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Examination of Preschool Children's Social Information Processing Skills in Terms of Attention and Emotion Regulation Skills

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This study aims to investigate the predictive effect of children's attention and emotion regulation skills, along with the examined demographic variables, on their social information processing abilities. Furthermore, it seeks to explore social information processing, emotion regulation, and attention skills in relation to children's age, gender, and duration of preschool education. The study group comprised 201 children aged between 60 and 72 months enrolled in preschools located in the city centre of Karaman, Türkiye. The study was designed using the relational survey model. Data collection instruments included the Personal Information Form, the Social Information Processing Process Test for Preschool Children, the Emotion Regulation Scale, and the FTF-K Attention Collection Test. Findings indicated that attention skills emerged as a significant predictor of social information processing skills, followed by the child's age range and emotion regulation skills. Additionally, while no substantial gender differences were observed in terms of social information processing and attention skills, a notable distinction was identified in favour of girls in emotion regulation skills. Furthermore, a significant disparity was identified in the social information processing and attention skills of children between the ages of 66 and 72 months, with a tendency towards higher performance in girls. The study concluded that social information processing, emotion and attention skills varied significantly based on the duration of preschool education, with children who attended preschool for a year or more demonstrating higher mean scores.

Introduction

The term "social information processing skills" is defined as the way individuals respond differently to similar social situations, exhibiting different behaviors (Erdley, Rivera, Shepherd & Holleb, 2010). These skills represent a significant aspect of social competence, which is associated with children's social interaction and facilitates their comprehension of surrounding environment (Dodge, 1986). These components have a profound impact on children's social skills (Crick & Dodge, 1994), which are inherently complex for children in the initial stages of development. They require the integration of diverse cognitive processes,

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including attention, memory, reasoning, focusing and information processing, as well as emotional processes such as emotion recognition, social and emotional understanding (Bauminger& Kimhi-Kind, 2008). The successful formation of social information processing skills is associated with the development of socially competent skills in children (Dodge & Price, 1994).

Research has demonstrated that children with well-developed social information processing skills also exhibit enhanced competencies in areas such as school readiness (Ziv, 2013), early academic success (Bascoe, Davies, Sturge-Apple & Cummings, 2009; Denham & Bassett, 2018; Denham et al., 2013), executive function (Caporaso, Marcovitch & Boseovski, 2021), self-regulation (Teague, 2006), social competence (Dodge, 2014; Dodge & Price, 1994), and emotion control (Dodge & Price, 1994; Peth-Pierce, 2000). These children are more resilient in the face of challenges and more successful in problem-solving (Öner & Özbey, 2022; Peth-Pierce, 2000). These research findings led us to focus our study on the preschool period.

Despite the existence of diverse models that seek to elucidate the social information processing (Crick & Dodge, 1994; Fontaine & Dodge, 2006; Lemerise & Arsenio, 2000; Ostrov & Godleski, 2010; Rowell Huesmann, 1988), the predominant model is the one developed by Dodge (1986) and later revised by Crick and Dodge (1994). The model emphasises the interrelated steps of encoding internal and external cues, interpreting cues, determining the goal, diversifying and structuring responses, deciding on the response, performing the response and evaluating the response before individuals evaluate a social situation or perform a social behaviour. The model underscores the crucial role of attention in recognizing and encoding social cues, which marks the first step in successfully completing the task. Furthermore, it highlights the efficacy of emotions in facilitating each phase of the model (Crick & Dodge, 1994). In the model developed by Lemerise and Arsenio (2000), emotional processes and cognition are viewed as integrated. It is indicated that emotional processing, emotional intensity and emotion regulation skills affect all steps of social information processing. This gives rise to emotional and cognitive processes related to social information processing.

Cognitive processes involved in social information processing enable the processing of social information, understanding and interpreting the emotions, intentions, and behaviors of others. Meanwhile, emotional processes include actions that regulate and shape behaviors. These two processes collaborate in carrying out behavioral actions (Cacioppo & Berntson, 1999; Herba & Phillips, 2004). In this process, emotions increase motivation and guide the formation of behavior (Izard, Stark, Trentacosta & Schultz, 2008). The capacity to regulate emotions represents a significant factor in how children process social information and respond to others' social cues (Murphy & Eisenberg, 1996). Young, Sandman and Craske (2019) emphasizes the effectiveness of strategies aimed at enhancing, sustaining, and reducing the duration, impact and intensity of positive and negative emotions in this process. According to Cole, Martin and Dennis (2004), emotion regulation can be defined as the systematic changes associated with active emotions, as well as the organisation and expression of emotions at the appropriate time and at the appropriate level.

One of the cognitive processes that form the basis of social information processing ability in the preschool period is the child's experience and attention skills. Attention skills, in particular, facilitate children’s ability to attend more closely to the complexities of their inteactions with peers, thereby enabling the development of more adaptive social information processing strategies (Bauminger& Kimhi-Kind, 2008; Rubin & Rose-Krasnor, 1992).

Attentional skills are defined as a function of the nervous system that allows an individual to focus their attention on stimuli that are in alignment with the immediate needs and goals, amidst the multitude of environmental stimuli (Parasuraman, 2000). These skills mediate individuals' emotional processes, serve as a prerequisite for acquiring cognitive and social competencies (Blair, 2002) and contribute to the regulation of negative emotions. Research highlights that children who can shift and sustain their attention are better able to regulate negative emotions by redirecting their focus away from emotionally distressing stimuli (Eisenberg & Fabes 1992; Eisenberg et al., 1997; Fabes et al., 1999; Matheny, Riese & Wilson, 1985). Conversely, studies have shown that children who experience difficulties in controlling their attention are at a higher risk of social withdrawal, externalizing behaviors, and social difficulties (Eisenberg et al., 2000; Lawson & Ruff, 2004; Yung, Lai, Chan, Ng & Chan, 2021). These findings suggest that motivation, along with the ability to focus and sustain attention, is closely linked to possessing socially competent mental representations (Ziv, 2013).

Research findings on the role of social information processing skills in the development of preschool children (Bascoe et al., 2009; Caporaso et al., 2021; Denham & Bassett, 2018; Denham et al., 2013; Dodge & Price, 1994; Dodge, 2014; Öner & Özbey, 2022; Peth-Pierce, 2000; Teague, 2006; Ziv, 2013), along with the emphasis on cognitive and emotional processes in models developed for this skill domain (Crick & Dodge, 1994; Lemerise & Arsenio, 2000), highlight the relationship between attention, emotion regulation, and social information processing skills. Moreover, Johnson et al. (2020) have pointed out that cognitive skills influencing the development of social information processing skills have received relatively little attention, while Pessoa (2008) emphasizes that emotions and cognition establish strong neural connections, contributing to the formation of behavior. Considering these perspectives, examining the relationship between social information processing skills and attention and emotion regulation skills is deemed important. In this context, the present study aims to investigate the predictive impact of preschool children's attention and emotion regulation skills on their social information processing skills. Additionally, it seeks to examine social information processing, attention, and emotion regulation skills in relation to children's age, gender and duration of preschool education.

Method

Research Model

The study employs the correlational survey model, one of the general survey models. This model aims to determine the relationships between two or more variables (Karasar, 2011). In the study, the dependent variable is preschool children's social information processing skills, while the independent variables are their emotion regulation and attention skills.

Participants

The study group of the research consists of 60–72-month-old children attending independent kindergartens affiliated to the Ministry of National Education and nursery schools within primary education in Karaman province. In the study, the sample size was calculated based on student numbers provided by the Karaman Directorate of National Education. The number of participants in the sample group was determined using G*Power 3.1.9.6, a program (Faul, Erdfelder, Buchner & Lang, 2009) employed for sample size estimation based on specific criteria outlined by Tabachnick, Fidell and Ullman (2013). Given that the study aims to determine the predictive effects of preschool children's attention and

emotion regulation skills on their social information processing skills, the values for the statistical power analysis were set as $\alpha = .05$, $\beta = .80$, and $f = .02$, considering the regression analysis as the selected data analysis technique (Faul et al., 2009). As a result, calculations indicated that a minimum of 148 children should be included in the study. However, to account for potential data loss, the study group was expanded to include 201 children aged 60–72 months. In selecting the study group, the following criteria were considered, children had to be between 60 and 72 months old, exhibit typical development, have both their preschool teachers and themselves willing to participate in the study and have parental consent forms approved. The demographic analysis indicated that 61 children (30.3%) in the study group were between 60 and 65 months old, while 140 children (69.7%) were between 66 and 72 months old. In terms of gender distribution, 90 participants (44.8%) were female, and 111 participants (55.2%) were male. Regarding preschool attendance, 106 children (52.7%) had been enrolled in preschool education institutions for one year or less, whereas 95 children (47.3%) had attended for more than one year.

Data Collection Tools

Personal Information Form consists of questions carefully designed by the researcher to assess the demographic characteristics of the children. The form includes inquiries related to the child's age, gender, and duration of preschool education.

The ***Emotion Regulation Scale*** was originally developed by Shields and Cicchetti (1997) and later adapted into Turkish by Batum and Yağmurlu (2007), and was employed to measure children's emotion regulation skills. The scale comprises 24 items distributed across two subscales: **variability/negativity** and **emotion regulation control**. It is designed to be completed by teachers and parents who have sufficient knowledge of children's behaviors. In the validity and reliability study conducted by Yağmurlu and Altan (2010), the internal consistency coefficients for the mother and teacher evaluations of the scale were reported as .75 and .84, respectively (Batum &Yağmurlu, 2007). The total score is obtained by reversing the items in the **variability/negativity** subscale and summing the responses. Higher scores indicate stronger emotion regulation skills (Apaydın Demirci, Arslan & Temel, 2020; Batum &Yağmurlu, 2007; Erel, 2016). Within the present study, the Cronbach's Alpha coefficient for the scale was calculated as .887.

The ***Social Information Processing Test for Preschool Children*** was originally developed by Ziv and Sorongon (2011) and later adapted into Turkish by Şenol and Metin (2019). The test aims to assess how children interpret the outcomes of social interactions with their peers. It consists of **five narratives** and **six sections**, each designed to evaluate different aspects of social information processing. In the first section, children are asked to identify and interpret various facial expressions. In the following sections, their responses to different social situations are assessed. The test includes several sub-dimensions, namely **recognition of facial expressions, encoding of social cues, interpretation of social cues, response diversification and structuring, response selection, and response evaluation**. The reliability and validity analyses of the test yielded a **KR-20** and **Cronbach's Alpha** coefficient of **0.695** for the **interpretation of social cues** sub-dimension, **0.705** for the **response diversification and structuring** sub-dimension, and **0.921** for the **response selection and evaluation** sub-dimension. The overall reliability coefficient of the scale was reported as **0.923** (Şenol & Metin, 2019). In the present study, the **Cronbach's Alpha coefficient** for the scale was calculated as **0.663**.

The ***FTF-K Attention Collection Test for Five-Year-Old Children***, originally developed by Raatz and Möhling (1971), was utilized in this study to assess children's attention skills. A validity and reliability study for the test was later conducted by Kaymak (1995). The test requires children to identify and mark pear images on a form that contains both apple and pear images within a **90-second** time limit (Gözalan & Koçak, 2014). As part of the reliability studies conducted by Kaymak (1995), the test was administered to a sample of **30 children aged 5–6 years** and the clarity of the test instructions was evaluated. Additionally, in a study conducted by Gözüm and Kandır (2018), the reliability of the test was assessed using the **test-retest method**, yielding a **test-retest reliability coefficient of .74** over a three-week interval.

Data Collection

The research data were collected following the acquisition of the necessary official permissions from the **Karaman Provincial Directorate of National Education**. The teachers observed the children for a minimum of one term before the data collection process. Initially, the researcher visited the preschool teachers to provide detailed information about the study. Through the teachers, the parental consent forms were distributed to parents, which outlined the type of research procedures, the purpose of data collection, and the voluntary nature of participation. The form also reassured parents that participation would not cause any discomfort, but that participants could withdraw at any time, and that the data would be used solely for the research purpose. Upon obtaining the required parental consent, children aged between **60 and 72 months** at the time of the scale administration and enrolled classes were included in the study. In each participating class, the children were informed about the research procedures in the presence of their teacher. The scales were administered individually to each participant by the researcher in environments deemed suitable and free from distractions, as determined by the school administration and preschool teachers. Before administering the scales, a brief conversation was held with the children to help them feel comfortable. If a child expressed a desire to discontinue participation, the data collection was immediately halted. The **FTF-K Attention Collection Test** and the **Social Information Processing Process Test for Preschool Children** took an average of **30 minutes** to complete. The **Emotion Regulation Scale** was filled out by the teachers at their convenience.

Data Analysis

A dataset was collected from 202 participants, and the Mahalanobis distance value was first calculated. Following the exclusion of extreme data, the analysis was conducted on the remaining 201 data points. Initially, the total scale scores were examined to determine whether they followed a normal distribution. The assessment of normality involved calculating the skewness and kurtosis values, with the criterion that these values should fall within the range of ±1.0 for the data to exhibit normal distribution characteristics (George & Mallery, 2019). The results showed the following: the emotion regulation total scores had a skewness value of -.978 and kurtosis value of .751, the social information processing total scores had a skewness value of -.673 and kurtosis value of .117, and the attention skills total scores had a skewness value of -.407 and kurtosis value of -.255. All variables were found to be normally distributed, as their skewness and kurtosis values were within the acceptable range of ±1.0. Therefore, parametric tests were deemed appropriate for further analysis. In this study, Pearson correlation analysis was employed to examine the relationships between attention and emotion regulation skills and social information processing skills in preschool children. To assess the predictive effects of attention and emotion regulation on social information processing, hierarchical regression analysis was used, considering the demographic variables included in the study. Additionally, a t-test for independent groups was

applied to investigate differences in children's social information processing, emotion regulation, and attention skills in relation to age, gender, and duration of preschool education.

Results

Table 1. t-Test Results for Social Information Processing, Emotion Regulation, and Attention Skills of Preschool Children by Gender Variable

Scale	Category	n	$\overline{X}$	Sd	t	p
Social Information Processing Skills	Girls	90	57.55	7.30	.605	.546
	Boys	111	56.90	7.70		
Emotion Regulation Skills	Girls	90	71.15	5.05	2.899	**.004***
	Boys	111	68.90	5.96		
Attention Skills	Girls	90	33.40	6.29	.417	.677
	Boys	111	33.00	6.84		

*p<.05

As a result of the analyses in Table 1, it was seen that the mean total scores of social information processing skills (t=.605, p>0.05) and the attention skills (t=.417, p>0.05) did not differ significantly between genders. However, a significant difference was observed in the mean scores for emotion regulation skills (t=2.899, p<0.05). Specifically, the female participants (x = 71.15) exhibited higher mean scores for emotion regulation skills than the male participants (x = 68.90).

Table 2. t-Test Results for Social Information Processing, Emotion Regulation and Attention Skills of Preschool Children by Age Range Variable

Scale	Category	n	$\overline{X}$	Sd	t	p
Social Information Processing Skills	60-65 Months	61	53.40	8.21	-4.994	**.000***
	66-72 Months	140	58.85	6.56		
Emotion Regulation Skills	60-65 Months	61	69.49	5.72	-.698	.486
	66-72 Months	140	70.10	5.65		
Attention Skills	60-65 Months	61	31.08	6.28	-3.046	**003***
	66-72 Months	140	34.10	6.53		

*p<.05,

Conducted to examine the social information processing, emotion regulation, and attention skills of preschool children in terms of the **age variable**, the analyses indicated no significant difference in the total mean scores of **emotion regulation skills** (t = **-0.698**, p > 0.05). However, a significant difference was found in the total mean scores of **social information processing skills** (t = **-4.994**, p < 0.01) and **attention skills** (t = **-3.046**, p < 0.01). Specifically, children aged **66-72 months** ($\bar{x}$ = **58.85**) exhibited higher mean scores in **social information processing** compared to children aged **60-65 months** ($\bar{x}$ = **53.40**). Regarding **attention skills**, children aged **66-72 months** ($\bar{x}$ = **34.10**) also exhibited higher mean scores than children aged **60-65 months** ($\bar{x}$ = **31.08**).

Table 3. t-Test Results for Social Information Processing, Emotion Regulation, and Attention Skills in Preschool Children Based on Duration of Preschool Education Attendance

Scale	**Category**	**n**	$\overline{X}$	**Sd**	**t**	**p**
Social Information Processing Skills	1 Year and Less	106	55.86	7.94	-2.694	**.008***
	More than 1 Year	95	58.68	6.73		
Emotion Regulation Skills	1 Year and Less	106	68.82	6.25	-2.991	**.003***
	More than 1 Year	95	71.13	4.68		
Attention Skills	1 Year and Less	106	32.31	6.44	-1.998	**.047***
	More than 1 Year	95	34.15	6.65		

*p<.05

As can be seen from Table 3, significant differences were found in the total mean scores of social information processing (t=-2.694, p<0.05), emotion regulation (t=-2.991, p<0.05), and attention skills (t=-1.998, p<0.05). Specifically, with respect to social information processing total mean scores, children who had attended preschool for more than 1 year ($\bar{x}$ = 58.68) showed significantly higher scores compared to those who attended preschool for 1 year or less ($\bar{x}$ = 55.86). Regarding emotion regulation skills, children who attended preschool for more than 1 year ($\bar{x}$ = 71.13) demonstrated higher mean scores than those with less than 1 year of attendance ($\bar{x}$ = 68.82). Additionally, in terms of attention skills, children with more than 1 year of preschool education ($\bar{x}$ = 34.15) had higher mean scores compared to those with 1 year or less of attendance ($\bar{x}$ = 32.31).

Table 4. Pearson Correlation Values between Emotion Regulation Skills, Attention Skills and Social Information Processing Skill Scores

	1	**2**	**3**
1. Emotion Regulation Skills	-	-	-
2. Social Information Processing Skill	.192**	-	-
3. Attention Skills	.181**	.365**	-

*p<.05, **p<.01

The results of the Pearson correlation analysis revealed a low-level significant positive relationship between the total score of the emotion regulation skills scale and the total score of social information processing skills (r = .192, p < .01). Similarly, a low-level significant positive relationship was found between the total score of emotion regulation skills and the total score of attention skills (r = .181, p < .01). Additionally, a moderately significant positive relationship was observed between the total score of social information processing skills and the total score of attention skills (r = .365, p < .01).

As a result of the analyses, it was determined that there was a relationship between social information processing skills and attention and emotion regulation. Additionally, it was found that the child's social information processing skills differed according to the variables of the child's age range and the duration of preschool education, but no significant difference was found in terms of the gender variable. As a result, hierarchical regression analysis was performed. Firstly, the predictive effect of attention and emotion regulation skills on social information processing skills was examined, in accordance with the purpose of the study.

Subsequently, these variables were included in the model to determine whether the child's age range and duration of preschool education were confounding factors.

Table 5. Hierarchical Regression Analysis Results on the Prediction of Social Knowledge Processing Skills

Model	Independent Variables	*B*	*SE*	*β*	*t*	*p*	Tolerans	VIF
1	Stable	34.132	3.651		9.348	.000***		
	Attention Skills	.361	.074	.319	4.873	.000**	.960	1.041
	Emotion Regulation Skills	.436	.125	.228	3.477	.001**	.960	1.041
Model 1: R^2=.18								
2	Stable	37.787	6.305		5.993	.000***		
	Age Range	4.130	1.075	.253	3.840	.000***	.912	1.096
	Duration of Attendance to Preschool Education	1.006	.994	.067	1.012	.313	.905	1.105
	Attention Skills	.319	.074	.282	4.306	.000***	.924	1.082
	Emotion Regulation Skills	.152	.076	.115	1.760	.040 *	.933	1.071
Model 2: R^2=.22, R^2 change=.4								
Durbin-Watson: 1.871, ***p<.001, **p<.01, *p<.05								
Model 1: R=.42, R^2=.18, ΔR^2 =.17, $F_{2\text{-}198}$=12.089, p<.001								
Model 2: R=.47, R^2=.22, ΔR^2 =.21, $F_{4\text{-}196}$=13.992, p<.001								

According to the results of the hierarchical regression analysis: Model 1: Attention skills and emotion regulation skills were added to the model. The results showed that attention and emotion regulation skills significantly predicted social information processing skills ($F_{2\text{-}198}$ = 12.089, p < .001). Model 2: In the study, the variables of age range and duration of preschool attendance were included in the regression analysis and transformed into dummy variables. According to this, children aged 66-72 months were coded as "1", and children aged 60-65 months were coded as "0". Regarding the duration of preschool attendance, children who had attended preschool for 1 year or less were coded as "0", and children who had attended preschool for more than 1 year were coded as "1".Accordingly, 66-72-month-old children were coded as 1 and 60-65-month-old children were coded as 0. In terms of the duration of preschool education, children who have been attending preschool education for 1 year or less were coded as 0, and children who have been attending preschool education for more than 1 year were coded as 1. This addition resulted in an increase of 4% in the explained variance, and it was found that the child's age range, attention skills, and emotion regulation skills significantly predicted social information processing skills ($F_{4\text{-}196}$ = 13.992, p < .001).When the relevant beta values were analyzed in the final model, the following results were obtained: A one-unit increase in attention skills scores increased social information processing skills by. 319 units. A one-unit increase in emotion regulation skills scores increased social information processing skills by .152 units. A one-unit increase in the age range of children increased social information processing skills by 4.130 units. The regression coefficient of the duration of preschool education on social information processing skills was not significant. The final model explained 22% of the change in social information processing skills (R^2 = .22). Accordingly, it was determined that the predictors of social information processing skills were attention skills (β = .282, p < .001), age range of the child (β = .253, p < .001), and

emotion regulation skills (β = .115, p = .040).

Discussion

The results of the analyses conducted to examine the social information processing, emotion regulation and attention skills of preschool children in terms of gender revealed no significant differences in social information processing and attention skills. However, a significant difference was found in emotion regulation skills. These findings suggest that children exhibit comparable social information processing and attention skills across genders. A study by Çorbacı-Oruç (2008) with preschool children found no significant gender differences in the encoding step of the social information processing process. However, girls were observed to interpret people's intentions as more hostile in the intention interpretation/understanding of intention step. No significant gender difference was found in the number of alternative solutions produced. The findings of studies by Durulan and Angın (2023), Aktaş (2021), and Gür (2018) on attention skills align with the present research, as they indicate that children's attention skills do not differ by gender. The research also yielded significant findings in favor of girls regarding emotion regulation skills. Girls were found to have higher mean scores than boys in this domain. This is consistent with the study by Yurdakul, Beyazıt and Ayhan (2021) showed that boys scored higher on the variability/negativity subdimension of the emotion regulation scale than girls. These findings are also consistent with those of Yılmaz (2020), Sanchis-Sanchis, Grau, Moliner and Morales-Murillo (2020), and Civil (2022), all of which found that girls' emotion regulation skills were superior to those of boys.

The findings of the study indicated significant variations in social information processing and attention skills among preschool children based on their age range. However, no substantial disparities were observed in emotion regulation skills. The results showed that the mean scores of children aged 66-72 months were significantly higher than those of children aged 60-65 months in terms of social information processing and attention skills. The study conducted by Denham et al. (2014) revealed that children tend to exhibit more adaptive behaviors as they grow older. In the study by Caporaso et al. (2021), age was significantly correlated with coding, response generation, and response evaluation, further supporting the age-related development of these skills. Regarding attention skills, the results indicated that children aged 66-72 months scored higher than those aged 60-65 months. This finding suggests that attention levels increase with age. It is well-established in child development literature that the capacity for sustained attention, which is limited in early stages of life, improves as children age. The duration of attention correlates directly with developmental stages (Durulan & Angın, 2023). Studies by Lawson and Ruff (2004) and Aslan, Aksoy and İmamoğlu (2020) also support the notion that children's attention levels improve with age. Similarly, López-Pérez, Gummerum, Wilson and Dellaria (2017) demonstrated that children's use of distraction strategies decreased with age. Another key finding of the study was that emotion regulation skills did not significantly differ according to age. A review of the literature revealed that the findings of studies by Acar Veziroğlu-Çelik, Çelebi, İngeç and Kuzgun (2021), Ahmetoğlu, Ilhan Ildız, Acar and Encinger (2018), MehmetoğluYontar (2019), and Dağlı and Dağlıoğlu (2021) also indicated no significant difference in emotion regulation skills based on age.

As a result of the research, it was determined that preschool children's social information processing, emotion regulation, and attention skills varied significantly according to the duration of preschool education. Specifically, in all three skill areas, the mean scores of

children who attended preschool education institutions for 1 year or more were significantly higher than those of children who attended preschool education institutions for 1 year or less. This finding suggests that as the duration of preschool attendance increases, children demonstrate improved social information processing, attention, and emotion regulation skills. The development of social skills in children is significantly influenced by the family, school, and broader environment. While children initially acquire social skills within the family, the school setting is the primary arena in which they learn the importance of adhering to social norms. As children continue their education, their social skills continue to develop and evolve (Çubukçu& Gültekin, 2006; Tagay, Baydan& Acar, 2010). A review of the literature on children's social skills, social-emotional adjustment and social competence (Dinç, 2015; Günindi, 2008; Gültekin-Akduman, Günindi & Türkoğlu, 2015; Riney & Bullock, 2012) revealed that preschool education and the duration of preschool education were found to play a significant role in developing children's social skills competencies. Regarding emotion regulation skills, the study conducted by Vardi and Demiriz (2021) indicated that as the duration of school attendance increased, emotional variability decreased, and the level of emotional expression increased. Similarly, the study by Velazquez-Martin (2013) demonstrated that children's emotion regulation skills improved with increased duration of school attendance. Concerning attention skills, the study by Durulan and Angın (2023) revealed that children's attention levels increased in parallel with the duration of their school attendance.

As a result of the analyses conducted within the scope of the research, it was determined that there is a relationship between social information processing skills and attention and emotion regulation skills. Furthermore, the child's social information processing skills differed according to the child's age and duration of preschool education, but there was no differentiation in terms of gender. Consequently, hierarchical regression analysis was performed. First, the predictive effect of attention and emotion regulation skills of preschool children on social information processing skills was examined in alignment with the purpose of the study. Then, these variables were incorporated into the model to determine whether the child's age and duration of preschool attendance served as confounding factors. It was determined that the duration of preschool education did not have a predictive effect on social information processing skills, with the predictors being attention skills, the child's age range, and emotion regulation skills.

The findings of the research indicate that attention skills predict social information processing skills. The positive beta and correlation values suggest that as children's attention skills increase, their social information processing skills also improve. This outcome can be interpreted to mean that as children's attention skills strengthen, they are better able to perceive the details of social events and generate more effective solutions to these events. In the initial phase of social information processing, which involves the coding of social cues from the environment, children perceive and interpret these cues through sensory processes. It is hypothesized that children with stronger attention skills will be more successful in these processes. According to social cognitive theory, children first direct their attention to events and situations by observing and imitating behaviors that they focus on, after undergoing mental processes and relying on their own experiences (Bandura, 1977). In line with information processing theory, stimuli are initially received through the sensory organs and subsequently directed to short-term memory, where attention plays a crucial role in processing these stimuli. In this process, sensory data is transferred to short-term memory through the operations of attention and perception (Erden & Akman, 1998). Notably, attention plays an active role in this process, and it is essential to exert mental effort to direct attention

toward a stimulus (Anderson, 2005). As Lim (2002) emphasizes, children with deficiencies in attentional control and inhibitory control are more likely to overlook key social cues and engage in non-participatory behaviors during social information processing. Blair (2002) suggests that attentional skills act as a conduit through which individuals navigate emotional processes and are foundational for acquiring cognitive and social competencies. In this context, attention control aids in regulating negative emotions. It has been stated that children who can shift their attention and maintain focus are better able to regulate their negative emotions by diverting their attention from stimuli that evoke negative emotions, thereby becoming more socially competent (Fabes et al., 1999; Kopp, 1989; Rothbart, 1989). Moreover, Rueda, Posner and Rothbart (2016) determined that attention contributes to the regulation of children's behaviors by performing monitoring and control tasks.

The research also indicates that children's age is a predictor of their social information processing skills. In other words, an increase of one unit in the child's age corresponds to an improvement in social information processing skills. The development of a strong emotional foundation that occurs with age enhances children's ability to predict both their own and others' emotions. This, in turn, enables them to use their emotional intelligence to improve their effectiveness in social interactions (Thompson & Lagattuta, 2006).

Furthermore, the study concluded that emotion regulation skills predict social information processing skills. The positive beta and correlation values suggest that as children's emotion regulation skills improve, so do their social information processing skills. This can be interpreted to mean that children develop an enhanced ability to understand and regulate their own emotions as their emotion regulation skills increase, which subsequently contributes to more successful navigation of their social relationships. In this context, Cole, Martin and Dennis (2004) emphasized the utility of conceptualizing the complex processes through which emotions are linked to cognition and behavior in terms of emotion regulation skills. In the existing literature on social information processing, it has been shown that emotion regulation skills are associated with the steps in social information processing and positively influence social information processing skills (Davies, Coe, Hentges, Sturge-Apple & Ripple, 2020; Denham & Bassett, 2018; Harper, Lemerise & Caverly, 2010; Terzian, Fraser, Day & Rose, 2015; Lemerise & Arsenio, 2000; Helmsen, Koglin & Peterman, 2012). Denham and Bassett (2018) found that self-regulation and emotional knowledge are linked to more adaptive social information processing responses. Lemerise and Arsenio (2000) found that the intensity of emotions, emotional processing, and emotion regulation affect all stages of social information processing. In a study by Davies et al. (2020), the temperamental dimensions of emotion were examined as potential precursors of children's social information processing related to stressful peer events. The findings indicated that effortful control, fear, and anger were predictive of subsequent changes in certain social information processing dimensions. Similarly, Helmsen et al. (2012) demonstrated that individuals with maladaptive emotion regulation and biased social information processing tendencies showed a greater inclination for aggressive behaviors. These studies support our conclusion that emotion regulation abilities predict social information processing competencies.

Conclusion and Recommendations

The study found no significant differences in social information processing and attention skills based on gender; however, girls demonstrated superior performance in emotion regulation skills. Social information processing and attention skills were significantly influenced by age, with children aged 66-72 months exhibiting better performance. In

contrast, no significant age-related differences were observed in emotion regulation skills. The study also revealed that social information processing, emotion regulation, and attention skills differed significantly according to the duration of preschool education. Children who attended preschool for more than one year had higher mean scores across these skills. Additionally, the research identified attention skills as the primary predictor of social information processing skills, followed by the child's age range and, lastly, emotion regulation skills. This highlights the importance of attention skills and age in the development of social information processing. Considering the crucial role of preschool education in the development of these skills, it is recommended that training programs be designed for teachers to support the enhancement of children's social information processing, attention, and emotion regulation skills. Attention and emotion regulation skills, as well as strategies to foster these competencies, should be incorporated into the curricula of training programs aimed at improving children's social information processing skills. Moreover, seminars could be organized to raise awareness among educators about how they can support and develop children's social information processing skills, with a particular emphasis on integrating attention and emotion regulation skills into the process.

Limitations

This study, which examined the attention and emotion regulation skills of preschool children and the predictive effect of demographic variables on social information processing skills, has several limitations. First, the attention and social information processing skills of the children were assessed based on data collected directly from the children, while the emotion regulation skills were evaluated through teacher assessments. In future studies, data on children's emotion regulation skills can be gathered using evaluation tools applied directly to the children themselves. Additionally, this study primarily focused on child-related characteristics associated with social information processing skills. Future research could explore variables related to the family, teacher, and classroom environment, which may also have an impact on children's social information processing. Lastly, the study was conducted with children aged 60-72 months. Future research could benefit from longitudinal studies that follow children over time to examine the development of these skills across different age groups.

Declarations

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Ethics Statements: Prior to the data collection process, ethical approval was obtained from Non-Interventional Clinical Research Ethics Committee of Selçuk University Faculty of Health Sciences on July 12, 2023, with the decision number 2023-663.
Conflict of Interest: The authors did not declare any conflict of interest.
Informed Consent: A consent form was obtained from the parents. Information was given about the type of application of the research, the purpose of using the collected data, that participation was voluntary, and that the data given would only be used for the relevant research. In each class participating in the study, firstly, the teacher and the children were informed about the application process. Just before the scales were administered, a short conversation was held with the children to relax the child, and the study was terminated when the child did not want to answer.

Data availability: The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

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