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Toddlers' Social-Emotional Development and Attachment in Early Childhood Education and Care

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Abstract

Over the first years of their life, children attain a multitude of social-emotional milestones and develop competencies in the emotional and social domain. Those include the expression and understanding of basic emotions, acquiring emotion regulation strategies, development of early forms of prosocial behavior, or building and maintaining early relationships with their peers. Caregivers support a child's social-emotional development via a variety of socialization practices and processes: They are, for example, models for constructive emotion regulation, employ emotion-related parenting practices, and create a positive emotional climate. Of particular relevance for a child's early social-emotional development is the attachment relationship, the "emotional bond" between a child and their caregiver. Delays or deficits in the development of social-emotional competence may indicate signs of early maladjustment or translate into subsequent problems or disorders. Psychosocial risk factors predict the occurrence and perpetuation of early social-emotional problems, while promotive and protective factors are associated with positive developmental outcomes. Developmentally appropriate preventive intervention programs strive to contain age-specific risk factors, promote risk-reducing conditions, and support children and adolescents to attain vital developmental tasks and transitions.

Due to the strong increase in the rate of childcare for children under the age of three in Germany, the early childhood education and care (ECEC) center and ECEC teachers[1] as context and agents of preventive interventions come to focus. Teachers' relationships with the children are of great importance for their social-emotional development, and these relationships may qualify as attachment relationships. Accordingly, several preventive intervention programs have focused on the child-teacher relationship and have repeatedly shown to be effective in targeting teacher variables such as knowledge, attitudes, or interaction quality and children variables such as social-emotional or communicative skills. Nonetheless, there is a lack of evaluated, quality-assured programs in Germany that can be comprehensively implemented.

The aims of this dissertation are, thus, 1.) to investigate the how family risk factors exert their influence on a child's developmental outcomes in the ECEC context, 2.) how these effects

[1] In the present dissertation, I refer to children's professional caregivers in ECEC centers as "(ECEC) teachers". In Germany, qualifications for ECEC teachers vary significantly: While the majority of teachers have two or three years of education (e.g., "Sozialassistent*in", "Kinderpfleger*in" vs. "Erzieher*in"), some teachers have a higher educational degree (e.g., bachelor degree in social work or childhood education). Teachers' varying qualifications do not necessarily lead to differing tasks or responsibilities in their ECEC centers' daily routines. Thus, if not otherwise relevant and for reasons of readability, I use the term "(ECEC) teachers".

can be addressed by ECEC teachers, and 3.) to describe the development, content, as well as formative and summative evaluation of the prevention program Papilio-U3 (Ortelbach et al., 2022) that addresses teachers in ECEC. The Papilio-U3 program aims at fostering sensitive teacher-child interactions and by this, the social-emotional development and attachment security of the children to their ECEC teachers. The Papilio-U3 program was developed and evaluated in a research project by collaborating teams from Freie Universität Berlin, Friedrich-Alexander-Universität Erlangen-Nürnberg, and Papilio gGmbH, Augsburg. It was evaluated by implementing a multi-centric, randomized intervention and waiting-control group design study that comprised three measurement waves and assessed numerous outcome measures and important covariates on the teacher and child level (e.g., observational, questionnaire, and developmental test data).

The dissertation encompasses three manuscripts that draw on the data of the Papilio-U3 pilot evaluation. The aim of the first manuscript was to investigate individual and institutional risk and protective conditions for the development of social-emotional competence and problems children display in the ECEC center. The second manuscript built on these insights and aimed to introduce the developmentally appropriate prevention program Papilio-U3 and to document the initial results from the pilot evaluation study. The aim of the third manuscript was to evaluate the effectiveness of the Papilio-U3 program regarding outcomes at the teacher level.

For *Manuscript I*, we asked 56 ECEC teachers to provide information on the characteristics of the ECEC center, their job-related stress, and self-efficacy beliefs as well as to assess the social-emotional competence and problems of the children from their groups (N = 353). Additionally, the parents provided information on family risk factors (proximal and distal risk). To account for the nested data structure, we conducted multilevel analyses and estimated a series of linear mixed models separately for children's social-emotional competence and problems as outcomes. More proximal (but not distal) risk factors predicted higher social-emotional problem scores of the children and we found a trend for a cross-level interaction involving teachers' self-efficacy: The association of risk and problem score decreased with increasing levels of teachers' self-efficacy. A child's age and gender, as well as teachers' self-efficacy, predicted social-emotional competence: Higher competence scores were associated with females, older children, and higher teacher self-efficacy.

Manuscript II comprises the overview of the development and evaluation of the developmentally appropriate prevention program Papilio-U3 according to the intervention mapping approach (IMA, Bartholomew Eldredge et al., 2016): We described the program

planning process comprising a needs assessment and description of the intervention context, the derivation of the change model, gave an account of the program design, production, implementation, and an overview of the program evaluation study. For the formative evaluation, the teachers of the intervention group (IG) provided extensive information on training content, methods, and potential challenges during the program implementation. Results indicated that the participating teachers were generally satisfied with the program content and teaching methods and stated that they would recommend it to other teachers.

Manuscript III considered teacher attributes (i.e., perceived job-related stress and teachers' self-efficacy beliefs) as the first outcomes of the summative evaluation of the Papilio-U3 program. These teacher attributes have in past studies been linked to process quality (e.g., teacher-child interactions) and child outcomes. We randomly assigned the participating teachers (N = 125) to an intervention or waiting-control group and asked them to rate their job-related stress and self-efficacy on three occasions (before, during, and after program implementation). Longitudinal analyses of covariance revealed that, post-intervention, teachers of the intervention group reported higher self-efficacy beliefs compared to the waiting-control group (controlling for baseline scores). The groups did not differ significantly on job-related stress.

For the concluding discussion of the dissertation, I focus on the relevance of teachers' self-efficacy beliefs, job-related stress, and the importance to support teachers in ECEC. I then provide an outlook on the further steps of the program evaluation. A detailed discussion of program contents focuses exemplarily on fostering teachers' emotion talk and the utilization of the video-feedback method. Furthermore, important practical implications of the results of this dissertation are outlined, namely, the widespread implementation of the Papilio-U3 program, the relation to the two subsequent programs for preschoolers and children of the first years in elementary school, Papilio-3to6 and Papilio-6to9 (Lechner et al., 2022; Scheithauer & Peter, 2022), and the benefits of a sequence of prevention programs for children aged 0 to 9.

Zusammenfassung

Sozial-emotionale Entwicklung und Bindung von Kleinkindern in der Kindertagesstätte

In den ersten Lebensjahren erreichen Kinder eine Vielzahl von sozial-emotionalen Meilensteinen und entwickeln Kompetenzen im emotionalen und sozialen Bereich. Dazu gehören der Ausdruck und das Verständnis basaler Emotionen, der Erwerb von Emotionsregulationsstrategien, die Entwicklung früher Formen prosozialen Verhaltens und der Aufbau früher Peerbeziehungen. Bezugspersonen unterstützen dabei die sozial-emotionale Entwicklung eines Kindes durch eine Vielzahl von Sozialisationspraktiken und -prozessen. Von besonderer Bedeutung für die frühe sozial-emotionale Entwicklung eines Kindes ist die Bindungsbeziehung, das "emotionale Band" zwischen einem Kind und seiner Bezugsperson. Verzögerungen oder Defizite in der Entwicklung der sozial-emotionalen Kompetenz können Anzeichen für eine frühe Fehlanpassung sein oder sich in späteren Problemen oder Störungen manifestieren. Psychosoziale Risikofaktoren sagen das Auftreten und die Aufrechterhaltung früher sozial-emotionaler Probleme vorher, während promotive oder protektive Faktoren mit positiven Entwicklungsergebnissen in Verbindung gebracht werden. Entwicklungsorientierte Präventionen zielen darauf ab, altersspezifische Risikofaktoren einzudämmen, risikomindernde Bedingungen zu fördern und Kinder und Jugendliche bei der Bewältigung wichtiger Entwicklungsaufgaben und -übergänge zu unterstützen.

Aufgrund des Anstiegs der Betreuungsquote für Kinder unter drei Jahren in Deutschland rücken die Kindertagesstätte sowie die pädagogischen Fachkräfte als Kontext und Akteur*innen präventiver Interventionen verstärkt in den Fokus. In der Forschung über die Rolle von pädagogischen Fachkräften bei der sozial-emotionalen Entwicklung von Kindern wurden wiederholt die Beziehungen zwischen Fachkräften und den Kindern untersucht, die auch die Qualität von Bindungsbeziehungen annehmen können. Unterschiedliche präventive Interventionsprogramme setzten bisher entsprechend an dieser Beziehung an und erwiesen sich verschiedentlich als wirksam in Bezug auf Outcomes der Fachkräfte wie beispielsweise Wissen, Einstellungen oder Interaktionsqualität sowie auf Outcomes der Kinder wie sozial-emotionale oder kommunikative Fähigkeiten. Dennoch fehlt es in Deutschland bisher an evaluierten, qualitätsgesicherten Programmen mit einer umfangreichen Implementationsstruktur, die flächendeckend umgesetzt werden können.

Ziel dieser Dissertation ist es daher, 1.) zu untersuchen, inwieweit familiäre Risikofaktoren Einfluss auf kindliche Entwicklungsoutcomes im Kontext der Kindertagesstätte

ausüben, 2.) wie diese Effekte von Fachkräften aufgegriffen werden können und 3.) die Entwicklung, den Inhalt sowie die formative und summative Evaluation des Präventionsprogramms Papilio-U3 (Ortelbach et al., 2022) zu beschreiben, das sich an pädagogische Fachkräfte in der Kindertagesstätte richtet. Das Programm Papilio-U3 zielt auf die Förderung einer feinfühligen Fachkraft-Kind-Interaktion und damit auf die Förderung der sozial-emotionalen Entwicklung und Bindungssicherheit der Kinder zu ihren Fachkräften. Papilio-U3 wurde in einem Forschungsprojekt von Teams der Freien Universität Berlin, der Friedrich-Alexander-Universität Erlangen-Nürnberg und der Papilio gGmbH, Augsburg, entwickelt und evaluiert. Die Evaluation erfolgte in einer multizentrischen, randomisierten Interventions- und Wartekontrollgruppenstudie, die drei Messzeitpunkte umfasste und zahlreiche Outcome-Maße und wichtige Kovariate auf Fachkraft- und Kindebene (z.B. Beobachtungs-, Fragebogen- und Entwicklungstestdaten) erfasste.

Die Dissertation umfasst drei Manuskripte, die der Papilio-U3-Pilotevaluation entstammen. Ziel des ersten Manuskripts war es, die individuellen und institutionellen Risiko- und Schutzbedingungen für die Entwicklung sozial-emotionaler Kompetenzen und Probleme von Kindern in der Kindertagesstätte zu untersuchen. Das zweite Manuskript baute auf diesen Erkenntnissen auf und zielte darauf ab, das entwicklungsorientierte Präventionsprogramm Papilio-U3 einzuführen und erste Ergebnisse der Pilotevaluationsstudie vorzustellen. Ziel des dritten Manuskripts war es, die Wirksamkeit des Programms in Bezug auf die Fachkräfte zu evaluieren.

In *Manuskript I* wurden 56 pädagogische Fachkräfte gebeten, Angaben zu den Merkmalen der Kindertagesstätte, zu ihrer beruflichen Belastung und zu ihren Selbstwirksamkeitsüberzeugungen zu machen sowie die sozial-emotionalen Kompetenzen und Probleme der Kinder ihrer Gruppen zu beurteilen (N = 353). Zusätzlich machten die Eltern der Kinder Angaben zu familiären Risikofaktoren (proximales und distales Risiko). Um der genesteten Datenstruktur Rechnung zu tragen, führten wir Mehrebenenanalysen durch. Mehr proximale (aber nicht distale) Risikofaktoren sagten höhere sozial-emotionale Problemwerte der Kinder voraus. Wir fanden einen Trend für eine Cross-Level-Interaktion mit der Selbstwirksamkeit: Die Stärke des Zusammenhangs zwischen Risiko und Problemwerten der Kinder nahm mit zunehmender Selbstwirksamkeit der Fachkräfte ab. Alter, Geschlecht der Kinder und die Selbstwirksamkeit sagten die sozial-emotionale Kompetenz voraus: Höhere Kompetenzwerte fanden sich für Mädchen, bei älteren Kindern und bei einer höheren Selbstwirksamkeit der Fachkräfte.

Manuskript II gibt einen Überblick über die Entwicklung und Evaluation des entwicklungsorientierten Präventionsprogramms Papilio-U3 nach dem Intervention-Mapping-Approach (IMA, Bartholomew Eldredge et al., 2016): Beschrieben wurden der Prozess der Programmplanung, die Ableitung des Veränderungsmodells, die Darstellung von Programmdesign, -produktion und -implementierung sowie ein Überblick über die Evaluationsstudie. Für die formative Evaluation gaben die teilnehmenden Fachkräfte Rückmeldungen zu Fortbildungsinhalten, Methoden und möglichen Herausforderungen während der Programmdurchführung. Die Ergebnisse zeigten, dass sie im Allgemeinen mit den Inhalten und Methoden des Programms zufrieden waren und angaben, dass sie es anderen Fachkräften weiterempfehlen würden.

In *Manuskript III* wurden Eigenschaften der pädagogischen Fachkräfte (berufliche Belastung und Selbstwirksamkeitserwartung) als erste Outcomes der summativen Evaluation des Papilio-U3-Programms untersucht. Diese Eigenschaften sind in früheren Studien mit der Prozessqualität und Outcomes der Kinder in Verbindung gebracht worden. Die randomisiert einer Interventions- oder Wartekontrollgruppe zugeordneten teilnehmenden Fachkräfte (N = 125) gaben zu drei Messzeitpunkten ihre berufliche Belastung und Selbstwirksamkeit an. Längsschnittliche Kovarianzanalysen ergaben nach der Programmdurchführung höhere Selbstwirksamkeitsüberzeugungen der Fachkräfte der Interventionsgruppe im Vergleich mit der Wartekontrollgruppe (unter Kontrolle der Ausgangswerte). Die Gruppen unterschieden sich nicht signifikant in Bezug auf ihre berufliche Belastung.

Für die abschließende Diskussion der Dissertation fokussiere ich mich auf die Relevanz der Selbstwirksamkeitsüberzeugungen von pädagogischen Fachkräften, deren berufliche Belastung und die Wichtigkeit der Unterstützung von Fachkräften. Anschließend gebe ich einen Ausblick auf die weiteren Schritte der Programmevaluation. Eine Diskussion der Programminhalte konzentriert sich exemplarisch auf die Förderung des Emotion Talks und den Einsatz von Videofeedback. Zentrale praktische Implikationen der Ergebnisse dieser Dissertation umfassen die flächendeckende Implementierung des Papilio-U3-Programms, die Verbindungen von Papilio-U3 zu den beiden Folgeprogrammen für Vorschul- und Grundschulkinder, Papilio-3bis6 und Papilio-6bis9 (Lechner et al., 2022; Scheithauer & Peter, 2022), sowie die Bedeutung einer Präventionskette mit Programmen für Kinder im Alter von 0 bis 9 Jahren.

General Introduction

The main aim and scope of the present dissertation is to introduce the Papilio-U3 program (Ortelbach et al., 2022), a preventive intervention program that aims to foster social-emotional development and attachment security of children under the age of three to their teachers in Early Childhood Education and Care (ECEC) centers.

The objective of this general introduction is the delineation of vital theoretical and empirical background that underlie the program development. I will mainly focus on the age period of infancy and toddlerhood (0 to 3 years) since the program is directed to children of this age. As I will discuss, there are research areas, where evidence for these early years is scarce. Thus, I will complement these topics with information on the development of children in the preschool period or beyond.

I will begin this general introduction with a brief overview of different conceptual approaches to the investigation of social-emotional development (developmental tasks, milestones, and competence), the presentation of influential models of social-emotional development, and an outline of crucial milestones and processes of a child's social-emotional development during the first years of life. I will then examine the social processes that contribute to the social and emotional competence of a child. As the distal goal of the program is to prevent children from developing emotional or behavioral problems, I will briefly define problems in the emotional and social domain that may occur early in life as well as examine conditions that contribute to or may protect against the occurrence of problems (i.e., risk and protective factors). This leads to the principles of developmentally appropriate prevention that provide the framework for the development of the Papilio-U3 program and an account of the relevance of the ECEC context for early preventive interventions. I will close this introduction with a summary of the gaps in the research literature that I intend to address with this dissertation.

Social-Emotional Development in the First Years of Life

Over the course of their life, children and adolescents are exposed to numerous developmental tasks and attain social-emotional milestones that build up their competence. Models of social-emotional competence and development integrate a variety of abilities and skills and inform the design of developmentally appropriate prevention programs. Essential aspects of emotional competence develop over the first years of a child's life, and even rudimentary forms of social competence are present during infancy and toddlerhood.

Social-Emotional Development, Developmental Tasks, and Milestones

> The term social-emotional development refers to the developing capacity of the child from birth through five years of age to form close and secure adult and peer relationships; experience, regulate, and express emotions in socially and culturally appropriate ways; and explore the environment and learn—all in the context of family, community, and culture. (The Center on the Social and Emotional Foundations for Early Learning, 2001)

Developmental Tasks. Developmental tasks, milestones, or boundary stones have been proposed to organize these "developing capacities", that is, issues or changes in ontogeny in the social-emotional domain. The definition of developmental tasks, milestones, or boundary stones permits to identify similarities across individuals and to consider or compare interindividual differences and potential delays. Developmental tasks (sensu R. J. Havighurst, 1972; see also McCormick et al., 2011; Sroufe, 1979) comprise of broad tasks an individual is confronted with during a given age period. A successful attainment of those tasks would increase the likelihood of positive further development including well-being and adjustment. Examples of developmental tasks in the first three years of life include building attachment relationships, developing self or impulse control, and interactive or social play (R. J. Havighurst, 1972; McCormick et al., 2011; Mrazek & Haggerty, 1994; Sroufe, 1979). Developmental tasks are often shaped by societal or cultural values, norms, and expectations (McCormick et al., 2011).

Milestones and Boundary Stones. Milestones and boundary stones comprise of specific, well-defined developmental targets, skills, or abilities that a defined portion of the population demonstrate at a specific age (Michaelis et al., 2013; Zubler et al., 2022). Typically, this means 50% or 75% of the children in a specified age group for milestones and 90-95% for boundary stones, respectively. Thus, boundary stones may, to a greater degree, indicate or help to detect children with potential developmental delays that might require further diagnostical clarification. Examples of social-emotional milestones in the first and second year are gazing at their own mirror image (six months), showing basic emotional facial expressions (nine months), imitation of peers (15 months), or noticing others' distress (24 months; Zubler et al., 2022). Milestones and boundary stones are often utilized in the pediatric setting and are the basis for screening instruments that assess a child's developmental status in specified domains (e.g., Brief Infant Toddler Social Emotional Assessment, Briggs-Gowan et al., 2004; Ages & Stages Questionnaires, Squires & Bricker, 1999). Additionally, tools employed to observe and

document child development for the use of young children's caregivers incorporate milestones of the social-emotional and other domains (Mayr et al., 2010; Pauen, 2011; U. Petermann et al., 2011). More broadly, the knowledge of children's and adolescents' developmental tasks at given age periods are at the center of developmentally appropriate prevention approaches that aim to support individuals to attain developmental tasks to build individual competence (Malti et al., 2009, Scheithauer & Scheer, 2022; see below).

The Interplay of Social and Emotional Competence

Emotional Competence. Specific attainments, abilities, or skills in the social-emotional domain are often integrated into models of social and/or emotional competence (e.g., Denham, 2014; Saarni, 1999). The term competence is commonly considered the result of a successful accomplishment of age-specific developmental tasks (e.g., Masten & Coatsworth, 1998; Masten & Obradovic, 2006). A child's emotional competence can briefly be defined as "the demonstration of self-efficacy in emotion-eliciting social transactions" (Saarni et al., 2008, p. 376). Denham (e.g., Denham et al., 2011; Denham, 2014) defined three vital components at the core of emotional competence: emotional expressiveness, emotion knowledge, and emotion regulation. Saarni formulated the following eight skills that constitute emotional competence:

> Awareness of one's emotional state (…), Skill in discerning others' emotions (…), Skill in using the vocabulary of emotion and expression terms (…), Capacity for empathic and sympathetic involvement in others' emotional experiences, Skill in understanding that inner emotional state need not correspond to outer expression (…), Skill in adaptive coping with aversive emotions and distressing circumstances (…), Awareness that the structure or nature of relationships is largely defined by how emotions are communicated in the relationship (…), Capacity for emotional self-efficacy (Saarni et al., 2008, p. 376).

Social Competence. Whereas several skills are subsumed under the construct of emotional competence that children attain from the first months of life onward, definitions of social competence and related abilities or skills typically focus on older children, adolescents, or adults (e.g., Rose-Krasnor, 1997). Rose-Krasnor (1997) pointed to the effectiveness in social interaction as the core feature of social competence, defined as "the ability to achieve personal goals in social interaction while simultaneously maintaining positive relationships with others over time and across situations" (Rubin & Rose-Krasnor, 1992, p. 285). Models of social competence include a vast number of knowledge components, abilities, and skills as part of this construct. Numerous reviews and meta-analyses investigated the construct of social

competence and its associations (e.g., Caldarella & Merrell, 1997; Huber et al., 2019; Hukkelberg et al., 2019; Trentacosta & Fine, 2010). Caldarella and Merrell (1997) proposed a taxonomy of social skills of children and adolescents, but, notably, studies that were integrated into this review only involved children older than three. Similarly, more recent meta-analyses on correlates of social competence primarily focused on preschoolers or older children and adolescents (Huber et al., 2019; Hukkelberg et al., 2019; Trentacosta & Fine, 2010). If they included younger toddlers, children of the incorporated studies had still been, on average, three years old or older (Hukkelberg et al., 2019). Scheithauer and Peter (2022, p. 25) reviewed the literature on social competence with a focus on preschool-aged children and compiled four crucial features that characterize socially competent children as indicated by research:

- Successful adaptation to the social context,
- Positive relationships with peers,
- Positive relationships with teachers,
- Prosocial behavior (e.g., sharing, cooperation, social interaction).

In conclusion, while a bulk of theoretical models and empirical research addresses social competence, there is as shortage of concepts and findings that are specific for infant and toddler children.

Social-Emotional Competence. Most importantly, emotional and social competencies are theoretically and empirically intertwined. For example, Halberstadt and colleagues' (Halberstadt, Denham, & Dunsmore, 2001; Halberstadt, Dunsmore, & Denham, 2001) Affective Social Competence model proposes four central abilities (affective or emotional awareness, identification, adjustment to context, and management or regulation) that form the basis for three components or processes involved in socially competent behavior: sending and receiving affective messages as well as experiencing an emotion or affect. The authors emphasize the importance of the social context for the development of social-emotional competence as do other social-cultural models of emotional development (e.g., Holodynski, 2005; Mesquita & Leu, 2007; Shweder et al., 2018). Numerous studies have empirically documented the relations between social and emotional competencies in toddlerhood or early childhood (Carter & Briggs-Gowan, 2006; Denham et al., 2012; Denham et al., 2014).

Attachment in Infancy and Toddlerhood

The close interplay between emotional and social competence is particularly apparent during the infant and toddler period. Most prominently, attachment theory focuses on the "emotional bond" between a child and their caregiver, where attachment is defined as "[. . .] a

relatively long-lived tie in which the partner is important as a unique individual, interchangeable with none other, from whom inexplicable involuntary separation would cause distress, and whose loss would occasion grief“ (Ainsworth, 1985, p. 799). Signs of a child's emotional arousal may serve as expressions of their activated attachment behavior system (e.g., signaling behaviors, such as calling or crying) and elicit, in turn, the activation of their caregiver's (e.g., parents) caregiving system. Their sensitivity to the child's signals includes acts of responding to, sharing, communicating about, and regulating an infant's emotions and are related to the emergence of a child's attachment security (Cassidy, 2016; DeWolff & van Ijzendoorn, 1997; Pasco Fearon & Belsky, 2016). Securely attached children are able to use their caregiver as a safe haven to return to if they feel insecure, afraid, or distressed, and as a secure base for exploring and learning (Cassidy, 2016). Attachment theory has even been conceptualized as emotion regulation theory (Spangler & Zimmermann, 1999). Spangler and Zimmermann (1999) argued that Internal Working Models of attachment may serve as regulatory mechanisms to control or coordinate different aspects or subsystems of emotions (e.g., cognition, affect, expression) and thus affect how individuals perceive and interpret emotions, and communicate emotions more or less coherently or appropriately.

Early Emotional Competence

The emergence of specific skills and aspects that are subsumed in different models of emotional competence is embedded in the emotional development over infancy, toddlerhood, and beyond. Different theoretical orientations on the study of emotions and emotional development are concerned with specific research questions. They differ, for example, in their views on which states should be considered discrete emotions or which functions emotions have. Sociocultural models of emotions emphasize the importance of developmental context and emotion socialization strategies of a child's caregiver (Holodynski, 2005). Caregivers repeatedly verbalize and link causes of emotions, the child's emotion expression, and an adequate response and contribute, thus, to the development of fully functioning emotions from precursor emotions (Holodynski, 2005).

Newborns' expressions of negative emotional states are undifferentiated and become more pronounced over their first months of life. They are increasingly able to express sorrow, anger, and fear (Lewis, 2008; Mitsven et al., 2020; Zubler et al., 2022). Although newborns already smile, only in the second half of their first year infants integrate smiling into their increasingly intentional communications with their caregivers (Lewis, 2008; Mitsven et al., 2020). The expression of positive emotions is particularly dependent upon caregivers' face-to-

face interactions with their children (Izard, 2002; Mitsven et al., 2020). Pertaining to the verbal expression of emotions, children grow a passive understanding of simple emotion words over their second year of life and are capable of having basic conversations about emotions by the end of the second year (Harris, 2008; Underwood, 1997). Only from the age of three do they grow more confident in naming the emotions of other people and causes of their own or others' emotions (Harris, 2008). Importantly, the passive understanding of emotional vocabulary precedes their active use. Milestones of emotion understanding comprise the growing recognition and labeling of own and others' emotions and the understanding of the situational influences on emotions over the third year of life (A. L. Gross & Ballif, 1991; Harris, 2008). Bridges and Grolnick (1995) proposed a model of sequential stages of the development of emotion regulation: They described infants' early regulation strategies such as diverting their attention by directing their gaze, self-comforting (e.g., thumb-sucking), or interactive strategies (e.g., seeking proximity to their caregivers). However, a child's capacity for emotion regulation develops is particularly embedded in their social context (i.e., the family): Caregivers are seen as important co-regulators of their infants' emotions (Denham et al., 2007; Holodynski, 2005).

Insights into a child's emotional development and their emerging emotional competence contain vital resources to derive practical implications for child-rearing practices and their use in prevention and intervention (Izard, 2002): Examples include the induction of positive emotions, modulating emotional responses, or the consideration of a child's emotional patterns and temperament (Izard, 2002). Research also points to the importance of caregivers' assistance in a child's emotion regulation. Although toddlers between two and three years of age are increasingly able to self-regulate negative emotions, they are still dependent on their caregivers in more difficult emotional states that exceed their regulatory competence (Holodynski, 2005).

Early Social Competence

Although the characteristics of socially competent children listed by Scheithauer and Peter (2022, p. 25, see above) are predominantly derived from research with older children, all of these aspects are either already present in infancy and toddlerhood in an at least rudimentary form or the foundation for later fully developed social competence are laid in these early age period. Two specific topics that cover important areas of (early) social competence were addressed in past research: the development of prosocial behavior and early peer relationships.

Prosocial Behavior. Seminal empirical works documented a variety of ways in which infants and toddlers demonstrate signs of prosocial behavior (Zahn-Waxler & Radke-Yarrow, 1982; Zahn-Waxler et al., 1992). Those signs include physical and verbal comfort, advice,

helping, sharing, and distraction. Zahn-Waxler et al. (1992) demonstrated that around half of children as young as 12 months showed at least one of these prosocial responses and one year later, nearly all of them showed these behaviors. Primarily physical forms of prosocial behavior were complemented by more and more complex forms over the course of the second year of life. In recent years, three broad areas or aspects of toddlers' prosocial behavior emerged from the literature: instrumental helping, sharing, and comforting (Paulus, 2014; Dunfield, 2014; Dunfield & Kuhlmeier, 2013). Children are capable of helping others from the first birthday on and helping behavior increases over the first half of the second year (Svetlova et al., 2010; Warneken & Tomasello, 2006, 2007). Children share with others from the second year on, with an increase between 18 and 24 months (Brownell, Iesue, et al., 2013; Brownell et al., 2009). Finally, toddlers comfort others who are emotionally distressed, however, comforting only develops between the second and fourth year of life (Dunfield & Kuhlmeier, 2013). Toddlers may address prosocial acts towards their peers, for example, they would share toys as a means to start a play interaction or comfort distressed peers (Demetriou & Hay, 2004; Hay et al., 1991).

Peer Relationships. Although the literature on peer relationships of children and adolescents has extensively grown over the last decades (Rubin et al., 2006), comparably much less is known about the peer relationships of infants and toddlers. Topics that emerge from the research on early peer relationships are cooperation and play, conflict, and the development of early friendships (Ahnert, 2011; Hay et al., 2018; H. Ross et al., 2010). Studies of early friendships are relatively scarce but show that young children do in fact form friendships (Howes, 1987, 1988; Vandell & Mueller, 1980; Whaley & Rubenstein, 1994). Howes (1987) proposed a model of developmental sequences to describe the changing appearances of early peer relationships and friendships: In infancy, children form preferential relationships with playmates, but from the toddler period on, they build stable friendships. While friendships of older children and adolescents contain reciprocal, intimate and affective aspects (Newcomb & Bagwell, 1995; Rubin & Bowker, 2018), definitions of early friendships differ in complexity. Whaley and Rubenstein (1994) suggested three features to define toddler friendships: time spent together, continuity, and mutual preference. From observations of toddler pairs between 22 and 36 months of age, they identified five dimensions that further characterize toddler friendships: helping, intimacy, loyalty, sharing, and similarity. These characteristics are predominantly expressed and experienced during toddlers' cooperative play. Hallmarks of cooperative play episodes among toddlers are the coordination of the play by imitation, complementary, and reciprocal actions and studies show that early peer pairs are successful during cooperative problem-solving tasks (Brownell et al., 2006; Eckerman & Didow, 1996; H. S. Ross, 1982).

Similar to cooperative play, conflicts with peers occur approximately from the first birthday on and become more frequent in the course of the second year (Caplan et al., 1991; Eckerman et al., 1975; Holmberg, 1980). These conflicts center mostly around possession and are predominantly of a social nature (Friedman & Neary, 2008; Hay & Ross, 1982). Hay and Ross (1982), for example, investigated 21-month-old toddler pairs and observed disputes over toys of which there would have been several duplicates available and that the children shifted their attention away from a toy in the center of a conflict right after the conflict had been resolved. Hay (2017) thus argues that the majority of behaviors during toddler conflicts are predominantly instrumental in the way that toddlers, for example, pull toys that a peer is holding. Conversely, the use of physical force or frequent and intense aggression is rare, but in combination with lower emotion regulation skills might be a predictor for later aggressive behavior (Baillargeon et al., 2007; Calkins et al., 1999; Hay et al., 2000; Hay et al., 2014; NICHD Early Child Care Research Network, 2004; Rubin et al., 2003). Thus, early conflict and aggression with peers may be predictive of later externalizing problems (Hay et al., 2000; Rubin et al., 2003) and merit the attention of caregivers.

Socialization of Children's Social-Emotional Development

Only in recent years, have investigations expanded their efforts to examine to what extent the ECEC context and ECEC teachers impact a child's development of social-emotional competence. In contrast, a bulk of the research focused on the role of the family or parents as primary socializers for emotional and prosocial development. Thus, a review of this literature is essential to derive hypotheses on how these approaches to emotional socialization can be adopted to the ECEC context and be integrated into intervention programs.

Socialization of Emotion

Drawing directly on models of social-emotional competence or evidence on social-emotional milestones, scholars gathered directions for caregivers' emotion socialization (e.g., Denham, 2014; Saarni, 1999; Spinrad et al., 2020). According to Denham (2014), emotion socialization comprises:

- Modeling of emotional expressiveness,
- Contingent reactions to a child's emotions, and
- Teaching about emotions.

Proposed models of emotion socialization integrate diverse lines of research and allow caregivers to support a child's social-emotional development and foster their competence

(Eisenberg et al., 1998; A. S. Morris et al., 2007). A. S. Morris et al. (2007) organized the literature on social influences on a child's emotion regulation in their tripartite model of familial influence. They identified three mechanisms or processes by which family variables may impact the development of a child's emotion regulation: observation/modeling, parenting practices, and the emotional climate of the family.

Observation/Modeling. The first mechanism, observation or modeling of parental emotion regulation, contains the idea that children directly learn emotion expression and emotion regulation strategies by observing their parents (Parke, 1994). A crucial process involved is social referencing: Young children use their caregiver as a reference on how to interpret an uncertain situation or on the appropriate behavioral response. From the second half of the first years, infants use eye contact to orient themselves with their caregivers' behavior, and from around their first birthday on, children can use their caregivers' emotional facial expressions as a reference (Friedlmeier, 1999; Klinnert et al., 1983).

Emotion-Related Parenting Practices. Second, caregivers use emotion-related parenting practices that are either supportive or detractive of children's emotional development. Practices that support a child's emotional regulation and social-emotional competence comprise of positive (as opposed to negative, dismissing, or punitive) reactions to a child's emotions as well as an "optimal" balance of encouragement and control of a child's emotions (Eisenberg et al., 1992; Eisenberg et al., 1996; Roberts & Strayer, 1987). Further, caregivers may support children by explicitly teaching age-appropriate, constructive emotion regulation strategies such as attention shifting or reframing and by deliberately selecting or avoiding situations that may elicit emotional reactions from their children (Aspinwall & Taylor, 1997; Gilliom et al., 2002; Parke, 1994). Another, more comprehensive, concept in the context of emotion-related practices is "emotion coaching" (Gottman et al., 1997; Gottman & Gottman, 2013). Gottman and colleagues described emotion coaching parenting as an interplay of the awareness of a child's emotions, recognizing emotion as an opportunity for connection and teaching, verbally labeling emotions, communication of empathy and understanding, and limit setting and problem-solving.

Emotional Climate. Third, the emotional climate of the family impacts children's social-emotional development, including aspects such as attachment security, family expressivity of emotions, and partnership quality. A secure attachment relationship to primary caregivers is an important predictor for a child's adjustment in the social-emotional domain (Groh et al., 2014; Thompson, 2016). Furthermore, studies show positive effects of parents' expression of positive emotions and a moderate extent of expressing negative emotions in an age-appropriate way on

children's social-emotional development (Cumberland-Li et al., 2003; Eisenberg et al., 2003; Halberstadt et al., 1999). Conflicts between caregivers or within the family as a whole also reflect the emotional family climate and are associated with child negative emotionality and maladjustment such as internalizing or externalizing behavior (Cummings & Davies, 2002; Davies & Cummings, 1998; Kerr et al., 2021).

Social Influences on Prosocial Behavior

In conclusion, much research has been dedicated to the question of how caregivers impact a child's development of emotional competence, self-regulation, or emotional problems. Due to the close interplay between emotional and social competence, results of the discussed studies often integrated not only emotional but also social child outcomes. Roberts and Strayer (1987), for example, investigated parents' encouragement of a child's emotional expressivity and integrated teacher-rated competence scales as outcomes that included aspects of social competence such as cooperation or peer competence. Spinrad and Gal (2018) argued that parental practices that would support the development of prosocial behavior would exert their effect through a child's increased emotional competence.

Additionally, a unique line of research in the domain of social competence investigated socialization mechanisms on the development of prosocial behavior (Brownell, 2016; Spinrad & Gal, 2018; Wong et al., 2021). Parents are hypothesized to play an important role in the development of their children's prosocial behavior. Empirical investigations on the benefits of specific parenting practices are extensive, though the magnitude of detected effects are not large (Hastings et al., 2007; Wong et al., 2021). Nonetheless, there is evidence that supportive parenting practices include an authoritative parenting style, warmth and sensitivity, encouragement, and inductive parenting. Inductive parents strive to impart norms and moral principles by explaining rules, sensitizing their children to the needs and well-being of others and pointing out potential consequences of children's actions for others. Conversely, an authoritarian parenting style, psychological or harsh control with strict limit-setting and punishment is viewed as associated with less prosocial in children (Brownell, 2016; Hastings et al., 2007; Spinrad & Gal, 2018; Wong et al., 2021).

It is noteworthy that although toddlers are generally capable of prosocial behavior, they vary greatly in the number of prosocial actions they exhibit (Eisenberg et al., 2006). Studies on "prosocial prompts" by caregivers document that a toddler's prosocial actions may be facilitated if caregivers ask children to help or share by explicitly stating their standards, needs or desires (Brownell et al., 2009; Hay & Murray, 1982; Reschke et al., 2022; Svetlova et al., 2010).

Insights into causes and processes that underlie a child's emotional and prosocial development are important to inform the design of preventive interventions with the aim to foster prosocial behavior and prevent potential developmental delays or social-emotional problems (Spinrad & Gal, 2018).

Early Social-Emotional Problems and Prevention

Delays or deficits in the development of social-emotional competence may indicate signs of early maladjustment or translate into subsequent problems or disorders. Psychosocial risk factors may help to understand the occurrence and perpetuation of early social-emotional problems and, in combination with promotive and protective factors, lay the foundation for developmentally appropriate prevention programs.

Early Social-Emotional Problems and Later Adjustment

Problems and disorders in childhood and adolescence may appear in a multitude of forms. Classification systems such as the multi-axial Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood (DC:0-5, ZERO TO THREE, 2016) comprehensively cover disorders present in the first years of a child's life. The DC:0-5 describes a child's mental health problems and disorders on five axes: Axis I (clinical disorders) comprises diagnostic criteria for disorders; those include early manifestations of mental disorders that are comparable with disorders diagnosed in adults (e.g., anxiety or mood disorders) as well as disorders that are specific for or primarily arise during the period of infancy and toddlerhood (e.g., neurodevelopmental disorders such as autism spectrum disorder, crying disorder of infancy/early childhood, or reactive attachment disorder). The remaining DC:0-5 axes capture the relational context of problems and disorders, physical health conditions and considerations, psychosocial stressors, and a child's developmental competence.

In contrast to categorical classifications of children's mental health problems, dimensional approaches usually pertain to the two broad dimensions of internalizing and externalizing symptoms (Achenbach et al., 2016; Achenbach & Rescorla, 2020; Goodman et al., 2010). Internalizing (or emotional) problems comprise emotional or mood problems such as anxiety and depressive or somatic symptoms, whereas externalizing (or behavioral) problems comprise acting out, aggression, disruptive, oppositional-defiant behavior, or substance abuse.

Early signs of dysregulation and social-emotional problems are already present in infancy and toddlerhood (Alakortes et al., 2017; Basten et al., 2016; Edwards & Hans, 2015; McDonald et al., 2016), although it is important to note that externalizing "symptoms" are also expressions

of emotional and self-regulatory capacities that have yet to develop during toddlerhood and are thus somewhat normative (van Zeijl et al., 2006). Early problems may continue into later childhood and adolescence. There is clear evidence for the prediction of later maladjustment by infant regulatory problems (Cook et al., 2019; Hemmi et al., 2011), and also problems in the social-emotional domain (including non- or sub-clinical abnormalities), that occur early in life have repeatedly been proven to persist into childhood or predict childhood social-emotional problems (Basten et al., 2016; Edwards & Hans, 2015; Mäntymaa et al., 2012).

Risk and Protective Factors for Social-Emotional Problems and Adjustment

Emotional and behavioral maladjustment has been associated with a variety of early risk factors. Models of developmental psychopathology, childhood vulnerability, and resilience hypothesized how the interplay between risk and protective factors explains further developmental outcomes (Luthar et al., 2000; Masten, 2001; Sameroff, 2012; Scheithauer et al., 2022; Sroufe, 1997). Risk factors or risk-increasing conditions are conceptualized as variables that precede outcomes in time and raise the probability of negative developmental outcomes (Kraemer et al., 1997; Masten, 2001), while promotive and protective factors are associated with desirable outcomes. Promotive factors or resources increase the probability of favorable developmental outcomes in terms of positive main effects, whereas moderating protective factors buffer the impact of risk-increasing factors (Lösel & Farrington, 2012; Luthar et al., 2000; Sameroff, 2012; Scheithauer et al., 2022).

Risk Factors. Research of the last decades compiled a vast amount of records on diverse sets of risk factors and conditions for a child's development (F. Petermann et al., 2000; Zeanah et al., 1997). These conditions have been categorized in different ways, for example, in terms of "origin" or proximity to the child. Vulnerability or factors in the child include temperamental traits or disorganized attachment and factors in the environment include dysfunctional parenting practices. Distal factors (e.g., poverty, early parenthood) are hypothesized to affect a child's development via proximal factors or mediators (e.g., insensitive caregiver interaction). Research further aimed to elucidate the mechanisms of how risk factors are exhibited and focused on single risk factors (e.g., socioeconomic status, Letourneau et al., 2013; Reiss, 2013) or specific child outcome areas (e.g., child abuse and neglect, Mulder et al., 2018; Stith et al., 2009). Driven by the realization that the presence of single risk factors are very uncommon, cumulative risk indices comprise of a number of individual variables that are combined and used to predict child adverse outcomes (Evans et al., 2013; Laucht et al., 1997; Sameroff, 2012). Family risk factors are associated with social-emotional development in the first years of life

(Laucht et al., 1997; McDonald et al., 2018; Palmer et al., 2013; Peralta-Carcelen et al., 2017; Whittaker et al., 2011) and family risk factors present in infancy and toddlerhood continuously predict maladjustment, behavior problems, and disease in older children, adolescents and adults as well (Appleyard et al., 2005; Felitti et al., 1998; Miner & Clarke-Stewart, 2008; Murray et al., 2010; Sameroff, 2012). Risk factors may also increase the probability of the association of early regulatory problems with later behavioral problems (Hemmi et al., 2011).

Attachment, Promotive and Protective Factors. In contrast to the fairly deficit-oriented view of research on risk factors, social-emotional competence of preschoolers and elementary school children has been demonstrated to serve as a promotive factor and is associated with cognitive competence and achievement in school (Blankson et al., 2013; Denham et al., 2012; Gut et al., 2012; Trentacosta & Izard, 2007) as well as health and well-being in adults (D. E. Jones et al., 2015). Particularly in infancy and toddlerhood, a child's secure attachment relationships to their primary caregivers are commonly considered as a promotive or protective factor for their subsequent social-emotional development (Groh et al., 2017; Thompson, 2016). Securely attached children have advantages in their emotion understanding, emotion regulation, and coping skills including the utilization of social support (Cooke et al., 2019; Mikulincer & Shaver, 2019; Thompson, 2016; Zimmer-Gembeck et al., 2017). In addition, attachment security is associated with social competence (Groh et al., 2014; J. T. Gross et al., 2017; Schneider et al., 2001). Meta-analytic results for associations of attachment security with peer competence are stable across various types of social competence assessment (i.e., self-reports, sociometrics, observations), but differed in the stronger effects of attachment security on social competence with non-friends as compared with friends were found (Groh et al., 2014). Conversely, insecure or disorganized attachment increases the risk for child maladjustment, internalizing, or externalizing symptoms, with meta-analyses detecting the strongest and most consistent associations of insecurity/disorganization with externalizing problems (Groh et al., 2012; Madigan et al., 2013; Pasco Fearon et al., 2010; van Ijzendoorn et al., 1999).

Prevention and Intervention in Infancy and Toddlerhood

Known risk factors for maladjusted child development and their interaction with promotive and protective factors are the center of approaches to developmentally appropriate prevention (cf. Malti et al., 2009; Scheithauer & Scheer, 2022). Specifically, developmentally appropriate preventive intervention programs comprise three core objectives: to contain age-specific risk-increasing conditions, promote age-specific risk-reducing conditions, and support children and adolescents to master vital developmental tasks and transitions.

Interventions for Parents and Families. Prevention programs and interventions for families have been developed by experts with diverse theoretical backgrounds, including behavior-oriented approaches (e.g., 1-2-3 Magic, Phelan, 2010; Triple P, Sanders, 2012), emotion-focused approaches (e.g., Emotion Coaching, Gottman et al., 1997; Tuning in to Kids, S. S. Havighurst & Kehoe, 2021), mindfulness-based approaches (e.g., Mindful Parenting, Duncan et al., 2009), and attachment-based approaches (e.g., Attachment and biobehavioral catch-up, Dozier et al., 2018; Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline, Juffer et al., 2017; Circle of Security, Powell et al., 2013). Family-based interventions proved effective to change parent-related outcomes (e.g., educational competence or parent mental health) and child-related outcomes (e.g., internalizing or externalizing behavior). Unsurprisingly, effects vary considerably across studies and outcomes. Commonly, effects on the parent level were stronger as compared with effects on the child level, and programs yielded greater effect sizes for children's externalizing (in contrast to internalizing) symptoms, although internalizing child outcomes have been studied less frequently (Dretzke et al., 2005; Lundahl et al., 2006; Mingebach et al., 2018; van Aar et al., 2017; Weber et al., 2019; Weiss et al., 2022).

Attachment-Based Interventions. Especially for parents of infants and toddlers, a lot of interventions focused on attachment, given the significance of secure attachment relationships for children in the first years of life. Rooted in attachment theory, the vast majority of respective programs focus on parents' sensitivity, while other points of intervention involved mental representations (e.g., affecting parents' internal working models) or support for burdened parents (Bakermans-Kranenburg et al., 2003; Berlin et al., 2016). Effective attachment interventions proved to foster (mothers') sensitive behavior toward their children, children's attachment security, and reduce internalizing and externalizing problems of children (Bakermans-Kranenburg et al., 2003; Jugovac et al., 2022; Letourneau et al., 2015; Mountain et al., 2017). A great deal of attention has been given to providing support for families from disadvantaged backgrounds that are afflicted by a cumulation of risk factors. STEEP (Steps Toward Effective, Enjoyable Parenting), for example, addresses high-risk young mothers and provides an intensive program including group sessions and home-visits over the course of the first two years after a child's birth (Farrell Erickson & Egeland, 2004; Suess et al., 2016).

ECEC as Context for Social-Emotional Development and Prevention

Other developmental contexts come into focus, notably the ECEC context, in light of the evidence of sustained impact of family risk factors, along with promising approaches from

effective parenting programs. In Germany, an increasing number of children under the age of three attend ECEC. Especially young children benefit from warm and caring relationships with their teachers that may take the form of attachment relationships. Thus, attachment-focused prevention programs have been developed to foster sensitive teacher-child interactions and early social-emotional competence.

For most children, the first non-familiar context they come into contact with is the ECEC microsystem. In Germany, the legal entitlement to nonparental childcare for all children beyond the first year of life (Child Support Act, Kinderförderungsgesetz - KiföG, 2008) led to a strong increase in the rate of childcare for children under the age of three, from 13.6% in 2006 to currently 35.5% (Statistisches Bundesamt, 2022). With the introduction of the Day Care Expansion Act (Tagesbetreuungsausbaugesetz - TAG, 2004), quality criteria for the upbringing and education in ECEC had been determined, which included not only the physical and mental but also the "social [and] emotional [...] development of the child" (§ 22 Tagesbetreuungsausbaugesetz - TAG, 2004). Not only currently but also in prior years, accordingly, investigating the quality of ECEC has been the focus of several major and minor, national and international research projects. Prominent and influential examples include the NICHD Study of Early Child Care and Youth Development (NICHD Early Child Care Research Network, 2001b), Cost, Quality, and Child Outcomes Study (Helburn, 1995), Early Head Start Research and Evaluation (Administration for Children & Families, 2023), and NUBBEK (Tietze et al., 2013). Besides plenty of insights into the different facets of childcare quality and their interplay, studies established that ECEC may indeed serve as a buffer for children with adverse backgrounds: Children from families with a lower socioeconomic status may especially benefit from high-quality childcare (Côté et al., 2008; Loeb et al., 2007; Votruba-Drzal et al., 2004) which, accordingly, may mitigate the effects of family risk factors for maladaptive development. For this purpose, the role of ECEC teachers is of particular importance.

Socialization of Emotion in ECEC

Reviews of ECEC teachers' role in children's social-emotional development (Mortensen & Barnett, 2015; Valiente et al., 2020) broadly focused either on the general relationship quality between ECEC teachers and children or on ECEC teachers' reactions to the emotions of children. Mortensen and Barnett (2015) discussed studies that identified sensitivity, responsiveness, verbality, cognitive stimulation, attention, and support as characteristics of high-quality teachers. Although studies clearly state the importance of teachers' interaction

quality for children's social-emotional development (Love et al., 2005; NICHD Early Child Care Research Network, 1998, 2001a), evidence on particular emotion socialization practices in the ECEC context only accumulated in recent years (e.g., Denham et al., 2020; Denham et al., 2022; Li et al., 2022; Ornaghi et al., 2022). For example, Denham et al. (2022) found that aspects of ECEC teachers' reactions to a child's emotions (e.g., positive emotional responses or supportive reactions) were somewhat related to their emotions (e.g., sadness or positive emotional responsiveness) as well as their competence with their peers (operationalized as sensitive/cooperative behaviors directed at peers).

ECEC Teachers as Attachment Figures

While the construct of childcare quality can be defined in a variety of ways, particularly for infants and toddlers, a child's relationship with their teachers is widely considered fundamental (Cadima et al., 2020). Attachment researchers agree on the notion that these relationships may in fact qualify as attachment relationships (Ahnert, 2021; Howes & Spieker, 2016; Pasco Fearon & Schuengel, 2021): Securely attached children explore their environment and engage in interactions both with their teachers and peers (teachers as secure base), and reach out to their teacher in uncertain situations or when they are hurt, sad, or frightened (teachers as safe haven). It is important to note, however, that children may form attachment relationships with their teachers, but not all children do: Some remain nonattached (Ahnert et al., 2000; Ahnert & Lamb, 2000; Goossens & van IJzendoorn, 1990). To address the question if, as with primary caregivers, teacher-child attachment relationships are the results of their individual relationship history, the research investigated predictors of attachment security. In parent and child dyads, (dyadic) sensitivity had proved as a weak to moderate, but stable predictor of children's attachment security (DeWolff & van Ijzendoorn, 1997; Lucassen et al., 2011; Zeegers et al., 2017). Conversely, teacher-child attachment security is predicted by teachers' sensitive, group-oriented behavior (Ahnert et al., 2006; Ereky-Stevens et al., 2018). This group-oriented sensitivity is characterized by teachers' appropriate and prompt response to the needs of the individual child while they simultaneously consider the needs of the entire group of children (Ahnert, 2014). Furthermore, studies established links between secure attachments to teachers and positive child developmental outcomes. Particularly in early childhood, attachments to teachers were associated with social competence (Ahnert, 2009; Howes et al., 1994; van IJzendoorn et al., 1992). However, in later development, children's relationships with their peers seem to grow in importance (Howes et al., 1998; Howes & Tonyan, 2000).

Prevention and Intervention Programs in ECEC

Drawing on the potential of ECEC as a resource for a child's subsequent positive development, several prevention and intervention programs have been designed to be implemented in the ECEC context. Children's social-emotional competence is considered an essential target of school-based preventive interventions (Domitrovich et al., 2017) and there is strong evidence for the efficacy of programs to promote social-emotional competence in the school setting (T. N. Barnes et al., 2014; Durlak et al., 2011; Garrard & Lipsey, 2007; Taylor et al., 2017; Wilson & Lipsey, 2007).

For teachers of infants or toddlers, interventions usually focused on the interaction processes and behaviors of teachers to foster close (or secure attachment) relationships with the children in their care. While the scientifically sound promotion of attachment security in ECEC is still an evolving field of research (Shirvanian & Michael, 2017), several meta-analyses investigated the effects of ECEC intervention programs on a variety of outcomes (Egert et al., 2018; Fukkink & Lont, 2007; Luo et al., 2022; Nelson et al., 2003; Werner et al., 2016). These programs proved effective with small to moderate sizes of effects on teacher variables such as knowledge, attitudes, or interaction quality and mostly smaller effects on children variables such as social-emotional or communicative skills. Notably, only a small number of studies contained in the meta-analyses were conducted with children in ECEC under the age of three.

However, there are a number of evaluated ECEC programs that specifically addressed children under the age of three and their teachers. A recent example is the Toddlers Empathy Prosociality Program (Brazzelli et al., 2021; Ornaghi et al., 2017): ECEC teachers are trained to read stories with emotional and prosocial content to a small group of children and afterwards converse about inner states and prosocial behavior. The program was shown to increase emotion knowledge and prosociality in toddlers. Van IJzendoorn and colleagues adapted their primarily attachment-based Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD) for the use in ECEC centers (Juffer et al., 2017). Principles of sensitive parenting include, for example, the guidance to better understand children's attachment and exploration behavior, verbalizing the child's needs, or sharing emotions. These principles are complemented by aspects of sensitive discipline (e.g., inductive discipline and distraction, or positive reinforcement). The core of the intervention is the video-feedback method: Over a moderate number of sessions trainers or intervenors discuss video-typed parent-child interactions with the parents (Juffer et al., 2017). Adaptations of the VIPP-SD for the ECEC setting have, in some of the effectiveness studies, shown effects on ECEC teachers' attitudes

and sensitivity and children's wellbeing (Groeneveld et al., 2011, 2016; Werner et al., 2018). Thus, these programs yield encouraging results and provide opportunities for teachers in ECEC to further strengthen their relationships to the young children in their care and foster children's social emotional competence.

Summary and Conclusion

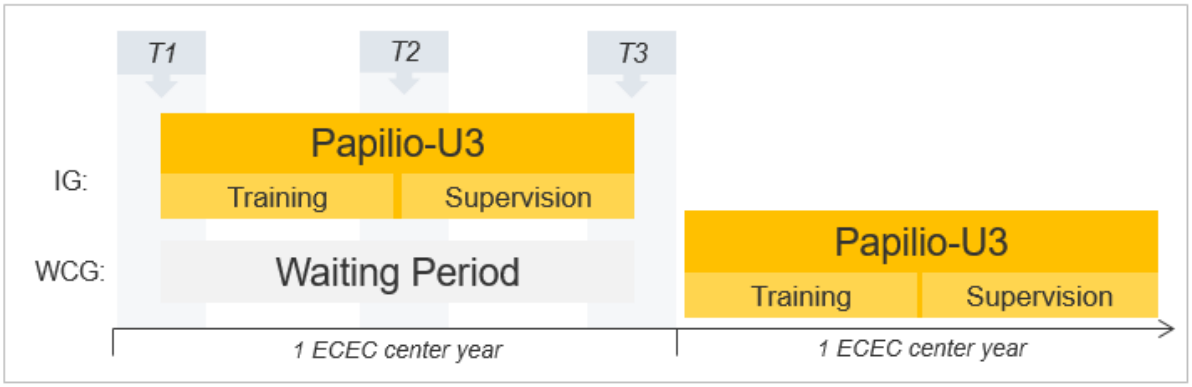
Over the first years of their life, children develop early social-emotional competencies such as emotion expression and understanding, emotion regulation, early forms of prosocial behavior, or early relationships with their peers. Deficits or problems in the social-emotional domain are predicted by early risk factors that can be addressed by early preventive intervention programs. These programs have repeatedly been shown to be effective in targeting teacher variables such as knowledge, attitudes, or teacher-child interaction quality and in addressing children variables such as social-emotional or communicative skills. Notwithstanding, most of the examples of effective ECEC prevention or intervention programs are international programs. Additionally, although there are many programs to foster social-emotional development or social-emotional learning, the majority of programs are directed at preschoolers or school-aged children (Blewitt et al., 2018; McCabe & Altamura, 2011). In German-speaking countries, single projects to develop and evaluate ECEC prevention programs for children under the age of three have been initiated (Binationales Zentrum Frühe Kindheit, 2022; Heidelberger Präventionszentrum, 2022), but to date, they still lack findings from evaluation studies or are not implemented widely. Thus, there are several gaps in the literature, that I intend to address in the present dissertation: First, there is still scarce evidence on how family risk factors exert their influence on a child's developmental outcomes over and above the family context and how these effects can be addressed in ECEC, particularly by ECEC teachers. Building on these insights, second and most importantly, this dissertation centers around the development, description, as well as the formative and summative evaluation of a prevention program that addresses teachers in ECEC and aims to foster sensitive teacher-child interactions and by this, the social-emotional development and attachment security of the children to their teachers.

Overall Study Design

Building on the promising evidence of effective approaches for prevention in ECEC and the lack of respective programs in Germany, collaborating teams from Freie Universität Berlin, Friedrich-Alexander-Universität Erlangen-Nürnberg, and Papilio gGmbH initiated a research project[2] that involved the development and evaluation of the preventive intervention program Papilio-U3. This project constituted the context for the present dissertation.

Figure 1

Planned Study Design and Measurement Waves of the Papilio-U3 Pilot Evaluation



Note. T1/T2/T3 = measurement occasions (waves 1, 2, 3, resp.); IG = intervention group, WCG = waiting-control group; ECEC center year = period from fall to summer (excluding the summer break); Figure © Papilio gGmbH.

Papilio-U3 is a program to foster the social-emotional development and attachment security of toddlers in ECEC. The program evaluation study comprised a multi-centric, randomized intervention and waiting-control group design (Figure 1). The program was implemented and evaluated in ECEC centers in Bayern, Berlin, Brandenburg, and North Rhine-Westphalia (Germany). Childcare centers and teachers were recruited and randomly assigned to an intervention or waiting-control group and assessed over three measurement occasions (waves 1 to 3: prior to, during, and after the implementation of the program). Over the course of the evaluation study, a multitude of instruments was utilized to measure study outcomes and potential covariates on the teacher and child level. Measures include, among others, parent

[2] The program was developed and evaluated from 2017 to 2020 by the German health insurance provider BARMER as development partner, Papilio gGmbH as program provider, Freie Universität Berlin (Univ.-Prof. Dr. Herbert Scheithauer, expert for prevention, and team) and Friedrich-Alexander-Universitat Erlangen-Nürnberg (Dr.in Ina Bovenschen, expert for attachment, and team).

reports of family risk factors, teacher questionnaires on health-related variables and children's temperament, well-being, and social-emotional competence, tests of cognitive and language developmental status in children, as well as observations of teacher-child interactions and children's attachment security.

The manuscripts that are incorporated in this dissertation utilized quantitative data from all three waves and integrated multiple informants: *Manuscript I* analyzed cross-sectional data from wave 1 (teachers' and parents' questionnaires), *Manuscript II* integrated the intervention group teachers' feedback from wave 3, and *Manuscript III* combined teacher reports from all three measurement waves.

Aims of the Present Dissertation

The three manuscripts of the present cumulative dissertation investigate the developmental psychological background of prevention in the ECEC context, document the derivation and structure of the Papilio-U3 program, and report the first results of the program's pilot evaluation study (see Table 1).

Table 1

Overview of the Three Manuscripts that are Part of the Present Dissertation

Manuscript	Main Research Questions and Objectives	Methods / Analyses
Manuscript I (Ortelbach, Gerlach, et al., 2023)	• To what extent do proximal and distal family risk factors predict children's social-emotional competence and problems in ECEC? • Which ECEC teacher attributes and characteristics of ECEC centers predict children's competence and problems? • Do characteristics of ECEC teachers or center moderate the impact of family risk on children's social-emotional competence or problems?	• Cross-sectional, clustered design • Linear Mixed Models (Bates et al., 2015; Kuznetsova A. et al., 2017)
Manuscript II (Ortelbach et al., 2022)	• What is the context, objectives, design, and contents of the Papilio-U3 program? • What is the implementation plan and pilot evaluation design? • How do the participating ECEC teachers rate the program (formative evaluation)?	• Intervention Mapping (Bartholomew Eldredge et al., 2016) • Descriptive statistics
Manuscript III (Ortelbach, Bovenschen, et al., 2023)	• Does the Papilio-U3 program impact ECEC teachers' self-efficacy beliefs? • Does the Papilio-U3 program impact ECEC teachers' job-related stress?	• Randomized controlled trial • Longitudinal analyses of covariance (Twisk et al., 2018)

Note. ECEC = early childhood education and care.

Family Risk, ECEC Teachers' Attributes, and Children's Social-Emotional Competence

In *Manuscript I* (Ortelbach, Gerlach, et al., 2023), based on models of cumulative childhood risk and resiliency, we aim to elaborate if family risk factors would predict children's social-emotional adjustment. More specifically, we distinguish cumulative indices of proximal and distal factors that were self-reported by parents (adapted from Lorenz et al., 2020) and link them with ECEC teachers' ratings of children's social-emotional competence and problems

(Briggs-Gowan et al., 2004). We employ multilevel modeling techniques to account for the nested data structure with restricted or non-restricted maximum likelihood estimations to compare models with random and fixed effects, respectively. Moreover, we investigate to what extent potential institutional risk and protective conditions are associated with a child's adjustment. Institutional variables include characteristics of the ECEC centers (center and group size, group concept, adult-child ratio) on the one hand and attributes of the ECEC teacher (self-efficacy expectations and job-related stress) on the other hand. Lastly, we examine interactions between family and institutional predictors to uncover possible moderating influences. Thus, we address the question if ECEC serves as a protective factor for a child's social-emotional development and argue for its potential as a context to implement preventive intervention programs.

Design, Implementation, and Formative Evaluation of the Papilio-U3 Program

In *Manuscript II* (Ortelbach et al., 2022), we introduce the Papilio-U3 prevention program, a program to foster the social-emotional development and attachment security of toddlers in ECEC. First, we delineate the program development utilizing the intervention mapping approach (Bartholomew Eldredge et al., 2016), a framework for the theory-guided, evidence-based development and implementation of health promotion programs. We describe the planning process comprising the assessment of the need for a new program and an account of the intervention context, derive the logic model of change, and present the targeted program outcomes. We further illustrate the program design, content, and program production and report on the program implementation. Furthermore, we provide an overview of the program's pilot evaluation study (including study design, measures, and participants) and report results of the formative evaluation. For the formative evaluation, we consider the detailed feedback of teachers from the intervention group on training content, methods, material, organizational conditions, and potential challenges in the course of program implementation. We conclude by discussing the revision of the program that followed the pilot evaluation.

First Results of Papilio-U3 on the ECEC Teacher Level

In *Manuscript III* (Ortelbach, Bovenschen, et al., 2023), we examine the intervention effects of the Papilio-U3 pilot evaluation study (effectiveness evaluation). We include data from the questionnaires the teachers were provided on the three measurement occasions. Considering the relevance of ECEC for a child's development, we examine the program's impact on teachers. We assessed teachers' self-efficacy beliefs and job-related stress, variables that proved

to be associated with teacher behavior and a child's developmental outcomes in past research. We conduct a longitudinal analysis of covariance to test our hypotheses that, after participating in the program, teachers of the intervention group (compared with teachers from the control group) would report higher levels of self-efficacy and lower levels of job-related stress.

Manuscript I

Zusammenwirken von familiärem Risiko und Merkmalen der Kindertagesstätte und pädagogischer Fachkräfte auf sozial-emotionale Probleme bei unter Dreijährigen: Bedeutung für die Resilienzförderung in der Kindertagesstätte

This manuscript is published in: Psychologie in Erziehung und Unterricht

Ortelbach, N., Gerlach, J., Bovenschen, I., Peter, C., Liel, C., & Scheithauer, H. (2023). Zusammenwirken von familiärem Risiko und Merkmalen der Kindertagesstätte und pädagogischer Fachkräfte auf sozial-emotionale Probleme bei unter Dreijährigen: Bedeutung für die Resilienzförderung in der Kindertagesstätte [Interaction of family risk and child care as well as early child care providers' characteristics on toddlers' social-emotional problems: Relevance for promoting resilience in kindergarten]. *Psychologie in Erziehung und Unterricht, 70*(1), 35–46. https://doi.org/10.2378/peu2023.art04d

p. 32-55

Manuscript II

Design, implementation, and evaluation of a preventive intervention program to promote social-emotional development and attachment security of toddlers in early childhood education and care: The Papilio-U3 program

This manuscript is published in: International Journal of Developmental Science

Ortelbach, N., Bovenschen, I., Gerlach, J., Peter, C., & Scheithauer, H. (2022). Design, implementation, and evaluation of a preventive intervention program to promote social-emotional development and attachment security of toddlers in early childhood education and care: The Papilio-U3 program. *International Journal of Developmental Science, 16*(3-4), 63–79. https://doi.org/10.3233/DEV-220336

p. 56-94

Manuscript III

Effects of an early childhood education and care prevention program on teacher attributes: First results of a randomized controlled trial

This manuscript is submitted for publication

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Effects of an Early Childhood Education and Care Prevention Program on Teacher Attributes: First Results of a Randomized Controlled Trial

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Highlights

- This RCT investigated the effects of an ECEC program on the teacher level.
- Intervention group teachers, compared with controls, experienced higher self-efficacy.
- No intervention effects on job-related stress were detected.

Abstract

The quality of Early Childhood Education and Care (ECEC) settings critically impacts children's development in the cognitive, language, and social-emotional domains. After structural and process features of ECEC quality had been comprehensively studied in the past, recent research also included childcare teachers' personal resources, knowledge, attitudes, and beliefs that may affect teacher-child interactions. The present randomized controlled trial aimed to investigate the effects of a universal preventive intervention program implemented in ECEC settings. To examine intervention effects on the teacher level, 125 German childcare teachers (age M = 34.0, 98 % female) who care for children between one and three years of age were randomly assigned to an intervention or waiting-control group. Teachers reported on their self-efficacy beliefs and job-related stress before, during, and after the implementation of the program. After completion of the program, teachers of the intervention group reported higher self-efficacy beliefs compared to the waiting-control group (controlling for baseline scores). No significant effects on job-related stress were detected. Results are discussed in light of their benefits for teachers and their relevance to promoting positive and sensitive teacher-child interactions.

Keywords: Early childhood education and care, developmentally appropriate prevention, childcare teachers, teacher stress, teacher self-efficacy, RCT

Worldwide, an increasing number of children spend a large part of their early childhood in some form of out-of-home childcare (Gromada & Richardson, 2021). For example, in 2019, 42 to 55 percent of U.S. children under the age of three spent some time in nonparental childcare (National Center for Education Statistics, 2021). Even in other Western countries with a traditionally more critical view on nonparental childcare throughout the first years of life, an increasing number of children attend out-of-home. For example, in Germany, the rate of children aged 0 to 3 years in ECEC increased between 2006 and 2022 to currently 35.5 per cent (Statistisches Bundesamt, 2022a, 2022b). Due to the increasing demand of early ECEC across countries, concerned parents, practitioners, and policymakers began questioning the impact of ECEC on children's development and policymakers initiated large-scale studies investigating the effects of early childcare.

Relations Between ECEC and Children's Development

Although family characteristics, particularly the parent-child interactions, critically impact children's development over time (Belsky et al., 2007), a large body of research has shown that the quality of childcare settings is also associated with children's developmental outcomes. For example, the most comprehensive study, the NICHD Study of Early Child Care, revealed that the quality of ECEC strongly predicted children's cognitive and language development. Similarly, the Cost, Quality, and Child Outcomes Study (Peisner-Feinberg et al., 1999) found that children who were enrolled in higher quality ECEC achieved better language and math scores in elementary school. Recent research also revealed significant effects of ECEC quality on other domains of children's development (e.g., on children's problem behavior, compliance and self-control), although some of the effects were rather moderate or inconsistent between studies (e.g., Barnes et al., 2010; Belsky et al., 2007; Bornstein et al., 2006; Votruba-Drzal et al., 2010).

Therefore, the question if and how high-quality childcare can be assured has been a major focus of recent early childhood research. However, childcare quality is a complex phenomenon that has been conceptualized and assessed in a variety of ways.

Many Faces of Childcare Quality

Childcare quality is operationalized in many ways but generally refers to the broad range of environmental features in non-parental care and education settings that have been linked to child outcomes in the academic and social domains (Cadima et al., 2022; NICHD, 2002; Slot, 2018).

On a global level, two domains are differentiated. First, a large body of research on ECEC addressed the question if and how structural features of childcare ("structural quality") predict ECEC outcomes with most studies focusing on the impact of the "iron triangle" adult-child-ratio, group size, and teacher education/training (Bradley & Vandell, 2007; Manning et al., 2019; Perlman et al., 2017; Slot, 2018). Second, the process quality of ECEC refers to the *"rather proximal processes of children's everyday experiences and involve the social, emotional physical, and instructional aspects of staff-child and peer interactions while being involved in play, activities or routines"* (Slot, 2018, p. 8). Both dimensions of childcare quality, structural and process quality, are intertwined and contribute indirectly and/or directly to children's outcomes. Specifically, structural characteristics of childcare enhance teacher-child interactions, which, in turn, are imperative in creating an environment that fosters children's learning and development (e.g., McDonald Connor et al., 2005; Slot et al., 2018).

Since interventions addressing structural quality typically are restricted to state regulations (i.e. legislation), licensing processes, and established standards (Bradley & Vandell, 2007), ECEC research emphasizes the importance of teacher-child relationships in childcare quality improvement. Interventions promoting positive teacher-child- and peer interaction have received a great deal of attention (e.g., Hamre et al., 2012).

The Role of Teacher Attributes

Apart from targeting the teacher-child interaction itself, recent research discussed the need for focusing on teachers' personal resources, knowledge, attitudes, and beliefs affecting teachers' behavior (e.g., Blewitt et al., 2020). For example, according to the Prosocial Classroom Model, teachers' social-emotional competence and well-being play an important role in creating a healthy classroom climate which, in turn, improves children's social, emotional, and academic outcomes (Jennings & Greenberg, 2009).

On the one hand, relevant attributes comprise knowledge of and attitudes toward instructional targets and effective interactions (Hamre et al., 2012). On the other hand, they may also encompass beliefs related to the self, for example, self-efficacy beliefs. According to Bandura, self-efficacy can be defined as "the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p. 193). Referring to teaching contexts, teachers' efficacy beliefs are defined as "judgment[s] of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (Tschannen-Moran & Hoy, 2001, p. 783). In their cyclical model of teacher efficacy, Tschannen-Moran et al. (1998) described efficacy as a result of

balancing teaching task demands and self-evaluated teaching competence. Efficacy is hypothesized to enhance (teaching) performance via greater effort and persistence and thus to entail further efficacy information. To elucidate the relevance of self-efficacy, past research examined the associations of teacher self-efficacy with teacher well-being and job-related variables (e.g., job satisfaction, coping, burnout, and stress) on the one hand and student or child academic and social-emotional outcomes on the other hand. In an early meta-analysis, generalized self-efficacy showed the highest link to job satisfaction and, to a less extent, to job performance (Judge & Bono, 2001). Studies consistently support significant associations between teacher self-efficacy and both higher job satisfaction and lower job-related stress or burnout (Zee & Koomen, 2016). Moreover, meta-analytic links of teacher self-efficacy yield effects of r = .28 for externally evaluated teaching performance (Klassen & Tze, 2014). Additionally, some longitudinal studies support the association between teacher self-efficacy and child academic outcomes with teacher-child interactions and classroom processes mediating the effect (cf. Guo et al., 2010; Zee & Koomen, 2016). However, the vast majority of past research has been conducted in the school context, whereas findings in ECEC settings are sparse.

Investigating 584 preschool, kindergarten, and first grade teachers, Fantuzzo et al. (2012) found that teachers experiencing higher levels of self-efficacy spent increased time teaching both cognitive skills and social-emotional skills. Similarly, Perren et al. (2017), comparing the influence of teacher beliefs related to the self (self-efficacy) with teacher beliefs related to teaching approach (attitudes), found that teachers' self-efficacy but not teachers' attitudes positively predicted educational practice. Teachers with higher self-efficacy beliefs tended to actively involve children in everyday group activities and to create stimulating learning opportunities. Thus, both studies highlight the role of professionals' self-efficacy when developing interventions aiming at promoting high-quality and child-centered ECEC.

In addition, also other facets of teachers' well-being, e.g. teachers' level of job satisfaction and job-related stress, have been discussed as relevant to children's outcomes. One focus of several studies has been to gain insight into teachers' levels of job satisfaction and job-related stress. In the majority of research on preschool teachers so far, teachers were generally content with their work and stated high *job satisfaction* (Buettner et al., 2016; Hall-Kenyon et al., 2014; Henry et al., 2021; Hossain et al., 2012). In contrast, a body of research documents teachers' emotional strain and mental health problems (Baldwin et al., 2007; Whitaker et al., 2013). In general, research on *job-related stress* yielded inconclusive results: While qualitative studies frequently documented high stress of ECEC teachers (Corr et al., 2014), many quantitative

studies only reported low to moderate average levels of stress or burnout with considerable ranges (e.g., Buettner et al., 2016; Hossain et al., 2012; Jeon & Ardeleanu, 2020; Rusby et al., 2013; Siekkinen et al., 2013; Whitaker et al., 2015; Zinsser et al., 2013).

Recent studies show that levels of teachers' job-related stress are linked to interaction quality and child outcomes. Higher teacher stress was associated with less emotional support and classroom organization (Ansari et al., 2022; Penttinen et al., 2020), negative reactions to children (Buettner et al., 2016), or more conflict with children (Whitaker et al., 2015). Accordingly, significant associations have also been found with teacher reports of child behavior problems and social competence (Rusby et al., 2013; Siekkinen et al., 2013), child engagement (Ota et al., 2013), and child well-being (Groeneveld et al., 2010).

Thereby, supporting ECEC teachers' well-being and, in particular, helping them to cope with job-related stress, may be a crucial strategy to foster positive teacher-child interactions.

ECEC Interventions Addressing Teachers' Self-Efficacy and Job-Related Stress

There is a growing body of evaluation research on ECEC interventions addressing variables such as teachers' self-efficacy and job satisfaction or stress. Studies showed that ECEC interventions can enhance teachers' self-efficacy beliefs (e.g., Bautista, 2011; Frosch et al., 2018; Gray, 2015; Tanaka et al., 2020). In contrast, results concerning job satisfaction or job-related stress were mixed. Whereas some research found a decrease of job-related stress or burnout in teachers participating in ECEC intervention programs (e.g., Sottimano et al., 2018; Tanaka et al., 2020; Zhai et al., 2011), other studies did not find significant changes in job-related outcomes or even indicated negative effects such as an increase of perceived stress (e.g., Frosch et al., 2018; Gray, 2015; Lang et al., 2020). One explanation might be that the intensity or dosage of interventions varied considerably among studies as they ranged from brief workshops delivered online to extensive multimodal interventions including individual counseling or reflective supervision. Moreover, some of these studies have methodical shortcomings such as lacking control groups, pretests or follow-up assessments. Therefore, methodologically sound intervention studies including randomized controlled trials in ECEC settings are needed.

The Present Study

Drawing on previous evidence for the effectiveness of ECEC programs, this randomized controlled trial (RCT) with a waiting-control-group design is the initial study to investigate the Papilio-U3 program, a universal preventive intervention program to promote positive and

sensitive teacher-child interactions as well as to foster toddlers' early social emotional competence and attachment security to their teachers (cf. section 2.2). We compared an intervention group (IG) with a waiting-control group (WCG) and measured numerous teacher and child variables prior to (wave 1), during (wave 2), and after the implementation (wave 3) of the program. In the present study, we aimed to examine intervention effects on the teacher level. We expected that the implementation of the program would be associated with beneficial effects on teachers' attributes. More precisely, we expected an increase of teacher self-efficacy beliefs and a decrease of job-related stress in the IG compared with the WCG from wave 1 to wave 3.

By supporting teachers' attitudes or beliefs and reducing job-related stress, we aim to contribute to positive ECEC classroom climates and sensitive teacher-child-interactions and thus strengthen the foundation for social, emotional and academic development for children under the age of three.

Method

Participants

The current study is part of a larger project evaluating the Papilio-U3 preventive intervention program (Papilio program for children under the age of three, Ortelbach et al., 2022) based on a randomized waiting-control group trial. The study involved 125 ECEC teachers working at 55 German ECEC centers, 652 children, and their parents. The convenience sample was recruited at four study sites spread across Germany covering a broad range of rural and urban areas (Bavaria, Berlin, Brandenburg, and North Rhine-Westphalia).

Over the course of the study, 28 ECEC teachers (22 %) dropped out because the ECEC centers decided to leave the study (mostly due to the increased workload), the teachers resigned from the centers, fell ill, or went on maternity leave. Detailed information on participant dropout is displayed in Figure 1. Preliminary analyses showed that teachers who dropped out after wave 1 did not significantly differ from teachers who provided data on all waves in terms of any of the subsequently reported outcome variables, age, professional experience, or group status (IG vs. WCG).

The final sample for the present longitudinal analyses comprised 97 ECEC teachers (98 % female, 2 % other or missing; see Table 1 for further sample characteristics) from 49 early ECEC centers.

Figure 1

Participant Flowchart

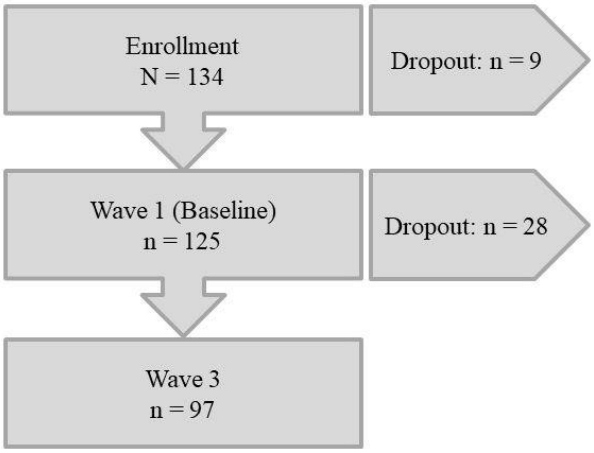

Table 1

Characteristics of ECEC Teachers at Baseline (Wave 1)

	Intervention Group (n = 61)		Waiting-Control Group (n = 64)		Full Sample (N = 125)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Age	34.46	9.03	33.48	11.16	33.96	10.14
Professional Experience (Years)	11.07	8.87	9.80	10.75	10.43	9.84
Group size	13.95	6.20	13.33	4.00	13.63	5.17

Intervention Description

Papilio-U3 (Ortelbach et al., 2022) is a universal preventive intervention program for ECEC teachers who work with children under the age of three. It was developed at Freie Universität Berlin and Friedrich-Alexander-Universität Erlangen-Nürnberg in cooperation with Papilio gGmbH, Augsburg, Germany. The program was designed following an intervention mapping approach (Bartholomew Eldredge et al., 2016). Vital conceptual foundations of the program are the developmentally appropriate prevention approach (cf. Malti et al., 2009; Scheithauer & Scheer, 2022), attachment theory (Ahnert et al., 2006; Ainsworth, 1985), and the internalization model of emotions (Holodynski, 2005). The program aims at promoting positive and sensitive teacher child interactions as well as fostering toddlers' early social emotional competence and attachment security to their teachers. Additionally, the program also targets teacher attributes such as teachers' self-efficacy and job-related stress (Blewitt et al., 2020).

Throughout the program implementation, the ECEC teachers received a 7.5 days training over a course of approximately eight months. The covered the following topics:

- Social emotional development in the first three years of life,
- Child temperament, self-regulation, and its relevance in ECEC settings
- Attachment theory and its application to the ECEC context (e.g., attachment behavior, sensitive teacher-child interaction, and attachment-based transition to childcare),
- Promotion of constructive relationships with the children's parents,
- Professional self-care, mindfulness, and self-efficacy.

Training procedures included theoretical inputs, video demonstrations, group discussions, role-play, self-reflection exercises, and video feedback (using videotapes of teacher-child interactions in the ECEC centers provided by each teacher).

The program implementation followed a train-the-trainer approach. To become a Papilio-U3 trainer, nine practitioners with a psychological or educational degree and professional experience in delivering the Papilio-3to6 program (Scheithauer et al., 2022) received a 4-day intensive training plus additional supervision meetings. Afterwards, the Papilio-U3 trainer delivered the training to ECEC teachers in their region.

Teachers from the IG received the Papilio-U3 training in small groups of 4 to 10 participants. To ensure a sufficient training dosage, the trainers additionally offered brief catch up sessions for teachers who missed training sessions (approximately a half day catch-up per missed training session).

Procedure

ECEC centers were recruited via telephone, press release, and based on established networks of Papilio gGmbH. Interested centers received detailed information about both the prevention program and the evaluation study and were screened for the following inclusion criteria: Enrollment of at least two ECEC teachers for the program who exclusively care for children under the age of three in their group(s), and at least two of those children remaining in the group until wave 3. Additionally, ECEC centers were excluded from the study if they already implemented the prevention program Papilio-3to6 (for children between three and five years of age) to avoid any bias (e.g., spillover effects). All eligible centers were randomly assigned to the IG (who implemented the Papilio-U3 program, n = 61 teachers from 27 centers) or the WCG (n = 64 teachers from 30 centers). Teachers in the WCG did not receive any of the training sessions of Papilio-U3, though at wave 3, 21 % of the IG and 28 % of the WCG stated

that they had participated in other courses, trainings, or programs at the time. All participants of the WCG received the intervention Papilio-U3 after finalizing the study.

Before participating, all teachers were provided detailed information on study procedures and gave written consent. Moreover, the teachers approached parents of the children in their groups to ask for their consent to provide child data (that are not relevant for the present study).

Data assessments took place in three waves. At wave 1 and 3, researches and trained research assistants from the collaborating research teams collected data at the ECEC centers and via questionnaires filled out by the teachers, whereas, at wave 2, the teachers only filled out the questionnaires. During the visits at the centers, the researchers videotaped teacher-child-interactions and conducted developmental tests with a subsample of the children. Data assessment at wave 1 was intended to be finalized before the intervention in the IG started. However, due to their massive workload, not all ECEC teachers of the IG answered the questionnaires as planned. Unfortunately, we were not able to control the teachers' returning of the questionnaires, and about 15% of the teachers returned them after the training had already started. Data assessment at wave 2 (questionnaires only) took place during the intervention period of the IG. Data assessment at wave 3 took place post-intervention (on average eight months after wave 1, range 4 to 13 months).

The questionnaires covered extensive information on the ECEC teachers' professional and personal background as well as information on the children of their group (e.g., social emotional competences or relationship quality). In the present paper, both child outcomes and observational data are not relevant as they are topic of other publications.

Data were collected between July 2018 and December 2019. Teachers who completed all measurements (wave 1 to wave 3) received a 10 € gift voucher. The participants received no further payments or incentives. The study was approved by the ethics committee of the Department of Education and Psychology, Freie Universität Berlin (207/2018).

Measures

Self-Efficacy Beliefs. ECEC teachers' self-efficacy beliefs were assessed by an adapted version of the Individual Teacher Self-efficacy Scale by Schwarzer and Jerusalem (1999). To capture tasks referring to the ECEC context, we had to adapt the phrasing of the items originally addressing school teachers (e.g., original item = "I know that I am able to teach even the most problematic students.", adapted item = "I know that I am able to teach even the most problematic children age-appropriate behaviors."). The scale comprises ten items ranging from

1 (not at all true) to 4 (exactly true), yielding a mean score (Cronbach's Alpha at wave 1 = .672, at wave 3 = .742) where higher values reflect higher self-efficacy.

Job-Related Stress. Teachers' job-related stress was assessed by the Job-Related Stress Scale by Enzmann and Kleiber (1989). The scale consists of 15 items ranging from 1 = strongly disagree to 5 = strongly agree (e.g., "I often feel overwhelmed with work.") that yield three subscales: Excessive demand, Feelings of being monitored, and Job dissatisfaction. For the present analyses we used a total (mean) score (Cronbach's Alpha at wave 1 = .847, at wave 3 = .884) with higher values reflecting higher job-related stress.

Covariates. Covariates included teacher education, professional experience (in years) as well as the baseline scores of the respective outcome (self-efficacy or job-related stress, respectively). Although teacher education and professional experience were not associated with the outcomes in our study, we included them as covariates referring to findings of recent research (Manning et al., 2019).

Data Analysis

Preliminary analysis of missing data revealed that, at wave 1, only very few data were missing: age (< 1 %), professional training (< 1 %), professional experience (< 1 %), baseline self-efficacy (0 %), and baseline job-related stress (0 %). Hence, we decided to implement a listwise exclusion of cases with missing values. Missing values of single scale items were handled using ipsative mean imputation: We calculated mean scores for the self-efficacy and job-stress scales based on the available items. A preliminary analysis of a sample with imputed wave 2 and wave 3 scores of the missing outcomes using an EM algorithm did not substantially change the results. Accordingly, we report results of the original data (without imputed outcome data).

To address our main research questions, we conducted longitudinal analyses of covariance with four separate models for wave 2 and wave 3 scores of the scales as outcomes taking into account the respective baseline value of every outcome variable. Group served as dichotomous predictor variable, with the waiting-control group set as the reference category. A treatment effect would be indicated by a significant regression coefficient for the group variable. Teacher education and professional experience (in years) were added as covariates. We calculated standardized effect-size measures and the respective confidence intervals by dividing the observed differences between IG and CG (taking the covariates into account) by the estimated population standard deviation (Lenth, 2022). The effect-size measures can be interpreted as Cohen's *d*.

Given the nested data structure (two teachers per ECEC center), a potential for biased estimates could not be completely ruled out. We did not apply multilevel modeling techniques for two reasons: First, preliminary analyses (to reveal potential clustering effects) indicated only small intraclass correlation coefficients and design effects (cf. Lai & Kwok, 2015), and second, we were not interested to model potential influences on the center level. Model assumptions such as normal distribution and independence of errors, multicollinearity and homoscedasticity were checked, and we identified potential outliers or influential data points. All conducted significance tests were two-tailed and the level of significance was defined as $p \leq .05$.

Analyses were conducted using the R packages stats, emmeans (Lenth, 2022), and olsrr (Hebbali, 2020) in R version 4.1.2.

Results

Preliminary Analyses

Means, standard deviations, and Pearson correlations between all study variables are presented in Table 2. None of the covariates were associated with self-efficacy or job-related stress at any measurement point. Self-efficacy and job-related stress scales were auto-correlated (large or moderate effects according to Cohen, 1988) and negatively associated with each other (moderate effects).

Table 2

Means, Standard Deviations, and Pearson Correlations of Covariates, Self-efficacy, and Job-Related Stress

Variable	*N*	*M*	*SD*	1	2	3	4	5	6	7	8
1. Group	127	0.49	0.50	1							
2. Professional Experience (Years)	123	10.43	9.84	.06	1						
3. Teacher Education	124	1.84	0.37	.12	.18*	1					
4. Self-Efficacy (Wave 1)	125	3.42	0.30	.03	.12	.08	1				
5. Job-Related Stress (Wave 1)	125	1.91	0.51	.04	.06	.09	-.31**	1			
6. Self-Efficacy (Wave 2)	110	3.43	0.30	.08	.14	.05	.70**	-.24*	1		
7. Job-Related Stress (Wave 2)	110	1.96	0.53	.13	-.00	.07	-.33**	.69**	-.38**	1	
8. Self-Efficacy (Wave 3)	99	3.40	0.31	.18	.01	.08	.57**	-.23*	.70**	-.27**	1
9. Job-Related Stress (Wave 3)	99	2.04	0.62	.02	.03	.02	-.30**	.67**	-.29**	.81**	-.34**

Note. Group: 1 = intervention group, 0 = waiting-control group, Teacher Education: 1 = ECEC teacher (higher qualification, at least 3 years of professional education), 0 = ECEC worker (lower qualification, 2 years of professional education).
* $p < .05$. ** $p < .01$.

Intervention Effects on ECEC Teachers' Self-Efficacy Beliefs

Results from the longitudinal covariance analysis revealed a significant group effect at wave 3 (but not at wave 2): Teachers in the IG reported higher self-efficacy beliefs compared to the CG (see Table 3). The effect can be considered small. Except baseline self-efficacy, none of the covariates significantly predicted self-efficacy beliefs at any of the two waves. We also examined potential moderating effects of the covariates, but no significant interaction effects were found.

Table 3

Results of Longitudinal Analyses of Covariance on ECEC Teachers' Self-Efficacy

	Wave 2			**Wave 3**		
Predictors	Estimate (SE)	*95% CI*	*p*	Estimate (SE)	*95% CI*	*p*
(Intercept)	1.06 (0.24)	0.58 – 1.54	< **.001**	1.27 (0.31)	0.66 – 1.88	< **.001**
Baseline (Wave 1 Self-Efficacy)	0.69 (0.07)	0.55 – 0.83	< **.001**	0.61 (0.09)	0.43 – 0.78	< **.001**
Group	0.03 (0.04)	-0.05 – 0.12	.459	0.12 (0.05)	0.02 – 0.23	**.023**
Professional Experience (Years)	0.00 (0.00)	-0.00 – 0.01	.427	-0.00 (0.00)	-0.01 – 0.00	.644
Teacher Education	-0.00 (0.06)	-0.12 – 0.11	.950	0.01 (0.07)	-0.13 – 0.14	.931
N	106			95		
R^2 / R^2 adjusted	0.495 / 0.475			0.365 / 0.337		
d [95% CI]	0.146 [-0.245 – 0.537]			0.481 [0.063 – 0.899]		

Note. Group: 1 = intervention group, 0 = waiting-control group, Teacher Education: 1 = ECEC teacher (higher qualification, at least 3 years of professional education), 0 = ECEC worker (lower qualification, 2 years of professional education).

Job-Related Stress

As presented in Table 4, none of the regression coefficients for the group variable showed a significant effect. Thus, no intervention effects were found for teachers' job-related stress, that is, the program participation did not predict teachers' job-related stress at wave 2 or wave 3. Again, the baseline job-related stress score was the only significantly related covariate.

Table 4

Results of Longitudinal Analyses of Covariance on ECEC Teachers' Job-Related Stress

	Wave 2			**Wave 3**		
Predictors	Estimate (SE)	*95% CI*	*p*	Estimate (SE)	*95% CI*	*p*
(Intercept)	0.55 (0.16)	0.23 – 0.87	**.001**	0.50 (0.20)	0.10 – 0.90	**.014**
Baseline (Wave 1 Job-related Stress)	0.75 (0.08)	0.60 – 0.90	< **.001**	0.88 (0.10)	0.69 – 1.07	< **.001**
Group	0.04 (0.08)	-0.11 – 0.19	.554	-0.08 (0.10)	-0.27 – 0.11	.419
Professional Experience (Years)	-0.00 (0.00)	-0.01 – 0.00	.284	-0.00 (0.00)	-0.01 – 0.01	.453
Teacher Education	-0.00 (0.10)	-0.20 – 0.20	.992	-0.04 (0.12)	-0.28 – 0.20	.756
N	106			95		
R^2 / R^2 adjusted	0.508 / 0.489			0.483 / 0.460		
d [95% CI]	0.118 [-0.276 – 0.512]			-0.170 [-0.586 – 0.246]		

Note. Group: 1 = intervention group, 0 = waiting-control group, Teacher Education: 1 = ECEC teacher (higher qualification, at least 3 years of professional education), 0 = ECEC worker (lower qualification, 2 years of professional education).

Discussion

In the present study, the impact of a recently developed ECEC prevention program on teachers' self-efficacy beliefs and job-related stress was investigated using an RCT design. Teachers of the IG attended an intensive 7.5-days-training including video feedback. Teachers' self-efficacy beliefs and job-related stress before, during, and after intervention were compared with a WCG over three assessment waves. As a main result, we found a significant intervention effect on teachers' self-efficacy: After receiving the Papilio-U3 prevention program, teachers in the IG reported higher self-efficacy beliefs compared to the WCG at wave 3. No significant effects on job-related stress at any of the assessment waves were detected.

Impact on ECEC Teachers' Self-Efficacy Beliefs

We detected a small intervention effect on self-efficacy of $d = 0.48$ at wave 3. Previous meta-analyses found similar average effect sizes of intervention effects on various teacher variables (Fukkink & Lont, 2007; Werner et al., 2016).

Our results extend findings from previous intervention studies specifically addressing self-efficacy beliefs of ECEC teachers (e.g., Bautista, 2011; Frosch et al., 2018; Tanaka et al.,

2020): First, in contrast to the aforementioned studies, we compared intervention effects of a randomly assigned IG with a WCG. Thus, we minimized possibly confounding factors such as a generally growing professional experience in the course of the study. Second, previous studies reported evaluation effects of intensive intervention programs focusing specifically on teacher attributes (e.g., Frosch et al., 2018; Tanaka et al., 2020). In contrast, our program chooses a broader approach addressing children's early social emotional competence, children's attachment security, and teacher attributes at the same time. In the current study, we found a small but still significant effect on teachers' self-efficacy as one of several program aims.

Drawing on Bandura's social cognitive learning theory (Bandura, 1977, 1997), the following mechanisms may explain the program's effects on the teachers' self-efficacy: mastery experience as teachers received feedback on their interactions with the children; vicarious experience as they analyzed videotapes provided by the other participants; and social persuasions as they repeatedly participated in discussions about sensitive child care practices (see Morris et al., 2017, for a comprehensive review of sources of teaching self-efficacy).

Lacking intervention effects at wave 2 indicate that self-efficacy beliefs might require more time to change. Furthermore, assessments at wave 2 took place after child-related topics had been the focus of the training (e.g., social-emotional development, attachment and sensitivity) whereas teacher-related topics (e.g., professional self-care) were discussed after wave 2.

Effects for Job-Related Stress

Contrary to our expectations, the results revealed no significant intervention effects on job-related stress. Previous research yielded mixed evidence for the effectiveness of ECEC prevention programs on teachers' job satisfaction or stress. Gray (2015) implemented the attachment-based Circle of Security Intervention in a smaller sample of family childcare providers and found no effect of the intervention on teachers' resources to cope with job-related stress. However, intensive programs specifically addressing nursery or preschool teachers' well-being, stressors, and resources have been found to reduce psychological exhaustion and indolence and to foster subjective control and job resources (Sottimano et al., 2018; Zhai et al., 2011). Tanaka et al. (2020) found positive effects of a 10-week training for ECEC teachers on their self-rated happiness and a reduction of stress and burnout, but their evaluation study did not comprise a control group. Thus, the lacking effects of our program may be due to several factors.

First, the program dosage might not have been enough to produce meaningful impacts on teachers' perceptions of stress. Studies comparing different intensities of programs point to benefits of more intensive interventions (e.g., Moreno et al., 2015). Moreover, to acquire and successfully implement stress reduction strategies might require more time for training and practice. Meta-analytic evidence for (mindfulness-based) stress reduction programs hints at potential additional post-intervention effects as indicated by higher effect sizes at follow ups for some outcomes (Jayewardene et al., 2017; Khoury et al., 2015). Similarly, some intervention studies of lower intensity revealed an increase of perceived job stress over the course of the program (Frosch et al., 2018; Lang et al., 2020).

Future modifications of our program should therefore consider to incorporate a broader range of coping strategies and various opportunities to practice problem-solving tasks that are relevant for the individual participants' job situation.

Second, analyses in the current study are limited to direct effects. In addition to assessing direct intervention effects on teachers' job-stress, more complex mechanisms of effects have been investigated in past research. Particularly, the implementation of social-emotional learning programs in preschool appeared to yield protective effects against the association of job-stress and burnout with measures of teacher-child interactions (Sandilos et al., 2018; Sandilos et al., 2020). The inspection of moderating effects will thus be part of our future analyses integrating observational measures of teacher-child interactions and child outcomes.

Third, ECEC teachers work under a lot of pressure and experience numerous sources of job-related stress. This is also buttressed by research findings identifying teachers to be at a great risk to develop burnout symptoms or other mental health problems (Baldwin et al., 2007; Jungbauer & Ehlen, 2015; Whitaker et al., 2013). However, it is outside of the scope of preventive intervention programs to change structural conditions such as group size or adult-child ratio that may be associated with job-related stress. Thus, the potential effects on perceived stress of such programs may be diminished whereas self-efficacy beliefs may, to a larger extend, be susceptible to change by programs that utilize psychological components.

Strengths, Limitations, and Future Directions

A core strength of the study is the consequent application of a longitudinal, randomized waiting-control design to investigate the intervention effects. Notwithstanding, important limitations of our evaluation should be noted.

Unfortunately, due to their massive workload, not all teachers of the IG finished the questionnaires at wave 1 as planned. Therefore, we cannot preclude possible confounding

effects in that teachers of the IG whose questionnaires were delayed might have contributed to a mitigation of intervention effects. However, we were still able to detect an intervention effect on self-efficacy as one of our pivotal outcomes presented here.

There are several possible sources of bias worth noting. One potential bias pertains to the quantitative measures we employed, namely the potential for ceiling and floor effects. Teachers in the present study rated their self-efficacy beliefs relatively high which is in line with findings of general skewed dispersions of this variable (Hinz et al., 2006). Similarly, other evaluation studies reported high baseline values limiting the potential to find intervention effects (see e.g., Moreno et al., 2015). Likewise, although informal communication with the teachers of our study pointed to a high stress level of the teachers, the teachers reported relatively low levels of job-stress in the questionnaire we employed. This result points to the possibility that we underestimated job-related stress and were not able to capture the "real" stress level with the measure we used. Similar results from a representative German study revealed that although job satisfaction was linked to indicators of working conditions, the teachers generally endorsed high levels of job satisfaction (Schreyer & Krause, 2016). Thus, in future studies, qualitative measures of job-related stress may be promising to identify ECEC teachers' stress (for a review, see Corr et al., 2014).

Moreover, teachers' answers may have suffered from social desirability bias. We applied a psychometric valid instrument to assess a potential bias (Kemper, 2013) and tested potential influences in preliminary analyses. Although this did not alter the results, the possibility of a social desirability bias cannot be completely ruled out.

Lastly, we cannot exclude a selection bias as it is possible that the participating ECEC centers were centers with particular low workload or low teachers' stress as pre-study information clearly stated the substantial time commitment associated with participating in the program and the evaluation study. Particularly, feedback of teachers confirmed that teachers in ECEC (in Germany) might not be very familiar with video feedback methods and, thus, reluctant to commit to a corresponding program. Thus, we cannot preclude that inherent features of the program, namely the video feedback, prevented teachers with lower involvement and less openness for new technologies to register.

Lacking effects may also be due to factors related to the train-the-trainer approach we used. Empirical evidence supports the general applicability and effectiveness of school-based interventions utilizing a train-the-trainer approach (Pearce et al., 2012; Sklad et al., 2012). However, the training of the professionals who delivered the program to the participating ECEC teachers as well as a potential information loss across the different implementation levels

(program design – training of the trainers – training of the ECEC teachers) might be critical. During program implementation, we invested large efforts into supervising the trainers to ensure a maximum of program fidelity. Nonetheless, we decided to investigate program effects under "real world" conditions as we are convinced that successful interventions must prove feasible not only under controlled laboratory settings.

Moreover, there are some limitations related to program contents. Feedback of some participaing teachers indicated that some topics (e.g., the role of children's temperament in ECEC settings) might have been too challenging. Teachers might need more support and guidance to transfer the knowledge and skills acquired in the course of the program to their daily routines. Although we designed the program to focus particularly on the teacher-child relationship, we considered curriculum-based activities for a future revision of the program. The lacking effect on teachers' job-related stress points to a specific area for improvement.

Finally, although we tested for possible moderating effects of teacher characteristics, we did not investigate specific subgroups and differential efficacy although a growing body of research highlights that teachers substantially differ in terms of stress or other job-related variables (e.g., Herman et al., 2018; Jeon et al., 2016).

The present study lays the groundwork for future research and evaluation of the Papilio-U3 program. Next steps comprise exploring subgroup effects to detect possible differential effects as well as analyzing intervention effects on teacher-child interactions and children's social-emotional competence and attachment security. Future studies should also consider larger sample sizes and additional follow-ups to ensure the persistence of the promising effects. Furthermore, future studies are needed to analyze the effects of specific program components (e.g., the session on teacher stress) as opposed to the current study which investigated effects of the program in its entirety.

Conclusion

Professional self-efficacy beliefs of ECEC teachers represent an important aspect in delivering high-quality early childcare (Perren et al., 2017), and our results show that teachers' self-efficacy beliefs benefited from participating in the Papilio-U3 program. In addition, teachers' self-efficacy has been found to serve as protective factor by levelling the adverse effects of cumulative family risks on children's problem behaviors in ECEC (Ortelbach et al., 2023), highlighting the crucial role of teachers' attributes in fostering adaptive child development.

The ECEC prevention program Papilio-U3 proved as a feasible program for teachers of children under three years of age that can be successfully implemented under real-life circumstances. The program can be seen as first step of prevention beginning in the first years of life when children enter ECEC and continuing through the early years in elementary school. Building on the Papilio-U3 program, the related programs Papilio-3to6 (Scheithauer et al., 2022) for preschoolers and Papilio-6to9 (Lechner et al., 2022) for first- and second-graders also aim at fostering positive, sensitive relationships of children and their teachers to promote social-emotional competence and to prevent behavior and emotional problems.

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Declarations of Interest

All authors contributed to the development of the Papilio-U3 program.

Credit Authorship Contribution Statement

Niklas Ortelbach: Conceptualization, Methodology, Data curation, Formal analysis, Writing - original draft; **Ina Bovenschen:** Conceptualization, Funding acquisition, Project administration, Supervision, Writing - original draft; **Jennifer Gerlach:** Conceptualization, Data curation, Writing - review & editing; **Herbert Scheithauer:** Conceptualization, Funding acquisition, Project administration, Supervision, Writing - review & editing.

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General Discussion

Summary and Integration

Summary of the Findings

The present cumulative dissertation introduced the Papilio-U3 program and reported the initial finding of the pilot evaluation study. The three manuscripts addressed distinct research questions that lay the groundwork for the development, implementation, and further evaluation of the program.

Manuscript I (Ortelbach, Gerlach, et al., 2023). The first aim of this dissertation was to investigate individual and institutional risk and protective conditions for the development of social-emotional competence and problems children display in the ECEC center, and to derive potential methods for preventive interventions in the ECEC context. To approach this aim, we used cross-sectional data from the first measurement wave of the evaluation study on the Papilio-U3 program. Participants were 56 teachers from 47 ECEC centers and 353 toddlers from their groups. The teachers provided information on the characteristics of the ECEC center, their job-related stress, and self-efficacy beliefs. On the child level, we assessed social-emotional competence and problems via teacher ratings and a set of family risk factors (proximal and distal risk indices) that were provided by the parents. To account for the nested data structure, we used multilevel modeling and estimated a series of linear mixed models separately for the child's social-emotional competence and problems as outcomes. A child's competence was predicted by their age and gender (teachers' ratings indicated higher competence scores for females and older children) and teachers' self-efficacy (higher teacher self-efficacy predicted higher competence of children). A child's higher problem scores were predicted by a larger number of proximal family risk factors and we found a trend for a cross-level-interaction and moderating effect of teachers' self-efficacy: The association of risk and problem score decreased with increasing levels of teachers' self-efficacy (Figure 1 in Ortelbach, Gerlach, et al., 2023). To conclude, we discussed the relevance of ECEC teachers' self-efficacy in the promotion of children's resilience through universal prevention programs.

Manuscript II (Ortelbach et al., 2022). The second aim of the dissertation was to introduce the developmentally appropriate prevention program Papilio-U3 and document the initial findings from the program pilot evaluation study. We utilized the IMA (Bartholomew Eldredge et al., 2016) to provide a detailed account of the program evaluation. Intervention mapping provides a systematic framework to support decision-making processes in the complex process of planning, developing, and implementing interventions. For step 1 of the

IMA, we provided information on the planning group, stated the need for a prevention program for children under the age of three years in ECEC, described the German ECEC context as the intervention context, and presented the aims of the program. During step 2, we selected detailed intervention outcomes and specified personal determinants and performance objectives in order to build a logic model of change. The description of the program design (step 3) comprised of an account of the program structure, the structure of the training delivered to the ECEC teachers, training topics, content, and methods. The program production (step 4) included the production of materials that were to be delivered on three levels, the child, teacher, and trainer levels, respectively. To define the program implementation plan (step 5), we illustrated general aspects of the program implementation (e.g., the train-the-trainer approach) and aspects that were predominantly related to the implementation during the pilot intervention study (e.g., defined inclusion and exclusion criteria). During step 6, we presented the evaluation design: We employed a multi-centric, randomized intervention and waiting-control group design with three assessment waves and targeted 120 and approximately 600 toddlers from 60 ECEC centers. As part of the summative evaluation, we assessed numerous outcomes on the teacher and child level via a variety of observational and questionnaire measures. Subsequently, we presented the formative evaluation results of the pilot evaluation study. The teachers of the intervention group provided extensive information on training content, methods, materials, organizational conditions, and potential challenges during the program implementation. Overall, the participants were satisfied with the program and would recommend it to other teachers. We then critically discussed these results, showed how they were considered for the revision of the program, and closed by giving an outlook on potential future revisions of the program.

Manuscript III (Ortelbach, Bovenschen, et al., 2023). The third global aim of the dissertation was to evaluate the effectiveness of the Papilio-U3 program regarding outcomes at the teacher level. After an overview of the different facets of childcare quality, we argued that teacher attributes such as perceived job-related stress, job satisfaction, or self-efficacy beliefs may provide additional insights into the impact of an ECEC preventive intervention program as these variables may, additionally to traditional approaches to process quality (e.g., teacher-child interactions), account for child outcomes. We used the quantitative, longitudinal data from all three waves of the Papilio-U3 pilot summative evaluation and assessed 125 ECEC teachers. The participants were randomly assigned to an intervention or waiting-control group and reported their job-related stress and self-efficacy beliefs before, during, and after program implementation (waves 1, 2, and 3, respectively). We conducted longitudinal analyses of covariance with separate models for wave 2 and wave 3 scores of the scales as outcomes

considering the baseline value of every outcome as well as teacher education and professional experience as covariates. After completion of the program, teachers of the IG reported higher self-efficacy beliefs compared to the waiting-control group (controlling for baseline scores). We did not detect any significant effects on teachers' job-related stress. Our results extend previous research on interventions that fostered teachers' self-efficacy beliefs but used less sound evaluation designs. Important limitations of our study include possible confounding due to the delayed return of the questionnaires, the potential for ceiling and floor effects of the employed measures, or the lacking representativeness of the sample.

Integration and Further Discussion

Over the course of the dissertation, several unifying themes emerged: supporting ECEC teachers and promoting their resources, knowledge, attitudes, and beliefs, fostering the social-emotional development of children in ECEC, and the foundations of developmentally appropriate prevention.

Social-emotional competence is a vital resource for a child's development and can be viably addressed in the ECEC context. ECEC teachers bear the potential to support children by addressing risk factors for their social-emotional development (e.g., early behavioral problems or lacking social support), providing caregiving conditions that foster promotive and protective factors (e.g., sensitive teacher-child interactions or providing goodness of fit), and helping children to attain age-specific developmental tasks (e.g., by their support for a sensitive transition to childcare) and build their competence. Thus, ECEC teachers act as protagonists of developmentally appropriate prevention practices.

Teachers' Self-Efficacy. One particularly interesting link that arose over the three manuscripts is the relevance of teachers' self-efficacy. We found their self-efficacy to have a moderating influence on the relation between family risk and child social-emotional competence, addressed teachers' self-efficacy in the Papilio-U3 program, and demonstrated that the program affected this variable.

Confidence or self-efficacy of parents are viewed as a central variable for parenting practices (T. L. Jones & Prinz, 2005) and evaluation studies in the family context proved effective in enhancing parents' self-efficacy with sustained effects at follow-ups up to one-year post-intervention (Amin et al., 2018; Breitenstein et al., 2012; Kirby & Sanders, 2014; Wittkowski et al., 2016). Moreover, intervention studies established the proposed links between parents' efficacy and actual parenting behavior and practices: Changes in parental self-efficacy

have been associated with both supportive parenting and inept or harsh discipline (Deković et al., 2010; Miller-Heyl et al., 1998).

For the ECEC teachers of our intervention group, we found an increase in their professional self-efficacy expectations (compared to the teachers from the waiting-control group). That is, for example, they reported greater confidence in dealing with difficult situations in their daily routines or with problematic children. Only in recent years have models of ECEC quality increasingly integrated teacher attributes such as self-efficacy, teachers' social-emotional competence, and stress to assess their influence on child outcomes via their effects on teacher-child interactions (Blewitt et al., 2020). We replicated and extended the results of ECEC preventive intervention programs that fostered teachers' self-efficacy beliefs (Bautista, 2011; Frosch et al., 2018; Tanaka et al., 2020) by employing a randomized-control design to substantiate these effects.

Job-Related Stress. Although during the formative evaluation, the majority of the ECEC teachers of our intervention group reported an increase in their job satisfaction accompanied by the implementation of Papilio-U3 (Manuscript II), we were not able to confirm the statistical significance of this impression by means of the standardized measure we used (Manuscript III). This was partly due to the initially low stress levels that the teachers reported on the measure we used. During the planning phase of the pilot study, we discussed the utilization of a variety of instruments to measure teachers' job-related stress, but eventually opted for the Job-Related Stress Scale (Enzmann & Kleiber, 1989) on grounds of the comparability of our results with those from previous evaluation studies of the other Papilio program for preschoolers (Scheithauer & Peter, 2022). Furthermore, there are discussions from statisticians and other scientists that have repeatedly criticized the reduction of statistical inference on supposedly arbitrary significance values and suggested alternative approaches to hypotheses testing (e.g., Amrhein et al., 2019; Wasserstein & Lazar, 2016; Wasserstein et al., 2019). For example, one approach would be to interpret interval estimates of an effect as "compatibility intervals" instead of "confidence intervals" (Amrhein et al., 2019; Wasserstein et al., 2019). A closer inspection of the point and interval estimates of Manuscript III effect sizes would, for example, imply that our data are compatible with the notion that Papilio-U3 may have had a small effect on teachers' job-related stress. Although the effect of d = -0.170 on teachers' job-related stress at wave 3 is the most probable effect given our data, it is not unlikely that the program may also have contributed to an increase in the teachers' stress level (i.e., d = 0.246), or, conversely, the reduction of the stress level could have been higher as compared with the one we found (i.e., d = -0.586). Nonetheless, future studies are needed to assess teachers' stress more sophisticatedly.

Predominantly, they should incorporate context-specific aspects of teachers' stress and working conditions in ECEC (Schreyer & Krause, 2016) and enable us to distinguish between teachers' stress and their job satisfaction. Other studies investigating ECEC teachers' job stress in Germany generally supported international evidence that teachers tended to rate their job satisfaction as high (Rudow, 2004; Schreyer & Krause, 2016), but concurrently, elevated levels of job strain, a heightened risk for burnout symptoms, or unfavorable ratios of job demands and gratifications have been found (Jungbauer & Ehlen, 2015; Rudow, 2004; Schreyer & Krause, 2016). Thus, investigations are needed on the questions of to what extent job stress and satisfaction are subject to change by preventive interventions, which variables moderate and mediate these changes, and how sustainable these effects are.

Outlook on the Further Evaluation of the Papilio-U3 Program

As outcomes of the Papilio-U3 pilot evaluation study, so far, we primarily obtained results on the teacher level (Ortelbach et al., 2022; Ortelbach, Bovenschen, et al., 2023). The following paragraphs outline further steps of the analyses that have already been taken or are yet to come.

Results of the Observational Measures

Teachers' Behavior. Over the course of the evaluation study, we collected videotaped observational data from a sub-sample of all investigated teachers. We selected this sub-sample of $N = 65$ teachers by randomly assigning one teacher per ECEC center group that participated in the program as an "index teacher" ($n_{IG} = 35$, $n_{WCG} = 31$). Bovenschen et al. (2022, September, 10-15) analyzed the effects of the Papilio-U3 program on index teachers' group-oriented behavior. Teachers' behavior was linked to their professional background, but no intervention effects on the two examined outcomes (Caregiver Interaction Scale, Arnett, 1989; Support of Group Processes, van Schaik et al., 2018) could be detected.

Attachment Security. Moreover, preliminary results for changes in children's attachment security to their teachers based on a subsample of $N = 72$ "index children" ($n_{IG} = 36$, $n_{WCG} = 36$) showed no overall intervention effect (Peter et al., 2020). However, further analyses revealed differential effects: For children with lower attachment security at pretest, we detected an increase in children's attachment security when their teachers participated in Papilio-U3 (intervention group) compared with children from the waiting-control group. Thus, preliminary results indicate that children with lower attachment security may benefit from participation in the Papilio-U3 program (Peter et al., 2020).

Next Steps of the Analyses

Whereas until now, we have extensively studied the effects of Papilio-U3 on the teacher level, crucial next steps comprise analyzing overall intervention effects on the child level. First, we plan to examine the remaining outcomes on the child level. For analyses on the child level, we will implement multilevel analyses to account for the nested data structure.

Throughout the Papilio-U3 pilot study, we assessed several constructs and variables in order to uncover the influence of potential covariates or moderating influences on the program effectiveness and the child's social-emotional developmental trajectories. In addition to family risk factors (Ortelbach, Gerlach, et al., 2023), important influential variables include child temperament, developmental status, and the quality of the transition to childcare. Detailed analyses will focus on moderator analyses to reveal potential differential effects, for example, tests of different intervention effects for children with differing levels of family risk factors or temperamental differences (cf. the differential susceptibility paradigm, Belsky, 1997; van Ijzendoorn & Bakermans-Kranenburg, 2012). Lastly, detailed analyses will focus on the quality of the child's transition to childcare. Studies clearly point out that the process of transitioning to childcare is challenging for children and associated with stress reactions and elevated levels of negative emotion, and that ECEC teachers play a particularly important role during the onset period of childcare (Ahnert et al., 2004; Ahnert et al., 2021; Ereky-Stevens et al., 2018; Nystad et al., 2021). At the first measurement wave, we asked the teachers to retrospectively provide information on their transition practices and experiences during the transition period of the index children. Thus, we will be able to consider this information to get insights into the processes involved in building teachers' attachment relationships with the children and their trajectories over the course of our study.

Program Design and Content

In Manuscript II (Ortelbach et al., 2022), we gave a detailed account of the original program design and revision and marked the addition of a second supervision session as the most significant change in the program. Subsequently, there were two program components for which the evidence base is particularly strong and which both are at the core of Papilio-U3: teachers' emotion talk (as an example for program content) and the use of video feedback during the training (as an example for training methods).

Emotion Talk

Elements of Emotion Talk. Caregivers' emotion talk can, on the one hand, be considered as their verbal reactions in an and emotional regulation of a given situation. This may comprise of identifying and labeling the child's emotions, facilitating the understandability of emotion words by speech tempo and complexity of the sentence, emphasizing and repeating emotion words, explaining the causes and consequences of the current emotion, and demonstrating and modeling an appropriate emotion regulation strategy (Aktar & Pérez-Edgar, 2020; Brinton & Fujiki, 2011; Houseman, 2017). In a broader sense, emotion talk pertains to the general frequency and intensity of which caregivers focus on emotional aspects in daily routines and make use of emotional verbalizations. Examples comprise of indicating caregivers' own emotions as well as other children's emotions, indicating emotions that emerge in situations such as farewell from parents, conflicts, or singing and playing during circle time, focusing on emotional content in the course of joint picture book reading and discussing, or emotional reminiscing on past events (Brinton & Fujiki, 2011; Brownell, Svetlova, et al., 2013; Laible, 2011; Pfalzgraf et al., 2020).

Impact of Emotion Talk. Caregivers' emotion talk has frequently been linked to a child's emotion vocabulary, emotion understanding, or prosocial behavior (Brown & Dunn, 1996; Brownell, Svetlova, et al., 2013; Garner et al., 2008; Harris, 2008). Emotion talk can easily be integrated into models of emotion socialization (Eisenberg et al., 1998; A. S. Morris et al., 2007): It is a crucial part of emotion-related parenting practices (i.e., emotion talk as caregivers' behavior towards the child) as well as parental modeling (i.e., caregivers' emotion talk as a model for a child's handling of emotions). Several processes are discussed to explain the beneficial role of caregivers' emotion talk. Emotion talk that incorporates a regulation component to calm children during an acute emotional episode contributes to caregivers' necessary (co-)regulation of children's emotions. Beyond that, by applying emotion talk, caregivers foster the child's emotion knowledge and vocabulary by continuously providing emotion words for children's feelings, or emotion understanding by repeatedly linking causes and consequences for emotions with emotional episodes (Houseman, 2017; A. S. Morris et al., 2007). In the internalization model of emotions, a caregiver's affect mirroring and a child's motor mimicry are crucial interdependent processes that constitute early emotional development, and during emotional development, verbal aspects of emotional expressions as facilitated through emotion talk are integrated into culturally shaped emotion expressions (Holodynski, 2005).

Emotion Talk in ECEC. Notably, for the ECEC context, emotion talk directed towards a specific child is rarely only beneficial for this single child. Effectively, the discussion of any emotional situation provides a learning experience for all children in the group. Studies established that children are very interested in emotional events and the emotions of others, which is mirrored in research on affect-biased attention (specially to fear) that emerges during the transition from infancy to toddlerhood (Aktar & Pérez-Edgar, 2020). Caregivers vary in their use of emotion talk (Kuersten-Hogan & McHale, 2000; van der Pol et al., 2015) and research indicates that ECEC teachers' labeling of or explaining emotions does not occur very frequently (Alamos & Williford, 2020; C. A. S. Morris et al., 2013). In a recent study that involved teachers reading and discussing a picture book that contained a lot of potentially emotional stimulating material with the children in their group, the authors expressed their surprise that "half of the teachers labeled emotions once at the most and were never observed to explain emotions or emotion-related behaviors to children" (Alamos & Williford, 2020, p. 8). Thus, fostering ECEC teachers' use of emotion talk appears to be a promising target for interventions and, accordingly, intervention programs that targeted a child's social-emotional competence incorporated discussions of a child's emotions (e.g., Fernández-Sánchez et al., 2015; Ornaghi et al., 2015; Salmon et al., 2013). For example, a brief intervention for children between three and four years focusing solely on their emotion talk increased the intervention group's use of emotion labels, though no other aspects of emotion knowledge (Salmon et al., 2013).

Emotion Talk in the Papilio-U3 Program. In the Papilio-U3 program, we implemented emotion talk as a core topic in our training for the ECEC teachers. Over the course of the training sessions on social-emotional development, we discussed teachers' emotional self-efficacy, their beliefs in their role in children's emotion socialization, and their current use of emotion talk, including a discussion on their active emotion vocabulary and theoretical impulses on the scientific background of emotion talk. Furthermore, we designed a role-play activity implemented in small groups during the teacher training that focused on typical situations from ECEC centers where children would display different emotions. We asked the teachers to take the role of the child or the teacher and practice the relevant aspects of emotion talk and discuss the facilitation of appropriate emotion regulation strategies. Subsequently, we encouraged the teachers to extend their practices of emotion talk in their daily routines and use their colleagues in the ECEC as a source for validation and feedback (Pfalzgraf et al., 2020). Lastly, on the stand-up display we designed for the teachers to position in their group room as 'best practice' leaflets (see Figure 3 in Ortelbach et al., 2022), several pages cover crucial

aspects of emotions, emotion talk, and emotion regulation and thus provide teachers with prompts to implement emotion talk in their daily routine. During the formative evaluation, when we asked teachers for their feedback on the different program topics, they gave their most positive feedback on the topics of emotions and emotion talk, as well as the topics attachment and sensitivity. Concurrently, as we discussed in Ortelbach et al. (2022), although the teachers were more hesitant in their ratings of the use of role-play activities during the training sessions, we considered these activities as a crucial element of our training for the practice and implementation of emotion talk. Additionally, in this manuscript, we mentioned the potential implementation of curriculum aspects in future revisions of the Papilio-U3 program. Potential elements, that may foster children's emotional development and that are associated with teachers' fostering of children's emotional development, would be the provision of picture books with stories on basic emotions and the design of a schedule for teachers to regularly involve the children in reading those stories, or emotional displays that allow children to connect their own current emotion with pictures on a poster or display, that could, for example, be used during morning circle (Brazzelli et al., 2021; Houseman, 2017).

Video Feedback

Another example of a crucial element of the Papilio-U3 teacher training is the utilization of the video feedback method.

Evidence Base for Video Feedback. Video feedback is a widely-used element of attachment-focused prevention and intervention programs for parents (e.g., Dozier et al., 2018; Juffer et al., 2017). Bakermans-Kranenburg et al.'s (2003) meta-analysis of attachment-based parenting interventions involving a variety of methods found that interventions that employed video feedback were more effective in promoting mothers' sensitivity, but less effective in fostering attachment security of children. A more recent meta-analysis specifically targeted video-feedback interventions (Fukkink, 2008) and found small to average effects of studies that assessed parenting behavior (e.g., sensitivity, cooperation, or negative parenting variables), parenting attitudes (e.g., experienced parenting problems or stress), as well as child outcomes (e.g., attachment security or problem behavior). Due to its widespread use in the family context and the promising results of effectiveness evaluations, the method has hence been adapted for use in ECEC settings (Early et al., 2017; Fukkink & Tavecchio, 2010; Groeneveld et al., 2011; Helmerhorst et al., 2017). Fukkink and Tavecchio (2010), for example, implemented a brief training for ECEC teachers (Video Interaction Guidance training) that consisted of four training sessions, each including video feedback. The intervention attained effects post-intervention and

at three-months follow-up on several global and specific indicators of positive teacher-child interactions (e.g., sensitive responsivity or making eye contact).

Video Feedback in the Papilio-U3 Program. In the revised program version, we implemented two video-feedback sessions over the course of the program (see Ortelbach et al., 2022). For the initial sessions of the program, we employed other training methods to cover the topics of child social-emotional development or temperament. We reserved the start of the video feedback to create group cohesion and a professional working relationship between the participants and the trainer, especially as we were aware that many teachers were reluctant or hesitant towards this method. Only during sessions 4 and 5 did the trainers introduce the video-feedback method and participants provided a short videotape of interaction with children from their ECEC center group prior to the subsequent training session (i.e., the first supervision session). During the session, the trainer presented a section of the videotape and the other group members were asked to provide resource-oriented feedback that was complemented by the trainer's positive feedback. This procedure was subsequently repeated during a second supervision session with the aim to evaluate changes in the teachers' interaction quality and to indicate a potential area of professional growth by the trainer. As the formative evaluation indicated, nearly all teachers (98%) positively rated the use of video feedback implemented in Papilio-U3. Qualitative statements of single teachers strongly emphasized these favorable accounts. Even though the video-feedback method was among the most commented aspects of the study, where the teacher's expressed hesitation in using the method, in retrospect it was the element they most benefitted from. Future evaluation studies of the Papilio-U3 program should evaluate the revised program version that implements a second video feedback session with the inclusion of the trainers' feedback on the limited or underdeveloped caregiving capacities of the teachers.

Implications

Comprehensive Implementation of Papilio-U3

An important result of the formative evaluation of the program pilot implementation was that the participating ECEC teachers positively evaluated the program content and methods of the training (Ortelbach et al., 2022). The program proved feasible under the circumstances that reflect how the program is disseminated after the pilot stage, that is, we evaluated the program by adopting a train-the-trainer approach. Over the course of the pilot project, we established a viable implementation infrastructure and network that connects more and more ECEC centers

with groups of children under the age of three in order to facilitate the subsequent widespread dissemination of the program.

The non-profit company Papilio gGmbH (Augsburg, Germany) is responsible for the implementation of the program Papilio-U3 (besides other ECEC preventive intervention programs, see below). Papilio gGmbH started the further implementation of the program shortly after the initial results of the pilot study and by the end of 2021, 29 trainers were trained to deliver the program to ECEC teachers from 11 different German states and 193 teachers completed the Papilio-U3 training and brought the program to the children in their ECEC centers (Papilio gGmbH, 2022). Moreover, 239 trainers and 7.975 ECEC teachers completed the Papilio-3to6 program for preschoolers, which has been implemented since 2006 (Papilio gGmbH, 2022; Scheithauer & Peter, 2022). Thus, there is a comprehensive network of ECEC centers that are already participating in Papilio programs with the aim of fostering sensitive teacher-child interactions and social-emotional competence of children in ECEC.

In Germany, there is currently a re-emerging debate on skilled labor shortage concerning especially the ECEC system (Tagesschau, 2022; Zeit Online, 2023). As this debate has been led for a very long time by now, the structural situation (in terms of an increase in staff number or decrease in adult-child-ratio) may not soon change for the better. Evidence-based prevention programs bear the potential to target psychological variables and foster teachers' competencies such as coping, emotion-regulation, or problem-solving skills that may help to attenuate situations with overburdening stress (Bartholomew Eldredge et al., 2016). Supporting teachers, increasing their job satisfaction and mental health, and thus contributing to providing sensitive care arrangements for children in ECEC are vital goals for Papilio-U3 – and the other Papilio programs.

Prevention From Infancy Until the First School Years

Papilio (Papilio gGmbH, 2023; Scheithauer & Scheer, 2022) provides an approach that encompasses prevention programs for children from their first year until the early elementary school years (Papilio-U3, Ortelbach et al., 2022; Papilio-3to6, Scheithauer & Peter, 2022; Papilio-6to9, Lechner et al., 2020). Two broad themes connect the three Papilio programs: fostering sensitive relationships between children and their teachers in ECEC, and fostering social-emotional competence of children in order to prevent subsequent emotional or behavioral problems. All three programs are designed for the ECEC context (early childcare, i.e., German "Kindertagesstätte", and years 1 and 2 of elementary school), and there are different elements that connect their settings: Papilio-U3 and Papilio-3to6 are set in ECEC centers and following

the increasing dissemination of Papilio-U3 in Germany, centers are increasingly implementing both programs in their groups for children under and over the age of three, respectively. Papilio-3to6 and Papilio-6to9 are connected over the measure “Puppet in the Box Story”, an interactive story focusing on emotion knowledge and emotion regulation of primary (Papilio-3to6) and secondary emotions (Papilio-6to9). This story engages teachers and children in discussions on emotions and emotion regulation strategies with the aim to foster children’s emotional competence. In the future, we plan to create program components that directly address the transition to the school setting, for example by initiating and supporting the closer collaboration of ECEC centers and elementary schools. Further common elements of the programs include the collaboration of teachers with parents to transfer program contents (e.g., strategies to foster children’s social-emotional competence) to the family system, the collaboration and mutual feedback and support within the team of teachers, and working on teachers’ beliefs and attitudes towards their own competence (e.g., self-efficacy beliefs) as well as their role in providing sensitive care for the children in their group. An overview of recurring themes that uniquely characterize the three Papilio programs is depicted in Table 2.

Lastly, Papilio employs a sustainable approach: Teachers who participated in a single training can implement the program in the long term. Papilio gGmbH provides an infrastructure for the supervision of the Papilio trainers and supports trainers by organizing regular meetings or buffer sessions with former participants. Those buffer sessions include the opportunity for teachers to exchange experiences with the program implementation or discuss difficult or challenging situations that emerge during their daily routines.

Table 2

Examples of Recurring Themes Addressed in the Three Papilio Programs

Main Theme	Papilio-U3 	Papilio-3to6 	Papilio-6to9 
Fostering of teacher-child relationships	• Fostering of sensitive teacher-child interactions and secure child-teacher attachment relationships	• Fostering of teachers' positive interaction skills and supportive educational atmosphere	• Fostering of child-teacher relationships via interventions and reflections from positive psychology
Fostering emotional competence	• Fostering of teachers' emotion talk • Modeling of effective emotion regulation	• Intervention Component "Puppet in the Box Story"	• Intervention Components "Puppet in the Box Story" and "Paula goes to school"
Support for self-regulation	• Co-regulation of emotions by teachers • Reflecting on children's temperament traits and needs	• Intervention Component "Mine-Yours-Our-Game" • Fostering of teachers' group management and positive interaction skills	• Collection of games to foster executive functions • Training of problem-solving skills
Support for peer relationships	• Fostering of teachers' group-centered sensitivity • Fostering of children's early prosocial behavior	• Intervention Component "Toys on Holiday" • Fostering of supportive educational atmosphere	• Intervention Component "Paula goes to school" • Collection of cooperative group games
Social competent behavior in the context of rules	• Reflecting on principles of sensitive discipline and positive reinforcement	• Intervention Component "Mine-Yours-Our-Game" • Fostering of teachers' group management and positive interaction skills	• Adaptation of the Good Behavior Game

Note. References for the three programs are provided in the text; images © Papilio gGmbH.

There are other preventive intervention programs set in different educational contexts in Germany that build upon each other. To our knowledge, however, they do not provide program versions for children under the age of three or lack results of evaluation studies (Koglin & Petermann, 2013; Schick & Cierpka, 2010). In a comparison of numerous international studies on the effectiveness of prevention programs in early childhood, Brooks-Gunn (2003) concluded that these programs can improve behavioral outcomes that are connected with later school performance of vulnerable children and that these effects are found above all for children with a lower family socioeconomic background. In general, the strength of these positive effects decreased over time, even though they were still evident in individual studies up to the elementary school age or over the secondary school years. The strongest and longest-lasting effects were found in programs that continue to accompany children during their elementary school years and provide a higher dose of the intervention on a sustained basis. We aim to devote future evaluation studies to investigating joint effects of the Papilio programs to test the notion that even small effects of programs may cumulate to impact children's competence and adjustment.

Strengths and Limitations

There are several strengths and limitations of the present dissertation primarily regarding the significance and interpretability of the pilot study evaluation results.

Attrition and Potential for Confounding

As described in (Ortelbach, Bovenschen, et al., 2023), two important limitations pertain to possible confounders of program effectiveness: the return of questionnaires by ECEC teachers and the attrition of participants. The potential mitigation of intervention effects by teachers returning the questionnaires after the training had already started does apply to variables on the child level as it does to the teacher variables. Furthermore, the first training sessions cover the topics of child social-emotional development, competence, and temperament. Teachers of the intervention group might have been sensitized towards these topics and this may have altered their perceptions of the children's social-emotional competence and problems. Thus, analyses of the respective study outcomes would be conservative estimates of the effects of the intervention. Conversely, attrition between the assessment waves primarily occurred on the ECEC teacher level: If teachers dropped out of the study because they changed jobs or went on maternity leave, in most cases we were able to retrieve child data from the second teacher of the same group. One systematic attrition on the

child level would be the dropout of older children from wave 1 to wave 3 because they changed the group to a preschool group of the ECEC center.

Observation Period and Sleeper Effects

It is conceivable that small effect sizes on teachers' self-efficacy-beliefs or lacking effects (e.g., on teachers' job-related stress or group-oriented behavior) are due to sleeper effects. There are indications in the literature that implementing behavioral changes might take more time because caregivers need more time to acquire and strengthen new skills or adjust to changed routines (van Aar et al., 2017; van der Put et al., 2018). J. Barnes and Freude-Lagevardi (2002) reviewed the findings of numerous early intervention studies and showed that early interventions do not always lead to effects that are immediately observable, but in some cases lead to effects that only unfold later. There are examples of parenting programs that report delayed effects on parenting or child outcomes after longer follow-up periods (Jouriles et al., 2009; Sofronoff et al., 2011; Somech & Elizur, 2012). A review and meta-analysis on parenting interventions that reduced child behavioral problems (van Aar et al., 2017) conclude that additional sleeper effects do occur after some interventions, but are not reported regularly.

Observational Data

Lacking effects on teachers' behavior might be due to several reasons (Bovenschen et al., 2022, September, 10-15). First, it is possible that the measures we used did not capture relevant aspects of teachers' behavior that had been addressed by the program. One central element of Papilio-U3 is fostering the teachers' emotion talk. Labeling children's emotions, identifying and explaining the causes and consequences of emotions, and communicating emotion regulation strategies are, to a lesser extent, represented in our measures of group-centered teacher interactions (Arnett, 1989; van Schaik et al., 2018). Second, our sample of ECEC teachers might have been too small and not representative of other German ECEC teachers, and the possible selection bias (Ortelbach, Bovenschen, et al., 2023) might cause ceiling effects which, in turn, can hinder the detection of significant intervention effects. Third, it is possible that we need a more intensive training to change teachers' behavior.

Randomized-Controlled Trial and Multitude of Data Sources

A major strength of the chosen evaluation design lies in the combination of different data sources and collection methods (questionnaire, observation, developmental test), and thus the potential for balancing out disadvantages of the individual method classes such as higher

subjectivity and possible response shifts (questionnaires) or the coverage of only a small part of the child's living environment and possible influence of the observation situation by the observing persons (observation methods). For some variables, we found a tendency for ceiling or floor effects with the instruments we employed. This applies to teachers' ratings of their self-efficacy beliefs and job-related stress (Ortelbach, Bovenschen, et al., 2023), as well as some of the observational scales we used to assess the teachers' group-oriented behavior (Bovenschen et al., 2022, September, 10-15). Burchinal (2018) also critically examines the results of existing studies on the effectiveness of prevention programs in promoting quality early care, mentioning the lack of availability of reliable and fully content-valid measurement instruments to validate intervention effects. However, while this may restrict the interpretability of effects on single variables, we expect that the shortcomings of individual instruments will become weaker once we fully understand the intervention effects on the individual levels and from our diverse set of data sources. Finally, a central strength of the study is the randomized waiting-control design with three measurement occasions that allows to attribute longitudinal changes in teachers' or children's variables to effects of the investigated program.

Conclusion

In conclusion, Brooks-Gunn (2003) cautions in her review of prevention programs in early childhood against expecting too much from short-term programs that are implemented once during this early period. Moreover, she points out that numerous further variables and influences affect children as they develop, such as the educational quality of the school children attend. Although further steps must be taken to confirm and extend our preliminary evaluation results, the implementation of Papilio-U3 offers an important perspective and potential: The long-term training of ECEC teachers precludes that trainings effects wear off shortly. Through the combination with the consecutive preschool program Papilio-3to6, important prerequisites arise that may consolidate initial, even small, effects. Papilio reaches the children with developmentally appropriate, low-threshold measures. Through the long-term link with the Papilio-6to9 program, or other evidence-based social-emotional learning programs implemented in elementary school, children can be further supported to develop social-emotional competence and grow up strong.

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Eigenständigkeitserklärung

Hiermit erkläre ich, dass ich die vorliegende Dissertation selbstständig verfasst und ohne unerlaubte Hilfe angefertigt habe. Alle Hilfsmittel, die verwendet wurden, habe ich angegeben. Die Dissertation ist in keinem früheren Promotionsverfahren angenommen oder abgelehnt worden.

Berlin, den 07.02.2023

Niklas Ortelbach