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# Zusammenhänge der Zielsetzung im Team frühpädagogischer Fachkräfte mit der domänenspezifischen Prozessqualität in Kindertagesstätten

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## **Zusammenfassung**

Es gibt vielversprechende Erkenntnisse aus der Organisationspsychologie zum Zusammenhang zwischen Zielsetzung und Leistung, aber es ist unklar, ob diese Erkenntnisse auch für frühpädagogische Fachkräfte gelten. Mit der vorliegenden Studie wurde dies untersucht. Die Zielsetzung des Teams frühpädagogischer Fachkräfte war positiv mit der pädagogischen Prozessqualität im Bereich der naturwissenschaftlichen Bildung, nicht aber in den Bereichen sprachliche Bildung und sozial-emotionale Unterstützung assoziiert.

## Relation entre la définition d'objectifs en équipe par les enseignants du préscolaire et la qualité des processus spécifiques à un domaine dans les garderies

### **Résumé**

Les résultats de la psychologie organisationnelle concernant les avantages de la définition d'objectifs de performance sont prometteurs, mais il n'est pas certain que ces résultats s'appliquent également aux enseignants du préscolaire. La présente étude s'est penchée sur cette question et a constaté que la définition d'objectifs en équipe par les enseignants du préscolaire était positivement corrélée à la qualité du processus pédagogique dans le domaine de l'éducation scientifique, mais pas dans les domaines de l'éducation linguistique et du soutien socio-émotionnel.

## Preschool teachers' team goal setting and domain-specific process quality in day-care centres

### **Abstract**

Evidence from organizational psychology for the benefits of goal setting for performance is promising, but it is unclear whether these findings also apply to preschool teachers. The present study explored this and found that preschool teachers' team goal setting was positively

associated with pedagogical process quality in the domain of science education, but not language education and social-emotional support.

## 1. Background and objectives

Early childhood education and care (ECEC) can make an important contribution to compensating for educational disadvantages at an early stage. High pedagogical quality is the decisive condition for its beneficial effects on children's learning and development (Anders, 2013; Sammons et al., 2009; Ulferts, Wolf, & Anders, 2019; Vandell et al., 2010). Hence, knowledge on the prerequisites of high pedagogical quality in ECEC is of high interest. Many studies have investigated the characteristics of the individual teachers in ECEC and their relation to pedagogical quality (e.g., Cryer, Tietze, Burchinal, Leal, & Palacios, 1999; Pianta et al., 2005; Slot, Lerkkanen, & Leseman, 2015; Stipek & Byler, 1997). In contrast, comparably little is known about how team variables of organisational quality relate to process quality and how they can contribute to high pedagogical quality (Resa, Groeneveld, Turani, & Anders, 2017; Slot & Nata, 2019; Strehmel & Ulber, 2014; Wertfein, Müller, & Danay, 2013). Literature from organisational psychology highlights the importance of goal setting for performance (Locke & Latham, 2013) and research on related topics such as successful leadership (Siraj-Blatchford & Manni, 2006) or effective professional development (Slot & Nata, 2019) in ECEC suggests that pre-school teacher (team) goal setting could be of great value for ECEC quality. Anyhow, there is a lack of evidence about goal setting in ECEC and its relation to pedagogical quality. Drawing on data from a German evaluation study of a federal programme, which supports participating day-care centres in developing the quality of language education, the present study explores the potential of preschool teachers' team goal setting for creating high pedagogical process quality. Since the present study is embedded within the German ECEC system, which is different to other countries' ECEC systems in various aspects, the following section gives a short insight into the main characteristics of ECEC in Germany.

### 1.1 The German ECEC system

In Germany, ECEC services follow a strong socio-pedagogical tradition and are as institutions embedded into the child and youth welfare sector. They mostly work in accordance with the situation-oriented approach which formed the base for many of the curricular frameworks of the 16 federal states (Bundesministerium für Bildung und Forschung, 2005; Haberkorn, 2012; Oertel, 1984). This child-centred approach emphasises learning as embedded into social situations emerging from children's play (Anders, 2015; Zimmer, 2007). As against other ECEC systems of other countries with a pre-primary approach focussing on fostering children's pre-academic development, the promotion of children's social-emotional skills and personal values has been and still is a priority of German ECEC.

Regulation of ECEC services is based on the principle of federalism resulting in a strongly decentralized ECEC system. Single ECEC providers are given high autonomy in the provision of ECEC. Centre-based ECEC is mostly run by either private or public service providers. Most of the providers are non-profit organisations such as church, welfare and youth organisations. Therefore, there is also great variety when it comes to pedagogical approaches and practices. For instance, between 2003 and 2007, all 16 federal states issued their own curricular framework (Textor, 2008). All curricular frameworks define learning areas, but they do not include any learning goals.

While the vast majority of preschool teachers in Germany have completed a three-year vocational training programme (Oberhuemer & Schreyer, 2018), there is a growing number of courses leading to a college or university degree in early childhood pedagogy. But the proportion of preschool teachers with a university degree is still very low (Autorengruppe Fachkräftebarometer, 2019). Most of the actual ECEC staff underwent training when fostering pre-academic skills was not yet considered a major educational responsibility of ECEC.

## 1.2 Pedagogical quality of ECEC

Numerous studies have documented educational inequalities related to family SES already when entering school and that these differences are often very persistent (for a summary see Anders, 2015; Kluczniok, 2017; Passaretta & Skopek, 2018; Weinert, Ebert, & Dubowy, 2010). Recent results of the Programme for International Student Assessment (PISA) showed once again that in Germany, the link between family SES and educational success continues to be stronger than the OECD average (OECD, 2019). Since ECEC can make an important contribution to compensating for educational disadvantages at an early stage, the discussion about pedagogical quality in ECEC is currently of high interest. High pedagogical quality is the decisive condition for the beneficial effects of ECEC on children's learning and development (Anders, 2013; Sammons et al., 2009; Ulferts et al., 2019; Vandell et al., 2010). Against the backdrop of the importance of ECEC quality for children's development, it is the more worrying that process quality of ECEC in Germany seems to be rather low, particularly when it comes to promotion of early academic skills (Kuger & Kluczniok, 2009; Tietze et al., 2013). Thus, identifying preconditions for high process quality and measures for quality development is a great concern.

Research on ECEC quality often draws on the structural-process model of quality in ECEC (Cryer et al., 1999; National Institute of Child & Human Development Early Child Care Research, 2000; Tietze, Roßbach, & Grenner, 2005). The model discriminates four main areas of pedagogical quality: Structural quality (relatively stable conditions of space and material, social composition and staff), orientation quality (e.g., preschool teachers' pedagogical beliefs, pedagogical concept of the centre), process quality (children's interactions and experiences with preschool teachers and material environment), and quality of family involvement. The model states that structural and orientation quality both contribute to process quality and quality of family involvement, which in turn are directly connected to the children's developmental outcomes. Although the structural-process model of quality describes global quality of ECEC, it can also be transferred to process quality in specific domains such as language education, early science education or social-emotional support (Kluczniok, Sechtig, & Roßbach, 2012). Besides, pedagogical process quality can also be distinguished regarding the level on which it is assessed: While most research considers process quality on the group level (for an overview see Smidt & Roßbach, 2016), a growing body of literature regards process quality on the level of the individual child (Jeon et al., 2010; NICHD ECCRN, 2006; Vitiello et al., 2012).

In addition to the four areas of quality mentioned above, some researchers added the area of organisational quality to the model (Becker-Stoll, 2009; Sachverständigenkommission, 2005; Strehmel & Ulber, 2014; Viernickel, 2006). This area refers to organisational aspects such as leadership and management, team building and development, job satisfaction as well as cooperation, planning and professional exchange within the team of preschool teachers. While the characteristics of the individual teachers in ECEC and their relation to pedagogical

quality have already been subject to many studies (e.g., Cryer et al., 1999; Pianta et al., 2005; Slot, Lerkkanen, et al., 2015; Stipek & Byler, 1997), comparably little is known about how team variables of organisational quality relate to process quality and how they can contribute to high pedagogical quality (Resa et al., 2017; Slot & Nata, 2019; Strehmel & Ulber, 2014). But interestingly, a study of Wertfein, Müller and Danay (2013) shed light into the meaning of team quality for process quality in ECEC. It shows that the effects of structural quality on process quality are mediated by team quality, implying that addressing team quality as part of organisational quality should form a crucial element of measures for developing process quality in ECEC.

### 1.3 Team goal setting and performance

One aspect of organisational quality in ECEC that concerns both the centre head and the team of ECEC settings is the agreement on and communication of goals (Strehmel & Ulber, 2014). In the field of organisational psychology, there is a large body of research on how goals and goal setting affect performance. The goal-setting theory was developed by John Edwin A. Locke in the 1960s (Locke, 1968). It states that having specific, clear, difficult and accepted goals positively affects an individual's performance (Locke & Latham, 1990). Researchers identified four variables that mediate the effect of goals on performance. First, a clear, high goal focuses a person's attention and effort towards activities that are relevant for reaching this goal and away from irrelevant activities. In addition, it activates the individual's knowledge and skills that are beneficial for reaching the goal. The focussing effect of goals is referred to as choice or direction. The second mechanism through which goals affect performance is effort. Since effort depends on the demands of attaining a goal, it differs in proportion to the difficulty level of the goal. The third mechanism is persistence. It refers to the fact that people work longer at a task with a specific, high goal than with an easy or imprecise goal. The fourth mechanism is task strategy. Setting goals stimulates planning and seeking for strategies because most people recognize they need a plan to pursue their goal.

Anyhow, if individuals strive for difficult goals on complex tasks, pressure and tunnel vision can inhibit effective planning procedures and cause people to struggle to discover new effective strategies. That is why goal setting seems to have a higher positive effect on simple than on more complex tasks (Locke & Latham, 2013). In other words, the relation between goal setting and performance is moderated by task complexity. In addition to task complexity, there are other factors moderating the effect that goals have on performance. It differs depending on the person's abilities and commitment to the goal, but also depending on situational factors such as the availability of resources. Besides, findings indicate that performance feedback is essential for goal setting to be effective. Through its influence on a person's affective state, it has an effect on future goal setting (Latham & Locke, 2007).

Flatter, team-based work structures in organisations have led to an increasing interest in determinants of successful teamwork and high team performance. Hence, although originally referring to individuals, the goal setting theory has also been applied to the team context (Kramer, Thayer, & Salas, 2013). The importance of goals for teams is already inherent in their definition: "A team is defined as a distinguishable set of two or more people who interact, dynamically, interdependently, and adaptively toward a common and valued goal/objective/mission, who have been assigned specific roles or functions to perform, and who have a limited lifespan of membership" (Salas, Dickinson, Converse, & Tannenbaum, 1992). Findings from a meta-analysis by Kleingeld, Van Mierlo, and Arends (2011) showed that the key assumptions on individual goals can be transferred to a team level. In another meta-analysis,

O'Leary-Kelly, Martocchio, and Frink (1994) found that teams with specific, difficult team goals outperformed teams with simple "do your best" goals by nearly one standard deviation ( $d = 0.92$ ). Results of a study by Wegge and Haslam (2005) show that teams with specific, challenging team goals perform better on a brainstorming task than teams with "do your best" goals. As a conclusion of the research on this topic, clearly set, shared team goals are one crucial factor for enhancing team performance. Despite these findings, one should consider the inherently social nature of team context and its implications for the transferability of the goal setting theory to the team context (Kramer et al., 2013).

#### **1.4 Goal setting and performance in a pedagogical context**

Most studies dealing with (team) goal setting focused on corporate settings. In education research, studies on goal setting usually looked at it as a predictor of student learning and achievement. Among these, some focused on the effect of setting goals compared to not setting any goals at all and found that goal setting was beneficial in various settings, depending on the complexity of the task and the students' abilities and resources (Fleming, 2002; Moeller, Theiler, & Wu, 2012; Yusuff, 2018). Other researchers, drawing on the achievement goal theory, investigated how students set goals or what kind of goals they set (Anderman & Gray, 2015; Huang, 2011). Compared to research on how goal setting supports student learning, literature addressing teacher goal setting in educational settings is scarcer (Retelsdorf & Günther, 2011). Still, the research on this topic showed benefits of teacher goal setting for teachers' skills (Camp, 2017) as well as for teaching practices (Butler, 2012; Retelsdorf, Butler, Streblow, & Schiefele, 2010).

Until now, there are only rather few studies addressing goals and goal setting in ECEC and investigating its relation to pedagogical quality. They can roughly be allocated to two interwoven research lines, both discussing common goals and a shared vision from different perspectives. One line of research looks at goal setting in the context of creating a shared vision as one element of successful leadership in ECEC (Colmer, 2008; Preissing & Schneider, 2012; Siraj-Blatchford & Manni, 2006; Strehmel & Ulber, 2014). For instance, in the ELEYS study (Effective Leadership in the Early Years Sector), Siraj-Blatchford and Manni (2006) drew upon a sample of day-care centres that had been identified as effectively promoting children's development in the EPPE study (Effective Provision of Pre-school Education: Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2004). They identified categories of effective leadership practice, among them the articulation of a collective vision and the ensuring of shared goals. The other line of research centres on professional development as a means for improving pedagogical quality. Studies in this line of research highlight the role of common goals and shared vision as one precondition of successful professional development (Peeters & Sharmahd, 2014; Slot & Nata, 2019). For example, a study within the EU-funded project 'Inclusive Education and Social Support to Tackle Inequalities in Society' (ISOTIS) addressed professionals working in diverse informal (community or after-school care) and formal (pre-school) education settings. It explored factors contributing to effective professional development and through this, high quality educational practice. As one main recommendation, the researchers call for a shared vision that is aligned with the collective goals of the organisation. More precisely, they claim that an explicit agreement on clear goals and concrete strategies as ways to achieve these goals can most successfully support professionals in improving their practice (Slot & Nata, 2019). Furthermore, research on teacher professional development emphasises teachers as active learners (Slot, Romijn, Cadima, Nata, & Wysłowska, 2018), suggesting that the promising results from studies on student goal setting might also apply to

preschool teachers. As a summary, the little existing literature on goal setting in ECEC suggests it can be a promising instrument for assuring and improving pedagogical quality in ECEC.

### 1.5 Objectives of the present study

The literature on goal setting stresses its importance not only for corporate organisations but also for student learning and teaching. Furthermore, studies support the assumption that the goal setting theory is not only applicable to individuals but also to groups and teams. There is an extensive body of literature on goal setting in organisational psychology and literature on related topics such as successful leadership or effective professional development in ECEC suggests that preschool teachers' (team) goal setting could be of great value for ECEC quality. Anyhow, studies are lacking that investigate goal setting in ECEC and its relation to pedagogical quality quantitatively based on a reliable sample. The present study aims to fill this research gap. It sheds light on the relation between preschool teachers' team goal setting and pedagogical process quality in the areas of language education, science education, and social-emotional support.

More precisely, it yields to answer the following research questions: Is preschool teachers' team goal setting related to pedagogical process quality in the area of (1) language education, (2) science education and (3) social-emotional support? It is hypothesized that preschool teachers' team goal setting is related to all three areas of process quality.

## 2. Method

### 2.1 Sample

*The evaluation study of the German federal programme 'Language day care centers: Because language is the key to the world'*

For the present study, data from the evaluation of the German federal programme 'Language day care centers: Because language is the key to the world' (January 2016 until December 2020) were used. Just as the programme itself, the evaluation study of the federal programme was funded by the German Ministry of Family Affairs, Senior Citizens, Women and Youth. The overall aim of the federal programme was to support more than 7000 participating day care centres in improving their language related process quality, following the pedagogical concept of language education embedded into daily routines, as well as the quality in the areas of inclusive pedagogy and cooperation with families. As part of the funding, the involved day care centres appointed an additional early childhood professional especially qualified to promote language and literacy learning in the day care centre, called the additional expert for language education. Please note that the present study, although using data from the evaluation study of the federal programme, does not investigate any effects of this intervention or its implementation. Hence, the sample from the evaluation study is not representative for the German context. Moreover, it is a particular sample in the way that at the time of data assessment, day-care centres participating in the federal programme were involved in a process of quality development in the domain of language education. On the other hand, the ongoing quality development process in the centres could lead to variance regarding team goal setting. Furthermore, data from the evaluation study include information on the most relevant aspects of team goal setting for a reliable sample size, making the sample ideally suited for this study.

Pedagogical process quality was observed in an evaluation sub-sample of 107 day-care centres. The present study draws on a sample of 952 preschool teachers within these 107 day-care centres. Analyses include data from an online team survey, an online monitoring survey<sup>1</sup>, and observational data on the process quality in the domains of language education, science education, and social-emotional support assessed in one group of each day-care centre observing two group teachers. Within each day-care centre, all preschool teachers were asked to participate in the online team survey. Therefore, the preschool teachers who participated in the online survey did not necessarily work in the group in which the observation of process quality took place. Since process quality is also proximally influenced by structural variables of the individual classroom or group, it might vary between different groups within a day-care centre (La Paro et al., 2009). Anyhow, team data are linked to process quality data based on the common assumption that the process quality observed in one group represents the process quality on centre level (Cryer et al., 1999; Tietze et al., 2013).

### *Staff, group and day-care centre characteristics*

An average of 62% of all preschool teachers in each day-care centre took part in the online team survey (SD = 32%). The average number of participating preschool teachers per day-care centre was 9 (SD = 5). With regard to personal background variables of those preschool teachers who participated in the online team survey, this sample is comparable to the German average of preschool teachers working in day-care centres (Autorengruppe Fachkräftebarometer, 2019; Destatis, 2019). At the time of data assessment, preschool teachers were on average 40 years old (SD = 12), had 13 years of experience working in ECEC (SD = 12), and had been working in the current day-care centre for 9 years (SD = 10). 7% of the preschool teachers had a university degree, 88% were German native speakers and 6% were male.

Day-care centres in the current sample were attended by 100 children, on average (SD = 49). 21% (SD = 11%) of the children are under three years old (German average: 19%, Destatis, 2019). On average, 27 children (SD = 23) attended the observed groups (this information includes centres not working grouped-based) and 8 children (SD = 3) per educator were present during the process quality observation. The mean proportion of children with an immigrant background in the observed group (definition: language predominantly spoken in the child's family not German) was 42% (SD = 29%). In 17% of the observed groups, at least one of the two observed preschool teachers had a university degree.

## **2.2 Measures**

Team goal setting was assessed in the online team survey in March to May of 2018 through five items inspired by the German version of the Team Climate Inventory (Brodbeck, Anderson, & West, 2000), rated on a five-point scale (1 = does not apply at all – 5 = fully applies). The scale 'team goal setting' consists of the five items 1) 'I am aware of the goals of our team', 2) 'In our team, we take the time we need to develop new ideas or goals', 3) 'I personally agree with the goals of my team', 4) 'The goals are realistic and achievable' and 5) 'In the team, we often develop clear procedures in order to achieve the goals we agreed on'. A scale was calculated from these five items (Cronbach's  $\alpha = 0.94$ ). In order to obtain an indicator for

<sup>1</sup> As part of the guidelines of the federal programme, the early childhood professional for language education of every centre participating in the federal programme – in some cases together with the centre head – had to answer a monitoring survey twice a year.



team goal setting for each day-care centre, the scale 'team goal setting' was aggregated on centre level. The intraclass correlation (ICC) for the scale 'team goal setting' is 0.74, pointing to an acceptable reliability of class-mean ratings (LeBreton & Senter, 2008).

Domain specific process quality was assessed from October 2018 to March 2019 by extensively trained external observers based on observations using two environment rating scales. The German versions of the Extension of Early Childhood Environment Rating Scale (ECERS-E) (KES-E: Roßbach, Tietze, Kluczniok, & Nattfort, 2018) is a widely used observational measure of the domain specific quality of preschool classroom environments in the field of ECEC. The items of the scale are rated on a seven-point scale (1 = inadequate quality, 7 = excellent quality). For this study, we used the ECERS-E subscales 'Literacy' (six items, Cronbach's  $\alpha = 0.66$ ) and 'Science and Environment' (three items, Cronbach's  $\alpha = 0.64$ ). The Sustained Shared Thinking and Emotional Well-Being Scale (SSTEWS: Siraj-Blatchford, Kingston, & Melhuish, 2015) is a rating scale for the observation-based assessment of interactions between caregiver and children. Anders and colleagues translated it into German and adapted it in winter 2016/2017 (Anders et al., 2017). A pre-test of the German version was conducted in 20 day-care centres. Just like the items of the ECERS-E, the items of the SSTEWS are rated on a seven-point-scale (1 = inadequate quality, 7 = excellent quality). For the present study, the two SSTEWS sub-scales 'Building trust, confidence and independence' and 'Social and emotional well-being' were used. Since the sub-scale 'Social and emotional well-being' consists of only one item and both SSTEWS sub-scales focus on the promotion of social-emotional development, they were merged to one scale (four items, Cronbach's  $\alpha = 0.81$ ). Observers had to pass a reliability test with at least 80% of the ratings in accordance with the master trainer. Inter-rater reliability for the applied scales was evaluated for the overall scales in a sub-sample of 20 day-care centres and found to be good (SSTEWS:  $\kappa = 0.67$ ; ECERS-E:  $\kappa = 0.74$ ).

Structural (quality) control variables of the observed group were group size, observed child-staff-ratio, proportion of children with non-German family language in the group and professional qualification of the observed preschool teachers (recorded as a dichotomous variable: 'Does at least one of the observed preschool teachers hold a university degree? yes/no'). Group size, child-staff-ratio and teacher qualification are regarded central structural characteristics influencing process quality and referred to as the 'iron triangle of structural quality' (Viernickel, 2006). Just as for the proportion of children with a foreign language background in the group, effects of these variables on process quality have been documented in numerous studies (Slot, 2018). These variables were assessed through a paper-pencil questionnaire filled in by the observers in the course of the process quality observation. Since data on the proportion of children under three years were not available for the observed group, they were included as a centre level variable assessed as part of the online monitoring survey.

## 2.3 Statistical analyses

Two multiple linear regression models were calculated for each measure of process quality with the software MPlus (version 8.1, Muthén & Muthén) to investigate the relationship between team goal setting and process quality in the domains literacy, science and social-emotional development, controlling for structural background variables: In the first model, only the background variables were considered as predictors of process quality. For the second model, in addition to these background variables, team goal setting was added as an additional predictor. Although the proportion of missing data was low (max. 3.7%), the full information maximum likelihood method was used to address missing data (Enders, 2001).

### 3. Results

In the observed sample, the quality of language education fell within the range of minimal quality ( $M = 3.37$ ,  $SD = 0.86$ ) while the quality of science education was still to be interpreted as inadequate ( $M = 2.92$ ,  $SD = 1.18$ ). Regarding social-emotional support, process quality in the day-care centres in this study was minimal ( $M = 3.82$ ,  $SD = 1.22$ ). On average, preschool teachers rated rather high on the scale 'team goal setting' ( $M = 3.99$ ,  $SD = 0.44$ ).

Two multiple linear regressions were calculated for each process quality measure to investigate the relation between team goal setting and process quality in the three different quality domains under control of several background variables. In the first model, only the background variables were considered. For the second model, in addition to these background variables, team goal setting was added as an additional predictor. The regression model results are presented in table 1.

In the first model (M1.1), process quality of language education was predicted by structural variables. It shows that the proportion of immigrant children in the group was the only one of these structural indicators significantly connected to the process quality in the language domain ( $\beta = -0.22$ ,  $p < 0.05$ ). This finding is also reflected in the low percentage of explained variance of only 7%. Adding team goal setting as a predictor (M1.2), the model changed only very slightly. Since the negative relation between the proportion of immigrant children in the group and quality did not reach significance in this model and team goal setting was not associated with process quality in the language and literacy domain ( $\beta = 0.04$ ,  $p > 0.05$ ), there was no significant predictor in this model and the proportion of explained variance slightly dropped.

Predicting process quality in the area of science education by structural variables (M2.1) revealed considerable relations of this quality domain with various structural indicators. Quality of science education was higher in bigger groups ( $\beta = 0.35$ ,  $p < 0.01$ ) and in groups where at least one of the observed preschool teachers had a university degree ( $\beta = 0.19$ ,  $p < 0.05$ ). In contrast, a higher proportion of immigrant children in the group and a higher proportion of children under three years in the centre were associated with a significantly lower quality of science education. The explained variance reached 21%. In the full model with team goal setting included as a predictor (M2.2) the reported associations of the structural variables with the quality of science education remained rather unchanged. There was a significant positive relation between team goal setting and the process quality of science education ( $\beta = 0.18$ ,  $p < 0.05$ ).

The results of model (M3.1) with only the structural variables as predictors show that a lower proportion of immigrant children in the group ( $\beta = -0.29$ ,  $p < 0.01$ ) and a lower proportion of children under three years in the centre ( $\beta = -0.31$ ,  $p < 0.01$ ) were associated with a significantly higher process quality of social-emotional support, assessed with the SSTEW. Quality was also higher when at least one of the two observed preschool teachers had a university degree ( $\beta = 0.24$ ,  $p < 0.01$ ). The structural variables in this model accounted for 16% of the variance. For the second model (M3.2), team goal setting was added as an additional predictor. The relations of the structural variables with process quality of social-emotional support remained almost unchanged. There was no significant connection between team goal setting and process quality of social-emotional support.

**Table 1.** Results from multiple linear regression models with aspects of structural quality and team goal setting as predictors and domain specific process quality, assessed with sub-scales of the ECERS-E and SSTEWS, as outcome variable.

	ECERS-E Language & Literacy				ECERS-E Science				SSTEWS Social-Emotional Support			
	M1.1		M1.2		M2.1		M2.2		M3.1		M3.2	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
Group size	0.09	0.11	0.09	0.11	0.35**	0.09	0.33**	0.10	0.15	0.10	0.14	0.10
Child-staff-ratio (children per caregiver)	-0.06	0.12	-0.05	0.12	-0.13	0.11	-0.09	0.11	-0.05	0.11	-0.04	0.11
Proportion of immigrant children in the group	-0.22*	0.11	-0.21	0.11	-0.34**	0.10	-0.31**	0.10	-0.29**	0.11	-0.28**	0.11
>= 1 observed preschool teacher with university de-	0.16	0.09	0.15	0.09	0.19*	0.09	0.17*	0.09	0.24**	0.09	0.23**	0.09
Proportion of children under three years in the centre	-0.07	0.11	-0.08	0.11	-0.20*	0.10	-0.22*	0.10	-0.31**	0.10	-0.32**	0.10
Team goal setting			0.04	0.10			0.18*	0.09			0.09	0.09
$R^2$	0.07		0.06		0.21**		0.22**		0.16*		0.17*	

Coefficients in bold are significant at the  $p < 0.01$  (\*\*) or  $p < 0.05$  (\*) level.

#### 4. Discussion

The present study investigated the relation between preschool teachers' team goal setting and process quality in the areas of language and literacy, science, and social-emotional support. Regression models were calculated for each measure of process quality to explore the relationship between team goal setting and the different domains of process quality, controlling for structural background variables. Results from these models show that preschool teachers' team goal setting was positively associated with pedagogical process quality in the domain of science education, but not language education and social-emotional support. Thus, only research hypothesis (2) referring to the area of science education can be confirmed.

In accordance with other national and international study results (Melhuish, Gardiner, & Morris, 2017; Pianta & Hamre, 2009; Slot, Leseman, Verhagen, & Mulder, 2015; Thomason & La Paro, 2009; Tietze et al., 2013), process quality in the three observed domains was low to moderate. Anyhow, there was considerable variance between the settings, especially for the quality domains of science and social-emotional support. The comparatively lower variance in the domain of language education might have resulted because day-care centres in this particular sample were all involved in a quality development process in this specific domain.

Regarding the results from the regression models considering only structural variables as predictors of process quality, it is noticeable that most of the structural variables were found to be predictive for the quality of science education and social-emotional support whereas the quality in the domain of language education was hardly predicted by any of these variables. This finding could be partly due to the participation of the day-care centres in the federal programme. It can lead to a limited variance in language education quality compared to the other two domains, thereby affecting the predictivity of all structural variables. Furthermore, it is possible that through the federal programme, preschool teachers were already trained in language education for smaller children, making this variable less decisive for the delivered quality in this area. Also, the federal programme facilitated professional development of preschool teachers in the area of language education. Therefore, the degree of pre-service education of the observed preschool teachers might be less relevant for the quality of language education compared to science education and social-emotional support.

The proportion of children under three years in the centre is negatively related to process quality both in the science and in the social-emotional domain. With regard to the science domain, preschool teachers probably provide less opportunities for science learning when children are very young. Furthermore, a high proportion of very young children puts higher demands on preschool teachers with regard to care work, thereby potentially lowering the quality of interactions with the children. Looking at the relation between group size and process quality, a better quality of science education was observed in groups with more children. This finding could be partly because some of the items from the ECERS-E science subscale focus on the quantity of available science material. The more children there are in a group, the bigger might be the classroom and the more science material might be available. Another explanation for this finding could be that in bigger groups there are probably also more preschool teachers working in the

group. Since each of them has an individual qualification and knowledge, a higher number of preschool teachers could also mean higher chances for expertise in the area of early science education and more flexibility in offering early science activities.

With regard to child-staff-ratio, evidence from research is mixed (Slot, 2018). In the present study, it was not predictive for any domain of process quality. In line with numerous other studies (e.g. Kuger, Kluczniok, Kaplan, & Rossbach, 2016; Slot, Lerkkanen, et al., 2015), the proportion of children with an immigrant background in the group was negatively associated with all three areas of process quality, indicating that working with disadvantaged children is more challenging for preschool teachers and calling for measures to support them with this task.

Looking at the main focus of the present study, the results of the multiple regression models show that, interestingly, there was no association of team goal setting with language related process quality and social-emotional support, whereas quality of science education was positively related to the preschool teachers' team goal setting. On the one hand, one might have expected a positive association in the language domain of quality in particular, since through the federal programme, preschool teachers in this sample were involved in a process of quality development, triggering goal setting in this domain. On the other hand, precisely because of their participation in the federal programme, all the day-care centres in this sample have most probably defined the development of language-related process quality as one of their main goals, limiting the variance of goal setting in this area and thus, the predictivity of goal setting for this quality domain. Another reason why goal setting was not related to language related process quality might just as well apply to the findings in the area of social-emotional support: Pedagogical work in these two domains usually arises rather spontaneously from the specific situational demands throughout the day. Social interaction with the children and – in particular in day-care centres taking part in the federal programme – also language education happens as part of the daily routines. This implies two consequences for goal setting: For one thing, while high quality of these processes might benefit from planning, its mere taking place per se does not require much planning. Secondly, since language education as well as social-emotional support call for preschool teachers' spontaneous, situation-oriented decisions and actions, the work in these two areas is complex. Probably, such spontaneous actions and decisions can be planned or influenced through goal setting only to a very limited extent. This is also reflected by research on the factors moderating the relation between goal setting and performance, showing that setting clear, difficult goals is less beneficial when the task is more complex (Locke & Latham, 2013). Regarding the quality of social-emotional support, there is another point possibly limiting the benefits of goal setting in this area: the warmth and sensitivity of teacher-child interactions, which are particularly relevant for the quality of social-emotional support, are not least affected by the preschool teachers' personality traits (Eckhardt & Egert, 2018; Kunter, Kleickmann, Klusmann & Richter, 2013; Smidt, Kammermeyer & Roux, 2015; Tietze et al., 2013) – factors, that cannot easily be changed through planning and goal setting.

In the present study, early science education was positively related to team goal setting. It has become an established notion among preschool teachers as well as in the public debate that early science education is an educational domain of growing importance (Steffensky, 2017). For example, in Germany, the non-profit 'Haus der kleinen Forscher' ('Little Scientists' House') Foundation has been promoting science education

for quite some time (Anders et al., 2018). Nevertheless, compared to language education, science education is still not as present in the everyday pedagogical processes. In line with other study results (e.g., Early et al., 2010), this also became evident in the present study, where process quality in science education was lowest. And while all the day-care centres from the present study have probably set goals for developing the quality of language education due to their participation in the federal programme, only some of the day-care centres made science education a priority. These centres probably took a very conscious decision to do so and the rating on team goal setting could be an indicator for this. In other words, centres who actively engage in implementing high quality science education in their practice are presumably often centres with very clear, shared goals in general. Besides the importance that different educational domains are given in the day-care centres, there is another relevant point to consider. Compared to language education and social-emotional support, there are certain differences between how science education happens or is approached by preschool teachers, and these differences could contribute to the understanding of the differential results in this study. One important difference is structuredness. It would be very desirable that science education, just as language education, takes place spontaneously, integrated into the daily routines. Unfortunately – at least in the German ECEC context – it usually still hardly does. Instead, science education activities are mostly very structured and planned beforehand. Typically, preschool teachers plan to, for instance, conduct an experiment on the concept of floating and sinking with the children the next day. To plan and prepare the experiment, they often use materials like books or thematic brochures providing them with concrete examples of science experiments and their implementation in practice. The reason why preschool teachers usually do not embed science education spontaneously into daily routines, picking up on the children's interest in the concrete situation, could be a lack of content knowledge and pedagogical content knowledge in science education. These facets of professional knowledge are crucial to firstly recognize the science learning potential of an everyday situation and then exploit this potential (Anders et al., 2018). It could be assumed that the fact that science education, for the stated reasons, is usually very structured and planned and rarely happens spontaneously, makes it benefit more from goal setting because it is not as complex and more easily plannable.

From the finding of the present study that team goal setting was positively related to science education, but not to language education and social-emotional support, it can be concluded that there are clues for potential benefits of team goal setting for pedagogical process quality. Still, the effect size of the link between team goal setting and process quality of science education is small and there seem to be certain limitations as to which types of pedagogical processes can be addressed through goal setting. Everyday practice in ECEC always demands from preschool teachers – regardless of the educational domain – both very spontaneous and unplanned activities arising from concrete situations and following the children's interest in these situations as well as planned and structured activities. While the former probably pose a complexity that inhibits the benefits of goal setting, planned, structured activities could greatly benefit from goal setting. Hence, teams of preschool teachers – under the lead of the centre head – should strive for setting clear goals for pedagogical practice since through planned educational activities, process quality in all domains could profit from these goals, in particular in those domains that had not been given much importance in the

centre before. In the light of results from research on leadership in ECEC (Siraj-Blatchford & Manni, 2006), creating these shared, clear goals on the team level is one important task of ECEC centre heads.

There are various limitations to the present study. Although the data from the evaluation study of the federal programme 'Language day care centers: Because language is the key to the world' was convenient for the present study with regard to sample size and assessed constructs, as stated earlier, the sample is also particular and not representative for Germany in several ways. For instance, variance regarding team goal setting could be limited with regard to the language education domain due to the aims of the federal programme and the consequential quality development efforts in this domain. Another limitation is that in the present study, team goal setting was only assessed in general and not regarding different domains. Also, it is not known if day-care centres participated in other programmes targeting for instance science education. It would have contributed to the value of results to know more in detail about goal setting in the investigated day-care centres. Another limitation of the present study concerns the assessment of goal setting on the team level. Not all team members of each day-care centre took part in the online team survey. Hence, although the intraclass correlation indicates an acceptable reliability of aggregated team goal setting values, there is no perfect representativity as in comparison to having data on the whole team. Yet another limitation to the current study is the fact that process quality was only assessed in one group of each day-care centre. Since process quality can vary between individual classrooms in one day-care centre, it can be questioned whether the assessed quality is representative for the whole centre. Anyhow, for the present study observational process quality data was only available for one classroom per centre and this approach is also in line with other research on ECEC quality (i.e. Tietze et al., 2013). Finally, the present study does not draw on longitudinal data. Therefore, it can merely show associations, but no causal relations between team goal setting and process quality. This is only one of the points where future research on this topic could add to findings from the present study. Also, more research is needed to explore more in detail how pedagogical processes differing in their structuredness and spontaneity can be addressed by team goal setting. Since ECEC in Germany is strongly shaped by long episodes of free play, research on the effects of team goal setting on pedagogical processes from other countries with more structured activities in ECEC would be desirable as a contrast. In addition, future research should seek to understand better through what mechanisms team goal setting affects process quality in ECEC since those mechanisms have only been investigated in the context of organisational psychology.

To conclude, the present study adds to the existing research by investigating the relationship between team goal setting and process quality in ECEC. The results show that striving for clear, shared goals can be a promising measure for developing process quality in ECEC.

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