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Examination of early literacy skills development levels in children aged 48-69 months

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Abstract: The aim of this study is to examine the relationship between early literacy skills and developmental levels in children aged 48-69 months attending preschool education. The study was conducted on 100 children attending private preschools in Istanbul, using a correlational survey design from quantitative research methods. The Early Literacy Assessment Tool (ELAS) and the Denver II Developmental Screening Test were used as data collection tools. According to the research findings, no significant relationship was found between early literacy skills and general developmental levels. Statistically significant differences were also not found in terms of variables such as gender, parental education level, and birth order; however, some sub-skills showed differences between girls and boys, parental education level, or birth order. In particular, positive correlations were found between phonological awareness and story comprehension and pre-writing skills; and between writing awareness and story comprehension and pre-writing skills. However, a low-level negative correlation was found between maternal age and pre-writing skills. In conclusion, it is emphasized that children's early literacy skills should be supported regardless of their developmental level. It is recommended that teachers incorporate more early literacy activities, that parents increase their children's interaction with books, and that fathers take an active role in family education. Future research is also advised to include larger samples from different socioeconomic levels and to utilize a variety of developmental tests.

Introduction

Early childhood is a critical and highly sensitive stage in human life where an individual's developmental capacity reaches its peak, marked by rapid progress in social-emotional, cognitive, and language skills. During this holistic phase, the foundations for a solid personality structure, strong social bonds, and an effective educational process are established. Crucially, it is also a dynamic and complex period for laying the groundwork for early literacy. Contrary to popular belief, a child's subsequent success in expressive language, reading, and writing is not merely natural but is intimately linked to the interactive experiences they engage in from a very young age (Tanju- Aslışen & Hakkoymaz, 2020; Yumuş, 2013).

Early literacy, an important component of this process, is a concept that encompasses the basic knowledge, skills, and attitudes that children need to acquire in order to prepare for the reading and writing process in the preschool period (Ergül et al., 2016). Early literacy skills cover the 0-6 age range, i.e., the preschool period, in terms of content and application (Kargın et al., 2017). As with the child's social, emotional, psychomotor, and language development, the preschool period is also crucial for the development of reading and writing skills.

The literacy perspective developed in the field of early literacy reveals the level of knowledge of young children in reading and writing (Çetin & Bencik-Kangal, 2021). Carefully designed educational programs and appropriate environmental arrangements are needed to support the literacy skills that children develop during this process. In recent years, there has been an increase in studies aimed at developing children's early literacy skills in our country (Karaman, 2013). Preschool education environments offer unique opportunities to support children's early literacy development (Özen-

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Altınkaynak, 2014).

In light of all this information, it is clear that early literacy skills play a critical role in children's transition to reading and writing. In this process, it is of great importance to assess children's developmental levels, determine appropriate educational methods, and support them in a way that will provide the greatest benefit. Recent studies show that literacy skills in preschool education can be more effectively supported in classroom environments shaped by rich materials and adult support within the framework of a developmentally appropriate approach. These studies highlight that children's early literacy gains develop through interactions with adults and peers in literacy-enriched learning environments (Feyman-Gök, 2013). The question of when to teach reading and writing has been an important area of research for educators (Delican & Ateş, 2021).

This study aims to examine the relationship between the early literacy skills and development of children aged 48-69 months.

Method

Research Model

This study aimed to examine the relationship between early literacy skills and development in children aged 48-69 months attending preschool education. The study was conducted using a correlational research design, which is a quantitative research method used to describe the degree to which two or more variables are related (Fraenkel et. al., 2012). This design was specifically preferred as it allows for the investigation of the strength and direction of the relationship between children's early literacy skills and their developmental characteristics without any manipulation of the variables.

Population-Sample

The population of this study comprises children aged 48-69 months with normal development who attend private preschool education institutions in Istanbul. From this population, a sample of 100 children (50 females and 50 males) was constituted. In the sample selection process, convenience sampling—one of the non-probability sampling methods—was used due to the practical difficulties of reaching the entire population of preschool children in a large metropolitan area like Istanbul. This method was preferred to ensure the study was conducted within a feasible timeframe and with accessible participants who met the inclusion criteria (Büyüköztürk et al., 2018). To ensure a balanced representation for gender-based analysis, an equal number of female (n=50) and male (n=50) participants were recruited from the selected institutions.

Table 1. Descriptive statistics on the demographic characteristics of the sample group

		Frequency	Percentage %
Gender	Male	50	50.0%
	Famale	50	50.0%
Mother's Educational Status	High school	28	28.0%
	Associate degree	22	22.0%
	Undergraduate and postgraduate	50	50.0%
Father's Educational Status	High school	28	28.0%
	Associate degree	21	21.0%
	Undergraduate or postgraduate	51	51.0%
Birth Order	1.	53	53.0%
	2.	43	43.0%
	3.	4	4.0%

An analysis of the data reveals an equal distribution of gender, consisting of 50 male (50.0%) and 50 female (50.0%) participants. Regarding the mothers' educational status, exactly half of the mothers (50.0%, n=50) hold an undergraduate or postgraduate degree, followed by high school graduates (28.0%, n=28) and associate degree holders (22.0%, n=22). A similar trend is observed in fathers' educational status; the majority of the fathers (51.0%, n=51) have an undergraduate or postgraduate degree, while 28.0% (n=28) are high school graduates and 21.0% (n=21) hold an associate degree. Finally, an examination of the

participants' birth order indicates that more than half of the sample are first-born children (53.0%, n=53). Second-born children constitute 43.0% (n=43) of the participants, whereas third-born children account for a very small minority at 4.0% (n=4).

Data Collection Tools

Personal Information Form

The Personal Information Form, prepared by the researcher to determine the demographic characteristics of the sample group, was used in the study. This form included basic demographic information such as the children's date of birth, number of siblings, birth order, parents' occupations, and educational status. The form was completed by the parents of the participating children. In addition, to ensure compliance with ethical principles during the research participation process, informed consent forms were obtained from the participants' parents, thereby emphasizing that participation in the research was voluntary and that ethical rules were observed.

Early Literacy Skills Assessment Tool

The Early Literacy Skills Assessment Tool (ELAS), developed by Karaman and Güngör-Aytar (2016), consists of five subtests comprising a total of 96 items: phonological awareness (53 items), writing awareness (16 items), story comprehension (9 items), matching images (9 items), and pre-writing skills (9 items). Each item is evaluated by giving 1 point for a correct response and 0 points for an incorrect answer. The validity and reliability of the scale were established through exploratory and confirmatory factor analyses, with KR-20 internal consistency coefficients for the sub-tests ranging from 0.61 to 0.91. In this study, the assessment tool was administered directly to each child by the researcher on a one-to-one basis within a quiet room in the school setting to ensure consistency and minimize distractions.

Denver 2 Developmental Screening Test

The Denver II Developmental Screening Test is a standardfrized tool used for the developmental assessment of children aged 0-6 years, examining four basic areas: personal-social, fine motor, language, and gross motor development. Originally developed by Frankenburg and colleagues, and revised in 1990, the test was standardized for the Turkish population by Yalaz and colleagues, with subsequent restandardization studies conducted in 1996 and 2009 by Yalaz and colleagues. The assessment includes a total of 125 items, and its validity and reliability in the Turkish context were established through high inter-rater agreement (ranging from 80% to 95%) and test-retest reliability. In this study, the Denver II was administered directly to each child by the researcher in a quiet environment within the school setting to determine their developmental status.

Data Analysis

The data obtained from the research were analyzed using the SPSS 29.0 software package. Prior to the main analyses, the normality of the numerical data was assessed through Kolmogorov-Smirnov and Shapiro-Wilk tests, as well as skewness-kurtosis coefficients and graphical examinations, including histograms and Q-Q plots. The results confirmed that the data generally followed a normal distribution. Statistical analyses were explicitly linked to the study's research questions; an independent samples t-test was utilized to investigate whether early literacy skills and developmental sub-dimensions significantly differed according to gender. Although the data exhibited normality, the non-parametric Kruskal-Wallis test was preferred over a one-way ANOVA for variables such as parental education level and birth order because the number of observations in certain subgroups was below 30. Specifically, the third-born child group consisted of only four participants (n=4). When significant differences were detected, post-hoc analyses were performed to identify the specific source of the variance. Additionally, a Pearson correlation analysis was conducted to examine the relationships among early literacy sub-skills, general developmental levels, and continuous variables, such as age. For all statistical tests, the significance level was accepted as $p<.05$.

Table 2. Kurtosis and skewness analyses of the data

Variables	N	Skewness	Kurtosis
Phonological Awareness Skills	100	-0,751	-0,415
Writing Awareness	100	0,045	-0,880
Understanding the Story	100	1,348	1,663
Matching Images	100	0,858	1,028
Pre-Writing Skills	100	0,741	0,349
Personal Social Skills	100	-0,592	-1,683
Fine Motor Skills	100	-1,052	-0,912
Language Development	100	-0,204	-1,999
Gross Motor Development	100	-1,446	0,092

The normality of continuous variables was assessed through skewness and kurtosis values. According to the findings, all variables were found to have skewness and kurtosis coefficients within the ±2 range, and the data were considered to satisfy the assumption of normal distribution (George & Mallery, 2010; Hair et al., 2019).

Results

Table 3. Analysis of differences between early literacy skills and gender

	Gender					
	Boys		Girls			
	Mean	Standard deviation	Mean	Standard deviation	t	p
Phonological Awareness Skills	39,24	10,11	39,68	9,20	0,228	0,820
Writing Awareness	9,72	3,08	9,44	3,04	0,457	0,648
Understanding the Story	2,94	1,72	2,84	1,71	0,292	0,771
Matching Images	3,28	1,62	3,06	1,28	0,753	0,453
Pre-Writing Skills	3,68	1,45	3,94	1,65	0,838	0,404

Independent Sample T Test**p<.05

An independent samples t-test was conducted to determine whether participants' early literacy skills differed significantly based on gender.

In cases where the number of observations in subgroups is low (<30), a more cautious approach was adopted, and nonparametric tests were preferred, considering the possibility that the assumptions of parametric tests (especially normality and homogeneity of variance) may not be reliably met (Field, 2018; Pallant, 2020). This approach is recommended to reduce the sensitivity of parametric test assumptions in small sample sizes.

The results of the analysis indicated that there were no statistically significant differences between gender and any of the sub-dimensions of early literacy: phonological awareness skills, t(98)=0.228, p=.820; writing awareness, t(98)=0.457, p=.648; story comprehension, t(98)=0.292, p=.771; matching images, t(98)=0.753, p=.453; and pre-writing skills, t(98)=0.838, p=.404. Although none of these comparisons reached statistical significance (p>.05), a descriptive examination of the mean scores showed that girls achieved higher scores in phonological awareness and pre-writing skills, while boys scored higher in writing awareness, story comprehension, and visual matching skills.

Table 4. Analysis of the difference between early literacy skills of the sample group and paternal educational status

		Mean	Standard deviation	Median	Min	Max	K-W	p
Phonological Awareness Skills	High school	39,89	9,80	43,50	14,00	51,00	0,552	0,795
	Associate degree	38,38	9,35	40,00	17,00	50,00		
	Undergraduate and postgraduate	39,67	9,79	44,00	18,00	53,00		
Writing Awareness	High school	9,18	2,75	9,00	4,00	16,00	0,663	0,718
	Associate degree	9,81	3,14	9,00	5,00	15,00		

	Undergraduate and postgraduate	9,71	3,20	10,00	4,00	15,00		
Understanding the Story	High school	2,71	1,44	2,00	,00	7,00	1,603	0,449
	Associate degree	2,52	1,36	2,00	1,00	6,00		
	Undergraduate and postgraduate	3,14	1,94	2,00	1,00	9,00		
Matching Images	High school	3,32	1,36	3,00	1,00	7,00	1,192	0,551
	Associate degree	3,19	1,33	3,00	1,00	6,00		
	Undergraduate and postgraduate	3,08	1,57	3,00	,00	8,00		
Pre-Writing Skills	High school	3,75	1,71	4,00	2,00	8,00	0,559	0,756
	Associate degree	4,00	1,52	4,00	2,00	8,00		
	Undergraduate and postgraduate	3,76	1,49	3,00	1,00	8,00		

Kruskal-Wallis **p<.05

A Kruskal-Wallis test was performed to determine whether early literacy skills differed significantly according to the paternal educational level. The results indicated no statistically significant differences across all sub-dimensions of the early literacy skills assessment: phonological awareness skills, H(2)=0.552, p=.795; writing awareness, H(2)=0.663, p=.718; story comprehension, H(2)=1.603, p=.449; visual matching, H(2)=1.192, p=.551; and pre-writing skills, H(2)=0.559, p=.756. Although the differences did not reach statistical significance (p>.05), a descriptive review of the findings showed that children whose fathers held undergraduate or postgraduate degrees tended to have higher scores in phonological awareness, story comprehension, and pre-writing skills.

Table 5. Analysis of the differences between early literacy skills and maternal educational attainment

		Mean	Standard deviation	Median	Min	Max	K-W	p
Phonological Awareness Skills	High school	40,07	9,36	43,00	20,00	53,00	0,58	0,747
	Associate degree	40,77	8,46	44,50	18,00	50,00		
	Undergraduate and postgraduate	38,54	10,31	42,50	14,00	53,00		
Writing Awareness	High school	9,50	2,96	9,00	4,00	16,00	0,07	0,963
	Associate degree	9,45	3,28	10,00	4,00	15,00		
	Undergraduate and postgraduate	9,68	3,05	9,00	4,00	15,00		
Understanding the Story	High school	2,79	1,66	2,00	,00	7,00	0,65	0,719
	Associate degree	2,86	1,93	2,00	1,00	8,00		
	Undergraduate and postgraduate	2,96	1,65	2,00	1,00	9,00		
Matching Images	High school	3,07	1,44	3,00	1,00	6,00	2,50	0,285
	Associate degree	2,91	1,74	3,00	,00	7,00		
	Undergraduate and postgraduate	3,34	1,33	3,00	1,00	8,00		
Pre-Writing Skills	High school	3,68	1,49	3,50	2,00	8,00	0,51	0,773
	Associate degree	3,82	1,33	4,00	1,00	7,00		

	Undergraduate and postgraduate	3,88	1,69	4,00	1,00	8,00

Kruskal-Wallis **p<.05

A Kruskal-Wallis test was conducted to determine whether children's early literacy skills differed significantly according to maternal educational attainment. The analysis results indicated that maternal education level did not have a statistically significant effect on any of the early literacy sub-dimensions: phonological awareness skills, H(2)=0.58, p=.747; writing awareness, H(2)=0.07, p=.963; story comprehension, H(2)=0.65, p=.719; matching images, H(2)=2.50, p=.285; and pre-writing skills, H(2)=0.51, p=.773. Although these differences did not reach statistical significance (p>.05), a descriptive examination of the findings revealed that children whose mothers held undergraduate or postgraduate degrees achieved higher mean scores in writing awareness, story comprehension, matching images, and pre-writing skills compared to those whose mothers had other educational backgrounds.

Table 6. Analysis of differences between early literacy skills and birth order

		Mean	Standard deviation	Median	Min	Max	K-W	p
Phonological Awareness Skills	1.	38,75	9,15	41,00	17,00	53,00	5,26	0,072
	2.	41,09	9,75	45,00	14,00	51,00		
	3.	31,25	11,56	30,50	19,00	45,00		
Writing Awareness	1.	9,40	3,12	9,00	4,00	16,00	0,85	0,652
	2.	9,70	2,97	10,00	4,00	15,00		
	3.	10,75	3,40	10,00	8,00	15,00		
Understanding the Story	1.	2,64	1,46	2,00	1,00	7,00	2,07	0,354
	2.	3,16	1,95	3,00	,00	9,00		
	3.	3,25	1,89	2,50	2,00	6,00		
Matching Images	1.	3,15	1,31	3,00	,00	6,00	0,26	0,874
	2.	3,23	1,66	3,00	1,00	8,00		
	3.	2,75	1,26	3,00	1,00	4,00		
Pre-Writing Skills	1.	3,68	1,73	3,00	1,00	8,00	2,17	0,338
	2.	3,98	1,37	4,00	2,00	7,00		
	3.	3,75	,50	4,00	3,00	4,00		

Kruskal-Wallis **p<.05

A Kruskal-Wallis test was conducted to determine whether children's early literacy skills differed significantly based on birth order. The results indicated that birth order did not have a statistically significant effect on any of the early literacy sub-dimensions: phonological awareness skills, H(2)=5.26,p=.072; writing awareness, H(2)=0.85,p=.652; story comprehension, H(2)=2.07,p=.354; matching images, H(2)=0.26,p=.874; and pre-writing skills, H(2)=2.17,p=.338. Although these differences did not reach statistical significance (p>.05), a descriptive examination of the mean scores showed that second-born children achieved higher scores in phonological awareness and pre-writing skills, while third-born children demonstrated higher scores in writing awareness and story comprehension.

Table 7. The relationship between early literacy skills

		Phonological Awareness Skills	Writing Awareness	Understanding the Story	Matching Images	Pre-Writing Skills
Phonological Awareness Skills	r	1	,193	,285**	,043	,230*
	p		,054	,004	,668	,022
Matching Images Phonological Awareness Skills Writing Awareness	r		1	,424**	,130	,353**
	p			<,001	,198	<,001
Writing Awareness Understanding the Story Matching Images	r			1	,577**	,283**
	p				<,001	,004
Understanding the	r				1	,189

Story	p					,060
Pre-Writing Skills	r					1
	p					

Pearson correlation**p <.05

A Pearson correlation analysis was conducted to examine the relationships between the various sub-dimensions of early literacy skills. The results revealed several statistically significant positive correlations among the variables. A low-level positive correlation was found between phonological awareness skills and understanding the story, r(98)=.285, p=.004, as well as between phonological awareness and pre-writing skills, r(98)=.230, p=.022. Writing awareness was found to have a moderate positive correlation with both understanding the story, r(98)=.424, p<.001, and pre-writing skills, r(98)=.353, p<.001. Furthermore, understanding the story showed a moderate positive correlation with matching images, r(98)=.577, p<.001, and a low-level positive correlation with pre-writing skills, r(98) = .283, p=.004. No statistically significant relationships were observed between phonological awareness and writing awareness (r(98)=.193, p=.054) or matching images (r(98)=.043, p=.668), nor between matching images and writing awareness (r(98) =.130, p=.198) or pre-writing skills (r(98)=.189, p=.060).

Table 8. Analysis of the relationship between early literacy skills and age, mother's age, father's age, and number of siblings

		Phonological Awareness Skills	Writing Awareness	Understanding the Story	Matching Images	Pre-Writing Skills
Age	r	,086	,055	,032	,186	,155
	p	,396	,588	,754	,064	,124
Maternal Age	r	-,128	-,050	-,136	-,189	-,208*
	p	,205	,618	,177	,059	,038
Paternal Age	r	-,001	-,068	-,106	-,165	-,171
	p	,992	,499	,292	,100	,089
Siblings	r	,032	,085	,073	-,058	,104
	p	,754	,399	,470	,566	,303

Pearson correlation**p<.05

A Pearson correlation analysis was conducted to examine the relationship between early literacy skills and demographic variables, including the child's age, maternal age, paternal age, and number of siblings. The results indicated no statistically significant relationships between early literacy skills and the child's age, paternal age, or the number of siblings (p>.05). Specifically, no significant correlations were found for child's age with phonological awareness skills, r(98)=.086, p=.396; writing awareness, r(98)=.055, p=.588; understanding the story, r(98)=.032, p=.754; matching images, r(98)=.186, p=.064; or pre-writing skills, r(98)=.155, p=.124. Similarly, paternal age and the number of siblings showed no significant correlations across any of the early literacy sub-dimensions (p>.05). However, a statistically significant low-level negative correlation was observed between maternal age and pre-writing skills, r(98)=-.208, p=.038. This finding suggests that as maternal age increases, children's pre-writing readiness skills tend to decrease. No other significant relationships were found regarding maternal age and the remaining sub-dimensions, such as phonological awareness, r(98)=-.128, p=.205, or writing awareness, r(98)=-.050, p=.618.

Table 9. Analysis of the relationship between the early literacy skills assessment tool and developmental characteristics

		Personal Social Skills	Fine Motor Skills	Language Development	Gross Motor Development
Phonological Awareness Skills	r	-,038	,119	,144	,050
	p	,708	,240	,152	,618
Matching Images	r	-,056	,191	,193	-,055
Phonological Awareness Skills	p	,582	,058	,055	,585
Writing Awareness					
Writing Awareness	r	-,171	,080	,166	-,004
Understanding the Story	p	,088	,428	,098	,965
Matching Images					
Understanding the	r	-,056	,102	-,005	-,024

Story	p	,582	,311	,962	,811
Pre-Writing Skills	r	,002	-,031	,058	-,048
	p	,983	,758	,566	,638

Pearson Correlation Test**p<.05

A Pearson correlation analysis was conducted to examine the relationship between the sub-dimensions of the Early Literacy Skills Assessment Tool and children's developmental characteristics, including personal-social skills, fine motor skills, language development, and gross motor development. The analysis revealed no statistically significant relationships between any of the early literacy skills and the assessed developmental domains (p>.05). Specifically, for phonological awareness skills, no significant correlations were observed with personal-social skills, r(98)=−.038, p=.708; fine motor skills, r(98)=.119, p=.240; language development, r(98)=.144, p=.152; or gross motor development, r(98)=.050, p=.618. Similarly, no significant correlations were found for writing awareness, where values ranged from r(98)=−.056, p=.582 for personal-social skills to r(98)=.193, p=.055 for language development. Understanding the story, matching images, and pre-writing skills also failed to show any statistically significant association with any of the developmental characteristics (p>.05). These results indicate that the early literacy skills measured in this study were not significantly linked to the participants' general developmental characteristics.

Conclusion and Discussion

This study was conducted to examine the relationship between early literacy skills and developmental levels in 48-69-month-old children attending preschool education. The findings obtained from the research were discussed, considering all tables within the context of the study's sub-problems and the relevant literature.

The sample of the study consisted of children with an equal gender distribution (50% girls, 50% boys) and a large proportion of parents with undergraduate or postgraduate education. Furthermore, the majority of participants (53%) were firstborn children. The normal distribution of the data supported the statistical power of the analyses. The selection of the sample from socio-culturally supportive family profiles and private preschools in Istanbul provided a critical basis for interpreting the findings.

The research findings showed that there was no statistically significant difference between children's early literacy skills and their gender. Although girls scored relatively higher in phonological awareness and writing readiness, and boys in writing awareness and story comprehension at the descriptive level, this difference did not reach statistical significance. This finding supports the view that the structure of early literacy, encompassing basic knowledge, skills, and attitudes, is shaped by environmental factors rather than a gender-specific process (Lee & Otabia, 2015; Ergül et al., 2016; Kısaoğlu & Çetin, 2023).

It was determined that the educational status of the father and mother, and the birth order of the child, did not create a significant difference in early literacy skills. Although the positive effects of parental education on child development are frequently encountered in the literature, the lack of a significant difference in this study can be explained by the compensatory role of the opportunities offered to children by preschool education environments (Özen-Altınkaynak, 2014; Canibey, 2022; Gengeç et al., 2022; Şenol & Turan, 2023; Yılmaz - Demirel & Yaman, 2023).

It was found that the educational status of the father and mother and the birth order of the child did not create a significant difference in early literacy skills. Although the positive effects of parental education on child development are frequently encountered in the literature, the lack of a significant difference in this study can be explained by the compensatory role of - opportunities offered to children in preschool education environments (Özen-Altınkaynak, 2014). Participation in standard or enriched preschool programs has leveled family-driven sociocultural differences. This finding highlights the profound impact of carefully structured educational programs (Çetin & Bencik-Kangal, 2021).

No significant relationship was found between the child's age, the father's age, and the number of siblings and early literacy skills. However, a statistically significant and low-level negative relationship

was found between the mother's age and writing readiness skills. This situation suggests that as the mother's age increases, there may be differences in the time allocated to interactive activities that support the child's writing readiness skills.

The most striking finding of the study is that there is no statistically significant relationship between children's general developmental characteristics, assessed with the Denver II, and their early literacy skills. This result proves that early literacy cannot be considered as a simple neuromotor or cognitive maturation process. Reading and writing success is not only a natural process but is closely related to interactive experiences (Tanju-Aslışen & Hakkoymaz, 2020; Yumuş, 2013).

All the findings confirm that early literacy is related to the quality of the educational programs offered and the richness of the home environment, rather than the child's general developmental level. Early literacy achievements develop in interactive environments with rich materials (Feyman-Gök, 2013).

Declarations

Authors' Declarations

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