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Children's Social-Emotional Development During the COVID-19 Pandemic: Protective Effects of the Quality of Children's Home and Preschool Learning Environments

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ABSTRACT

Research Findings: The study examined the development of children's social-emotional problems between 2019 (T1) and winter 2021/22 (T2) during the COVID-19 pandemic, as well as the role of children's home and preschool learning environments. The sample included 228 German children ages 3–7 years at T1 ($M_{Age} = 5.13$, $SD = 0.79$, 46% female). Results showed an increase in emotional problems between T1 and T2, which was more pronounced among already disadvantaged groups of children from families with lower income and lower educational background. Peer problems increased only among children from families with lower educational backgrounds. The emotional climate of the family and the quality of children's preschool learning environment were identified as protective influences for the development of children's peer problems, but not for children's emotional problems. *Practice or Policy:* The policy restrictions implemented to slow the spread of the COVID-19 virus had longer-lasting consequences for (some) children's emotional functioning. Efforts should be undertaken to mitigate such detrimental effects by supporting disadvantaged groups of children. In addition, based on the findings regarding the importance of high-quality interactions to prevent the development of social problems among children, policy should establish the conditions for preschool staff to provide high-quality interactions in childcare.

The COVID-19 pandemic and the strict restrictions implemented to limit the spread of the virus in many countries, including Germany, severely impacted children's lives. Preschool children were isolated from peers and (extended) family members due to social distancing measures, experienced discontinuity, and uncertainty due to preschool closures, and increased levels of stress in their home environments due to the effects of the restrictions on parents (Huebener et al., 2021; Oppermann et al., 2021; Spinelli et al., 2020). Attention has thus grown around potential negative consequences for child development. Although research documents that children's social-emotional skills have been affected in the short-term, i.e., during the first and second lockdown (Feinberg et al., 2022; Ravens-Sieberer et al., 2021; Sancho et al., 2021; Santa-Cruz et al., 2022; Walters et al., 2021), few studies have examined how the pandemic affected children's social-emotional development beyond the first year of the pandemic. Moreover, little is known about risk factors for problematic social-emotional development and protective influences that may buffer the negative effects of the COVID-19 pandemic on children. Using longitudinal data collected before the pandemic in 2019 and again 2 years later in winter 2021/2022 in Germany, the present study investigates the effects of the pandemic on the development of

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children's emotional functioning and social competence with peers, as two aspects of their social-emotional skills. In addition, we examine the role of individual and contextual risk factors as well as protective factors in children's home and preschool learning environments for their social-emotional development.

The Development of Social-Emotional Skills

Social-emotional skills comprise a variety of intra- and interpersonal competencies that enable children to understand, regulate and express emotions as well as participate in social interactions and establish healthy relationships (Denham, 2006; Malti & Noam, 2016). In the present study, we focus on two aspects of children's social-emotional skills that were likely severely affected by the COVID-19 pandemic: Children's emotional functioning, i.e., their ability to remain in a positive emotional state despite the uncertainty and stress children experienced, as well as children's peer relations, i.e., their ability to keep and establish healthy relationships with their peers despite the preschool closures and social distancing measures.

The first aspect, children's emotional functioning, is an umbrella term for a set of constructs that include the strategic awareness of one's own and others' emotions, the ability to share emotions in relationships and to regulate emotional experiences (Denham, 2006; Eisenberg et al., 2001). Emotional dysfunction results from a lack of these abilities and finds its expression in emotional problems, inwardly directed and over-controlled emotions and moods including guilt, anxiety, worry, and somatic complaints with no known medical basis (Aschenbach & Rescorla, 2001). Such emotional problems are sometimes referred to as internalizing problems (Zahn-Waxler et al., 2000).

The second aspect, children's peer relations, are considered to be a central indicator of their social competence: Children who are socially competent behave in a prosocial manner, create cohesion, and tend to sustain and enhance healthy relationships with peers (Howes, 2000). In contrast, children with low social competence show aggressive and disruptive behavior toward their peers, which can lead to dislike, rejection, or withdrawal (Denham, 2006; Howes, 2000). In other words, children's social competence shapes but is also expressed in their peer relations (Howes, 2000). Peer relations, in turn, are an important influence on children's emotional development (Murphy et al., 2004) and have been shown to predict future adaptive behavior (Hay et al., 2004).

Effects of the COVID-19 Pandemic on Children's Social-Emotional Skills

The development of children's social-emotional skills is embedded in children's learning environments at home and the early childhood education and care (ECEC) settings (Bronfenbrenner & Morris, 2006). The family is the first developmental context for children. Particularly the quality of parent-child-relationships and -interactions are assumed to support the development of social-emotional skills (Denham et al., 2014; Morris et al., 2007). In addition, in the ECEC context children first interact with peers and caretakers and, through these interactions, children learn to regulate their emotions and they learn to build healthy relationships.

Both learning environments have been affected by the COVID-19 pandemic and the governmental restrictions implemented in order to slow the spread of the virus. Germany, among many other countries, repeatedly closed ECEC centers and thus deprived children of an important environment for learning and development as well as of their peer contacts. These (repeated) changes in ECEC attendance created discontinuity and instability in children's ECEC experiences, and discontinuity has been linked to lower social-emotional skills (for an overview, see Anders, 2013). The limited and changing access to ECEC negatively affected children's contact with peers, which is considered problematic as children need (stable) peer contact for their social-emotional development (Anders, 2013). Moreover, a recent study from the UK demonstrates that ECEC attendance during the lockdowns was associated with better executive skills compared to the children who stayed at home (Davies et al., 2021). In addition, the closure of ECEC centers as well as the other restrictions had

indirect effects on children by putting a strain on their families. Due to the closure of institutional ECEC in many countries, children were at home for extended periods of time and parents had to juggle child care with all other demands such as their occupation, household work, and/or home schooling. The family stress model illustrates how stressors, such as working from home while having to care for small children, increase parental stress and – through that – negatively influence parenting behavior and child development (Masarik & Conger, 2017). During the first wave of infections in spring 2020 studies documented increased parental stress and lower parental wellbeing in several countries, such as Germany (Huebener et al., 2021; Oppermann et al., 2021), Italy (Spinelli et al., 2020), and the US (Adams et al., 2021). In line with the assumptions of the family stress model, parent's stress and exhaustion were negatively associated with changes in parent's home learning activities (Oppermann et al., 2021) and with parental reports of their children's wellbeing (Christner et al., 2021; Cusianto et al., 2020; Langmeyer et al., 2020; Petrocchi et al., 2020; Specht et al., 2021).

Taken together, the restrictions implemented in many countries, such as Germany, can be expected to interfere with children's developmental context at home as well as in the ECEC learning environment, likely leading to social-emotional problems. Several previous longitudinal studies have examined changes in preschool-aged children's social-emotional skills due to the pandemic. Internationally, findings from the US, Spain, and Chile point to an increase in children's social-emotional problems during the pandemic compared to pre-pandemic measures (Feinberg et al., 2022; Sancho et al., 2021; Santa-Cruz et al., 2022; Walters et al., 2021). For instance, Feinberg et al. (2022) showed for US-children ages 4–9 years that the number of children within clinical ranges of internalizing and externalizing problems increased significantly in 2020 compared to pre-pandemic levels in 2017. This mirrors findings by Santa-Cruz et al. (2022), who also found severe increases in internalizing and externalizing problems from 2018/19 to 2020 in their study of 5–9-year-old children in Chile. In contrast, two longitudinal studies from Jordan and Sweden found no increase in the level of social-emotional problems among children ages 3–5 years between pre-pandemic measures and measures during the first lockdown in 2020 (Hastings et al., 2021; Linnavalli & Kalland, 2021). The authors argue that the lack of changes in children's social-emotional problems may be due to the small sample size in these studies; another factor may be that the restrictions in Sweden and Jordan were less severe than in other countries, such as the US and Germany. However, a Danish study by Specht et al. (2021) found significantly higher social-emotional problem scores during the first lockdown in April 2020 compared to pre-lockdown levels in January 2020 – even though Denmark had fewer restrictions than other countries. A cross-country comparison by Orgilés et al. (2022) showed that increases in children's levels of behavioral problems and anxiety after the first lockdown in Spring 2020 were highest in Italy, which had the strictest confinements, whereas there were no significant changes in children's behavioral problems and anxiety in Portugal where measures had been comparatively less strict. Results for Germany, which was one of the countries with more severe restrictions, consistently show an increase in social-emotional problems among children ages 3–17 years (Christner et al., 2021; Essler et al., 2021; Langmeyer et al., 2020; Ravens-Sieberer et al., 2021). Specifically, studies report a significant increase in emotional and peer problems during the first lockdown in Germany in Spring 2020 compared to pre-pandemic levels (Langmeyer et al., 2020; Ravens-Sieberer et al., 2021) and a decrease in emotional and behavior problems when restrictions were loosened in Summer 2020 compared to Spring 2020 (Essler et al., 2021). Similarly, findings from a longitudinal study in Brazil showed that 5–17-year-old-children's emotional problems decreased again after the first lockdown in Spring 2020 until Spring 2021 (Zuccolo et al., 2022). However, these longitudinal studies had no pre-pandemic baselines, so that it remains unclear whether children's social-emotional problems decreased back to pre-pandemic levels (Essler et al., 2021; Zuccolo et al., 2022). In addition, although empirical findings relatively consistently show detrimental short-term effects of the first lockdown in 2020 in Germany and other countries, fewer studies have examined longer time spans. From a theoretical perspective, one may argue that short-term restrictions during one lockdown are easier to cope with than many months of uncertainties and restrictions, which may take a larger toll on children's social-emotional functioning. In order to determine the effects of the pandemic on

children's social-emotional problems, longitudinal studies are necessary that include pre-pandemic baseline measures and cover a longer time span into the pandemic are necessary. The present study addresses this open question using longitudinal data from the fall of 2019 until winter 2021/2022.

Vulnerability and Resilience of Children During the COVID-19 Pandemic

The review of the theoretical and empirical research literature shows that social-emotional problems among children emerged across countries during the pandemic and particularly during the first lockdown. However, not all children are equally affected by crises, such as the COVID-19 pandemic (Prime et al., 2020). Children differ in their responses to external challenges based on internal and external resources – or the lack thereof. Resilience research suggests that individual as well as contextual factors can increase or decrease children's risk for developing problems during a crisis (Fröhlich-Gildhoff & Rönnau-Böse, 2020; Prime et al., 2020). Highly vulnerable individuals show an increased risk to react with psychological or physical harm to external challenges due to internal or external risk factors. Resilience, in contrast, is characterized by individuals drawing on protective resources to cope and overcome adversity despite their individual or external risk factors (He et al., 2021; Masten & Barnes, 2018). Such protective resources can be characteristics of the individual child or the children's environment which enable children to cope and to successfully adapt in times of crises (He et al., 2021). In the present study, we examine both, the dynamics of risk factors as well as the role of potential protective influences for the development of children's social-emotional skills during the COVID-19 pandemic.

Vulnerability and Risk-Factors

Vulnerability during the COVID-19 pandemic is characterized by an elevated risk of negative outcomes, i.e., developing social-emotional problems due to internal or external risk factors (He et al., 2021). For instance, individual risk factors that have been shown to be associated with higher social-emotional problems during the pandemic was a younger age, being a single child and coming from a family with a lower socio-economic status and lower educational background (Christner et al., 2021; Langmeyer et al., 2020; Mochida et al., 2021; Ravens-Sieberer et al., 2021). Fewer studies have examined contextual risk factors. For instance, it seems plausible that the negative effects of the pandemic on children's social-emotional development depend on the number and intensity of stressors that children were exposed to. As one of the few studies, de Vet et al. (2021) showed, based on a Dutch sample, that the extend of children's stress during preschool closures, which included stress due to social distancing and isolation, was associated with children's negative affectivity, as one aspect of their emotional functioning. Similarly, Ravens-Sieberer et al. (2021) showed for slightly older children ages 11–17 years that two-fifth of the children felt that their relationships with their peers had been impaired by the pandemic. Zuccolo et al. (2022) report that less contact with family and peers was associated with higher levels of emotional problems among children. The present study builds on these findings by aiming to directly assess the weight of the pandemic in terms of the amount and intensity of COVID-19-related stressors for children's social-emotional development. This allows us to examine whether effects of the pandemic on children's social-emotional development indeed depend on individual and contextual risk factors, such as the COVID-19-related stressors, that children were exposed to.

Resilience of Children

In the context of the COVID-19 pandemic, resilience describes the ability to remain in a positive and healthy psychological state despite COVID-19-related stressors (Veer et al., 2021). Wustmann (2011) distinguishes between child-specific sources of resilience that a child is either born with (e.g., temperament) or acquires through developmental processes, and sources of resilience in a child's environment. In this study, we focus on sources of resilience in a child's environment in the family and the ECEC context (Fröhlich-Gildhoff & Rönnau-Böse, 2020; Prime et al., 2020). Concerning children's

home learning environment (HLE), previous research has highlighted the importance of (family) relationships, both, as a potential way through which stressors can negatively affect children (see above), but also as source of resilience if the quality of these relationships is high (Fröhlich-Gildhoff & Rönnau-Böse, 2020; Prime et al., 2020). From a pedagogical perspective, particularly the process quality of day-to-day parent-child-interactions are deemed crucial for child development (Anders et al., 2012; Kluczniok et al., 2013; Lehrl et al., 2020). Conceptions of high process quality vary, but often include a warm emotional climate and the overall stimulation across different developmental domains (Kluczniok et al., 2013). Empirical findings underline the importance of high-quality HLE, which is associated with less problem behavior (Foster et al., 2005), higher emotional self-regulation, and more social competencies (Rose et al., 2018). In fact, a recent study showed that enriching activities at home during the COVID-19 pandemic were associated with higher social competencies six months later (Hendry et al., 2023). Moreover, a close and emotionally warm relationship with parents can buffer the negative effects of poverty or critical life events on children's behavioral problems (Flouri et al., 2015). Thus, both, the emotional quality as well as the quality of educational activities provided at home seem to act as potential protective factors in the relation between child/family risks and children's social-emotional outcomes (Mochida et al., 2021).

The protective effect of positive relations extends beyond the family itself, such as the preschool staff (Fröhlich-Gildhoff & Rönnau-Böse, 2020). For instance, research has demonstrated that secure attachments with nonparental caregivers can compensate for insecure attachments to parents (Mitchell-Copeland et al., 1997). Thus, the quality of relationships with preschool staff but also the quality of ECEC services (Ellenbogen et al., 2014) can act as a source of resilience. Quality in ECEC is conceptualized in terms of the quality of structural characteristics of the ECEC centers ("structural quality," e.g., staff-child-ratio, materials) and the "process quality," which is the quality of interactions between children and their preschool teachers, their peers, and their spatial-material environment (Kluczniok & Rossbach, 2014). The structural quality is assumed to indirectly affect child development through the process quality in ECEC, which has direct effects on child development (Kluczniok & Rossbach, 2014). Process quality is a multidimensional construct that includes the social-emotional quality in the ECEC classroom (e.g., a positive emotional climate, teacher sensitivity and responsiveness, the quality of support for children's social-emotional wellbeing and development) as well as the quality of cognitive stimulation (e.g., supporting children's learning, critical thinking, and development in pre-academic domains) (Hamre et al., 2014; Howard et al., 2020). From a theoretical perspective, both facets of process quality can be assumed to be relevant for children's social-emotional development: The social-emotional quality is important for children's social-emotional wellbeing and teaches children to recognize and regulate their emotions, relate positively to others, and engage in prosocial behavior (Ahnert et al., 2006; Denham et al., 2014; Hestenes et al., 2015). In addition, the quality of cognitive stimulation in ECEC classrooms – particularily in language and literacy – can be assumed to help children verbalize their emotions, solve conflicts verbally and engage in cooperative behavior (Rose et al., 2018).

Despite this theoretical distinction of social-emotional and cognitive quality aspects, most empirical studies are based on integrated measures of overall process quality. Previous empirical findings show that overall high process quality in ECEC is associated with better social-emotional development in children (see Anders, 2013; Melhuish et al., 2015 for an overview): Children who attend high-quality preschools show better social-emotional skills and behavior in preschool (NICHD ECCRN, 2003; Siekkinen et al., 2013) and in elementary school (Sammons et al., 2008), as well as better self-regulation skills (Salminen et al., 2021; Sylva et al., 2020) and less internalizing/externalizing problems from childhood (Votruba-Drzal et al., 2004, 2010) to adolescence (see Melhuish et al., 2015 for an overview; Vandell et al., 2020). However, a few studies found no main effects of ECEC process quality on children's social-emotional development until elementary school (Keys et al., 2013; Oppermann et al.,

2023; Peisner-Feinberg et al., 2001), although there were positive associations between ECEC quality and children's later social-emotional outcomes for subpopulations of children (Oppermann et al., 2023). Some studies suggest compensatory effects of ECEC, i.e., that high ECEC quality matters most for children from disadvantaged backgrounds (Schmerse, 2020) and for children with initially lower social-emotional skills (Broekhuizen et al., 2017). In fact, ECEC process quality has been shown to buffer negative effects of early child or family risks on children's emotional problems/internalizing problems, problem behavior, and prosocial behavior (Burchinal et al., 2006; Hall et al., 2013; Seiler et al., 2017; Wustmann Seiler et al., 2022). The extent to which these factors affected children during the COVID-19 pandemic, however, remains unclear and empirical research is necessary to examine the potentially protective effects of the HLE and ECEC context for children's development during and after the pandemic. In this study, we address this research gap. In addition, we examine whether the quality of children's HLE and ECEC learning environments have been functioning as buffers against the potentially negative effects of COVID-19-related stressors on children's development of social-emotional problems.

The Present Study

The present study examines the development of children's emotional and peer problems during the pandemic as well as the role of children's HLE and preschool learning environments. The contribution of the present study is threefold. *First*, we directly test developmental changes in children's emotional and peer problems using longitudinal data from 2019 to 2021. *Second*, the present study explores the role of individual risk factors as well as COVID-19-related stressors as contextual risk factors for the development of children's emotional and peer problems during the pandemic. *Third*, we examine potentially protective influences of the two most important learning environments in childhood, namely children's home and preschool environment, for children's emotional and peer problems at the transition from pre- to primary school. The theoretical model is illustrated in Figure 1.

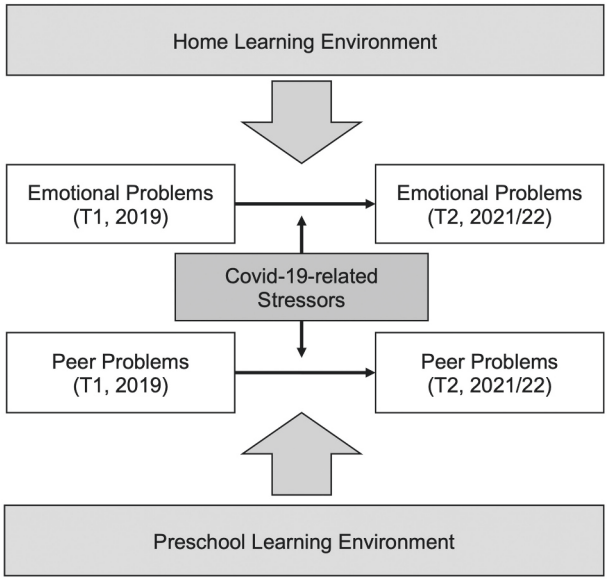

Figure 1. Conceptual model: Interrelations of COVID19-related stressors, home and preschool learning environment, and emotional and peer problems.

We investigate the following research questions (RQ):

RQ1: *How did children's emotional problems and peer problems develop during the pandemic?*

Based on existing longitudinal findings showing an increase in children's social-emotional problems already in the first months of the pandemic, we expect an increase in children's emotional and peer problems from measurement point 1 (T1) in 2019 to measurement point 2 (T2) in 2021 (H1).

RQ2: *How do individual characteristics and COVID-19-related stressors relate to the development of children's emotional and peer problems?*

Based on the empirical research literature, we expect to find significant relations between children's and families' background characteristics (e.g., educational background) and the development of children's emotional and peer problems (H2a) (e.g., Christner et al., 2021; Mochida et al., 2021; Ravens-Sieberer et al., 2021). Drawing on the theoretical and empirical research literature regarding the (potentially) devastating effects of COVID-19-related stressors (e.g., social distancing) on children's social-emotional development (de Vet et al., 2021; Feinberg et al., 2022; Prime et al., 2020), we also expect a stronger increase in emotional and peer problems among children who experienced more COVID-19-related stressors (H2b).

RQ3: *What role does children's home learning environment play in the development of children's emotional and peer problems during the pandemic?*

Based on the theoretical and empirical research literature (Masarik & Conger, 2017), we hypothesize that the family's emotional climate and the educational activities offered at home, as two central aspects of children's HLE (Anders et al., 2012; Kluczniok et al., 2013), are negatively related to the development of children's emotional and peer problems during the pandemic (H3a). In addition, we assume that a high-quality HLE can buffer the potentially detrimental influence of COVID-19-related stressors on children's social-emotional development (H3b; see Masarik & Conger, 2017). The effects are viewed as protective if they result in a reduced impact of COVID-19-related stressors on children's social-emotional problems at T2 (Masten, 2001; Seiler et al., 2017).

RQ4: *How does preschool quality relate to the development of children's emotional and peer problems during the pandemic?*

Prior research has demonstrated the importance of high preschool quality for children's social-emotional development (Peisner-Feinberg et al., 2001; Sylva et al., 2020) as well as its potential to compensate for disadvantageous circumstances, such as a lower socio-economic status (Peisner-Feinberg et al., 2001; Schmerse, 2020). We therefore hypothesize that preschool quality is negatively related to the development of children's emotional and peer problems during the pandemic (i.e., the higher the quality, the lower children's emotional and peer problems) (H4a). In addition, we assume that high-quality preschool environments can buffer potentially detrimental effects of COVID-19-related stressors on children's social-emotional development (H4b).

Method

Procedure and Sample

The present study draws on data that was originally collected as part of the German research project "SprachKitas" (Anders et al., 2020). Data collection in July until November 2019 as part of the study

included family questionnaires and questionnaires for preschool center managers as well as observations of the process quality of the preschool learning environment (see measures for more information). In an initiative to examine the effects of the COVID-19 pandemic on children, families who participated in the study were contacted again in the fall of 2021 and were invited to participate in a follow-up online survey (T2). Altogether, $N = 250$ families participated in both measurement points (T1 in 2019 and T2 in winter 2021/2022). However, 22 cases were removed from the dataset because the birthdate of the child did not align, which indicated that parents referred to a different child in T2 compared to T1. The final sample for the present study consists of $N = 228$ children ages 3–7 years at T1 ($M = 5.13$ years, $SD = 0.79$) and ages 5–9 years at T2 ($M = 6.99$ years, $SD = 0.86$) from 9 federal states of Germany (19.8% Baden-Württemberg, 29.5% Bavaria, 22.5% Saarland, 7% North Rhine-Westphalia, 5.7% Berlin, 5.7% Brandenburg, 5.7% Hesse, 2.6% Hamburg, 1.3% Thuringia). At T2 in 2021, 48.5% of the children were in 1st grade ($N = 100$, these children started school in 2021), 33% were in 2nd grade and 18.4% were in 3rd grade; for $N = 22$ children information on the current grade was missing.

The study abided APA ethical guidelines on conducting studies with human participants. Written informed consent was given by parents, participating preschool teachers and center head managers. Participants were informed that they could stop the survey at any time without any disadvantage. The "SprachKitas"-Study was reviewed by the Ethics Committee of the University of Bamberg, Germany, and an approval was granted (No. 2022–03/11).

Measures

Children's Emotional and Peer Problems

Children's emotional and peer problems were measured at T1 and T2 through parental report using the respective subscales of the German version of the Strengths and Difficulties Questionnaire (SDQ; R. Goodman, 1997), which has been effectively used and normed for the German population of children ages 6–16 years (Woerner et al., 2002). Moreover, the SDQ has been previously used to measure COVID-19-related effects on children's social-emotional skills (Christner et al., 2021; Hastings et al., 2021; Ravens-Sieberer et al., 2021), which allows us to compare the results of the present study to previous findings.

The emotional problems subscale consists of 5 items. Example items are: [The child . . .] "has many worries," "is often unhappy, downhearted." Parents rated the extent to which these statements describe their child on a 3-point scale (0 = not true, 1 = somewhat true, 2 = certainly true). Reliability was low at T1, but acceptable at T2 (T1: McDonald's Omega, $\omega = .56$; T2: $\omega = .72$). This comparatively low reliability of SDQ-subscales is a typical finding in the research literature (Woerner et al., 2004) and may be due to the fact that the subscales consist of only 5 items and that some items had very low frequencies (Muris et al., 2003). Nevertheless, the SDQ and its subscales have been shown to be a robust predictor of children's concurrent and prospective mental health (A. Goodman & Goodman, 2009).

The peer problems subscale also consists of 5 items, such as: [The child . . .] " . . . is picked on or bullied," " . . . is generally liked by other children (recoded)." The response format was the same as for emotional problems. Reliability was low at T1, but close to acceptable at T2 (T1: $\omega = .58$; T2: $\omega = .69$), which is very similar to the reliability scores for the German population of children (Woerner et al., 2004).

In line with the scoring recommendations in the research literature and previous research, sum scores were formed for each of the two subscales. To ensure that missing data did not distort the scores, sum scores were only formed for those cases with at least 3 valid responses on the 5 items.

Children's COVID-19-related Stressors

To capture the strain placed on children during the pandemic and particularly the lockdown, we asked parents to indicate if and to which degree a number of social-emotional stressors burdened their child

during the COVID-19 pandemic. The stressors were assessed regarding the most recent lockdown at the time of data collection at T2, which was in winter 2020/2021. Parents were given the following instructions: "Please think back to the last lockdown and the closures of preschool centers and schools between Christmas 2020 and Spring 2021. Please indicate for each of the following events if they occurred and if so, how burdensome they were for your child." The following potential stressors on children's social-emotional development were assessed through single items: Lack of peer contact, feelings of loneliness, not enough physical contact to others, anxiety or nervousness, not enough time with central caretakers, lack of family contact (e.g., grandparents). Parents rated these stressors on a 5-point-scale, ranging 1 (*did not occur*), 2 (*a bit burdensome*) to 5 (*very burdensome*). As we were interested in children's overall stressors (as perceived by the parents), rather than individual stressors, we computed an overall scale representing the intensity of social-emotional stressors that children were exposed to during the lockdown by averaging the items. Reliability was good ($\omega = .81$, 6 Items).

Process Quality of the Home Learning Environment

To capture cognitive as well as emotional aspects of the process quality of children's home learning environment, parents were asked to report their educational activities offered at home as well as the emotional family climate at T2.

Educational activities were measured by asking the parents to estimate the frequency in which they offer educational activities at home with 6 items. Example items are: "Reading books to or with your child," "Speaking about measuring units (e.g., weight, temperature) in everyday activities" (see Table S1 in the Supplementary Materials for the item wordings of the entire scale). Parents rated how frequently they engaged in these activities with their child in the last three months on an 8-point-scale (1 = *never*, 8 = *daily*). Reliability was acceptable ($\omega = .73$).

The **family's emotional climate** was measured using a 13-item-scale developed for the present study based on the short version (Roth, 2002) of the family climate scale (Schneewind et al., 1985) as well as based on previous work by von Maurice (2004). The scale captures the feeling of cohesion and the general emotional climate in the family as well as the degree to which communication in the family is open and positive, and to which conflicts are handled in a constructive way. Example items are: "We feel very close to one another in our family," "In our family, we speak openly about problems" (see Table S1 in the Supplementary Materials for the item wordings of the entire scale). Parents rated their agreement or disagreement with these statements on a 4-point-scale (1 = entirely disagree, 4 = entirely agree). Reliability was good ($\omega = .86$).

Child and Family Background Characteristics

We controlled for several child and family background characteristics associated with children's social-emotional development. These include children's age, gender, and their socio-economic background (Konrad Ristau & Burghardt, 2021) as operationalized by parental education and family income. In addition, we controlled for children's native language background, which has been shown to be associated with children's social-emotional development (see Konrad Ristau & Burghardt, 2021; Pakarinen et al., 2018). We assessed all child and family background characteristics through parental report. Families' language background was coded 0 = family language mostly German and 1 = mostly a different family language than German; Parental education was operationalized by parents' highest professional qualification (1.3% had no qualification, 45.3% finished vocational education and training, and 53.5% had a university degree).

Process Quality of the Preschool Learning Environment

All preschool variables were measures in 2019 (T1). The process quality of children's preschool learning environment was measured using the German version (Anders et al., 2017) of the Sustained Shared Thinking and Emotional Wellbeing (SSTEW) scale (Siraj-Blatchford et al., 2015). The SSTEW is an observational measure of the quality of teacher-child-interactions comprising 14 items on 5 subscales: Building trust, confidence, and independence (e.g., self-regulation, social

development), supporting social and emotional well-being, supporting and extending language and communication (e.g., encouraging children to talk with others, staff supports children's language use), supporting learning and critical thinking (e.g., supporting problem solving, encouraging sustained shared thinking), and assessing learning and language (e.g., using assessment to support and extend learning and critical thinking). Each item is scored on a 7-point scale (1 = *inadequate quality* to 7 = *excellent quality*). The SSTEW thus measures both, the quality of the social-emotional climate and support as well as the quality of educational activities and cognitive stimulation in preschool. The SSTEW was rated by trained research staff who completed a two-day training and had successfully passed a reliability check over one live-observation day (maximum of ±1 point deviation from the expert ratings). Ratings of the SSTEW-scales were based on observations that lasted three to four hours over one morning in each preschool. Scores for each subscale were then averaged to create an overall process quality score. The scale had excellent internal consistency ($\omega = .92$). Inter-rater reliability was evaluated for the overall SSTEW-scale in a subsample of 20 preschools and found to be acceptable (ICC(3,1) = .69; two-way mixed model, single measure with absolute agreement) (Cicchetti, 1994). We also calculated the percentage of absolute agreement between the raters, which was high (96% with ±1 point).

Structural Preschool Characteristics

We considered the following structural characteristics of the preschool centers: The observed child-teacher-ratio, the percentage of children under three years, the percentage of children with a migration background, and the percentage of teachers with a university degree. The structural characteristics were treated as control variables in our analyses because they have been shown to be associated with the process quality of children's preschool environment (Kuger & Kluczniok, 2008).

Statistical Analyses

Our first research question was answered by examining mean-level changes and changes in the percentiles of children's emotional and peer problem scores between T1 and T2.

For the second research question we investigated associations between child/family characteristics as well as COVID-19-related stressors (RQ2) and the development of children's emotional and peer problems between T1 and T2 in multiple regression analyses in Mplus (Version 8.3; Muthén & Muthén, 1998–2017). Importantly, we controlled for children's baseline in terms of their emotional and peer problems at T1 and thus were able to capture the development of children's emotional and peer problems between T1 and T2. There was between 0% and 3.5% of missing data on our independent or dependent variables. Full-information maximum likelihood (FIML) estimation was used to handle missing data, which is considered the superior method given such low amounts of missing data (Arbuckle, 1996; Enders & Bandalos, 2001).

We answered our third research question regarding potential protective effects of the quality of children's HLE (RQ3) on the development of children's emotional and peer problems using multiple regression analyses in Mplus. Children's HLE was entered as predictor of children's emotional and peer problems at T2, while controlling for children's initial emotional and peer problems at T1 as well as for their families' background characteristics.

Our last research question (RQ4) related to the potentially protective influences of preschool quality on the development of children's emotional and peer problems during the pandemic. However, 18.1% of the children on our sample started school already in 2019 and were not in preschool during the COVID-19 pandemic, and another 31.9% started school in the summer of 2020. Because the first lockdown in Germany was by far the harshest lockdown where preschool centers closed for several weeks with only very restricted access to preschool, most children who entered school in 2020 did not attend preschool during the pandemic or just attended preschool for a few weeks. Because we were interested in (buffering) effects of preschool quality during the pandemic, we only included those children in the analyses for RQ4 who entered school in 2021 and

thus had more than a year of preschool experiences during the COVID-19 pandemic. The subsample of children who entered school in 2021 consisted of $N = 100$ children (44.2% of the total sample), nested in 66 preschool centers (average cluster size = 1.52). The proportion of variance between preschools (Intraclass Correlation Coefficients; ICC(1)) was ICC = 0.05 for emotional problems and ICC = 0.13 for peer problems, indicating that most of the variability at T2 was at the child level. We accounted for the multilevel structure of the data using standard error adjustments (type = complex in Mplus; Muthén & Muthén, 1998–2017). The sample statistics of the subsample of children who started school in 2021 were similar to the rest of the sample (see Table A1 in Appendix A for details). The only significant difference between the subsample and the full sample were differences in age, which is to be expected as children in this subsample started school later and thus are younger. Based on the subsample, regression analyses were conducted in Mplus to examine the associations between preschool quality and the development of children's emotional and peer problems, while controlling for child and family background characteristics as well as for structural characteristics of the preschool. The high number of predictors and covariates in the models to answer RQ4, combined with the reduced sample size of $N = 100$, however, led to error terms in Mplus (Muthén & Muthén, 1998–2017). To ensure that the coefficients of the main effects of interest (effects of preschool quality on our outcomes) were trustworthy, we ran additional robustness analyses with a reduced number of covariates, so that the model did not produce error terms. The results of the reduced, error-free model are displayed in Table A3 in the Appendix. Results regarding the effects of preschool quality on our two outcome variables were very similar in both models, indicating that the coefficients are trustworthy (see Table 5 as well as Table A3 in the Appendix for results of the reduced, error-free model).

Results

Descriptive Results and Mean-Level Changes in Children's Social-Emotional Skills

The descriptive statistics of the variables included in our analyses are displayed in Table 1, the bivariate correlations between these variables are reported in Table A2 in the Appendix. Descriptive results showed that children's emotional problems increased, on average, by 0.64 points; children's peer problems only slightly increased, on average, by 0.11 points. Bivariate correlations with child and family background characteristics indicated that children from families with a lower educational background had higher emotional and peer problems at T2. Boys had more peer problems at T2

Table 1. Descriptive statistics.

	N	Range	M/%	SD	Min	Max
Child and family characteristics						
Age at T1	226	–	5.13	0.79	3.53	7.14
Female	225	0/1	46%			
Non-German language background	227	0/1	16%			
Parental education	225	1–3	2.52	0.53	1.00	3.00
Family income	221	–	1991.34	997.29	357.14	5000.00
Emotional problems T1	228	0–10	1.55	1.51	0.00	8.00
Emotional problems T2	223	0–10	2.19	2.08	0.00	10.00
Peer problems T1	228	0–10	1.08	1.40	0.00	6.00
Peer problems T2	223	0–10	1.19	1.53	0.00	7.00
COVID-19-related stressors	220	1–5	2.90	0.87	1.00	5.00
HLE: Family activities	215	1–8	5.71	0.81	2.50	8.00
HLE: Family climate	213	1–4	3.37	0.42	2.08	4.00
Preschool characteristics (T1)						
Child-teacher-ratio	40	–	8.17	3.15	3.67	20.25
Children under 3 years (%)	66	–	24.08	10.98	0.00	58.46
Immigrant children (%)	66	–	34.97	25.39	0.00	100.00
Teachers with university degree (%)	48	–	6.58	7.07	0.00	25.00
Preschool quality	41	1–7	3.11	0.98	1.02	5.57

Table 2. Cumulative percentages of children's emotional and peer problem scores.

Raw Scores	Emotional Problems T1	Emotional Problems T2	Peer Problems T1	Peer Problems T2
0	25.4	23.3	47.8	47.1
1	60.5	47.1	71.1	68.2
2	77.2	64.6	86.8	83.4
3	91.2	76.7	**91.2**	**90.1**
4	**94.7**	**85.7**	96.9	94.6
5	97.4	91.5	98.2	98.2
6	98.7	94.6	100	99.6
7	99.6	98.7	–	100
8	100	99.1	–	–
9	–	99.6	–	–
10	–	100	–	–
N	228	223	228	223

Note. Cumulative percentages are shown for each raw score and measurement point. Cut-off points for slightly raised scores ("borderline") are highlighted in bold.

than girls. Children from lower income families also had higher emotional problems at T2 and higher peer problems at T1 than children from higher income families. Children with a non-German language background had higher peer problems at T1 than children with a German language background.

We tested the significance of the mean level changes in children's emotional and peer problems using paired-sample t-tests. There was a significant increase in children's emotional problems from T1 to T2, ($t(222) = 4.56$, $p < .001$), but no significant change in children's peer problems ($t(222) = 1.03$, $p > .05$), which only partly confirms our first hypothesis (H1). In addition, we compared the distribution of children's emotional and peer problem scores at T1 and T2 to (a) the published cutoffs for the SDQ to determine children's mental health (https://www.sdqinfo.org/) as well as to (b) a distribution of SDQ scores obtained for a nationally representative sample of children ages 6 to 16 years in Germany (Woerner et al., 2004). For the emotional and peer problem subscales, sum scores of 0–3 points are considered normal, scores of 4 are considered slightly raised, scores of 5–6 are considered high and scores of 7 and above are considered very high (Woerner et al., 2004). At T1, 91.2% of the children in our sample fell within the normal range of emotional problem scores (0–3; see Table 2), which is very similar to the 86% found by Woerner et al. (2002) for the nationally representative sample of 6–16-year-olds. However, at T2, only 76.7% of children in our sample had emotional problem scores that fell within the normal range (0–3), which is 9.3% higher than expected based on the population of German children that age (Woerner et al., 2004). The percentage of children with slightly raised emotional problem scores (scores of exactly 4; also labeled as "borderline," see Woerner et al., 2004) increased from 3.5% at T1 to 9% at T2 in our sample, which is also higher than the 6.3% obtained for "borderline" scores for the German population of children aged 6 to 16 years (Woerner et al., 2004). Similarly, the percentage of children with high or very high scores (scores >5; also labeled as "abnormal," see Woerner et al., 2004) nearly tripled from 5.2% at T1 to 14.2% at T2, which is twice as much as expected based on the German population of children that age (7.7%; Woerner et al., 2004). In fact, cross-tabulation of the scores at T1 and T2 showed that 19.7% of the children in our sample moved from a normal score (0–3) to a "borderline" or abnormal score (4–10) between T1 and T2, whereas only 4.9% of the children moved in the opposite direction (borderline/abnormal to normal) from T1 to T2. Regarding peer problems, the differences were negligible: The percentage of children with peer problem scores within the normal range (0–3) did not change much from T1 (91.2%) to T2 (90.1%) and was similar to the 86.7% obtained for the nationally representative sample (Woerner et al., 2004). Similarly, the percentages of children with slightly raised and high scores did not increase much from T1

to T2 and were also within a range that was similar to the percentages obtained for the German population of children (Woerner et al., 2004).

Risk Factors: Relevance of Child and Family Characteristics as well as COVID-19-related Stressors for the Development of Children's Social-Emotional Problems

We examined the role of individual child and family characteristics for the development of children's emotional and peer problems between T1 and T2 (RQ2; H2a) using single regression models for each characteristic. Results indicated significant associations between the development of children's emotional problems and parental educational background (ß = −.16, $p = .011$) as well as parental income (ß = −.14, $p = .023$), but no significant associations with children's age, gender, or native language background. Specifically, paired sample t-test showed a stronger increase in emotional problems among children from lower educational backgrounds ($t(101) = 4.89$, $p < .001$) than among children from higher educational backgrounds ($t(117) = 2.14$, $p = .034$). For income, results showed, based on a median split by income, that the increases in emotional problems among children from families with lower income were more severe ($t(109) = 4.54$, $p < .001$) compared to children from families with higher income ($t(105) = 2.47$, $p = .015$).

The development of children's peer problems was significantly associated with children's gender (ß = −.16, $p = .010$) and their parents' educational background (ß = −.19, $p = .002$) but not with children's age, native language background, or parental income. Specifically, boys and children in families with lower educational backgrounds were more likely to develop peer problems between T1 and T2 than girls and children from higher educational backgrounds. However, paired sample t-test for the development of peer problems showed no change in peer problems for girls ($t(101) = 0.43$, $p = .671$) or boys ($t(117) = 1.74$, $p = .085$). With regard to the educational background, paired sample t-test showed that the peer problems of children from lower educational backgrounds increased from T1 to T2 ($t(101) = 2.03$, $p = .045$), whereas there was no change in peer problems among children from higher educational backgrounds ($t(117) = 0.41$, $p = .680$).

To test Hypothesis 2b, children's COVID-19-related stressors were entered as an independent variable in multivariate regression analyses in predicting the development of children's emotional and peer problems, while controlling for children's and families' background characteristics. Results are displayed in Table 3. Children's COVID-19-related stressors, which capture the occurrence and intensity of social-emotional stressors during the last lockdown, were positively and significantly related to the development of children's emotional and peer problems. Thus, children who

Table 3. Effects of COVID-19-related stressors on children's emotional and peer problems.

	Emotional Problems (T2)		Peer Problems (T2)	
	β	*SE*	β	*SE*
Child and family characteristics				
Age at T1	.06	.06	.01	.06
Gender	−.02	.06	−.14*	.06
Native language background	−.10	.06	.03	.07
Parental education	−.04	.07	−.17*	.07
Family income	−.09	.07	.08	.06
Social-emotional skills at T1				
Emotional problems T1	.32***	.06		
Peer problems T1			.30***	.06
Predictors				
Children's COVID-19-related stressors	.23***	.06	.21**	.06
R^2	.22***	.05	.22***	.05

Note. $N = 228$. Gender was coded as 0 = male, 1 = female; Children's native language background was coded as 0 = both parents are German native speakers, 1 = at least one parent is a native speaker of a language other than German.
#$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

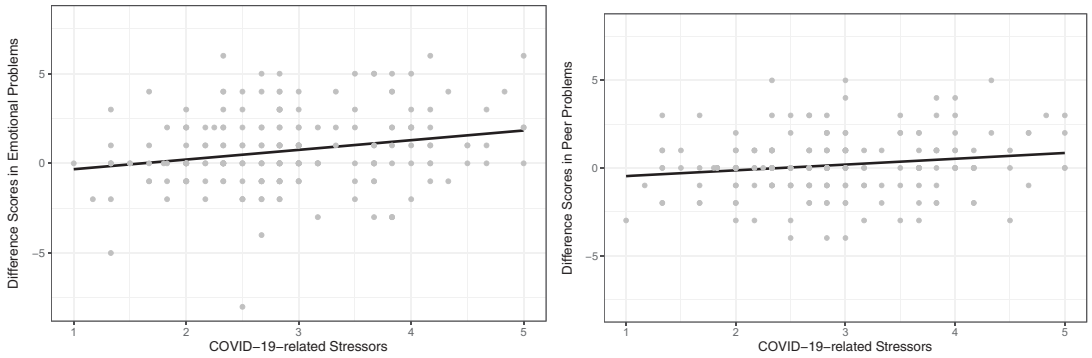

Figure 2. Relation between children's COVID-19-related stressors and changes in children's (a) emotional problems and (b) peer problems.
Note. Raw difference scores for emotional and peer problems between T1 and T2 were calculated, positive values indicate an increase in emotional/peer problems from T1 to T2. The analyses were controlled for children's and families' background characteristics.

experienced more COVID-19-related stressors developed more emotional problems and peer problems between T1 and T2. The COVID-19-related stressors were, in fact, a stronger predictor of the development of emotional and peer problems than child and family characteristics (see Table 3). The models each explained 22% of the variance in children's emotional and peer problems at T2. The relevance of COVID-19-related stressors for changes in children's emotional and peer problems is illustrated in Figure 2a, 2b.

Protective Factors: The Role of the HLE for Children's Social-Emotional Development

Results for RQ3 showed no significant effects of family's educational activities at home or the family's emotional climate on the development of children's emotional or peer problems (see Table 4). Hypothesis 3a was thus not supported by the data. The addition of the two HLE scales led to only a small increase in explained variance by 2% in children's peer problems at T2 compared to the model without the HLE scales (see Table 3); there was no increase for emotional problems. However, the

Table 4. Effects of the HLE on children's emotional and peer problems.

	Emotional Problems (T2)		Peer Problems (T2)	
	β	*SE*	β	*SE*
Child and family characteristics				
Age at T1	.06	.06	−.01	.06
Gender	−.02	.06	−.15*	.06
Native language background	−.10	.06	.03	.06
Parental education	−.04	.07	−.17**	.07
Family income	−.09	.07	.10	.07
Social-emotional skills at T1				
Emotional problems T1	.32***	.06		
Peer problems T1			.27***	.06
Predictors				
Children's COVID-19-related stressors	.23***	.06	.20**	.06
HLE: Family activities	−.04	.07	−.09	.06
HLE: Family's emotional climate	.00	.07	−.10	.06
R^2	.22***	.05	.24***	.05

Note. $N = 228$. Gender was coded as 0 = male, 1 = female; Children's native language background was coded as 0 = both parents are German native speakers, 1 = at least one parent is a native speaker of a language other than German.
*$p < .05$, **$p < .01$, ***$p < .001$.

strength of the effect of children's COVID-19-related stressors on the development of peer problems slightly decreased in the model with the two HLE scales compared to the previous model (see Tables 3 and 4). We explored compensatory effects of the two HLE scales by including interaction terms between each HLE scale and children's COVID-19-related stressors in single models for each interaction term and outcome (H3b). There was only one significant interaction term: The effect of children's COVID-19-related stressors on the development of children's peer problems was lower when the quality of the emotional family climate was higher (interaction effect: ß = −.15. $p = .013$), thus partially confirming our hypothesis H3b.

Protective Factors: The Role of Preschool Process Quality for Children's Social-Emotional Development

We investigated the associations between preschool process quality, as measured by the SSTEW-scale, and the development of children's emotional and peer problems (RQ4) while controlling for child and family background characteristics as well as for the structural quality of the preschool. Results showed no protective effects of the structural quality characteristics of the preschool center (e.g., child-teacher-ratio and proportion of teachers with a university degree) and one significant effect of the child group composition: Children in preschools with a higher percentage of younger children under three years showed a stronger increase in emotional and peer problems between T1 and T2. Regarding the process quality of the preschool, results showed a significant negative, i.e., protective, effect of preschool quality on the development of children's peer problems between T1 and T2, but not on children's emotional problems. Thus, children in preschools with higher process quality developed less problematic peer relations between T1 (2019) and T2 (2021). Hypothesis 4a was thus partially supported by the data. The model explained 34% of the variance in children's emotional problems and 38% of the variance in children's peer problems. The main effect of preschool quality on the development of children's peer problems is illustrated in Figure 3. In order to determine which particular aspect of preschool quality was most relevant for children's peer problems, we ran additional analyses with each of the five subscales of the SSTEW (see Table A4 in the Appendix). The two subscales that measure the

Table 5. Preschool quality effects on children's social-emotional development.

	Emotional Problems (T2)		Peer Problems (T2)	
	β	*SE*	β	*SE*
Child and family characteristics				
Age at T1	−.10	.11	.08	.09
Gender	−.11	.08	−.39***	.08
Native language background	−.24*	.11	.04	.14
Parental education	.04	.11	−.03	.12
Family income	−.23*	.09	.08	.11
Social-emotional skills at T1				
Emotional problems T1	.37**	.11		
Peer problems T1			.23*	.11
Predictors				
Children's COVID-19-related stressors	.16*	.06	.16*	.08
Preschool characteristics				
Child-teacher-ratio	−.02	.12	−.03	.11
Children under 3 years (%)	.22*	.11	.27*	.11
Immigrant children (%)	.16	.13	−.02	.13
Teachers with university degree (%)	−.15	.16	−.01	.11
Preschool quality	−.07	.11	−.29*	.13
R^2	.34***	.07	.38***	.10

Note. $N = 100$ because this analysis included only those children who were in 1st grade at T2. Gender was coded as 0 = male, 1 = female; Children's native language background was coded as 0 = both parents are German native speakers, 1 = at least one parent is a native speaker of a language other than German.
#$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

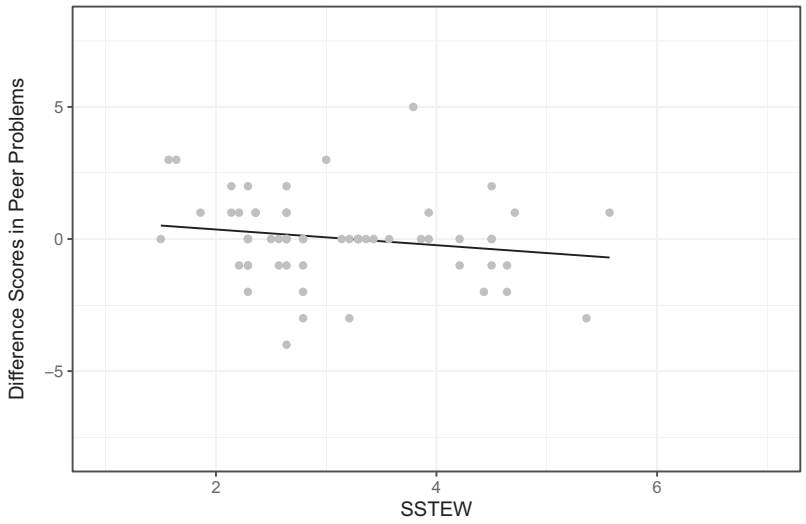

Figure 3. Relation between preschool quality and changes in children's peer problems.
Note. $N = 100$. Raw differences scores for peer problems between T1 and T2 were calculated, positive values indicate an increase in peer problems from T1 to T2. The x-axis shows raw scores for ECEC quality measured by the SSTEW (range 1–7).

quality of cognitive simulation in literacy and critical thinking had the strongest negative associations with the development of children's peer problems, followed by the two subscales related to the support of children's social-emotional development and autonomy. The SSTEW-subscale measuring the quality of feedback had no significant association with the development of children's peer problems[1].

We also tested for compensatory effects of preschool quality with regard to the COVID-19-related stressors by including interaction terms between preschool quality and children's COVID-19-related stressors in single models for each outcome (H4b): Contrary to our hypothesis 4b, there were no significant compensatory effects of preschool quality in the relation between children's COVID-19-related stressors and the development of children's emotional or peer problems ($p > .05$).

Discussion

The present study examined effects of the COVID-19 pandemic on children's emotional and peer problems based on a longitudinal dataset that included pre-pandemic baseline measures and covers a time-period of 1.5–2 years into the pandemic. In addition, the present study investigated the role of individual risk factors and COVID-19-related stressors as well as potential protective influences of the quality of children's home and preschool learning environments. Results showed that children's emotional problems significantly increased between 2019 (T1) and 2021/22 (T2). There was no overall mean-level change in children's peer problems between T1 and T2, however, we did find an increase in peer problems among children from families with lower educational backgrounds. Similarly, the development of children's emotional problems was more pronounced among children from families with lower educational backgrounds and lower incomes. In addition, the intensity of COVID-19-related stressors was significantly and uniquely associated with the development of emotional and peer problems between T1 and T2. The emotional family climate and the quality of children's preschool learning environment were identified as protective influences for the development of children's peer problems, but not for children's emotional problems. In the following, we discuss our key findings and the implications.

Changes in Children's Social-Emotional Problems

Based on the literature review showing increases in social-emotional problems already in the first months of the pandemic (Christner et al., 2021; Essler et al., 2021; Langmeyer et al., 2020; Ravens-Sieberer et al., 2021), we expected to find an increase in children's emotional and peer problems from measurement point one (T1) in 2019 to measurement point two (T2) in winter 2021/22 (H1). Results partly confirmed our hypothesis H1: Children's emotional problems significantly increased between T1 and T2, whereas there was no significant mean-level change in children's peer problems. The lack of significant changes in children's peer problems was surprising and also contrasts the results of previous studies that showed a significant increase in emotional and peer problems during the first lockdown in Germany in Spring 2020, compared to pre-pandemic levels (Langmeyer et al., 2020; Ravens-Sieberer et al., 2021). Potentially, these discrepancies can be explained by the timing of T2 in our study, which was in Winter 2021/22 and thus around 9 months after the last lockdown in Germany (second lockdown in December 2020 to March 2021). Peer problems may arise during (Langmeyer et al., 2020; Ravens-Sieberer et al., 2021) and shortly after the lockdowns due to the social distancing measures and (partial) closures of ECEC centers, but children likely reengaged in peer relations after the restrictions had been lifted. This may be why children's peer problems, on average, decreased back to pre-pandemic levels after the COVID-19-related restrictions were reduced. In addition, it may also be that due to social distancing in (pre-) school closures, there was a reduction in mobbing and in preexisting problematic peer relations for some children. Thus, the effects of the pandemic may have been very different depending on children's initial relation to peers, which is why we may not see significant mean-level changes.

In contrast, children's emotional problems were still elevated in Winter 2021/22. Specifically, 16.6% of the children in our sample moved from normal ranges to emotional problem scores that were slightly raised or high and 3.1% of children even moved to very high emotional problems scores between T1 and T2. It is important to note that the present study included a pre-pandemic baseline (T1 in 2019) and thus these differences are likely associated with the COVID-19 pandemic. Moreover, we could validate the distribution of emotional problems scores based on the results obtained for a nationally representative sample of children ages 6–16 years in Germany before the pandemic (Woerner et al., 2004). The distribution of scores at T1 (2019) were similar to those obtained for the nationally representative sample of German children ages 6–16 years by Woerner et al. (2004), whereas the distribution of scores at T2 (2021/22), after 1.5–2 years of the COVID-19 pandemic, were much higher than would be expected for that age group in Germany. These findings extend previous research, which has largely focused on shorter-term changes in children's social-emotional problems during the first or second lockdown (Essler et al., 2021; Langmeyer et al., 2020; Ravens-Sieberer et al., 2021). Specifically, results of the present study suggest that increases in children's emotional problems due to the pandemic persisted even after the lockdowns have been lifted. Emotional problems, sometimes also referred to as internalizing problems (Flouri et al., 2015), are characterized by withdrawal, anxiety, loneliness, and somatic complaints (Zahn-Waxler et al., 2000). It seems that once children develop such emotional problems, they do not simply disappear after the lockdown ceased. This increase in emotional problems over the time span of 1.5–2 years is particularly concerning because one would normally expect a *decrease* in emotional problems over time due to maturation: Research consistently shows that children's social-emotional problems decrease with age as part of maturation (Bornstein et al., 2010; Denham et al., 2014). Thus, maturation may even partly counteract the changes found in children's emotional problems, leading to more conservative estimations of increases in emotional problems due to the COVID-19 pandemic. Emotional problems are associated with more problem behavior, and lower social competencies with peers (Denham, 2006; Dougherty, 2006; Howes, 2000) as well as lower school engagement and lower mental health in adolescence and adulthood (Bayer et al., 2011). Increases in emotional problems in childhood thus may have negative consequences not just for children's psychological health but also their relationships, personal and educational success.

From an international perspective, our findings concur with results from the US and Chile showing severe increases in internalizing and externalizing problems among children during the pandemic compared to pre-pandemic measures (Feinberg et al., 2022; Santa-Cruz et al., 2022). Interestingly, studies from Jordan and Sweden, where COVID-19 restrictions were more lenient, found no increases in social-emotional problems during the pandemic (e.g., Hastings et al., 2021; Linnavalli & Kalland, 2021). This pattern of findings suggests the inference that increases in social-emotional problems may have been stronger in countries with stricter COVID-19-related restrictions, such as Germany, Italy, or the US (see also Orgilés et al., 2022 for a cross-country comparison). Based on this rationale, the present study aimed to capture the effects of the stress of the pandemic and the implemented restrictions on children's social-emotional development (see below).

Risk Factors: The Role of Child Characteristics and COVID-19-related Stressors

Theoretical and empirical work on vulnerability and resilience suggests that not all children are equally affected by crises, such as the COVID-19 pandemic, but that individual as well as contextual factors can increase or decrease children's risk for developing social-emotional problems as a consequence of a crisis (Fröhlich-Gildhoff & Rönnau-Böse, 2020; Prime et al., 2020). Building on the research literature regarding the importance of individual (Christner et al., 2021; Langmeyer et al., 2020; Mochida et al., 2021; Ravens-Sieberer et al., 2021) and contextual (de Vet et al., 2021; Prime et al., 2020) risk factors during the pandemic, the present study explored the role of individual background characteristics as well as of COVID-19-related stressors for the development of children's emotional and peer problems between T1 and T2. In line with our hypothesis H2a, results showed that a lower educational background and lower family income was associated with a stronger increase in children's emotional problems from T1 to T2. Regarding the development of children's peer problems, we found significant associations with children's gender and families' educational background. These findings are in line with the results of previous research showing that a lower socio-economic status was associated with a higher risk for social-emotional problems during the first and second lockdowns (Christner et al., 2021; Langmeyer et al., 2020; Mochida et al., 2021; Ravens-Sieberer et al., 2021).

Regarding the role of COVID-19-related stressors as contextual risk factors, results supported our hypothesis H2b: Children who experienced more COVID-19-related stressors also developed significantly more emotional and peer problems. In fact, children's COVID-19-related stressors were a much stronger predictor of the development of emotional and peer problems than individual background characteristics, such as gender or the families' educational background. These findings support the notion that the COVID-19-related stressor scale captured some of the negative consequences of the pandemic, which negatively affected children's emotional functioning and peer relations. Thus, these contextual risk factors seemed to be much more relevant for the development of children's emotional and peer problems than individual background characteristics. This is an important finding for risk prevention as it shows that negative social-emotional consequences of crises, such as the COVID-19 pandemic, are best prevented by addressing children's social learning environments. In particular, we explored two learning environments in the present study, namely children's HLE and ECEC learning environments, to determine the potentially protective effects of these environments for children's social-emotional development.

Protective Factors: The Role of the HLE for Children's Social-Emotional Development

The theoretical and empirical research literature highlights the importance of family processes as a source of resilience during crises (Fröhlich-Gildhoff & Rönnau-Böse, 2020; Prime et al., 2020). The present study examined the role of the emotional family climate and the educational activities offered at home, as two central aspects of the process quality of children's HLE (Anders et al., 2012; Kluczniok et al., 2013), for the development of children's emotional and peer problems. In contrast to our hypothesis H3a, however, results showed no significant main effects of either HLE scale on the

development of children's emotional or peer problems – despite the fact that we saw significant bivariate correlations between the family climate and children's emotional and peer problems at T2 and also partly at T1 (see Table A2). Thus, the emotional family climate seemed to be associated with children's emotional and peer problems at a single measurement point, but the family climate did not explain any variance in the change in children's emotional or peer problems over time. This may be because the HLE is children's first learning environment and thus HLE-related differences in children's social-emotional skills emerge very early in childhood and subsequently remain stable.

However, our hypothesis H3b regarding buffering effects of the HLE was partially supported: The negative influence of COVID-19-related stressors on the development of children's peer problems was buffered by the emotional family climate. This interaction effect of family climate can be viewed as protective because it resulted in a reduced impact of COVID-19-related stressors on children's peer problems if the emotional family climate was high (Masten, 2001; Seiler et al., 2017). Thus, although HLE quality could not explain changes in children's emotional and peer problems directly, it did explain individual differences in children's ability to cope with COVID-19-related stressors in terms of developing problematic peer relations. Our findings that the emotional climate of the family, but not the educational activities, were related to children's peer problems is in line with previous theoretical and empirical work that underlines the relevance of emotionally warm relationship with parents for children's social-emotional development (Flouri et al., 2015).

Protective Factors: Preschool Quality and Children's Social-Emotional Development

The empirical research literature has demonstrated the importance of high preschool quality for children's social-emotional development (Peisner-Feinberg et al., 2001; Sylva et al., 2020; Vandell et al., 2010) as well as its potential to compensate for disadvantageous circumstances (Peisner-Feinberg et al., 2001; Schmerse, 2020). We therefore hypothesized that preschool quality would be associated with the development of children's emotional and peer problems during the pandemic (H4a) and may even buffer the negative effects of COVID-19-related stressors on children's social-emotional development (H4b). Results partly supported hypothesis H4a: Preschool process quality was negatively associated with the development of children's peer problems, but there were no significant associations with children's emotional problems. Our hypothesis H4b was not supported by the data: Although we found significant main effects of preschool quality on the development of children's peer problems, preschool quality did not buffer the negative influence of COVID-19-related stressors on the development of children's emotional or peer problems. This lack of interaction effects may be explained by the fact that the COVID-19-related stressors largely referred to the latest lockdown in winter 2020/21 where many children did not attend preschool at all or only with reduced hours. Because children were mostly staying home during the time when these COVID-19-related stressors were most severe, it was the HLE (and not the preschool environment) and particularly the emotional climate at home that mattered most for reducing the negative impact of COVID-19-related stressors.

Although the preschool environment could not reduce the impact of COVID-19-related stressors, it did, however, matter for the development of children's peer problems between 2019 and 2021/22. Specifically, results showed that children from higher quality preschools developed fewer peer problems between T1 and T2, whereas preschool quality was not associated with the development of emotional problems. There are several potential reasons for these differential relations between preschool quality and children's emotional and peer problems: First, it may be that emotional problems result from internal psychological processes which are less likely to be influenced by children's learning environments, whereas children's peer relations are more prone to external influences. In fact, results of the present study showed that children's home and preschool learning environments both affected children's peer relations whereas there were no associations with children's emotional problems. Second, German preschools put a particular emphasis on fostering children's social development in their practices: Educational curricula in Germany and pedagogical practices in German preschools focus on fostering children's ability to interact in a prosocial way, solve

conflicts constructively and engage in positive and healthy peer relations, whereas there is less focus on children's emotional development (e.g., through emotion talk).

The present study also explored which particular aspects of preschool process quality mattered most for the development of children's peer relations. Results showed that associations were strongest for the SSTEW-subscales related to the quality of cognitive stimulation (supporting language and communication; supporting learning and critical thinking), whereas the SSTEW-subscales related to the quality of social-emotional support were not significantly associated with the development of children's peer relations ($p < .10$). Although this finding was counter-intuitive, this was not the first study to reveal such patterns: A recent longitudinal study from Germany also found stronger(er) associations for cognitive than social-emotional process quality with children's social-emotional development (Oppermann et al., 2023). These results may be specific to the context of the present study: One of the peculiarities of the German ECEC system is that preschool centers place a high emphasis on unguided free play (Anders, 2014). Consequently, high-quality (pre-) academic and cognitive stimulation may be important because such learning opportunities provide children with structure and guidance in otherwise unguided free play. Moreover, academic learning opportunities tend to be carried out in smaller groups of children and they tend to be more structured and more teacher-guided, which may help children engage in positive social interactions (e.g., learning to take turns, sharing materials). In addition, academic stimulation – particularly in language and literacy – may help promote children's ability to solve conflicts verbally and cooperate with others (Rose et al., 2018). It may also be that children in preschools that provide more cognitive stimulating activities simply have less opportunities to engage in destructive peer interactions. Thus, taken together, the quality of cognitive stimulation in preschool seems to matter for both, children's cognitive as well as their social development – at least in countries with a high emphasis on unguided free play. Future research should build on these findings and examine associations of different facets of preschool quality for children's social-emotional development in countries with different pedagogical traditions.

Limitations

As in any study, there are limitations that should be noted.

First, although we draw on a longitudinal dataset, the results cannot be interpreted in a causal manner. Moreover, the sample was not randomly selected. For instance, parents with low educational levels were underrepresented in our sample compared to the German average (Statistisches Bundesamt, 2020). In order to minimize the influence of these potential biases, we controlled for a number of child and family background characteristics in our analyses.

In addition, it is important to note that the HLE scales were measured at T2 because these scales were not included in the original study in 2019 (T1) and were thus added to the follow-up study in winter 2021/22 (T2). Consequently, we were unable to examine effects of children's initial HLE (at T1) on changes in children's social-emotional problems between T1 and T2 – which may explain the lack of associations between the HLE scales and children's social-emotional development. However, despite this limitation, emotional climate at home at T2 was an important moderator that explained children's coping with COVID-19-related stressors in terms of their social-emotional development, which underscores the importance of accounting for children's HLE despite the challenges posed by the timing of the measures.

Third, the subsample used for the analyses on preschool influences (children who entered school in 2021, $N = 100$ children) was comparatively small. Robustness analyses showed that the main effects of preschool quality were robust to changes in the model covariates, which suggests that the effects were systematic and stable. Nevertheless, the findings of the present study on protective influences of preschool quality for children's social-emotional development should be replicated in future research.

Furthermore, the reliabilities of SDQ-subscales were acceptable at T2 but below acceptable ranges at T1. Although this is a typical finding in the research literature (Muris et al., 2003; Woerner et al., 2004), further adaptions of the scales may lead to improved scale reliabilities. Nevertheless, the results

of the present study demonstrate meaningful associations of these subscales despite the low reliabilities, which is consistent with evidence of convergent and predictive validity of the SDQ-subscales provided by previous studies (Essler et al., 2021; Ravens-Sieberer et al., 2021; Specht et al., 2021).

Lastly, it is important to acknowledge that the study is based on parental report, which may be biased. However, although parental report has been shown to have limited validity when parents are asked to recall specific details about activities (Nivison et al., 2021), parental report is a well-established source of information on children's more general characteristics, such as their children's social-emotional skills. In fact, the SDQ, which is based on parental reports, has been successfully used in numerous studies and was also validated and normed for the German population of children (Woerner et al., 2004).

Conclusion and Implications for Research and Practice

The present study examined changes in children's emotional and peer problems between 2019 and winter 2021/22 due to the COVID-19 pandemic and protective influences of children's home and preschool learning environments. Our findings demonstrate that children retain severe emotional problems 1.5–2 years into the pandemic and that these problems were stronger among already disadvantaged groups of children from families with lower educational backgrounds and among children from families with lower income. Although there were no overall mean-level changes in peer problems, peer problems also increased among children from families with lower educational backgrounds. The strongest predictor of changes in children's emotional and peer problems between T1 and T2, however, was the intensity of COVID-19-related stressors that children were exposed to – which indicates that these changes indeed occurred due to the COVID-19 pandemic and the governmental restrictions implemented to slow the spread of the virus. This finding adds to the pattern of results internationally, strengthening the rationale that social-emotional problems among children may have been more severe when stricter COVID-19-related restrictions were implemented (Feinberg et al., 2022, Hastings et al., 2021; Orgilés et al., 2022; Santa-Cruz et al., 2022). The educational and practical implications of these findings are threefold: *First*, results of the present study demonstrated, in line with previous research, that the governmental restrictions implemented in Germany, such as the closure of ECEC centers and the social distancing measures, took a toll on children and even led to increases in emotional problems that were detectable a year after the last lockdown. Policy restrictions that affect children's learning environments should thus be a last resort and, ideally, not be implemented in the future. *Second*, efforts should be undertaken to mitigate these detrimental effects, particularly for disadvantaged groups of children. Research demonstrates that effective interventions, such as parenting interventions (Rapee et al., 2009), can have a long-term positive impact on children's developmental outcomes. *Third*, given that the COVID-19 pandemic was unlikely to be the last crisis, policy and practice should focus on promoting children's resilience to cope with future crises. In this regard, the present study provides some indication on protective influences: Results indicate that the emotional quality of children's HLE buffered the negative associations between COVID-19-related stressors and the development of peer problems. Moreover, the quality of children's preschool learning environments seemed to be protective for the development of children's peer problems during the pandemic. Importantly, it was not the structural but the process quality of the preschool environment that mattered most. These results add to the large body of research on the importance of HLE and ECEC process quality for children's cognitive and social-emotional development (e.g., Anders, 2013; Anders et al., 2012, Melhuish et al., 2008; Vandell et al., 2010). Specifically, our findings document the importance of high-quality interactions and emotional support in ECEC settings, not only by mitigating detrimental effects of the pandemic but also by potentially enhancing resilience in non-crisis scenarios. Thus, we advocate the need to consistently establish conditions for providing high-quality interactions in both home and ECEC settings to support children's social-emotional development during as well as beyond pandemic crises in policy and practice.

Note

1. Note that we also explored potential effects of preschool attendance on the development of children's emotional and peer problems. Preschool attendance was included as a binary variable (0 = little to no preschool attendance during COVID-19 as children entered school already in 2019 or 2020; 1 = at least one year of preschool attendance during the COVID-19 pandemic and beginning school in 2021 or later) in the regression models (see Table 5). However, results showed no main effects of preschool attendance on either outcome (ß = .00, $p = .961$ for emotional problems, ß = .04, $p = .723$ for peer problems). This finding aligns with previous research highlighting the paramount importance of the quality of the ECEC environment for children's social-emotional development (e.g., Love et al., 2003; Sammons et al., 2008; Sylva et al., 2011).

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References

Adams, E. L., Smith, D., Caccavale, L. J., & Bean, M. K. (2021). Parents are stressed! Patterns of parent stress across COVID-19 [Original research]. *Frontiers in Psychiatry*, *12*, 12. https://doi.org/10.3389/fpsyt.2021.626456

Ahnert, L., Pinquart, M., & Lamb, M. E. (2006). Security of children's relationships with nonparental care providers: A meta-analysis. *Child Development*, *74*(3), 664–679. https://doi.org/10.1111/j.1467-8624.2006.00896.x

Anders, Y. (2013). Stichwort: Auswirkungen frühkindlicher institutioneller Betreuung und Bildung. [Keyword: Effects of centre-based early childhood education and care programmes]. *Zeitschrift fur Erziehungswissenschaft*, *16*(2), 237–275. https://doi.org/10.1007/s11618-013-0357-5

Anders, Y. (2014). *Literature review on pedagogy, literature review for the OECD*. OECD.

Anders, Y., Ballaschk, I., Blaurock, S., Kluczniok, K., Lehrl, S., Resa, E., & Wieduwilt, N. (2017). *Deutsche Übersetzung der Sustained Shared Thinking and Emotional Well-being (SSTEW) Scale. (Unveröffentlichte Forschungsversion). [German translation of the Sustained Shared Thinking and Emotional Well-being (SSTEW) scale. (Unpublished research version)]*. Freie Universität Berlin.

Anders, Y., Kluczniok, K., Bartels, K. C., Blaurock, S., Grimmer, J., Große, C., Hummel, T., Kurucz, C., Resa, E., Then, S., Wieduwilt, N., & Roßbach, H.-G. (2020). *Policy Brief zum vierten Zwischenbericht zur wissenschaftlichen Evaluation des Bundesprogramms „Sprach-Kitas: Weil Sprache der Schlüssel zur Welt ist". Ergebnisse zur nachhaltigen Wirkung des Bundesprogramms*. [Policy brief on the fourth interim report on the scientific evaluation of the federal program "Sprach-Kitas: Weil Sprache der Schlüssel zur Welt ist". Results on the impact of the federal program].

Anders, Y., Rossbach, H. G., Weinert, S., Ebert, S., Kuger, S., Lehrl, S., & von Maurice, J. (2012). Home and preschool learning environments and their relationship to the development of numeracy skills. *Early Childhood Research Quarterly*, *27*(2), 231–244. https://doi.org/10.1016/j.ecresq.2011.08.003

Arbuckle, J. L. (1996). Full information likelihood estimation in the presence of incomplete data. In G. A. Marcoulides & R. E. Schumaker (Eds.), *Advanced structural equation modeling* (pp. 243–278). Lawrence Erlbaum Associates.

Aschenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms and profiles*. University of Vermont Research Center for Children, Youth, & Families.

Bayer, J. K., Rapee, R. M., Hiscock, H., Ukoumunne, O. C., Mihalopoulos, C., & Wake, M. (2011). Translational research to prevent internalizing problems early in childhood. *Depression and Anxiety*, *28*(1), 50–57. https://doi.org/10.1002/da.20743

Bornstein, M. H., Hahn, C.-S., & Haynes, O. M. (2010). Social competence, externalizing, and internalizing behavioral adjustment from early childhood through early adolescence: Developmental cascades. *Development & Psychopathology*, *22*(4), 717–735. https://doi.org/10.1017/S0954579410000416

Broekhuizen, M. L., Slot, P. L., van Aken, M. A. G., & Dubas, J. S. (2017). Teachers' emotional and behavioral support and preschoolers' self-regulation: Relations with social and emotional skills during play. *Early Education and Development*, *28*(2), 135–153. https://doi.org/10.1080/10409289.2016.1206458

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In R. M. Lerner (Ed.), *Handbook of child psychology. Volume 1: Theoretical models of human development* (6th ed. pp. 793–828). Wiley. https://doi.org/10.1002/9780470147658.chpsy0114

Burchinal, M., Roberts, J. E., Zeisel, S. A., Hennon, E. A., & Hooper, S. (2006). Social risk and protective child, parenting, and child care factors in early elementary school years. *Parenting: Science and Practice*, *6*(1), 79–113. https://doi.org/10.1207/s15327922par0601_4

Christner, N., Essler, S., Hazzam, A., Paulus, M., & Slobodskaya, H. R. (2021). Children's psychological well-being and problem behavior during the COVID-19 pandemic: An online study during the lockdown period in Germany. *PLONE*, *16*(6), e0253473. https://doi.org/10.1371/journal.pone.0253473

Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, *6*(4), 284–290. https://doi.org/10.1037/1040-3590.6.4.284

Cusianto, M., Iannattone, S., Spoto, A., Poli, M., Moretti, C., Gatta, M., & Miscioscia, M. (2020). Stress, resilience, and well-being in Italian children and their parents during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, *17*(22), 8297. https://doi.org/10.3390/ijerph17228297

Davies, C., Hendry, A., Gibson, S. P., Gliga, T., McGillion, M., & Gonzalez-Gomez, N. (2021). Early childhood education and care (ECEC) during COVID-19 boosts growth in language and executive function. *Infant and Child Development*, *30*(4), e2241. https://doi.org/10.1002/icd.2241

de Vet, S. M., Vrijhof, C. I., van der Veek, S. M. C., Pieplenbosch, J. M., van Bakel, H. J. A., & Vermeer, H. J. (2021). Child care in times of COVID-19: Predictors of distress in Dutch children and parents when re-entering center-based child care after a 2-month lockdown [Original research]. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.718898

Denham, S. A. (2006). Social–emotional competence as support for school readiness: What is it and how do we assess it? *Early Education and Development*, *17*(1), 57–89. https://doi.org/10.1207/s15566935eed1701_4

Denham, S. A., Bassett, H. H., Zinsser, K., & Wyatt, T. M. (2014). How preschoolers' social–emotional learning predicts their early school success: Developing theory-promoting, competency-based assessments. *Infant and Child Development*, *23*(4), 426–454. https://doi.org/10.1002/icd.1840

Dougherty, L. R. (2006). Children's emotionality and social status: A meta-analytic review. *Social Development*, *15*(3), 394–417. https://doi.org/10.1111/j.1467-9507.2006.00348.x

Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reiser, M., Murphy, B. C., Losoya, S. H., & Guthrie, I. K. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development*, *72*(4), 1112–1134. https://doi.org/10.1111/1467-8624.00337

Ellenbogen, S., Klein, B., & Wekerle, C. (2014). Early childhood education as a resilience intervention for maltreated children. *Early Child Development and Care*, *184*(9–10), 1364–1377. https://doi.org/10.1080/03004430.2014.916076

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal*, *8*(3), 430–457. https://doi.org/10.1207/S15328007SEM0803_5

Essler, S., Christner, N., & Paulus, M. (2021). Longitudinal relations between parental strain, parent-child relationship quality, and child well-being during the unfolding COVID-19 pandemic. *Child Psychiatry and Human Development*, *52*(6), 995–1011. https://doi.org/10.1007/s10578-021-01232-4

Feinberg, M. E., Mogle, J. A., Lee, J. K., Tornello, S. L., Hostetler, M. L., Cifelli, J. A., Bai, S., & Hotez, E. (2022). Impact of the COVID-19 pandemic on parent, child, and family functioning. *Family Process*, *61*(1), 361–374. https://doi.org/10.1111/famp.12649

Flouri, E., Midouhas, E., Joshi, H., & Tzavidis, N. (2015). Emotional and behavioural resilience to multiple risk exposure in early life: The role of parenting. *European Child & Adolescent Psychiatry*, *24*(7), 745–755. https://doi.org/10.1007/s00787-014-0619-7

Foster, M., Lambert, R., Abbott-Shim, M., McCarty, F. A., & Franze, S. (2005). A model of the home learning environment and social risk factors in relation to children's literacy and social outcomes. *Early Childhood Research Quarterly*, *20*(1), 13–36. https://doi.org/10.1016/j.ecresq.2005.01.006

Fröhlich-Gildhoff, K., & Rönnau-Böse, M. (2020). Resilienzförderung in Kindertageseinrichtung und Grundschule – Konzept und Erfahrungen. [The promotion of resilience in early childhood institutions and primary schools–concept and experiences]. *Zeitschrift für Psychodrama und Soziometrie*, *19*(1), 35–50. https://doi.org/10.1007/s11620-020-00526-4

Goodman, A., & Goodman, R. (2009). Strengths and difficulties questionnaire as a dimensional measure of child mental health. *Journal of the American Academy of Child & Adolescent Psychiatry*, *48*(4), 400–403. https://doi.org/10.1097/CHI.0b013e3181985068

Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, *38*(5), 581–586. https://doi.org/10.1111/j.1469-7610.1997.tb01545.x

Hall, J., Sylva, K., Sammons, P., Melhuish, E., Siraj-Blatchford, I., & Taggart, B. (2013). Can preschool protect young children's cognitive and social development? Variation by center quality and duration of attendance. *School Effectiveness and School Improvement*, *24*(2), 155–176. https://doi.org/10.1080/09243453.2012.749793

Hamre, B., Hatfield, B., Pianta, R., & Jamil, F. (2014). Evidence for general and domain-specific elements of teacher–child interactions: Associations with preschool children's development. *Child Development*, *85*(3), 1257–1274. https://doi.org/10.1111/cdev.12184

Hastings, P. D., Partington, L. C., Dajani, R., & von Suchodoletz, A. (2021). Adrenocortical and psychosocial responses of families in Jordan to the COVID-19 pandemic. *Child Development*, *92*(5), e798–e816. https://doi.org/10.1111/cdev.13662

Hay, D. F., Payne, A., & Chadwick, A. (2004). Peer relations in childhood. *Journal of Child Psychology and Psychiatry*, *45*(1), 84–108. https://doi.org/10.1046/j.0021-9630.2003.00308.x

He, M., Cabrera, N., Renteria, J., Chen, Y., Alonso, A., McDorman, S. A., Kerlow, M. A., & Reich, S. M. (2021). Family functioning in the time of COVID-19 among economically vulnerable families: Risks and protective factors [Original research]. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.730447

Hendry, A., Gibson, S. P., Davies, C., McGillion, M., & Gonzalez-Gomez, N. (2023). Toward a dimensional model of risk and protective factors influencing children's early cognitive, social, and emotional development during the COVID-19 pandemic. *Infancy*, *28*(1), 158–186. https://doi.org/10.1111/infa.12495

Hestenes, L. L., Kintner-Duffy, V., Wang, Y. C., La Paro, K., Mims, S. U., Crosby, D., Scott-Little, C., & Cassidy, D. J. (2015). Comparisons among quality measures in child care settings: Understanding the use of multiple measures in North Carolina's QRIS and their links to social-emotional development in preschool children. *Early Childhood Research Quarterly*, *30*, 199–214. https://doi.org/10.1016/j.ecresq.2014.06.003

Howard, S. J., Siraj, I., Melhuish, E. C., Kingston, D., Neilsen-Hewett, C., de Rosnay, M., Duursma, E., & Luu, B. (2020). Measuring interactional quality in pre-school settings: Introduction and validation of the sustained shared thinking and emotional wellbeing (SSTEW) scale. *Early Child Development and Care*, *190*(7), 1017–1030. https://doi.org/10.1080/03004430.2018.1511549

Howes, C. (2000). Social-emotional classroom climate in child care, child-teacher relationships and children's second grade peer relations. *Social Development*, *9*(2), 191–204. https://doi.org/10.1111/1467-9507.00119

Huebener, M., Waights, S., Spieß, C., Siegel, N., & Wagner, G. (2021). Parental well-being in times of COVID-19 in Germany. *Review of Economics of the Household*, *19*(1), 91–122. https://doi.org/10.1007/s11150-020-09529-4

Keys, T. D., Farkas, G., Burchinal, M. R., Duncan, G. J., Vandell, D. L., Li, W., Ruzek, E. A., & Howes, C. (2013). Preschool center quality and school readiness: Quality effects and variation by demographic and child characteristics. *Child Development*, *84*(4), 1171–1190. https://doi.org/10.1111/cdev.12048

Kluczniok, K., Lehrl, S., Kuger, S., & Rossbach, H.-G. (2013). Quality of the home learning environment during preschool age – domains and contextual conditions. *European Early Childhood Education Research Journal*, *21*(3), 420–438. https://doi.org/10.1080/1350293X.2013.814356

Kluczniok, K., & Rossbach, H.-G. (2014). Conceptions of educational quality for kindergartens. *Zeitschrift fur Erziehungswissenschaft*, *17*(6), 145–158. https://doi.org/10.1007/s11618-014-0578-2

Konrad Ristau, K., & Burghardt, L. (2021). Differences in children's social development: How migration background impacts the effect of early institutional childcare upon children's prosocial behavior and peer problems [Original research]. *Frontiers in Psychology*, *12*(335). https://doi.org/10.3389/fpsyg.2021.614844

Kuger, S., & Kluczniok, K. (2008). Prozessqualität im Kindergarten — Konzept, Umsetzung und Befunde. [Process quality in kindergartens – concepts, implementation and findings]. In H.-G. Roßbach & H.-P. Blossfeld (Eds.), *Frühpädagogische Förderung in Institutionen* (pp. 159–178). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-91452-7_11

Langmeyer, A., Guglhör-Rudan, A., Naab, T., Urlen, M., & Winklhofer, U. (2020). *Kindsein in Zeiten von Corona. Erste Ergebnisse zum veränderten Alltag und zum Wohlbefinden von Kindern* [Being a Child in Times of Corona: Initial Findings on the Changed Everyday Life and Well-being of Children]. München: Deutsches Jugendinstitut.

Lehrl, S., Evangelou, M., & Sammons, P. (2020). The home learning environment and its role in shaping children's educational development. *School Effectiveness and School Improvement*, *31*(1), 1–6. https://doi.org/10.1080/09243453.2020.1693487

Linnavalli, T., & Kalland, M. (2021). Impact of COVID-19 restrictions on the social-emotional wellbeing of preschool children and their families. *Education Sciences*, *11*(8), 435. https://doi.org/10.3390/educsci11080435

Love, J. M., Harrison, L., Sagi-Schwartz, A., van, I. M. H., Ross, C., Ungerer, J. A., Raikes, H., Brady-Smith, C., Boller, K., Brooks-Gunn, J., Constantine, J., Kisker, E. E., Paulsell, D., & Chazan-Cohen, R. (2003). Child care quality matters: How conclusions may vary with context. *Child Development*, *74*(4), 1021–1033. https://doi.org/10.1111/1467-8624.00584

Malti, T., & Noam, G. G. (2016). Social-emotional development: From theory to practice. *European Journal of Developmental Psychology*, *13*(6), 652–665. https://doi.org/10.1080/17405629.2016.1196178

Masarik, A. S., & Conger, R. D. (2017). Stress and child development: A review of the family stress model. *Current Opinion in Psychology*, *13*, 85–90. https://doi.org/10.1016/j.copsyc.2016.05.008

Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, *56*(3), 227–238. https://doi.org/10.1037/0003-066X.56.3.227

Masten, A. S., & Barnes, A. J. (2018). Resilience in children: Developmental perspectives. *Children (Basel)*, *5*(7), 98. https://doi.org/10.3390/children5070098

Melhuish, E., Ereky-Stevens, K., Petrogiannis, K., Ariescu, Penderi, E., Rentzou, K., Tawell, A., Slot, B., & Leseman, P. (2015). *A review of research on the effects of early childhood Education and Care (ECEC) on child development. Curriculum quality analysis and impact review of European early childhood education and care*. CARE project.

Melhuish, E., Sylva, K., Sammons, P., Siraj-Blatchford, I., Taggart, B., Phan, M., & Malin, A. (2008). Preschool influences on mathematics achievement. *Science*, *321*, 1162–1162.

Mitchell-Copeland, J., Denham, S. A., & DeMulder, E. K. (1997). Q-Sort assessment of child–teacher attachment relationships and social competence in the preschool. *Early Education and Development*, *8*(1), 27–39. https://doi.org/10.1207/s15566935eed0801_3

Mochida, S., Sanada, M., Shao, Q., Lee, J., Takaoka, J., Ando, S., & Sakakihara, Y. (2021). Factors modifying children's stress during the COVID-19 pandemic in Japan. *European Early Childhood Education Research Journal*, *29*(1), 51–65. https://doi.org/10.1080/1350293X.2021.1872669

Morris, A. S., Silk, J. S., Steinberg, L., Myers, S. S., & Robinson, L. R. (2007). The role of the family context in the development of emotion regulation. *Social Development*, *16*(2), 361–388. https://doi.org/10.1111/j.1467-9507.2007.00389.x

Muris, P., Meesters, C., & van den Berg, F. (2003). The strengths and difficulties questionnaire (SDQ): Further evidence for its reliability and validity in a community sample of Dutch children and adolescents. *European Child & Adolescent Psychiatry*, *12*(1), 1–8. https://doi.org/10.1007/s00787-003-0298-2

Murphy, B., Shepard, S., Eisenberg, N., & Fabes, R. (2004). Concurrent and across time prediction of young adolescents' social functioning: The role of emotionality and regulation. *Social Development*, *13*(1), 56–86. https://doi.org/10.1111/j.1467-9507.2004.00257.x

Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus User's Guide* (8th ed.). Los Angeles, CA: Muthén & Muthén.

NICHD ECCRN. (2003). Does quality of child care affect child outcomes at age 4 1⁄2? *Developmental Psychology*, *39*(3), 451–469. https://doi.org/10.1037/0012-1649.39.3.451

Nivison, M. D., Vandell, D. L., Booth LaForce, C., & Roisman, G. I. (2021). Convergent and discriminant validity of retrospective assessments of the quality of childhood parenting: Prospective evidence from infancy to age 26 years. *Psychological Science*, *32*(5), 721–734. https://doi.org/10.1177/0956797620975775

Oppermann, E., Cohen, F., Wolf, K., Burghardt, L., & Anders, Y. (2021). Changes in parents' home learning activities with their children during the COVID-19 lockdown – the role of parental stress, parents' self-efficacy and social support [Original research]. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.682540

Oppermann, E., Lehrl, S., & Burghardt, L. (2023). Associations between preschool quality and children's social-emotional development until 2nd grade of elementary school. *Early Childhood Research Quarterly*, *63*, 133–144. https://doi.org/10.1016/j.ecresq.2022.12.002

Orgilés, M., Francisco, R., Delvecchio, E., Espada, J. P., Mazzeschi, C., Pedro, M., & Morales, A. (2022). Psychological symptoms in Italian, Spanish and Portuguese youth during the COVID-19 health crisis: A longitudinal study. *Child Psychiatry & Human Development*, *53*(5), 853–862. https://doi.org/10.1007/s10578-021-01211-9

Pakarinen, E., Salminen, J., Lerkkanen, M.-K., & Suchodoletz, A. (2018). Reciprocal associations between social competence and language and pre-literacy skills in preschool. *Journal of Early Childhood Education Research*, *7*, 207–234.

Peisner-Feinberg, E. S., Burchinal, M. R., Clifford, R. M., Culkin, M. L., Howes, C., Kagan, S. L., & Yazejian, N. (2001). The relation of preschool child-care quality to children's cognitive and social developmental trajectories through second grade. *Child Development*, *72*(5), 1534–1553. https://doi.org/10.1111/1467-8624.00364

Petrocchi, S., Levante, A., Bianco, F., Castelli, I., & Lecciso, F. (2020). Maternal distress/coping and children's adaptive behaviors during the COVID-19 lockdown: Mediation through children's emotional experience. *Frontiers in Public Health*, *8*, 587833. https://doi.org/10.3389/fpubh.2020.587833

Prime, H., Wade, M., & Browne, D. T. (2020). Risk and resilience in family well-being during the COVID-19 pandemic. *American Psychologist*, *75*(5), 631–643. https://doi.org/10.1037/amp0000660

Rapee, R. M., Schniering, C. A., & Hudson, J. L. (2009). Anxiety disorders during childhood and adolescence: Origins and treatment. *Annual Review of Clinical Psychology*, *5*, 311–341. https://doi.org/10.1146/annurev.clinpsy.032408.153628

Ravens-Sieberer, U., Kaman, A., Erhart, M., Devine, J., Schlack, R., & Otto, C. (2021). Impact of the COVID-19 pandemic on quality of life and mental health in children and adolescents in Germany. *European Child & Adolescent Psychiatry*, *31*(6), 879–889. https://doi.org/10.1007/s00787-021-01726-5

Rose, E., Lehrl, S., Ebert, S., & Weinert, S. (2018). Long-term relations between children's language, the home literacy environment, and socioemotional development from ages 3 to 8. *Early Education and Development*, *29*(3), 342–356. https://doi.org/10.1080/10409289.2017.1409096

Roth, M. (2002). Entwicklung und Überprüfung einer Kurzform der Familienklimaskalen für Jugendliche (K-FKS-J). [Development and evaluation of a short-form of the German K-FKS-J]. *Zeitschrift für Differentielle und Diagnostische Psychologie*, *23*(2), 225–234. https://doi.org/10.1024/0170-1789.23.2.225

Salminen, J., Guedes, C., Lerkkanen, M.-K., Pakarinen, E., & Cadima, J. (2021). Teacher–child interaction quality and children's self-regulation in toddler classrooms in Finland and Portugal. *Infant and Child Development*, *30*(3), e2222. https://doi.org/10.1002/icd.2222

Sammons, P., Sylva, K., Melhuish, E. C., Siraj-Blatchford, I., Taggart, B., Hunt, S., & Jelicic, H. (2008). *Effective Pre-school and Primary Education 3–11 Project (EPPE 3–11): Influences on children's cognitive and social development in Year 6*. DCSF Publications.

Sancho, N. B., Mondragon, N. I., Santamaria, M. D., & Munitis, A. E. (2021). The well-being of children in lock-down: Physical, emotional, social and academic impact. *Children and Youth Services Review*, *127*(106085), 106085. https://doi.org/10.1016/j.childyouth.2021.106085

Santa-Cruz, C., Espinoza, V., Donoso, J., Rosas, R., & Badillo, D. (2022). How did the pandemic affect the socio-emotional well-being of Chilean schoolchildren? A longitudinal study. *School Psychology*, *37*(1), 85–96. https://doi.org/10.1037/spq0000493

Schmerse, D. (2020). Preschool quality effects on learning behavior and later achievement in Germany: Moderation by socioeconomic status. *Child Development*, *91*(6), 2237–2254. https://doi.org/10.1111/cdev.13357

Schneewind, K. A., Beckmann, M., & Hecht-Jackl, A. (1985). *Das FK-Testsystem. Das Familienklima aus der Sichtweise der Eltern und der Kinder. [The FK test system The family climate from the point of view of parents and children] (Forschungsberichte aus dem Institutsbereich Persönlichkeitspsychologie und Psychodiagnostik, Nr 81)*. Ludwig-Maximilians-Universität.

Seiler, C. W., Müller, E., & Simoni, H. (2017). The protective role of childcare quality for behavioral adjustment in 3- to 5-Year-old children. *Zeitschrift fur Entwicklungspsychologie und Padagogische Psychologie*, *49*(1), 1–10. https://doi.org/10.1026/0049-8637/a000162

Siekkinen, M., Pakarinen, E., Lerkkanen, M.-K., Poikkeus, A.-M., Salminen, J., Poskiparta, E., & Nurmi, J.-E. (2013). Social competence among 6-year-old children and classroom instructional support and teacher stress. *Early Education and Development*, *24*(6), 877–897. https://doi.org/10.1080/10409289.2013.745183

Siraj-Blatchford, I., Kingston, D., & Melhuish, E. (2015). *Assessing quality in early childhood education and care. Sustained Shared Thinking and Emotional Well-being (SSTEW) Scale for 2–5-year-olds provision*. Trentham Books.

Specht, I. O., Rohde, J. F., Nielsen, A.-K., Larsen, S. C., & Heitmann, B. L. (2021). Changes in emotional-behavioral functioning among pre-school children following the initial stage Danish COVID-19 lockdown and home confinement. *Frontiers in Psychology*, *12*, 12. https://doi.org/10.3389/fpsyg.2021.643057

Spinelli, M., Lionetti, F., Pastore, M., & Fasolo, M. (2020). Parents' stress and children's psychological problems in families facing the COVID-19 outbreak in Italy [Original research]. *Frontiers in Psychology*, *11*(1713). https://doi.org/10.3389/fpsyg.2020.01713

Statistisches Bundesamt. (2020). *Mikrozensus 2019: Haushalte und Familien, Ergebnisse des Mikrozensus*.

Sylva, K., Melhuish, E., Sammons, P., Siraj-Blatchford, I., Taggart, B., Stephen, C., Ang, L., & Brooker, L. (2011). Pre-school quality and educational outcomes at age 11: Low quality has little benefit. *Journal of Early Childhood Research*, *9*(2), 109–124. https://doi.org/10.1177/1476718X10387900

Sylva, K., Sammons, P., Melhuish, E., Siraj, I., & Taggart, B. (2020). Developing 21st century skills in early childhood: The contribution of process quality to self-regulation and pro-social behaviour. *Zeitschrift für Erziehungswissenschaft*, *23*(3), 465–484. https://doi.org/10.1007/s11618-020-00945-x

Vandell, D. L., Belsky, J., Burchinal, M., Vandergrift, N., Steinberg, L., & Network, N. E. C. C. R. (2010). Do effects of Early Child Care Extend to Age 15 Years? Results from the NICHD study of early child care and youth development. *Child Development*, *81*(3), 737–756. https://doi.org/10.1111/j.1467-8624.2010.01431.x

Vandell, D. L., Lee, K. T. H., Whitaker, A. A., & Pierce, K. M. (2020). Cumulative and differential effects of early child care and middle childhood out-of-school time on adolescent functioning. *Child Development*, *91*(1), 129–144. https://doi.org/10.1111/cdev.13136

Veer, I. M., Riepenhausen, A., Zerban, M., Wackerhagen, C., Puhlmann, L. M. C., Engen, H., Köber, G., Bögemann, S. A., Weermeijer, J., Uściłko, A., Mor, N., Marciniak, M. A., Dahl Askelund, A., Al-Kamel, A., Ayash, S., Barsuola, G., Bartkute-Norkuniene, V., Battaglia, S., Bobko, Y., & Kalisch, R. (2021). Psycho-social factors associated with mental resilience in the corona lockdown. *Translational Psychiatry*, *11*(67). https://doi.org/10.1038/s41398-020-01150-4

von Maurice, J. (2004). *Generationenübergreifende Interessenrelationen im Spiegel einer Theorie der Person-Umwelt-Passung* [Dissertation]. Universität Trier. Universitätsbibliothek Trier. https://doi.org/10.25353/ubtr-xxxx-37e8-53e2

Votruba-Drzal, E., Coley, R. L., & Chase-Lansdale, P. L. (2004). Child care and low-income children's development: Direct and moderated effects. *Child Development*, *75*(1), 296–312. https://doi.org/10.1111/j.1467-8624.2004.00670.x

Votruba-Drzal, E., Coley, R. L., Maldonado-Carreño, C., Li-Grining, C. P., & Chase-Lansdale, P. L. (2010). Child care and the development of behavior problems among economically disadvantaged children in middle childhood. *Child Development*, *81*(5), 1460–1474. https://doi.org/10.1111/j.1467-8624.2010.01485.x

Walters, G. D., Runell, L., & Kremser, J. (2021). Social and psychological effects of the COVID-19 pandemic on middle-school students: Attendance options and changes over time. *School Psychology*, *36*(5), 277–284. https://doi.org/10.1037/spq0000438

Woerner, W., Becker, A., Friedrich, C., Rothenberger, A., Klasen, H., & Goodman, R. (2002). Normierung und Evaluation der deutschen Elternversion des Strengths and Difficulties Questionnaire (SDQ): Ergebnisse einer repräsentativen Felderhebung. [Normative data and evaluation of the German parent-rated Strengths and Difficulties Questionnaire (SDQ): Results of a representative field study]. *Zeitschrift für Kinder- und Jugendpsychiatrie und Psychotherapie*, *30*(2), 105–112. https://doi.org/10.1024//1422-4917.30.2.105

Woerner, W., Becker, A., & Rothenberger, A. (2004). Normative data and scale properties of the German parent SDQ. *European Child & Adolescent Psychiatry*, *13*(S2), II//3–II//10. https://doi.org/10.1007/s00787-004-2002-6

Wustmann, C. (2011). *Resilienz. Widerstandsfähigkeit von Kindern in Tageseinrichtungen fördern. [Resilience. Promoting children´s resilience in daycare facilities]*. Cornelsen.

Wustmann Seiler, C., Sticca, F., Gasser-Haas, O., & Simoni, H. (2022). Long-term promotive and protective effects of early childcare quality on the social–emotional development in children [original research]. *Frontiers in Psychology*, *13*, 13. https://doi.org/10.3389/fpsyg.2022.854756

Zahn-Waxler, C., Klimes-Dougan, B., & Slattery, M. (2000). Internalizing problems of childhood and adolescence: Prospects, pitfalls, and progress in understanding the development of anxiety and depression. *Development and Psychopathology*, *12*(3), 443–466. https://doi.org/10.1017/S0954579400003102

Zuccolo, P. F., Casella, C. B., Fatori, D., Shephard, E., Sugaya, L., Gurgel, W., Farhat, L. C., A., Argeu, TeixeiraM., Otoch, L., & Polanczyk, G. V. (2022). Children and adolescents' emotional problems during the COVID-19 pandemic in Brazil. *European Child & Adolescent Psychiatry 23(6),* 1083–1095. https://doi.org/10.1007/s00787-022-02006-6

Appendix

Table A1. Comparison of children in the subsample (school start in 2021) to all other children.

	All other children		Subsample (School start in 2021)			
	M/%	SD	M/%	SD	F	*p*
Age at T1	5.57	0.78	4.58	0.32	**141.94**	**.000**
Gender (0 = male)	46%	0.50	46%	0.50	0.01	.943
Family language background	17%	0.38	16%	0.37	0.03	.973
Highest parental education	2.49	0.55	2.57	0.50	1.08	.300
Family income	1941.36	1001.73	2062.11	1003.77	0.78	.377
Emotional problems T1	1.59	1.44	1.54	1.60	0.54	.816
Emotional problems T2	2.27	2.11	2.09	2.06	0.41	.523
Peer problems T1	1.00	1.33	1.19	1.50	1.01	.315
Peer problems T2	1.13	1.50	1.27	1.57	0.44	.507
N	126		100			

Note. Subsample = Children, who were included in the analyses for our fourth research question. All other children = children, who were not included in the analyses for our fourth research question.

Table A2. Bivariate correlations between the study variables.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Age at T2																
2	Gender	−.00															
3	Native language background	−.07	−.07														
4	Parental education	−.14*	.08	.14*													
5	Family income	−.07	.21**	−.16*	.38***												
6	Emotional problems T1	.06	.09	−.07	−.06	−.07											
7	Emotional problems T2	.13	−.03	−.08	−.18**	−.16*	.36***										
8	Peer problems T1	−.06	−.08	.21**	−.09	−.17*	.37***	.09									
9	Peer problems T2	.03	−.18**	.08	−.23***	−.10	.03	.28***	.33***								
10	Children's COVID-19-related stressors	.13	−.10	.13	−.24***	−.16*	.09	.38***	.13	.30***							
11	HLE: Family activities	−.16*	−.08	.00	.02	.05	−.16*	−.11	−.07	−.13*	−.02						
12	HLE: Family climate	−.06	−.01	−.05	.09	.13	−.26***	−.15*	−.16*	−.21**	−.15*	.34***					
13	Teacher-child-ratio	.05	.05	−.10	.02	−.19*	.15*	.05	.11	−.06	−.02	−.22**	−.18*				
14	Children under 3 years (%)	−.05	.13	−.07	.02	.02	.05	.05	−.12	.06	−.14*	.05	−.07	.18			
15	Immigrant children (%)	−.12	.09	.27***	−.01	.04	−.02	−.02	.06	−.08	.07	.07	.10	−.44***	−.25***		
16	Teachers with university degree (%)	.02	.10	−.17*	.04	.01	−.11	−.07	−.15*	−.00	−.06	.02	.15	−.02	.13	−.07	
17	Preschool quality	−.04	−.02	−.09	−.01	−.08	−.04	.04	−.06	−.08	−.03	.03	.02	.13	−.08	−.21**	−.04

Note. $N = 228$. *$p < .05$. **$p < .01$. ***$p < .001$.

Table A3. Robustness analyses without error terms and with fewer covariates.

	Emotional Problems (T2)		Peer Problems (T2)	
	β	*SE*	β	*SE*
Child and family characteristics				
Gender	−.05	.08	−.40***	.08
Family income	−.20*	.09	.06	.09
Social-emotional skills at T1				
Emotional problems T1	.39***	.11		
Peer problems T1			.25**	.09
Predictors				
Children's COVID-19-related stressors	.14	.10	.20**	.07
Preschool characteristics				
Children under 3 years (%)	.16	.09	.27**	.10
Preschool quality	−.06	.10	−.28*	.12
R^2	.28**	.08	.36***	.10

Note. $N = 100$ because this analysis included only those children who were in 1st grade at T2. Gender was coded as 0 = male, 1 = female; Children's native language background was coded as 0 = both parents are German native speakers, 1 = at least one parent is a native speaker of a language other than German.
# $p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

Table A4. Subscale analysis of the associations between preschool quality and the development of children's emotional and peer problems.

	Emotional Problems (T2)		Peer Problems (T2)	
Predictors	β	*SE*	β	*SE*
SSTEW-Subscales				
Building trust, confidence, and independence	−.10	.13	−.26#	.14
Social and emotional well-being	.05	.12	−.26#	.14
Supporting language and communication	−.06	.11	−.28*	.13
Supporting learning and critical thinking	.00	.12	−.33*	.13
Assessing learning and language	−.18	.11	−.11	.12

Note. $N = 100$. Results are based on single models for each subscale. All models include the following covariates: Children's age, gender, native language background, parental education, family income, children's initial skills at T1 and children's stress during the lockdown as well as the following preschool characteristics: Child-teacher-ratio, percentage of children under 3 years, percentage of immigrant children, percentage of teachers with a university degree.
#$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.