Development of emotional knowledge and its relationship with productive vocabulary in monolingual and multilingual children in pre-primary classes

[1,3,4*]Christin Büning, [1,4]Irene Corvacho del Toro, [2,4]Arianne Lydia Andreas, [2,4]Mirjam Naomi Menz, [2,4]Miriam Hansen, [3]Carolin Quenzer-Alfred, [3]Daniel Mays

[1]*University of Siegen, Germany*
[2]*Goethe University Frankfurt, Germany*
[3]*University of Education, Freiburg, Germany*
[4]*IDeA Centre, Germany*

*Corresponding Author: christin.buening@uni-siegen.de

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Abstract

Emotional and language skills are prerequisites for successful participation in educational processes. Multilingual children often have different backgrounds for acquiring German, which can affect their language and emotional development. Studies indicate a reciprocal relationship between language and emotional competencies. However, the relationship between productive vocabulary and emotional knowledge has not yet been sufficiently investigated. In Hesse, Germany, children who have been deferred from school enrolment due to developmental delays can attend pre-primary classes. No research has examined their skills so far. This study explores productive vocabulary and emotional knowledge of monolingual and multilingual pre-primary classes children. Using data from 179 children, the study examines initial differences, developmental trajectories, and potential correlations between productive vocabulary and emotional knowledge, with a particular focus on the role of home language exposure. Productive vocabulary was measured at the beginning of pre-primary class using the picture-naming subtest from SET 5–10. Emotional knowledge was assessed at the beginning and end of pre-primary class using the ATEM 3–9. The analysis was carried out using MANOVA, ANOVAS and Spearman's rank correlation. The results show significant differences at school entry: Monolingual children perform better than multilingual peers in both domains. Within the multilingual group, home exposure to German is associated with higher scores. Over the school year, all groups show significant increases in emotional knowledge. A moderate to strong correlation can be found between productive vocabulary and emotional knowledge. The study underscores the importance of integrating systematic and additional emotional and language learning programs in primary education.

Keywords: Emotional knowledge, productive vocabulary, multilingualism, primary school, emotional development

Introduction

Language as a Foundation for Educational Development

The transition to the school system is an important developmental stage in which language skills appear central to educational success. Language skills are both a medium and a prerequisite for successful school participation (Gabler et al., 2020). In particular, the area of

vocabulary is central to be able to successfully participate in educational processes. A distinction is commonly made between a productive and a receptive vocabulary (Seifert et al., 2019). While the receptive vocabulary serves the purpose of being able to understand content, the productive vocabulary can be actively used in conversations and narratives and serves to verbally express one's thoughts, opinions, and emotions. The findings of Bahn et al. (2023) suggest that monolingual children in preschool and primary school already use a varied productive emotional vocabulary to describe internal states in the context of narrative retellings. Grosse et al. (2021) found out that the usage pattern of emotion words becomes more similar to adult usage with age. This result indicates that for children, adjusting their labeling of emotional states to adult labeling is a long process, which is not yet completed at primary school age. Furthermore, their results show that children in primary school start to produce first words with broader covering and the specific ones who adults use in the direct interaction.

Particularly for children learning a second language, language development depends to a large extent on the conditions of acquisition, such as the age by first contact with the language, the amount of time in years using the language and the quality of the input in the German language (Ehl & Grosche, 2020). In bilingual children with German as a second language it seems that their German vocabulary is more limited than for monolingual children at the same age (Limbrid, 2007; McElvany et al., 2017).

Emotional Competence in Educational Contexts and Development of Emotional Knowledge

In addition to language competencies, emotional competencies are fundamental for successful participation in educational processes (Denham & Brown, 2010). Emotional knowledge is seen as a subset of emotional competences, along with emotional expression and emotional regulation, and enables the recognition, understanding and appropriate interpretation of one's own and others' emotions (Petermann et al., 2016). In this context, emotional knowledge refers specifically to the understanding, recognition, and verbal labeling of emotions, as a basic requirement for and as a distinct from emotional regulation or expression. Since emotional knowledge is shaped by cultural socialization influences (Petermann & Wiedebusch, 2016), the term here refers to the emotional knowledge that predominates in everyday language and also the professional discourse in Germany.

The development of emotional knowledge begins in early childhood. As early as the third month of life, children can distinguish between emotional facial expressions of basic emotions such as happiness, anger, sadness, fear, or surprise (Petermann & Wiedebusch, 2016). This ability deepens with age and moral development, so that by the end of the second year, secondary emotions such as pride, guilt, jealousy, or empathy are added (Tracy et al., 2005; Petermann & Wiedebusch, 2016). Cognitive development and emotional experience precede the development of verbal expression of emotion. By the end of the second year, children should be able to verbalize individual words for basic emotions and have developed a basic

passive understanding of emotions (Petermann & Wiedebusch, 2016). Between the ages of three and five, children should be able to recognize the emotions of others based on cues or situational descriptions (Voltmer & Salisch, 2021). The vocabulary of emotions continues to expand, so that by the fourth year of life, many children are able to name the emotions of others and conduct conversations about emotions (Petermann & Wiedebusch, 2016). By primary school age, children develop usually step by step the ability to perceive multiple emotions simultaneously (mixed emotions) and to distinguish between a culturally or socially desired expression of emotion and an actually felt emotion (Klinkhammer et al., 2022). Younger children are often able to make this distinction only with the help of appropriate cues, while from the age of six onwards they are increasingly able to do so independently (Voltmer & von Salisch, 2021).

Emotional knowledge differs between children with a migration background and children born in Germany. Voltmer and von Salisch (2018) were able to show that in Germany, children with a migration background between the ages of three and six have significantly less emotional knowledge than children without a migration background. These differences in emotional knowledge can have an impact on successful participation in educational processes. For example, comprehensive emotional knowledge is conducive to the acquisition of emotional regulation skills (Denham et al., 2012, 2014; von Salisch et al., 2015). These regulatory skills are crucial for children's school readiness and long-term educational success (Denham & Brown, 2010; Petermann & Wiedebusch, 2016). Emotional regulation facilitates adaptation to academic challenges and social integration, whereas difficulties in this area are associated with attention problems, aggressive behavior, and lower academic achievement (Eisenberg et al., 2001; Bulotsky-Shearer & Fantuzzo, 2004). Children who have acquired adequate emotional competence can also develop additional competencies in other areas of development (Petermann & Wiedebusch, 2016).

Relationship between Emotional and Language Competencies

Emotional and language skills are considered central areas of development in early, primary and middle childhood. There is thought to be a reciprocal relationship between the two, with emotional skills having a positive impact on language skills and vice versa (Beck et al., 2011). Thus, language is used to express, process, and share emotions with others. The naming of emotional states can help to organize and reflect on one's own emotional experiences, which in turn can lead to an expansion of emotional knowledge. At the same time, verbal expression of emotions can support understanding of the emotions of others (von Salisch & Wübker, 2021).

Previous studies point to positive correlations between different emotional and linguistic subskills (cf. Petermann & Wiedebusch, 2016). For example, von Salisch et al. (2015) found a positive relationship between emotional knowledge and language comprehension in 261 children aged between 46 and 72 months. Köckerlitz et al. (2010) point to a positive relationship between an understanding of emotions and receptive language comprehension

in children with and without a migration background aged between three and six years. Beck et al. (2011) also found a positive relationship between declarative emotional knowledge and receptive vocabulary, and between receptive vocabulary and mixed emotion awareness and facial expression recognition among 210 predominantly monolingual German children aged seven to nine. Ertanir et al. (2019) found positive correlations between vocabulary and socio-emotional skills in predominantly multilingual kindergarden children. Mayer et al. (2024) were able to show that children with mental health problems in the second and third grades of special education schools with a focus on emotional and social development have a limited productive vocabulary. Furthermore Ulrich et al. (2019) found out that vocabulary influences performance in naming but not in recognizing basic emotions. In addition, Ertanir et al. (2019) as well as Rose et al. (2016) could show that socio-emotional skills can predict vocabulary.

These reciprocal effects between language and emotion can be theoretically framed within constructivist perspectives, which emphasize the social function of language not only as a means of communication but also as a mediator of internal processes such as emotion regulation and self-reflection. Through language children can name, classify, and discuss emotional experiences, thereby transforming diffuse affective states into structured emotional knowledge (Denham et al., 2003; Vygotsky, 1978). In particular, acquiring emotion-related vocabulary enables children to reflect on and differentiate between emotional states, which in turn supports more advanced regulation strategies and social understanding. This dynamic interplay suggests that language development may act both as a prerequisite for and a result of emotional competence development.

While previous research has largely focused on receptive language skills, the role of productive vocabulary in the development of emotional knowledge remains underexplored, especially among children in primary school. Most of the existing studies refer to early childhood.

The Pre-Primary Classes as a Research Context

In Hesse, a federal state in Germany, there are so-called pre-primary classes. These can be attended by children of school age whose enrolment has been postponed with the consent of their parents. The Hessian school law forms the basis for these pre-primary classes. According to this, the enrolment of children in the regular primary school can be deferred due to physical, mental, or intellectual development delays (SchulG HE, 2017, § 58, Abs. 3). In this case, children can attend a pre-primary class before starting regular primary school. A high number of children attending the pre-primary classes learn German as a second language or have a migration background. In the Hessian city of Offenbach, for example, 89,2% of the pre-primary class children have a migration background (Ploch & Heinzmann, 2021). This rate is likely to vary depending on the catchment area of the pre-primary classes. However, it is assumed that most classes have a high proportion of children from immigrant backgrounds. Pre-primary classes serve as a preparatory measure to facilitate the children's transition from the kindergarten to the first class of the primary school. In the pre-primary classes, children are taught in smaller groups, and social workers are responsible for the class as class

teachers. The teaching in the pre-primary classes aims at a positive development in the areas of cognition, emotion, psyche, motor skills and social behaviour (Ploch & Heinzmann, 2021). The aim is to enable children to participate successfully in regular classes. Although the Hessian pre-primary classes have been in existence since 1953 (Leiner, 2022), there is currently no known research on these children's competencies.

The Project SEM: Language – Emotion – Mathematics

The interdisciplinary research project Language - Emotion – Mathematics (SEM) aims to contribute to filling this research gap. Within the project SEM, a language-integrated intervention in the areas of emotion and mathematics was developed and implemented in the pre-primary classes to support the learners in the areas of language, emotion, and mathematics. The interventions were implemented by the classroom teachers over a twelve-week period after a professionalization measure. The language-integrated emotion intervention focuses on the basic emotions joy, sadness, fear, anger, disgust, and surprise along with their linguistic expression and regulation. The language-integrated mathematical intervention focuses on the development of preliminary skills in the areas of counting, ordinal numbers, quantities, and numerical relations, which will not be further addressed in this paper. This paper reports first findings of the SEM project related to language and emotion regarding the multilingual children of the sample. On the one hand, this paper is going to contribute to closing the research gap concerning language and emotional competencies of children in Hessian pre-primary classes and the development of emotional knowledge. On the other hand, while the relationship between emotional competencies and receptive vocabulary has received increasing attention in literature, the relationship between emotional knowledge and productive vocabulary remains underexplored. By examining this connection, the SEM study seeks to contribute addressing this gap.

Aim and Research Questions

This article aims to examine the emotional knowledge and the productive vocabulary of monolingual and multilingual children in the Hessian pre-primary classes from various perspectives. Using a broad definition of the term multilingualism we refer to children who speak at least one other language in addition to German in their home environment. A special focus of the article refers to differences in children's emotional knowledge and productive vocabulary depending on the use of German in the home environment. The three central questions are:

1. How well developed are the productive vocabulary and the emotional knowledge of monolingual and multilingual children at the beginning of the pre-primary classes?

This question will be addressed to identify differences in productive vocabulary and emotional knowledge of monolingual and multilingual children in the pre-primary classes and to identify possible support needs at entering school.

2. Is there a relationship between emotional knowledge and productive vocabulary of monolingual and multilingual children in the pre-primary classes?

The purpose of this question is to discover a relationship between emotional and language competencies. Furthermore, it will be investigated whether this relationship is different depending on the language use, especially the use of German in the home environment.

3. How does the emotional knowledge of monolingual and multilingual children develop over the duration of a school year in the pre-primary classes?

To answer this question, it will be examined whether children's knowledge of emotions changes over the course of a pre-primary class year and whether different developmental trajectories emerge in relation to multilingualism and the use of German as a home language.

The overall aim of the study is to gain a deeper understanding of the emotional knowledge and productive vocabulary of monolingual and multilingual children in the Hessian pre-primary class at the transition to primary school. The findings are to serve as a basis for specific language and emotion-related support in the pre-primary classes and provide suggestions for language-sensitive pedagogical practice.

Methodology

Design

In the context of this article, the data on children's emotional knowledge and general productive vocabulary collected in the SEM project will be used. In Hesse, there are around 300 pre-primary classes. As part of the SEM study, 20 pre-primary classes were invited to participate in the project. Of the invited classes, 17 took part in the project. This means that approximately 5% of the children who attended a pre-primary class in the school year 2023/24 took part in the data collection. The children's competencies were assessed with the consent of their legal guardians. For this purpose, the guardians received an informed declaration of consent to be completed. This was made available also in various languages and in plain language if required. The children's emotional knowledge and productive vocabulary were collected at the beginning of the Hessian pre-primary classes (Measurement Point 1, MP1) in October 2023 through individual testing conducted by trained examiners. The emotional knowledge was additionally assessed at the end of the school year (MP2) in June/July 2024. During the school year, the children in the Hessian pre-primary class received a language-integrated emotion intervention for twelve weeks, which was conducted by the pre-primary class teachers. The pre-primary school teachers were going to implement the language-integrated emotion intervention for at least two school hours a week.

Sample

Data from 181 children from 17 Hessian pre-primary classes could be included. The mean age of the children at the first assessment was 6 years and 9 months (SD = 3.73 months). 79.33% of the children are multilingual. Of the multilingual children, 62.68% do not speak German at home. The pre-primary classes are located in the Hessian Rhine-Main region. It

was ensured that both children from inner city as well as from rural areas were represented in the sample. A language acquisition biography of the participating pre-primary children is not available. Neither is a diagnostic evaluation of the children's developmental delays known. In the context of the declaration of consent obtained from the parents, specific questions were asked to determine whether the children grow up multilingual, which other languages besides German are spoken, and whether German is used in the home environment.

Instruments

The Adaptive Test for the Assessment of Emotional Knowledge (ATEM 3-9) (Voltmer & von Salisch, 2021) was used to assess emotional knowledge in an individual testing. The test measures a child's emotional knowledge regarding the emotions happiness, sadness, fear, anger, disgust, and surprise in the seven components of recognizing emotions in other people's facial expressions, recognizing situations as triggers of emotions, (not) fulfilling wishes as triggers of emotions, mixed emotions, beliefs as triggers of emotions, knowledge about rules for expressing emotions, and knowledge about strategies for regulating emotions. The test is a non-verbal test. Children do not require a productive vocabulary to complete the test. The evaluation can be carried out for the individual components as well as for the entire test and is based on separate norm tables for monolingual and multilingual children.

Children's language skills were assessed using the Standardised Test of Language Skills for Children aged 5-10 years (SET 5-10) (Petermann, 2010). The subtest U1 Picture naming was used in the context of individual tests. The subtest measures productive vocabulary. The child is asked to name the contents of picture cards. The evaluation of this test procedure is based on norm tables which have been established on the basis of monolingual and multilingual children.

Data Analysis

Analyses were conducted using the software R (R Core Team, 2021). Cases were included in the data analysis if information was available regarding the child's emotional knowledge and productive vocabulary, as well as their language background concerning mono- or multilingualism and the use of the German language in the home environment.

First, the relevant variables were visually inspected for outliers. Subsequently, outliers were excluded from the analysis using the interquartile range method. As a result, two cases were excluded from the sample size, resulting in a final sample of 179 children.

Additionally, data from 11 children were excluded, because of their missing data at MP2. These reduces the sample size for the analysis of emotional knowledge development to a final number of 158 children.

The data on productive vocabulary and emotional knowledge were initially analyzed descriptively. To identify differences between monolingual and multilingual children, as well as among multilingual children considering their use of the German language at home, a MANOVA was conducted. For this purpose, the data were first examined for multivariate

normality using the Shapiro-Wilk test, for homogeneity of the covariance matrices using the Box's M test, and for homoscedasticity using the Levene test. Subsequently, univariate ANOVAs and post-hoc tests were performed. In addition, the effect sizes were calculated using the Eta square (η^2).

To investigate the relationship between productive vocabulary and emotional knowledge, a correlation analysis was performed. First, the emotional knowledge and productive vocabulary data were tested for normal distribution using the Shapiro-Wilk test. Subsequently, a correlation between emotional knowledge and productive vocabulary was calculated using Spearman's method.

In addition to the overall correlation between emotional knowledge and productive vocabulary, the relationship between productive vocabulary and the subscales recognition of emotions in others' facial expressions and mixed emotions of the test ATEM 3-9 were also examined.

To examine the development of children's emotional knowledge from the beginning (MP1) to the end of the school year (MP2) in the Hessian pre-primary class, a Mixed ANOVA was conducted. Furthermore, an ANCOVA was performed, controlling for the vocabulary skills measured in MP1. Following this, several t-tests for dependent samples were carried out to prove if there was a significant difference between the means within the groups (monolingual children, multilingual children with German at home, multilingual children without German at home) in their emotional knowledge from the beginning to the end of pre-primary class. The effect size was calculated using Cohen's d.

In order to identify the differences in emotional knowledge between the groups at the end of the pre-primary class, a descriptive analysis was followed by a one-way ANOVA and post-hoc tests.

Findings

Productive Vocabulary and emotional knowledge at the Beginning of Pre-Primary Classes

To address the first research question, the productive vocabulary and emotional knowledge of monolingual and multilingual children at the beginning of the pre-primary year were examined. This analysis aims to identify potential group differences and early language support needs as well as needs for support in emotional knowledge. 179 children can be included in the evaluation of their productive vocabulary and emotional knowledge at the beginning of the pre-primary class. The descriptive results of the productive vocabulary can be seen in Table 1.

Table 1. Productive vocabulary of monolingual and multilingual children at the beginning of the Hessian pre-primary classes

		$M_{\text{raw value}}$	$SD_{\text{raw value}}$	$M_{\text{T-score}}$	$SD_{\text{T-score}}$	n
MP 1	Monolingual children	19.59	6.53	36.27	7.38	37
	Multilingual children	7.99	5.89	28.38	6.54	142

German language at home	10.23	6.65	30.49	6.86	53
No German language at home	6.65	4.96	27.12	6.03	89

Monolingual children show below-average scores in productive vocabulary at the beginning of the pre-primary class (T-score: M = 36.27), whereas multilingual children score far below average (T-score: M = 28.38). Multilingual children who speak German at home perform slightly better (T-score: M = 30.49) than those without German language exposure at home (T-score: M = 27.12). The descriptive results of the emotional knowledge can be seen in Table 2.

Table 2. Emotional knowledge of monolingual and multilingual children at the beginning of the Hessian pre-primary classes

		$M_{\text{raw value}}$	$SD_{\text{raw value}}$	$M_{\text{T-score}}$	$SD_{\text{T-score}}$	n
MP 1	Monolingual children	15.35	5.97	41.31	10.48	37
	Multilingual children	11.35	5.41	36.87	8.80	142
	German language at home	12.34	5.30	38.58	8.77	53
	No German language at home	10.75	5.42	35.86	8.70	89

At the beginning of the school year (MP1), monolingual children show emotional knowledge scores in the lower normative range (T-score: M = 41.31), while multilingual children perform below average (T-score: M = 36.87). Within the multilingual group, children expose to German at home demonstrate higher emotional knowledge (T-score: M = 38.58) compared to those who do not use German in their home environment (T-score: M = 35.86).

To investigate whether these group differences are statistically significant, a MANOVA was conducted with independent groups (monolingual, multilingual with German at home, multilingual without German at home). The dependent variables were emotional knowledge (ATEM 3-9, raw value) and productive vocabulary (SET 5-10, U1, raw value). Prior to conducting the MANOVA, the following assumptions were checked and fulfilled: No outliers were identified within the sample, which was assessed using the interquartile range (IQR) method. Multivariate normality was confirmed by Shapiro-Wilk tests for each dependent variable within each group (p > .05). Homogeneity of covariance matrices was confirmed using Box's M test (p > .05). Homoscedasticity (homogeneity of variances) was tested using Levene test, which indicated equal variances between groups (p > .05).

The MANOVA reveals a statistically significant multivariate effect of the group on the combined dependent variables with a high effect size, $F(4, 352) = 23.62$, $p < .001$, Pillai's Trace = 0.423, $\eta^2 = .212$. This indicates that the scores for emotional knowledge and vocabulary differ significantly depending on the language background of the children.

Subsequent, univariate ANOVAs were performed to examine group differences in the dependent variables separately. A significant effect of language group can be found for productive vocabulary, $F(2, 176) = 64.26$, $p < .001$, $\eta^2 = .422$.

Tukey post-hoc tests reveal significant differences between all groups in productive vocabulary: Monolingual children perform significantly better than multilingual children in whose home German is spoken (+9.37, 95% CI [6.41, 12.32], $p < .001$) and those in whose home German is not spoken (+12.94, 95% CI [10.24, 15.64], $p < .001$). In addition, multilingual children for whom German is spoken at home perform significantly better than children for whom this is not the case (+3.57, 95% CI [1.18, 5.97], $p = .002$).

For emotional knowledge, the ANOVA also shows a significant group effect, $F(2, 176) = 9.16$, $p < .002$, $\eta^2 = .094$. Tukey post-hoc tests show that monolingual children perform significantly better than multilingual children in whose home German is spoken (+3.01, 95% CI [0.23, 5.80], $p = .031$) and those in whose home German is not spoken (+4.60, 95% CI [2.05, 7.14], $p < .001$). The difference between the two multilingual groups is not statistically significant (-1.59, 95% CI [-3.84, 0.67], $p = .223$).

Relationship Between Emotional Knowledge and Productive Vocabulary

To investigate this research question, the relationship between emotional knowledge and productive vocabulary was examined. This includes both overall correlations and associations within specific subgroups, such as monolingual versus multilingual children and the influence of home language context.

Since both the productive vocabulary and the knowledge of emotions differ significantly between monolingual and multilingual children at the beginning of the pre-primary class, it should be investigated whether these areas are related. For this purpose, the Shapiro-Wilk test was first used to determine whether the data on emotion knowledge and productive vocabulary were normally distributed. Emotional knowledge and productive vocabulary are not normally distributed according to the Shapiro-Wilk test ($p < .05$). Due to the lack of normal distribution of the data, the correlation was calculated using the non-parametric Spearman method.

Table 3 presents the correlation matrix between overall emotional knowledge, its subcomponents, and productive vocabulary at the beginning of the pre-primary class.

Table 3. Correlation between emotion knowledge and productive vocabulary

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
Measures of emotional knowledge											
1. emotional knowledge in total	12.17	5.75	—								
2. recognize emotions	4.43	1.44	.55**	—							
3. situations	3.01	1.68	.84**	.33**	—						
4. wishes	1.64	1.61	.79**	.21**	.62**	—					
5. mixed emotions	0.87	1.14	.65**	.20**	.47**	.45**	—				
6. convictions	0.66	0.98	.66**	.28**	.48**	.48**	.26**	—			
7. expression rule	0.45	0.66	.57**	.17*	.48**	.35**	.34**	.42**	—		
8. emotion regulation strategies	1.12	0.86	.60**	.27**	.44**	.41**	.33**	.27**	.24**	—	
Measure of productive vocabulary											
9. productive vocabluary	10.39	7.64	.49**	.55**	.27**	.33**	.37**	.27**	.25**	.25**	—

Note. *p < .05. **p < .01.

The results show that all seven subcomponents of emotional knowledge are strongly correlated with overall emotional knowledge (Spearman's ρ > .50, p < .01). Regarding productive vocabulary, a moderate correlation with overall emotional knowledge can be found (ρ = .49, p < .01). The subcomponent recognition of emotions in others' facial expressions shows a strong correlation with productive vocabulary (ρ = .55, p < .01). Moderate correlations are also found between productive vocabulary and the subcomponents mixed emotions (ρ = .37, p < .01) and (non-)fulfillment of wishes (ρ = .33, p < .01). The remaining subcomponents show weaker but significant correlations (ρ > .20, p < .01).

Table 4 presents the correlations between productive vocabulary and emotional knowledge with the subcomponents recognize emotions and mixed emotions for the overall sample and different subgroups.

Table 4. Correlation between emotional knowledge and productive vocabulary of monolingual and multilingual children

Variable	*n*	emotional knowledge in total	recognize emotions	mixed emotions
All children productive vocabulary	179	.49**	.55**	.37**
Monolingual children productive vocabulary	37	.49**	.33**	.39**
Multilingual children productive vocabulary	142	.40**	.56**	.23**
German language at home productive vocabulary	53	.47**	.50**	.33*
No German language at home productive vocabulary	89	.33**	.55**	.18

Note. *p < .05. **p < .01.

These subcomponents were chosen based on their stronger correlation values. The findings show that the correlation in the overall emotional knowledge is stronger in monolingual children (ρ = .49, $p < .01$) than in multilingual children (ρ = .40, $p < .01$). Among multilingual children, the correlation is stronger when German is spoken at home (ρ = .47, $p < .01$) compared to those who do not speak German at home (ρ = .33, $p < .01$).

The subcomponent recognize emotions shows a moderate correlation in monolingual children (ρ = .33, $p < .01$), and a high correlation in multilingual children (ρ = .56, $p < .01$). Within multilingual subgroups, correlations are high whether German is spoken at home (ρ = .50) or not (ρ = .55).

The subcomponent mixed emotions shows a moderate correlation with productive vocabulary in monolingual children (ρ = .39, $p < .01$), while in multilingual children this correlation is weaker (ρ = .23, $p < .01$). Among multilingual children, those who speak German at home show a stronger correlation (ρ = .33, $p < .05$) than those who do not (ρ = .18, n.s.).

Development of Emotional Knowledge During the School Year

After finding moderate to strong correlations between emotional knowledge and productive vocabulary, the next step is to investigate how emotional knowledge develops over the course of a school year. In the evaluation of the knowledge of emotions, 158 children can be included, of whom data are available at the beginning (MP1) and the end (MP2) of the Hessian pre-primary classes. The descriptive results can be found in Table 5.

Table 5. Emotional knowledge of monolingual and multilingual children at the beginning and at the end of Hessian pre-primary classes

		$M_{\text{raw value}}$	$SD_{\text{raw value}}$	$M_{\text{T-score}}$	$SD_{\text{T-score}}$	n
MP 1	Monolingual children	15.71	5.89	42.00	10.11	34
	Multilingual children	11.31	5.38	36.79	8.77	124
	German language at home	12.36	5.49	38.59	9.07	50
	No German language at home	10.59	5.21	35.58	8.41	74
MP 2	Monolingual children	19.12	4.75	44.92	8.68	34
	Multilingual children	16.15	5.40	43.06	8.72	124
	German language at home	16.84	5.11	43.89	8.54	50
	No German language at home	15.69	5.58	42.50	8.86	74

Figure 1 illustrates the development of emotional knowledge across the groups from MP1 (October 2023) to MP2 (June/July 2024). The goal of this analysis is to assess changes over time and explore differences related to language background and home language use. For this purpose, a mixed ANOVA was conducted with time (MP1 vs. MP2) as the within-subjects factor and group (monolingual, multilingual with German at home, multilingual without German at home) as the between-subjects factor. Emotional knowledge (ATEM 3-9, raw value) served as the dependent variable.

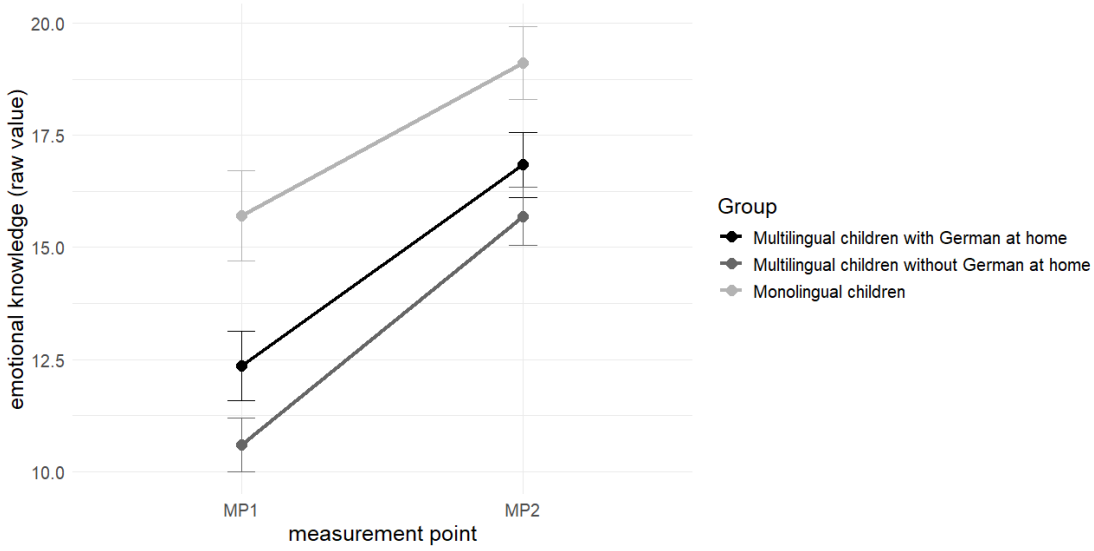

Figure 1. Development of emotional knowledge from MP1 to MP2 across different language groups

The analysis reveals a significant main effect of the factor time, indicating a general improvement in emotional knowledge over the course of the school year, $F(1, 155) = 88.90$, $p < .001$, $\eta^2 = .131$. There is also a significant main effect of group, $F(2, 155) = 10.04$, $p < .001$, $\eta^2 = .087$, suggesting that emotional knowledge scores differ by language background. However, the interaction effect between time and group is not significant, $F(2, 155) = 1.10$, $p = .336$, suggesting that all groups show a similar developmental progress over time.

An analysis of covariance (ANCOVA) was then performed to examine the effects of group (monolingual, multilingual with German at home, multilingual without German at home) and time point (ATEM 3-9, MP1 and MP2) on the overall test score controlling for productive vocabulary (SET 5-10, U1) at the beginning of pre-primary class (MP1). The results show a significant main effect of group, $F(2, 152) = 11.71$, $p < .001$, $\eta^2 = .133$, indicating meaningful differences in overall test scores between the three groups. The covariate also has a significant effect, $F(1, 152) = 33.72$, $p < .001$, $\eta^2 = .18$. In terms of within-subject variation, there is a significant main effect of time point, $F(1, 153) = 105.52$, $p < .001$, $\eta^2 = .405$, indicating a significant change in test scores over the time of the school year. However, the interaction is not significant, $F(2, 153) = 1.08$, $p = .341$, indicating that the change over time from the beginning to the end of the school year does not differ significantly between the groups.

To examine the observed increase in emotional knowledge more closely and to analyse the developmental trajectories within each group more precisely, paired-samples t-tests were conducted. For the group of monolingual children, there is a significant increase in emotional knowledge, $t(33) = 3.46$, $p = .002$, $d = 0.59$. Among the multilingual children who do speak German at home, there is also a significant increase in emotional knowledge over the course of a school year, $t(49) = 6.46$, $p < .001$, $d = 0.91$. Among the multilingual children who do not

speak German at home, the increase in emotional knowledge is also significant, $t(73) = 7.64$, $p < .001$, $d = 0.89$.

At the end of the pre-primary class, monolingual children (T-score: $M = 44.92$), multilingual children who speak German at home (T-score: $M = 43.89$) and multilingual children who do not speak German at home (T-score: $M = 42.50$) all show emotional knowledge in the lower normal range. It was then checked whether the groups differ in terms of emotional knowledge at the end of the pre-primary class (MP2). A one-way ANOVA reveals a significant difference between the groups in terms of emotional knowledge, $F(2, 155) = 4.95$, $p = .008$, $\eta^2 = .060$.

Tukey post-hoc tests show that monolingual children perform significantly better in emotional knowledge at the end of pre-primary class than multilingual children who do not speak German at home (+3.43, 95% CI [0.85, 6.01], $p = .006$). The difference between monolingual children and multilingual children depending on German spoken at home is not statistically significant (+2.28, 95% CI [-0.49, 5.05], $p = .129$), nor is the difference between the two multilingual groups (-1.15, 95% CI [-3.43, 1.13], $p = .458$).

Discussion

The present study examines selected language and emotion-related skills of 179 children in the Hessian pre-primary classes.

Productive Vocabulary at the Beginning of Pre-Primary Classes

The group of monolingual children show below average scores in productive vocabulary at the beginning of the pre-primary class. The two groups of multilingual children (with and without German at home), on the other hand, show far below average scores in productive vocabulary at the beginning of the pre-primary classes. These results indicate language difficulties in both monolingual and multilingual children, which points to a need for targeted support for productive vocabulary at the beginning of the pre-primary school year.

However, there is a significant difference between the group of monolingual children and the two groups of multilingual children. Monolingual children have a larger productive vocabulary than multilingual children who speak German at home and those who do not. The significant differences between monolingual and multilingual children support existing research findings according to which multilingual children, especially with limited contact to the German language, tend to have lower competences in vocabulary (Autor:innengruppe Bildungsberichterstattung, 2022; Stanat et al., 2021). The findings are also consistent with those of Stitzinger (2022), who show that children of kindergarden age who grew up monolingual demonstrate better language skills than multilingual children who have been learning German simultaneously since birth and than children with German as a second language.

Within the group of multilingual children, there is also a significant difference in productive vocabulary depending on the use of German in the home environment. Multilingual children who speak German at home show a better productive vocabulary than children who do not

use German in their home environment. These findings underscore the influence of the home language context for language development. The results confirm findings on language and written language performance that point out that children who do not speak German at home differ particularly strongly from monolingual children, but also from children who speak German and another language at home (Lenhard, Lenhard, Segerer & Suggate, 2015; Lenhard & Lenhard, 2017).

Emotional knowledge at the Beginning of Pre-Primary Classes

At the beginning of pre-primary class, monolingual children show significantly better emotional knowledge than multilingual children with and without using German at home. Monolingual children's emotional knowledge is in lower norm range, whereas multilingual children's scores remain below average. These results are consistent with findings by Voltmer and von Salisch (2021), who report that monolingual children demonstrate better emotional knowledge than multilingual children.

Within the group of multilingual children, there is a tendency towards higher emotional knowledge among those who speak German at home. However, the difference between the groups is not statistically significant. As emotional knowledge is shaped by cultural socialization influences (Petermann & Wiedebusch, 2016), children who use German at home likely have better access to culture-specific conventions of emotional expression and interpretation.

Exploration of the Relationship Between Emotional Knowledge and Productive Vocabulary

A moderate correlation between emotional knowledge and productive vocabulary was found in the group of children in the Hessian pre-primary classes (Spearman's $\rho = .49$). These results are comparable to the findings of Beck et al. (2011) regarding the relationship between emotional knowledge and receptive vocabulary. This similarity suggests that both productive and receptive language abilities may play an important role in the development of emotional understanding during the childhood. The results also align with previous research emphasizing the mutual influence of emotional and language development (cf. Petermann & Wiedebusch, 2016).

The group of monolingual children (Spearman's $\rho = .49$) and multilingual children who speak German at home (Spearman's $\rho = .47$) show a stronger correlation than multilingual children whose home environment does not include German (Spearman's $\rho = .33$). These subgroup differences support the notion that access to the school language at home may not only enhance vocabulary development, but also deepen children's ability to label, understand and reflect on emotional experiences. In multilingual contexts, the presence of German at home may act as a bridge to the emotional concepts and expectations prevalent in the cultural setting of school.

The subcomponent mixed emotions show a moderate correlation with productive vocabulary (Spearman's ρ = .37). This correlation is somewhat stronger for monolingual children (Spearman's ρ = .39) and for multilingual children who use German at home (Spearman's ρ = .33), but notably weaker for those who do not (Spearman's ρ = .18). These results vary depending on language socialization and suggest that more complex emotion concepts, such as the experience of simultaneous or contradictory feelings, may particularly depend on verbal scaffolding through exposure to the dominant cultural language.

The subcomponent recognizing emotions in the facial expressions of others shows a strong correlation with productive vocabulary among children in the Hessian pre-primary classes (Spearman's ρ = .55). Interestingly this relationship is only moderate among monolingual children (Spearman's ρ = .33), but high among multilingual children (Spearman's ρ = .56). In both groups of multilingual children – those with and without German spoken at home – the correlations remain high (Spearman's ρ = .50 and ρ = .55). This could suggest that multilingual children, who may often need to interpret emotional cues in more than one cultural context, develop a particular sensitivity to facial expressions. The ability to verbally name these emotions may therefore be more tightly coupled with their interpretation. This further supports the idea that verbal and non-verbal emotional competencies are closely intertwined in multilingual children's developmental trajectories.

The stronger correlation observed in monolingual children may indicate that for this group, verbal language is a more dominant tool for processing and articulating emotional experiences. In contrast, multilingual children, especially those with limited exposure to German, may rely more on non-verbal strategies or context-bound language use when engaging with emotional content. These patterns align with theoretical perspectives suggesting that language functions both as a vehicle for emotional expression and as a structuring tool for emotional understanding (von Salisch & Wübker, 2021; Lange & Polat, 2024).

Regarding the Development of Emotional Knowledge During the School Year

The results concerning the development of emotional knowledge over the course of the school year in the Hessian pre-primary class show a positive trend in all groups examined, even when controlling for productive vocabulary at the beginning of the pre-primary class. Both monolingual and multilingual children demonstrate a significant increase in emotional knowledge from the beginning to the end of the school year. The effect sizes indicate medium (monolingual children) to large (multilingual children) effects, suggesting an overall effective support process within the pre-primary class.

By the end of the school year, multilingual children reach scores in the lower norm range for emotional knowledge, whereas at the beginning they had below-average values. The significant differences in emotional knowledge between monolingual and multilingual children who do not speak German at home remain, however, the difference between monolingual children and multilingual children who speak German at home is no longer significant.

The large increase in emotional knowledge among multilingual children and the no longer existing statistical difference between monolingual and multilingual children who speak German at home could indicate that school contexts and targeted support services can have a compensatory effect on socialization-related differences in terms of language diversity. The school setting seems to provide a space in which culture-specific emotional conventions can be learned and emotional competencies can be developed and expanded. These findings highlight the importance of early educational interventions for all children, particularly in supporting emotional competencies, which are central to school success and social integration (Bulotsky-Shearer & Fantuzzo, 2004; Eisenberg et al., 2001).

Implications for Educational Practice

These findings underline the pedagogical value of integrated approaches that jointly foster language and emotional competencies. For practice in pre-primary classes, this suggests implementing emotion-themed language activities, such as storytelling, guided discussions, and role plays, especially targeting multilingual children with limited German input at home. Access to culture-specific emotion vocabulary appears to be a key resource for their successful social participation and emotional self-regulation in school settings.

Limitations

When interpreting the results, some limitations need to be considered.

In the present study, all children who speak at least one language in addition to German are categorized as multilingual. However, there is no information on whether German was acquired as a first or second language. Furthermore, no details are provided about the other languages spoken. For the subgroup of multilingual children who use German in their home environment, no information is available regarding the frequency or quality of German language use at home.

Additionally, there is a lack of data on other influencing factors relevant to the acquisition of the German language such as the child's age at first exposure to German, duration of contact with the language, and the quality and quantity of language input (Ehl & Grosche, 2021). This makes it difficult to assess the language proficiency of multilingual children in a nuanced way. Therefore, it cannot be clearly determined whether the children's language skills are age-appropriate or if the below-average results indicate a specific need for support. The Test of Language Skills for Children aged 5-10 years (SET 5-10) is based on a normative sample that includes both monolingual and multilingual children. However, the evaluation does not include separate norm tables for monolingual and multilingual children, nor does it consider norms sensitive to multilingual language acquisition. Future studies should therefore consider test procedures that include such norms to better assess the competencies of children in the pre-primary class.

Regarding emotional knowledge, the test instrument Adaptive Test of Emotional Knowledge (ATEM 3–9) does include separate norm tables for monolingual and multilingual children.

However, other relevant factors, such as the age of the child at first contact with the German language and the duration, quality and quantity of contact with the language, are not taken into account and should be considered in future test development.

Although the ATEM 3–9 is a low-verbal test that does not require productive vocabulary, a certain level of receptive vocabulary is still necessary to understand the test items. Therefore, there is a risk that lower test results in multilingual children may not be solely due to limited emotional knowledge, but also to differences in language comprehension or language-related uncertainties.

A further limitation of the present study concerns the development of emotional knowledge. Emotional knowledge was only reported at two measurement points (beginning and end of the pre-primary class). Although it is generally recommended in longitudinal research to include three or more time points to capture developmental trajectories more accurately, the present study focused on a pre-post comparison. This comparison was chosen to obtain an overview of the general developmental changes in emotional knowledge over the course of the school year and to investigate the overall effectiveness of this educational setting.

Furthermore, according to the Hessian School Law, a pre-primary class is only intended for children with physical, emotional, or cognitive developmental delays. A developmental delay in language, or difficulties in acquiring the German language, do not qualify as criteria for pre-primary class admission. However, this study lacks both verified diagnostic information on existing support needs and concrete data on actual developmental delays among the children.

Outlook

The present results provide valuable initial insights into emotional and language competencies of children in the Hessian pre-primary classes and highlight the influence of monolingualism and multilingualism as well as the home language context on the development of these skills. In addition, this study is the first to track the development of emotional competence in children throughout the course of a school year in the Hessian pre-primary class.

A central finding is the significant gain in both productive vocabulary and emotional knowledge over the course of the pre-primary year, particularly among multilingual children who initially performed far below average. These developments suggest that an early additional support as described above can be an effective tool for supporting foundational competencies and should therefore be maintained and further expanded. Their tailored support structures, such as small group settings and integrated pedagogical approaches, appear especially beneficial for children with (emotional- and social) developmental needs or limited exposure to the language of instruction.

Elementary schools in Hesse can also opt for a so-called "flexible start to school" program, combining grades 1 and 2 into a single educational unit. All school-age children in a grade

are admitted to the school without a determination of school readiness and taught in mixed-age groups. A team of teachers and social workers teaches and supports the children individually and in a group-specific manner. Depending on their individual learning abilities and abilities, students have the option of completing the combined grades 1 and 2 in one, two, or three school years. A third year completed under the flexible start to school program is not counted toward their school career.

Further research projects should clarify whether the support measure presented here can also be implemented in the “flexible start school” program in order to reduce to a minimum the early exclusion and stigmatization dynamics that the preparatory class concept inevitably brings with it.

Another key implication stems from the observed moderate to strong correlations between emotional knowledge and productive vocabulary. These findings support the notion that language and emotion are interrelated domains of early development. Consequently, it seems pedagogically promising to pursue integrated approaches that simultaneously foster emotional understanding and expressive language skills. Such approaches could include, for example, language-rich activities embedded in socio-emotional learning contexts, or the explicit teaching of emotion-related vocabulary and communication strategies. Future work should focus on evaluating and refining integrated support concepts that combine language and emotion-related learning.

Particularly in high-needs rural elementary schools, the co-constructive development and research of practical social emotional learning (SEL) action concepts which take into account the “voices” of practitioners for the earliest possible promotion of emotional-social and language skills at the transition to primary school appears to be promising as recent research in his field underlines (Dyson et al., 2023). A development and evaluation process on equal footing between partners from practice and research is likely to be of key importance here.

Conclusion

This study examined emotional knowledge and productive vocabulary among monolingual and multilingual children in Hessian pre-primary classes, with a particular focus on the role of home language context. Three main conclusions can be drawn:

1. Significant differences in competencies were observed at the beginning of the school year for children in the pre-primary classes. Monolingual children outperformed their multilingual peers in both productive vocabulary and emotional knowledge. Within the multilingual group, home use of German was associated with stronger performance.

2. Moderate to strong correlations between productive vocabulary and emotional knowledge were found, highlighting the interdependence of linguistic and emotional development. This relationship was particularly pronounced among children who speak German at home.

3. All groups made substantial developmental progress in emotional knowledge, particularly multilingual children, who showed the greatest gains. This suggests that structured pedagogical environments can mitigate early developmental disparities.

These findings underscore the importance of integrated support strategies in early education that combine language development with emotional learning. Additional and flexible support programs, especially those with language-sensitive and emotionally responsive approaches, appear to be an effective educational setting to promote foundational competencies in children with diverse language backgrounds.

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Conflict of interest

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References

Autor:innengruppe Bildungsberichterstattung (2022). *Bildung in Deutschland 2022. Ein indikatorengestützter Bericht mit einer Analyse zum Bildungspersonal*. DOI: 10.3278/6001820hw

Bahn, D., Sommer, J., Schwarzer, G. & Kauschke, C. (2023). Granularität beim Erzählen emotionaler Ereignisse im Kindes- und Erwachsenenalter. *Kindheit und Entwicklung, 32*(3), 161-173. DOI: 10.1026/0942-5403/a000420

Beck, L., Kumschick, I. R., Eid, M., & Klann-Delius, G. (2011). Relationship Between Language Competence and Emotional Competence in Middle Childhood. *Emotion.* Advance online publication. DOI: 10.1037/a002632

Bulotsky-Shearer, R. & Fantuzzo, J. (2004). Adjustment scales for preschool intervention: Extending validity and relevance across multiple perspectives. *Psychology in the Schools*, 41, 725 – 736. DOI: 10.1002/pits.20018

Cohen, J. (1992). Statistical Power Analysis. *Current Directions in Psychological Science, 1*(3), 98-101. DOI: 10.1111/1467-8721.ep10768783

Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S. & Queenan, P. (2003). Preschool emotional competence: pathway to social competence? *Child Dev., 74*(1). 238-256. DOI: 10.1111/1467-8624.00533.

Denham, S. A., & Brown, C. (2010). "Plays Nice With Others": Social–Emotional Learning and Academic Success. *Early Education and Development, 21*(5), 652–680. DOI: 0.1080/10409289.2010.497450

Denham, S. A., Bassett, H. H., Thayer, S. K., Mincic, M.S., Sirotkin, Y. S. & Zinsser, K. (2012). Observing preschoolers' social-emotional behavior: structure, foundations, and prediction of early school success. *Journal of Genetic Psychology, 173*(3), 246–278. DOI: 10.1080/00 221325.2011.597457

Denham, S. A., Bassett, H. H., Way, E., Kalb, S., Warren-Khot, H., & Zinsser, K. (2014). „How Would You Feel? What Would You Do?" Development and Underpinnings of Preschoolers' Social Information Processing. *Journal of Research in Childhood Education, 28*(2), 182–202. DOI: 10.1080/02568543.2014.883558

Dyson, B., Shen, Y., Howley, D. & Baek, S. (2023). Social emotional learning matters: Interpreting educators' perspectives at a high-needs rural elementary school. *Sec. Educational Psychology*, 8. DOI: 10.3389/feduc.2023.1100667

Ehl, B. & Grosche, M. (2020). Einbezug von Alter und Sprachkontaktdauer in die Wortschatzdiagnostik bei Mehrsprachigkeit. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie, 52*(1–2), 41–53. DOI: 10.1026/0049-8637/a000228

Ertanir, B., Kratzmann, J. & Sachse, S. (2019). Sozio-emotionale Kompetenzen mehrsprachiger Kindergartenkinder und deren Wechselwirkungen mit den Sprachleistungen im Deutschen. Zeitschrift für Entwicklungspsychologie und *Pädagogische Psychologie, 51*(1), 31–44. DOI: 10.1026/0049-8637/a000207

Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reiser, M., Murphy, B. C., Losoyaa, S. H. & Guthrie, I. K. (2001). The Relations of Regulation and Emotionality to Children's Externalizing and Internalizing Problem Behavior. *Child Development, 72*(4), 1112–1134. DOI: 10.1111/1467-8624.00337

Gabler, K., Mannel, S., Hardy, I., Henschel, S., Heppt, B., Hettmannsperger-Lippolt, R., Sontag, C. & Stanat, P. (2020). Fachintegrierte Sprachförderung im Sachunterricht der Grundschule: Entwicklung, Erprobung und Evaluation eines Fortbildungskonzepts auf der Grundlage des Scaffolding-Ansatzes. In C. Titz, S. Weber, H. Wagner, A. Ropeter, C. Geyer & M. Hasselhorn (Hrsg.), *Sprach- und Schriftsprachförderung wirksam gestalten: Innovative Konzepte und Forschungsimpulse* (S. 59-83). Stuttgart: Kohlhammer.

Grosse, G., & Streubel, B., Gunzenhauser, C. & Saalbach, H. (2021). Let's Talk About Emotions: The Development of Children's Emotion Vocabulary from 4 to 11 Years of Age. *Affec Sci, 2*, 150–162. DOI: 10.1017/S0954579400006374

Klinkhammer, J., Voltmer, K. & von Salisch, M. (2022). *Emotionale Kompetenz bei Kindern und Jugendlichen. Entwicklung und Folgen*. Stuttgart: Kohlhammer.

Kockeritz, M., Klinkhammer, J. & von Salisch, M. (2010). Die Entwicklung des Emotionswissens und der behavioralen Selbstregulation bei Vorschulkindern mit und ohne Migrationshintergrund unter Berücksichtigung des Sprachverstandnisses. *Praxis der Kinderpsychologie und Kinderpsychiatrie*, 59, 529 – 544. DOI: 10.13109/prkk.2010.59.7.529.

Lange, S. D.& Polat, S. (2024). Scoping review on primary school teachers' beliefs on multilingualism in classroom teaching, *International Journal of Multilingualism*, doi.org/10.1080/14790718.2024.2383739

Leiner, S. (2022). Ein Grund zum Feiern? Die Vorklasse an hessischen Grundschulen wird 70. *Hessische Lehrerzeitung*, 7-8, 28-29. https://www.gew-hessen.de/details/ein-grund-zum-feiern [Accessed May 12, 2025]

Lenhard, A. & Lenhard, W. (2017). *Diagnostik von Lesestörungenmit ELFE II bei Kindern mit Migrationshintergrund (inklusive ad-aptierter Normen).* Dettelbach: Psychometrica.

Lenhard, A., Lenhard, W., Segerer, R. & Suggate, S. (2015). *PeabodyPicture Vocabulary Test* , 4. Ausgabe. Frankfurt am Main: Pearson.

Limbird, C. K. (2007). *Phonological processing, verbal abilities, and second language literacy development among bilingual Turkish children in Germany*. Dissertation. Freie Universität Berlin.

Mayer, A., Schramm, C. & Ulrich, T. (2024). Sprachliche Fähigkeiten von Kindern mit psychischen Auffälligkeiten. *Zeitschrift für Heilpädagogik*, 75,148 –162.

McElvany, N., Ohle, A., El-Khechen, W., Harsy, I. & Cinar, M. (2017). Förderung sprachlicher Kompetenzen – Das Potenzial der Familiensprache für den Wortschatzerwerb aus Texten. *Zeitschrift für Pädagogische Psychologie, 31*(1), 13 – 25. DOI: 10.1024/1010-0652/a000189.

Petermann, F. (2010). *SET 5-10. Sprachstandserhebungstest für Kinder im Alter zwischen 5 und 10 Jahren.* Göttingen: Hogrefe.

Petermann, F., Petermann, U. & Nitkowski, D. (2016). *Emotionstraining in der Schule. Ein Programm zur Förderung der emotionalen Kompetenz*. Göttingen: Hogrefe.

Petermann, F. & Wiedebusch, S. (2016). *Emotionale Kompetenz bei Kindern*. Göttingen: Hogrefe.

Ploch, B. & Heinzmann, S. (2021). *Erziehung und Bildung in Offenbach. Bericht 2021. Offenbach am Main.* https://www.offenbach.de/medien/bindata/of/fachstelle_Bildung/Erziehungs-und-Bildungsbericht-2021.pdf

Pokitsch, D.(2021). *Wer spricht? Sprachbezogene Subjektivierungsprozesse in der Schule der Migrationsgesellschaft*. Wiesbaden: Springer VS.

R Core Team (2021). *R: A language and environment for statistical computing. R Foundation for Statistical Computing*, Vienna, Austria. https://www.R-project.org/

Rose, E., Ebert., S. & Weinert, S. (2016). Zusammenspiel sprachlicher und sozial- emotionaler Entwicklung vom vierten bis zum achten Lebensjahr. *Frühe Bildung, 5* (2), 66–72. DOI:10.1026/2191-9186/a000254.

SchulG HE (Stand 28.03.2023): *Hessisches Schulgesetz*. Vom 01. August 2017 zuletzt geändert durch die Verordnung vom 28.03.2023, https://www.rv.hessenrecht.hessen.de/bshe/document/jlr-SchulGHE2017V12P58/part/s [Accessed April 24, 2025].

Seifert, S., Paleczek, L. & Gesteiger-Klicpera, B. (2019). Rezeptive Wortschatzleistungen in der Grundschule. Unterschiede zwischen Kindern mit Deutsch als Erst- oder Zweitsprache. *Empirische Sonderpädagogik, 11*(4), 259-278. DOI: 10.25656/01:18334

Stanat, P., Schipolowski, S., Schneider, R., Sachse, K. A., Weirich, S., Henschel, S. (2021). *IQB-Bildungstrend 2021. Kompetenzen in den Fächern Deutsch und Mathematik am Ende der 4. Jahrgangsstufe im dritten Ländervergleich*. Münster, New York: Waxmann. DOI: 10.25656/01:26077

Stitzinger, U. (2022). Einflussfaktoren im Spracherwerb mehrsprachig aufwachsender Kinder im Vergleich. M. Spreer, M. Wahl & H. Beek (Hrsg.), *Sprachentwicklung im Dialog: Digitalität – Kommunikation – Partizipation* (S. 301-310). Idstein: Schulz-Kirchner.

Tracy, J. L., Robins, R. W. & Lagattuta, K. H. (2005). Can children recognize pride? Emotion, 5, 251 – 257. DOI: 10.1037/1528-3542.5.3.251Voltmer, K. & von Salisch, M. (2018). Native-born German and immigrant children's development of emotion knowledge: A latent growth curve analysis. *Br J Dev Psychol, 37*(1), 112-129. DOI: 10.1111/bjdp.12262

Ulrich, F., Petermann, F. & Gust, N. (2019). Einfluss der Aufgabenstellung und des Wortschatzes auf die Emotionserkennung bei Drei- bis Fünfjährigen. *Kindheit und Entwicklung, 28*(1), 59–67. DOI: 10.1026/0942-5403/a000271

Voltmer, K. & von Salisch, M. (2021). *ATEM 3-9. Adaptiver Test des Emotionswissens*. Berlin: Springer.

von Salisch, M., Hänel, M. & Denham, S. A. (2015). Emotionswissen, exekutive Funktionen und Veränderungen bei Aufmerksamkeitsproblemen von Vorschulkindern. *Kindheit und Entwicklung*, 24, 78–85. DOI: 10.1026/0942-5403/a00

von Salisch, M. & Wübker, M. (2021) Sprache und Emotionswissen. In M. von Salisch, O. Hormann, P. Cloos, K. Koch, & C. Mähler (Hrsg.), *Fühlen Denken Sprechen: Alltagsintegrierte Sprachbildung in Kindertageseinrichtungen* (S.33-40). Waxmann.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Massachusetts: Harvard University Press. DOI: 10.2307/j.ctvjf9vz4