

Play Behaviors and Self-Regulated Learning in Preschool Children

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Abstract

This study, structured using a cross-sectional design, investigates the extent to which preschool children's play behaviours predict their self-regulated learning skills. The research sample comprised 301 five-year-old children (145 boys and 156 girls) enrolled in preschools across the Turkish Republic of Northern Cyprus. Participants were selected through a convenience sampling method based on accessibility. The Preschool Play Behaviour Scale and the Children Independent Learning Development Checklist 3-5 (CHILD 3-5) were used to collect data. This study employed a survey research design to examine the predictive effect of play behaviours of preschool children on self-regulated learning behaviours. The results revealed a significant and positive relationship between children's social play, solitary passive play, and solitary active play behaviours, and their levels of self-regulated learning. This result indicated that the degree of self-regulated learning changes in tandem with the increase or decrease of social play, solitary passive play, and solitary active play behaviours. No significant correlation was found between rough play and children's self-regulated learning behaviours. However, preschoolers' social play, solitary passive play, and solitary active play behaviours significantly predicted their self-regulated learning behaviours. Among these, social play was the most predictive, while solitary active play was the least. These findings suggest a role for children's play in the development of self-regulated learning.

Keywords : *Play, play behaviours, self-regulated learning, early childhood*

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Introduction

Self-regulation involves setting goals, making plans, and tracking progress (Carver & Scheier, 1998). It plays a key role in children's learning and impacts both academic and social success. Children who self-regulate well tend to be better at listening and waiting patiently (McClelland & Cameron, 2012). While self-regulation continues to develop across the lifespan, research shows that the first five years are especially critical (Timmons, 2019). For instance, Montroy et al. (2016) observed rapid growth in self-regulation during early childhood as they tracked children from preschool to first grade. Self-regulation refers to an individual's capacity to manage their emotions, behaviours, and attention across various aspects of life. Self-regulated learning, on the other hand, is a focused application of this ability within educational settings, involving a children's active role in planning, tracking, and assessing their own learning process. Self-regulated learning is defined as taking the responsibility of one's own learning and controlling one's own learning by actively participating in the learning process (Livingston, 2012). Self-regulated learners direct their cognitive processes, acquire internal motivation and are strategic during learning (Winne & Perry, 2000). According to the model developed in Whitebread et al., (2009b)'s study on young children, self-regulated learning has three elements as metacognitive knowledge, metacognitive regulation and emotional-motivational regulation. Metacognitive knowledge refers to the children's awareness concerning the learning process, learning tasks, and strategies that enable them to manage cognitive processes (Whitebread et al., 2009a). Some examples of metacognitive knowledge are repeating information to remember it or knowing that starting from the corner of a puzzle will help (Saraç & Gülay Ogelman, 2021). Metacognitive knowledge also includes a child's awareness that they have trouble with certain tasks, like seeing that they can't color inside the lines or cut with scissors. Metacognitive regulation is when a child plans, checks, controls, and evaluates the cognitive activities he or she is doing while learning (Whitebread et al., 2009a). A good example of metacognitive regulation is when young children have trouble with an activity in a learning center and ask their teacher for help (Deluca et al., 2020). Metacognitive regulation is also observed when a child counts the wrong number of items and starts over or uses a different

method, like counting on their fingers (Whitebread & Coltman, 2010). The last element of the model is emotional-motivational regulation. Emotional-motivational regulation is the process by which children monitor and evaluate their emotional states and motivations during a learning task (Whitebread et al., 2009a). Children demonstrate emotional-motivational regulation when they smile or applaud themselves as a sign of appreciation (Zachariou & Whitebread, 2015) or when they talk to themselves to encourage themselves (Robson, 2016; Whitebread & Coltman, 2010).

To gain a better understanding of how self-regulated learning skills develop in early childhood, it is essential to consider the everyday contexts in which children naturally apply these abilities. One such context is play, where children actively engage in planning, problem-solving, and regulating their emotions-core components of self-regulated learning. In addition to being an essential component of young children's daily lives, play is an activity that affords them opportunities to engage in social roles (Weisgram & Dinella, 2018). Every child needs to play. Play has the same meaning for children everywhere (Colliver & Doel-Macaway, 2021). Play is an activity in and of itself (play for play) in which the process, rather than the outcome, is emphasized (Tamis-LeMonda, Uzgiris & Bornstein, 2002). Therefore, it is essential to investigate the effects of play on the development of preschoolers. Thus, the short-term and long-term effects of play on children are the subject of extensive research. Play is a phenomenon that can affect all stages of development. Children's natural verbal and nonverbal behaviours can be reinforced through play. It is possible to identify a child's personality characteristics, developmental skills, and peer relationship dynamics since the naturally occurring process of play allows for the acquiring of trustworthy information about the child (Kelly-Vance & Ryalls, 2008; Moyles, 2012).

Preschool education aims to identify and assess children in addition to supporting the various stages of development and individual differences that are present in young children, providing them with equal educational opportunities, and offering guidance to the families of these children. Experiences gained through play can improve a wide variety of social and emotional competencies, including communication skills, ability to form positive relationships with peers, emotional intelligence, and emotional competence (Rauf & Bakar, 2019; Tahmores, 2011). Researchers (Fantuzzo, Sekino, & Cohen, 2004; Quinn, Donnelly,

& Kidd, 2018; Walsh, 2017) note that play can positively influence general cognitive abilities such as self-regulation, independence, language skills, problem-solving, and a positive learning attitude. Early childhood play offers a natural context for children to develop the social-emotional and cognitive skills needed for peer cooperation (O'Conner & Stagnitti, 2011). It fosters social skills, self-awareness, and the ability to work with others (Pellegrini, 2009). Flanagan et al. (2024) also noted that infants' play behaviours can be early indicators of developmental differences in those later diagnosed with autism spectrum disorder. These findings emphasize that play in early childhood is crucial not only for promoting development but also for identifying developmental concerns. Additionally, play has a lasting impact on development. According to Johnson, Christie, and Wardle (2010), play can impact future risk-taking, fine motor skills, and gross motor skills. In a five-year longitudinal study, Cairney et al. (2018) demonstrated that free play and organized physical activities during the preschool years are associated with movement skills in elementary school. Baardstu et al. (2023) found that shy children who showed less social play and had poorer language skills faced a greater risk of developing anxiety over time, whereas those with stronger language abilities and more frequent social play were less likely to experience such issues. Likewise, Choi (2025) observed that the quality of peer interactions during play between ages three and six could serve as a predictor of externalizing behaviours in early childhood. In a nutshell, the effects of play on a child's development, both in the short and the long term, are extremely important during the preschool years. Due to the fact that it is a multifaceted idea, there are many different theories, classifications, and approaches concerning the development of play as well as the various forms it can take (Mawson, 2010). For instance, Piaget (1951) divides play into three categories: functional play, symbolic play, and games with rules (Sheridan, 2011). On the other hand, Parten (1932) identifies six distinct categories of play: unoccupied behaviour (0-24 months), solitary play (24-30 months), onlooker behaviour, parallel play (30-42 months), associative play (42-54 months), and cooperative play (Smith & Pellegrini, 2013). This study examined four play behaviours (social play, solitary passive play, rough play, and solitary active play), as categorized by Coplan and Rubin (1998). Social play is defined as play that involves interaction with peers and is organized in small or large groups (Coplan, Rubin, & Findlay, 2006). Solitary passive

play refers to children's play with objects alone (Rubin 1982; Rubin & Asendorf, 1993). For instance, children can play independently with Lego blocks or puzzles. In certain instances, they can concentrate on an object and examine it. Rough play refers to socially and physically aggressive behaviours displayed throughout the game (hit-and-run, pushing, fighting, rolling around, chasing, wrestling etc.). In these games, children do not intend to harm their peers (Harbin, 2016). Solitary active play refers to the imaginative and role-playing children engage in independently, with or without objects (Coplan et al., 1994). This study examined the effects of four play behaviours (social play, solitary passive play, rough play, and solitary active play) on the self-regulated learning skills of preschoolers.

Self-regulated learning is a concept that emerges in early childhood and continues to develop throughout adolescence and adulthood and is related to future competencies such as academic achievement and mental health (Braund & Timmons, 2021; Deluca et al., 2020). Interactions with peers are crucial to its development (Boekarts & Cascallar, 2006). As per studies, children exhibit self-regulated learning behaviours during pair or group activities that demand intense peer interaction (Robson, 2010; Robson, 2016; Shamir, Mevarech, & Gida, 2009; Timmons, Pelletier & Corter 2016; Whitebread et al., 2007; Zachariou & Whitebread, 2015). Children interact with their peers most frequently within the context of play. Researchers (Timmons, 2019; Vohs & Baumeister, 2017) note that there are various opportunities to enhance self-regulated learning through play. Play provides a natural environment that supports children's self-regulated learning skills. During play, children develop skills such as goal setting, planning, maintaining attention, following rules, and problem solving. In addition, processes such as taking turns, controlling emotions, and thinking flexibly strengthen self-regulation capacity (Pino-Pasternak, Basilio & Whitebread, 2014; Vohs & Baumeister, 2017). Children who have the opportunity to evaluate their own behaviour by interacting with others in group play also develop the skills of self-assessment and monitoring their learning. Therefore, play supports many of the skills that form the basis of self-regulated learning. children to engage in flexible thinking, sustained attention, and goal-directed behaviour (Vohs & Baumeister, 2017). Through play, children gain experience with things and phenomena they are interested in, like, dislike, and are inquisitive about in relation to their environment and peers. They acquire a variety of concepts, skills, and

knowledge. Thus, improvements in self-regulated learning behaviours can be observed. Vygotsky (1978) emphasizes that play is a crucial factor for children to become aware of and arrange their learning processes. Children can enhance their behaviour management skills by setting goals during play (Vohs & Baumeister, 2017; Vygotsky, 1978; Whitebread, 2010). Preschoolers' play habits may influence their ability to self-regulate their learning since play stimulates intentional learning, which necessitates close attention to and management of one's thoughts and actions (Whitebread & O'Sullivan, 2012). Based on Zimmerman's (2008) model of self-regulated learning, it can be inferred that the skills involved in this type of learning may also be expressed through play. While Zimmerman did not specifically address play, he described self-regulated learners as actively engaged on metacognitive, motivational, and behavioural levels. Metacognitively, they set goals, plan, monitor their progress, and evaluate their performance. Motivationally, they use feedback to adjust goals and track improvement. Behaviourally, they apply strategies that support goal achievement. In a related context, Pyle et al. (2022) identified two main perspectives on the role of play in developing self-regulation. One emphasizes the value of free play for fostering emotional self-regulation, while the other promotes a more holistic view in which both free and teacher-guided play contribute to broader aspects of self-regulation. These insights underline the reciprocal link between play and self-regulated learning, as both emerge during the preschool years and strengthen each other over time. As a result of the literature review, no studies were found concerning the predictive effect of preschool children's play behaviours on self-regulated learning. Thus, it is asserted that this study will contribute to the literature. In this regard, the purpose of this study was to investigate the predictive effect of preschool children's play behaviours on their self-regulated learning behaviours. The research questions were as follows:

1. Do social play behaviours predict self-regulated learning?
2. Do solitary passive play behaviours predict self-regulated learning?
3. Do rough play behaviours predict self-regulated learning?
4. Do solitary active play behaviours predict self-regulated learning?

Method

This study employs a survey research design to examine the predictive effect of play behaviours of preschool children on self-regulated learning behaviours.

Participants

A total of 301 normally developing 5-year-olds attending preschools administered by the Ministry of National Education and Culture in the Turkish Republic of Northern Cyprus (TRNC) participated in the study. 145 (48.2%) of the children were female, while 156 (51.8%) were male. The mean total age of the children is 57 months and 3 days. The study group was determined using the technique of convenient sampling (Büyükoztürk et al., 2014). The convenience sampling method refers to selecting the sample from agents that are easy to access and implement due to time, money, and workload constraints. Thus, the researchers formed the sample group by contacting schools that they could easily access and with which they already had communication.

Measurements

The Preschool Play Behaviours Scale and Children Independent Learning Development Checklist (3-5 years) were used as data collection instruments.

Preschool Play Behaviour Scale

Coplan and Rubin (1998) developed the scale to assess the individual behaviours of preschool children during play in relation to teacher opinions. Gülay Ogelman (2012) adapted the scale for Turkish children. In its original form as well as in the Turkish translation, the scale is composed of 18 items. There are 5 subscales in total. The silent play behaviour subscale (4 items) consists of items about aimlessly observing the environment. Solitary-active play behaviour subscale (2 items) includes items about play in which children talk, role play, or play an instrument on their own. Solitary-passive play behaviour (4 items) refers

to play in which children build or explore things alone. The social play behaviour subscale (6 items) includes group and socio-dramatic play. Rough play behaviour subscale (2 items) includes items associated with play in which children pretend to scuffle and fight. For each item, a five-point Likert scale is used to assess the frequency of the child's play behaviour (never, rarely, sometimes, often, always). Each sub-scale provides the child with a score. There is no overall score. In the Turkish adaptation form, Cronbach's Alpha coefficients for the sub-scales are .88 for social play behaviour, .90 for solitary-passive play behaviour, .86 for rough play behaviour, .86 for silent play behaviour, and .72 for solitary-active play behaviour. As part of the scale adaptation process, test-retest reliability was assessed over a two-week interval. The results indicated a positive and statistically significant correlation between the two administrations (social play behaviour: .80; solitary-passive play behaviour: .92; rough play behaviour: .84; silent play behaviour: .79; solitary-active play behaviour: .66). For predictive validity, a chi-square test was conducted to examine the relationship between scores on the Preschool Play Behaviour Scale and the types of play that children reportedly preferred, based on both teacher and child responses. The analysis revealed a consistency between the types of play children reportedly enjoyed—based on both teacher and child perspectives—and their scores on the Preschool Play Behaviour Scale. Sample items from the scale include: *"Talks to other children during play"* representing social play behaviour, *"Plays rough-and-tumble with other children"* reflecting rough play behaviour, *"Assumes the role of an onlooker or observer"* corresponding to silent play behaviour, *"Plays alone while exploring a toy or object"* indicating solitary-passive play behaviour, and *"Engages in pretend scenarios independently"* representing solitary-active play behaviour (Gülay Ogelman, 2012). In the present study, internal consistency coefficients were calculated as follows: .86 for social play, .75 for solitary-passive play, .79 for rough play, .66 for silent play, and .73 for solitary-active play. Due to the relatively low reliability score of the silent play subscale (.66), this dimension was excluded from further analysis. Consequently, the study focused on the remaining four subscales: social play behaviour, solitary-passive play behaviour, rough play behaviour, and solitary-active play behaviour.

Children Independent Learning Development Checklist 3-5 (CHILD 3-5)

The scale was developed by Whitebread et al. (2009a) and adapted to Turkish by Saraç, Karakelle and Whitebread (2019). The original version of the scale includes 22 items, while the Turkish adaptation consists of 16 items. During the adaptation process, items that were found to be psychometrically inadequate were removed from the Turkish version. The scale is unidimensional. Each item refers to behaviours that indicate various components of self-regulated learning. The preschool teacher assesses each child in the classroom for each item using a four-point Likert scale based on the frequency of the behaviour. (1=Never; 4=Always). Some illustrative items from the checklist include “*Can make reasoned choices and decisions,*” “*Persists when faced with difficulties,*” “*Finds own resources without adult help,*” and “*Develops own ways of carrying out tasks.*” These items reflect key aspects of self-regulated learning. Higher scores on the scale reflect stronger self-regulation abilities in children, whereas lower scores suggest weaker self-regulation capacities. In the adaptation study conducted by Saraç, Karakelle, and Whitebread (2019), the internal consistency coefficient of the scale was reported as .97. In the current study, the internal consistency was calculated at .94, indicating a high level of reliability.

Procedure

The research ethics committee approval was obtained from Yakın Doğu University Ethics Committee (YDU/EB/2022/914). Informed consent was first obtained from teachers to conduct the study within their classrooms. Subsequently, parental consent was secured for the participation of their children in the research. Both teachers and parents were thoroughly informed about the purpose of the study and the assessment tools used. All consent forms were coded numerically, and no personal information was collected from teachers, parents, or children. Additionally, the names of the participating schools were not included in the study to ensure confidentiality. All data collection instruments were completed by preschool teachers. The teachers were provided with printed copies of the forms, which they filled out and returned to the researchers. They responded to the items based on their observations of the children over the previous seven months. It was confirmed through school administrators

that all participating teachers had been working in the same classroom with the same group of children since the beginning of the academic year. The data collection process was completed over a period of approximately five weeks.

Analysis

Study findings were analyzed through SPSS 21.0 software. The normality of the data was assessed using skewness and kurtosis values. As presented in Table 1, the values for all variables fall within acceptable limits, indicating a normal distribution. In line with the criteria proposed by Tabachnick and Fidell (2013), skewness and kurtosis values between -1.5 and +1.5 are considered indicative of normally distributed data. To investigate the predictive relationship between preschool children's play behaviours and their self-regulated learning skills, a simple linear regression analysis was conducted.

Table 1. *The skewness and kurtosis values*

Variables	Skewness	Kurtosis
Self-regulated learning behaviours	-.12	-.61
Social play behaviour	-.90	1.02
Solitary passive play behaviour	-.58	-.18
Rough play behaviour	.39	-1.21
Solitary active play behaviour	-.52	-.39
Silent play behaviour	.22	-.73

Results

Table 2. shows correlations among the variables. The results showed that the social play behaviours of preschoolers had a positive, moderate, and statistically significant relationship with self-regulated learning behaviours ($r=.600$; $p < .01$). Based on these findings, the level of self-regulated learning behaviours increases or decreases as the level of social play behaviours increases or decreases. A positive, moderate, and significant relationship was

found between children's solitary-passive play behaviours and their self-regulated learning ($r=.396$; $p < .01$). According to the findings of this study, the level of self-regulated learning either increases or decreases in correlation with solitary-passive play behaviours. Children's solitary-active play behaviours have a positive, moderate, and statistically significant relationship with their self-regulated learning levels ($r=.395$; $p < .01$). Based on this result, it appears that the level of self-regulated learning either increases or decreases in tandem with the frequency of solitary-active play behaviours. There was no statistically significant relation between children's self-regulated learning behaviours and the frequency of rough play they engaged in.

Table 2. *Descriptive statistics and the correlations among study variables*

Variables	M	Sd	r
Self-regulated learning behaviours	47.77	9.69	-
Social play behaviour	24.40	4.20	.600*
Solitary passive play behaviour	15.03	3.37	.396*
Rough play behaviour	4.94	2.72	-.012
Solitary active play behaviour	7.48	1.90	.395*

* $p < .01$

Table 3. shows regression results predicting children's self-regulated learning with play behaviours. Social play behaviours of preschool children significantly predicted self-regulated learning ($R=.600$, $R^2=.359$, $F=167.789$, $p<.001$) and explained 36% of the variation in children's self-regulated learning. Solitary-passive play behaviours significantly predicted self-regulated learning ($R=.396$, $R^2=.157$, $F=55.507$, $p<.001$) and explained 16% of the variation in children's self-regulated-learning. Solitary-active play behaviours significantly predicted self-regulated learning ($R=.171$, $R^2=.029$, $F=1.206$, $p<.005$) and explained 0.3% of the variation in children's self-regulated learning. In contrast, rough play behaviours did not predict rough play significantly.

Table 3. *Simple linear regression analysis results concerning the predictive effect of play behaviours on self-regulated learning*

Variables	R	R ²	F	Std. Er.	β	t	P
Social play behaviours	.600	.359	167.789	7.76	.600	12.953	.000**
Solitary-passive play behaviours	.396	.157	55.507	8.91	.396	7.450	.000**
Rough play behaviours	.012	.000	.040	.9.70	-.012	-.200	.841
Solitary-active play behaviours	.171	.029	8.991	1.206	.145	2.998	.003*

* p<.005; ** p<.001

Discussion

The purpose of this study was to investigate whether preschoolers' play behaviours can be used as a predictor of their ability to engage in self-regulated learning. Three out of four play types (social play, solitary-passive play, and solitary-active play) were significant predictors of children's ability to self-regulate their learning. The frequency of social play, solitary-passive play, and solitary-active play predicted children's capacity to learn independently. These results show that children's social play, passive play, and active play in preschool settings all contribute to the development of children's ability to control their own learning. These findings highlighted the significance of children's play behaviours in preschool settings for the development of children's self-regulated learning skills.

It should be emphasized that self-regulated learning can be supported by play since play is the most natural and powerful way in which children learn and develop. The term *play-based learning* emphasizes the notion that children can achieve any educational objective, primarily academic, through play (Pyle & Danniels, 2017). According to Leibowitz (2020), executive functions, self-regulation, attention, and flexibility can all be improved through play. These are the skills that are closely related to self-regulated learning. Three studies were conducted by Whitebread et al. (2009a), one an observational study and the other two experimental studies, to investigate the relationship between play and the development of self-regulated learning skills in children ages 3 to 5. In the observational study, the researchers recorded 582 instances that involved self-regulation or metacognition. The experimental studies compared the effects of learning in a "taught" (i.e. traditional classroom)

versus a “play” (i. e. unstructured, incorporated opportunities to engage in play) settings on children’s abilities to self-regulate and reflect on their learning. The results of these studies provided further evidence that play is an effective tool for helping young children learn to regulate their emotions and behaviours. In particular, the development of children's self-regulation and metacognition was facilitated by their play with peers in small groups (Whitebread et al., 2009a). Play can improve children's ability to self-regulate by fostering interactions between teachers and students, as emphasized by Blair & Diamond (2008). When kids play, they engage in intense social interaction with their peers. Young children's play often features complex interactions between players, including ideas and rule-setting exchanges, role-playing, joke-telling, the thrill of discovery, and a healthy dose of uncertainty. According to Fromberg and Bergen (2006), play provides children with the opportunity for instinctive and unpredictable experiences, thought, perception, and creativity. According to Contreras, Bonilla & Peña Pérez Negrón (2019), experiences and feedback during play can improve learning motivation. Furthermore, due to its nature, play provides children with independence (Santer, Griffins & Goodall, 2007). Children reap many benefits from play because it is during this stage that they learn to take charge of their lives, become responsible for their actions, and experience a sense of freedom and comfort (Garner & Berger, 2006). Unstructured learning environments provide children with a variety of options regarding what, how, and when they will learn, and give children the ability to take charge of their educational pursuits (Land, 2020). Play is an activity that supports learning and self-regulated learning, so in this sense, play can and should be used as an educational tool. When young children play, they will improve their ability to self-regulate their learning and acquire a variety of learning experiences, as the findings of this study have shown. Because of the positive relationship between play behaviours and self-regulated learning, children's levels of play participation and motivation will increase their levels of self-regulated learning. On the other hand, Mooji (2007) argues that a child's motivation and scaffolding experiences related to responsibilities, roles, and instructions increase as the child's level of “learner control” rises. Bredikyte and Brandisauskiene (2023), also, identified a statistically significant relationship between children's levels of play engagement and their self-regulation skills, suggesting that more advanced role enactment in play correlates with higher self-regulation. Their findings further reveal that factors such as a child's proficiency in play,

gender, and age serve as predictors of their self-regulatory behaviour during play. This association between imaginative play and self-regulation is echoed in earlier foundational research. Berk and Meyers (2013) assert that high-quality, imaginative play environments offer rich opportunities for children to internalize self-regulatory strategies. Similarly, Veraksa et al. (2022) emphasize the close links between play and executive functioning, arguing that play serves as a central developmental context through which children internalize new behaviours, practice social interactions, and foster both imagination and regulatory competencies. Complementing these findings, a longitudinal study conducted by Colliver et al. (2022) in Australia demonstrated that the amount of time spent in unstructured, free play at ages 2–3 and 4–5 significantly predicted children's self-regulation abilities two years later. This perspective is also consistent with Vygotsky's sociocultural theory, which frames play as a “leading activity” that enables the development of higher psychological functions (Vygotsky, 1978).

This study also revealed no correlation between rough play and self-regulated learning. Additionally, aggressive play did not predict self-regulated learning. This can be explained by the distinctive characteristics of rough play. As in scuffle, rolling, and wrestling games, rough play necessitates substantial physical strength and contact (MacDonald, 1993). In addition, Pellis & Pellis (2007) stated that socially competent children may exhibit low levels of rough play behaviour. On the basis of these findings, it can be concluded that, compared to other types of play, rough play provides children with a limited environment for developing and experiencing self-regulated learning. On the other hand, some research suggests that rough play can help kids learn to control their emotions and manage their behaviour (Anderson, St. George & Roggman, 2019; Flanders et al., 2010; Freeman & Robinson, 2022). However, the focus of the aforementioned studies was self-regulation rather than self-regulated learning. Self-regulation is a prerequisite for self-regulated learning (Jacob et al., 2020), but self-regulated learning involves more than the ability to regulate one's emotions and behaviours. Learners self-regulate their cognition (also known as metacognition), emotions, motivation, and behaviours to achieve their desired levels of learning through the process known as self-regulated learning. The metacognitive dimension is therefore the distinguishing feature of self-regulated learning. The children's engagement in rough play does not support the development of their metacognitive abilities. However,

these findings need to be investigated further in subsequent research.

The findings of the study indicate that self-regulated learning and play behaviours are two concepts that are closely related and which, in general, lend support to one another. Play can support self-regulated learning by providing an environment conducive to learning by fostering social relationships. Young people can learn a lot from playing, including how to follow directions, about other cultures, about their own abilities and limitations, about the similarities and differences among others, and about how to be a role model for others or to accept others as role models. It has been argued that providing young children with a rich environment full of experiences can improve their motivation, academic, social, and emotional knowledge, and consequently their capacity to support self-regulated learning.

The findings of this study can serve as a foundation for further research that focuses on the effects of play behaviours on self-regulated learning. Rather than relying on the teachers' observations, children's play behaviours can be observed in natural settings. The concept of self-regulated learning was evaluated using a one-dimensional instrument for the purposes of this study. On the other hand, as was stated earlier in the introduction, self-regulated learning incorporates both emotional-motivational and metacognitive dimensions. In subsequent research, the concept of self-regulated learning can be approached from multiple dimensions, and the effects of play behaviours on each of these dimensions can be investigated. In subsequent research, the connection between play and self-regulated learning can also be investigated on a longitudinal scale, and the ways in which children's play evolves over time and the impact that this has on their ability to self-regulate can be investigated from a developmental perspective. The significance of children's play was once again highlighted in this research. The findings emphasized how important it is for educators to offer children opportunities and utilize play-based learning experiences. From this vantage point, it is recommended to organize in-service training for teachers about play and the striking effect that play has on children's academic development and examine the effect that this training has on the self-regulated learning behaviours of children in these classes. Additionally, Quackenbush (2020) suggests that preschool educators could benefit from a better understanding of how children of this age can and should learn to self-regulate their learning.

Conclusion

The findings showed that preschool children's social play behaviours, solitary passive play behaviours, and solitary active play behaviours are significantly and positively related to their levels of self-regulated learning behaviours. This result suggested that the level of self-regulated learning behaviours increases or decreases as social play behaviours, solitary passive play behaviours, and solitary active play behaviours increase or decrease, respectively. There was no significant correlation between rough play and the level of children's self-regulated learning behaviours. In addition, preschool children's social play behaviours, solitary passive play behaviours, and solitary active play behaviours significantly predicted their level of self-regulated learning behaviours. Social play behaviours were the most predictive of self-regulated learning, whereas solitary active play behaviours were the least predictive. The results indicated that children's play might play a role in developing self-regulated learning.

Limitations and Implications for Further Research

This study is subject to several limitations. Firstly, children's self-regulated learning and play behaviours were assessed solely based on teacher reports. Although preschool teachers had interacted with the children for approximately seven months, this still presents a constraint in terms of fully capturing children's developmental profiles. Incorporating perspectives from children and parents, as well as direct observational data, could provide a more nuanced and comprehensive understanding of children's behaviours. Another limitation relates to the study's sampling, which included 301 children from the Turkish Republic of Northern Cyprus, thereby limiting the generalizability of the findings to broader populations.

Additionally, the Preschool Play Behaviour Scale was used with some adaptations; the silent play subscale was not included in the analysis due to its relatively lower internal consistency compared to the other subscales. The study also employed convenience sampling, which may have introduced bias. Employing more rigorous sampling methods, such as

simple random sampling, in future studies may yield more representative results. Furthermore, the study utilized a cross-sectional design, capturing data at a single point in time. Given the rapid developmental changes during the preschool years, longitudinal studies would be more effective in tracing how self-regulated learning and play behaviours evolve and interrelate over time. It is reasonable to assume that such an approach would generate deeper insights into the dynamic interplay between these two domains during early childhood.

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