in size and direction, within and across countries, there is a possibility that the association between years of experience and staff-child interactions reflect both within-country variation and differences according to countries. However, these results should be considered with caution, given the small number of studies included in the meta-analyses.

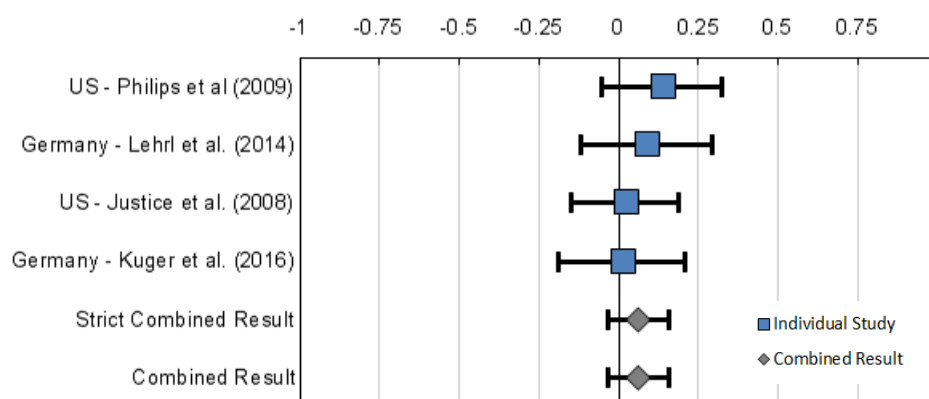
**Figure 3.9. Inconsistent associations between work experience and staff-child interactions.****Panel A. Using a global score of staff-child interactions.****Panel B. Based on a combined score of staff emotional, instructional, and organisational staff-child interactions.**

*Note:* Effect sizes are depicted as either blue squares for individual studies or grey diamonds for combined results, each with black lines spanning the lower limit and the upper limit of the 95% confidence interval for each estimated effect. Individual studies, labelled here with the information for country of study, author, and the year of study publication, refer to original studies that provided effect size measures entering into each meta-analysis. These measures are then combined into a summary effect size, which is the average association between two variables. See Box 3.1 for more details on how to interpret the charts.

*Source:* (von Suchodoletz et al., 2017<sub>[17]</sub>).

Moreover, the meta-analysis also demonstrated that higher quality or more exposure to developmental and educational activities for children (as a process indicator) did not depend on staff work experience (Figure 3.10). The meta-analysis also demonstrated that these associations did not vary between studies from the United States and studies conducted outside the United States (i.e. combined across all other countries covered).

**Figure 3.10. No evidence of association between staff work experience and provision of development and educational activities.**



*Note:* Effect sizes are depicted as either blue squares for individual studies or grey diamonds for combined results, each with black lines spanning the lower limit and the upper limit of the 95% confidence interval for each estimated effect. Individual studies, labelled here with the information for country of study, author, and the year of study publication, refer to original studies that provided effect size measures entering into each meta-analysis. These measures are then combined into a summary effect size, which is the average association between two variables. See Box 3.1 for more details on how to interpret the charts.

*Source:* (von Suchodoletz et al., 2017<sup>[17]</sup>).

Because working conditions tend to vary, depending on the amount of work experience, these inconsistent findings may mask the role of other relevant structural indicators. For instance, more experienced staff may be faced with a larger child-to-staff ratio (Pianta et al., 2005<sup>[31]</sup>) or group of children (Connor et al., 2005<sup>[61]</sup>). In centre-based ECEC settings for 2- and 3-year-olds in the Netherlands, having more work experience or more opportunities for professional development appeared to compensate for working with higher child-staff ratios in the classroom (Slot, Lerkkanen and Leseman, 2015). For work experience, the reverse also appeared the case: less experienced staff provided higher curriculum quality in classrooms with a more favourable ratio. Finally, more opportunities for professional development were related to higher quality, but only for more experienced staff, and the opposite was true for less experienced staff. This might reflect the need for more experienced staff to keep their knowledge and skills up to date, whereas for less experienced staff, this might reflect that they are less susceptible to professional development activities, as they rely more heavily on the recent training they received.

Another study from the US used a person-centred approach of staff characteristics and staff-child interactions by conducting a latent profile analysis (Jeon, Buettner, & Hur, 2016). Three examined three distinct staff profiles as a combination of work experience, attitudes towards the work and staff-child interactions (Jeon, Buettner and Hur, 2016<sup>[173]</sup>). The first profile showed the highest process quality (as measured with the CLASS) and concerned teachers with more work experience and mixed job attitudes (i.e. strong job commitment, but also slightly higher work stress). The other two profiles concerned staff with less work experience and either more positive work attitudes or less positive attitudes, but both profiles showed lower quality than the first profile. The profile with the highest quality showed higher QRIS ratings and more favourable child-staff ratios; staff

pay was also higher and the director was more likely to have a specialised ECE background.

For centres for children under the age of 3, the evidence for the relationship between working experience and staff-child interactions tended to be more consistent, and no negative associations were reported. Staff with more work experience in class- or playrooms for children under 3 demonstrated higher-quality staff-child interactions in the United States and the Netherlands (Jamison et al., 2014<sub>[65]</sub>; King et al., 2016<sub>[74]</sub>; Phillipsen et al., 1997<sub>[101]</sub>; Slot et al., 2017a<sub>[36]</sub>; Vogel et al., 2015a<sub>[66]</sub>).

Effects of work experience on process quality may be restricted to some subdomains of process quality and to some age groups, but the evidence is thus far inconclusive. For example, in the Netherlands and in the United States, work experience was only related to staff support for children's development (King et al., 2016<sub>[74]</sub>; Slot et al., 2017a<sub>[36]</sub>). In the Flemish Community of Belgium and in other US evidence, associations between staff work experience and process quality were documented only for emotional support, and in Flanders only for infant groups (Hulpia et al., 2016<sub>[73]</sub>; Vogel et al., 2015a<sub>[66]</sub>). At the same time, two Portuguese and other US studies revealed no significant associations between staff work experience and staff-child interactions (Barros et al., 2016<sub>[39]</sub>; Castle et al., 2016<sub>[153]</sub>; Pessanha, Aguiar and Bairrão, 2007<sub>[113]</sub>; Vogel et al., 2015b<sub>[67]</sub>).

### ***The evidence for the effect of work experience in family daycare settings is inconclusive***

Just as with the evidence for centres for children between 3 and 6, the evidence concerning staff work experience in family daycare settings and relations with process quality is mixed. Several studies reported no associations between work experience and staff-child interactions in the United States (Burchinal, Howes and Kontos, 2002<sub>[76]</sub>; Colwell et al., 2013<sub>[116]</sub>), and specifically for infant groups in the Flemish Community of Belgium (Hulpia et al., 2016<sub>[73]</sub>). However, for toddler groups in Flemish Belgium, staff work experience showed negative relations with process quality, but only for providers affiliated with a professional organisation that mediates between the parents and the home-care provider, handles administration and financial issues and provides support for ongoing professional development. More specifically, affiliated providers with more work experience demonstrated lower levels of emotional support for infants and support for children's development and learning for toddlers than affiliated providers with less work experience (Vandenbroeck et al., 2018<sub>[29]</sub>).

### ***Preliminary evidence suggests that staff well-being is related to higher-quality staff-child interactions***

For centres for children 3 to 6 years old, one US study looked into various dimensions of staff-reported well-being, and found that staff who reported depression and burnout demonstrated lower process quality. It also found that staff with higher positive affect, an indicator of well-being, demonstrated higher-quality staff-child interactions (Jennings, 2015<sub>[174]</sub>). However, in a Finnish study, there were no associations between staff stress and observed staff-child interactions (Pakarinen et al., 2010<sub>[92]</sub>).

For centres for children under the age of 3, in the United States, staff with higher levels of well-being<sup>2</sup> demonstrated higher emotional support in the class- or playroom (Cassidy et al., 2017<sub>[175]</sub>); and staff with higher reported job satisfaction and a lack of depressive symptoms demonstrated higher-quality staff-child interactions (Vogel et al., 2015a<sub>[66]</sub>).

### ***Higher salaries are associated with higher quality in a few cases***

While working conditions for ECEC staff have not been studied, there is some evidence that staff earning higher salaries provided higher-quality staff-child interactions in China (Hu et al., 2016a<sub>[104]</sub>) and the US (Cryer et al., 1999<sub>[106]</sub>; Pianta et al., 2005<sub>[31]</sub>), but not in Germany or Spain (Cryer et al., 1999<sub>[106]</sub>).

The strength of this association varied greatly, and probably depended on other associated factors. In China, staff earning higher salaries were much more likely to demonstrate higher process quality (Hu et al., 2016a<sub>[104]</sub>) than in the United States (Pianta et al., 2005<sub>[31]</sub>). However, it is important to note that in China, the staff whose salaries were higher had higher levels of qualification and more often worked in public settings (with better resources), and in classrooms with more favourable child-staff ratios. In the United States, staff earning higher salaries also had higher levels of qualification, but there was no association with child-staff ratios.

Salaries may also work differently across the staff ECEC categories. In Portugal, higher ECEC leader salaries, but not staff salaries, were related to staff-child interactions whereas in the United States, higher staff salaries, but not leader salaries, were related to staff-child interactions (Cryer et al., 1999<sub>[106]</sub>).

For centres for children under the age of 3 years, preliminary evidence from Portugal indicates that staff earning higher salaries offer higher process quality (as measured by the ITERS; (Pessanha, Aguiar and Bairrão, 2007<sub>[113]</sub>).

No studies were reported for family daycare settings.

### ***Organisational climate seems to be associated with the quality of staff-child interactions***

To date, only a few studies have examined the association between organisational characteristics of ECEC centres and process quality. Preliminary evidence shows that centres for children aged 3 to 5 with a better organisational climate, i.e. more team collaboration and cohesion, demonstrate higher quality of staff-child interactions in general (Bloom and Bella, 2005<sub>[176]</sub>; Bloom and Sheerer, 1992<sub>[177]</sub>; Sylva et al., 2004<sub>[13]</sub>), and higher language support in particular, as measured by the ECERS-R, (Lower and Cassidy, 2007<sub>[178]</sub>), than centres with a less optimal organisational climate.

In a couple of studies, the relationship between organisational climate and quality has been found to be even stronger than other classroom characteristics, such as child-staff ratio (Biersteker et al., 2016<sub>[154]</sub>; Dennis and O'Connor, 2013<sub>[179]</sub>); Dennis and O'Connor, 2013), as well as staff characteristics, including qualifications and work experience (Biersteker et al., 2016<sub>[154]</sub>).

Organisational climate is also associated with other centre characteristics. For instance, in smaller organisations, rather than large organisations, staff perceived more autonomy and support to show leadership, exchanged their visions with colleagues more often, and reported more opportunities for participating in decision-making in curriculum-related issues (Ho, Lee and Teng, 2016<sub>[180]</sub>).

For centres for children under the age of 3, a study from South Africa showed that organisational quality was the strongest predictor of overall process quality (as measured by the ITERS), above and beyond staff characteristics and classroom features, as was the case with the centres for children aged 3 to 5 (Biersteker et al., 2016<sub>[154]</sub>).

Other aspects of centre organisational characteristics examined for under-3s include affiliations with a professional organisation. In the United States, centres that were affiliated with a professional organisation provided higher-quality staff-child interactions than centres with no affiliation (Thomason and La Paro, 2009<sub>[38]</sub>).

***Some research suggests that networking may play an important role in the quality of staff-child interactions in family daycare settings***

Opportunities for networking or collaborating with other family daycare providers seem to be associated with higher-quality staff-child interactions. In Canada, informal networking was a predictor of better staff-child interactions, although organised networking with other providers was not related to quality (Doherty et al., 2006<sub>[132]</sub>). The benefits associated with these mechanisms of quality, particularly opportunities for collaboration and networking, may be specific to family daycare settings, given the small number of staff and children in each provision (see Box 3.2).

**Box 3.2. Organisation of networking in family daycare settings**

In most countries, family-care providers work independently from their own home, with limited opportunities for collaboration or networking with other providers. In some European countries, providers jointly take care of children at the same location. For instance, in France, some federal states in Germany and in the United Kingdom, family-care providers are allowed to collaborate and jointly take care of larger groups of children (Boogaard, Bollen and Dijkers, 2014<sub>[78]</sub>). In Denmark, family-care providers living in the same neighbourhood organise themselves in so-called “playroom groups”, and have regular meetings where children can play together and also organise activities, such as music, movement or dance, as well as outings for the whole group of children.



## Notes

1. One potential explanation for this mixed pattern of results is that while one study investigated whether staff had a Child Development Associates credential in ECEC (Vogel et al., 2015a<sup>[66]</sup>), the other study included staff with a BA degree as well, which appeared to predict educational process quality (Vogel et al., 2015b<sup>[67]</sup>).
2. In this study, well-being was operationalised as the perception of wage fairness in comparison to others in their organisation and other staff in the profession, and staff perceived autonomy in hiring (Cassidy et al., 2017<sup>[175]</sup>).

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