**Research Article**

# The predictive power of motivation on self-regulation skills of gifted preschooler

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## Article Info

## Abstract

This study aimed to analyze the relationship between preschool potentially gifted children's (PGC) self-regularion skills (SRSs) and their motivation levels .The study group consists of a total of 45 children aged 50-76 months, who were considered to be gifted by their parents and teachers, among 3775 children who attended the official independent kindergartens affiliated to the Ministry of National Education in the city center of Çorum and the kindergarten classes within the primary/secondary school/high school. The research designed in relational screening model. The findings revealed that the motivation of the PGC, who were nominated by their teachers and parents, was above the medium level. The normality test results revealed that data distribution is normal. Thus, parametric tests were used during data analysis. The relationships between the PGC's motivation and their SRSs were examined through use of Pearson moment multiplier correlation analysis. Linear regression analysis was used to determine how motivation predicted children's SRSs. The results uncovered that PGC's general motivation was above the medium level. Mastery pleasure was found to have the highest scores, while social persistence with adults and social persistence with children had the lowest scores obtained from the seven dimensions of the scale. Considering the PGC's SRSs, their regulation skills were satisfactory in terms of dimensions, their control skills were above the medium level, and their SRSs are at a satisfactory level in general. Upon investigating the relationship between motivation and SRSs of the preschool PGC, the highest level and positive relationship between the dimensions of the self-regulation scale and the total scores was correlated with the general competence dimension of the motivation scale. The results of regression analysis suggested that general competence dimension of the motivation scale was the only variable predicting self-regulation total score and all of the regulation skills dimensions. Social persistence with adults dimension also predicted regulation skills together with general competence. It can be recommended to conduct studies based on longitudinal or mixed models in order to reveal the relationship between SRSs and motivation in preschool gifted children.

**To cite this article:**

Cerezci, O., Daglioglu, H. E. & Kocak, C. (2022). The predictive power of motivation on self-regulation skills of gifted preschooler. *Journal of Gifted Education and Creativity, 9*(4), 351-367.

## Introduction

Parallel to intelligence, giftedness is one of the research fields whose meaning and scope are highly debated and still not fully defined. In this regard, various terms such as superior intelligence, superior talent, special talent etc. have been used from past to present. Considering the pre-school period, they are generally expressed as PGC in the relevant literature

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since scales for identifying gifted children can be administered from the age of three and there is a dearth of measurement tools for these children, especially in the pre-school period.

It is indicated that PGC are curious about the things they encounter, try to perceive them through their senses and like complicated situations that require thinking rather than routine activities. In addition, they like mind games, their interests are extremely wide, they ask a lot of questions regarding a situation they are interested in, they try to think and reason for a long time, and their concentration is extremely intense (Dağlıoğlu, 2015; Goodman, 2020; Renzulli, 2012; Worrell, Subotnik, Olszewski-Kubilius & Dixson, 2019). Under the strength of all these characteristics, gifted children exhibit different developmental characteristics that are superior to those of their peers in some areas, which may result from their learning speed, depth and diversity in their interests (Matthews & Foster, 2004). In his three-ring theory on giftedness, Renzulli (1978, 1986) argues that above-average talent, skills related to creativity and task commitment interact with each other and exhibit the behaviours related to giftedness (Borland & Wright, 2000). In this regard, Renzulli considers task commitment as one of the basic characteristics that constitute giftedness (Street, 2001). In the following process, task achievement was considered structurally in Renzulli's (1986) three ring theory; therefore, it was replaced by the term "motivation" since it is a part of motivation (Mönks & Mason, 2000). In the 2000s, Gagnè (2004, 2009) suggested that motivation is an auxiliary element in the emergence of a certain skill and in the implementation of learning, namely, it is a part of development. Likewise, Gottfried et al. (Gottfried & Gottfried, 2004; 2009; Gottfried, Cook, Gottfried & Morris, 2005) also highlighted that motivation should be regarded as one of the areas of giftedness rather than a structural part.

**Motivation and Giftedness**

The concept of motivation has been searched by numerous theories to make human behaviours understandable. One of these theories, self-determination theory is grounded on three basic needs namely competence, autonomy and relatedness. Social environment conditions that meet these needs facilitate the individual's motivation and form the basis for the maintenance of intrinsic motivation. According to this theory, motivation is conceptualized between two extremes, intrinsic motivation and amotivation considering extrinsic motivation (Deci & Ryan, 2000; Ryan & Deci, 2000a; Ryan & Deci, 2000b). Extrinsic motivation concerns behaviours based on external factors, and intrinsic motivation refers to internal factors (Marcou & Philippou, 2005). While intrinsic motivation stems from the individual's need for self-development, discovery, pleasure, interest, curiosity and learning; extrinsic motivation occurs with the expectation of reward or benefit (Deci & Ryan, 2000; Ergün, 2019; Ryan & Deci, 2000b; Sak, 2020). Deci and Ryan (2000) stated that extrinsic motivation strategies such as reward or punishment undermine autonomy, reduce intrinsic motivation, and negatively affect creativity as well as problem solving. It is suggested in some research that motivation generally decreases when extrinsic motivation lacks rewards (Sak, 2020). The concept of amotivation is used for the lack of both intrinsic and extrinsic motivation within the context of Self-Determination Theory, and is explained as the state of being inactive due to the lack of intention to engage in a behaviour (Deci & Ryan, 2000; Ryan & Deci, 2000b).

According to Carlton (1996), children are innately eager to learn about their world, learn very quickly that they can control various elements in their environment, and they tend to maintain this control (Wentzel, 2020). Motivation is one of the major determinants of how well a child will be able to learn (Adedigba, 2015). Teachers, parents, friends and other important people in children's life may affect their motivational development (Wentzel, 2020). When children are supported to think of themselves as a writer or explorer and discover, the joy of research, their motivation and interest are highly triggered (Malaguzzi, 1998).

When popular studies on the significance of motivation in the education of gifted students are examined; it is emphasized that there is a need to cooperate with multiple stakeholders such as talented individuals, peers, parents, teachers and mentors (Grassinger, Porath & Ziegler, 2010; Siegle & McCoach, 2005); to get motivated for many different possible goals (Schunk, Pintrich & Meece, 2008) and to take into account many different causes and processes that mediate motivation-related behaviours such as intrinsic motivation and curiosity (Gottfried & Gottfried, 2009; Gottfried, Gottfried & Guerin, 2006). In addition, studies confirmed that gifted children have a higher level of intrinsic

motivation than their peers (Gross, 2004; McAlpine & Reid, 1996). When the studies on motivation are examined, it is seen that they are generally conducted with primary school students with and without special needs. (Pintrich, Anderman & Klobucar, 1994), secondary school students (Ali, 2016; Kaymakcı, 2018), gifted high school students (Lee & Gao, 2014) and those with special needs studying in higher education institutions (Milyutina, E., Lobacheva, A., Lukyanova, T., & Zakharov, D. (2019). Hence, it is noteworthy that a large part of them was conducted especially in these periods apart from the pre-school period.

### Self-regulation and Giftedness

Another prominent common characteristic of gifted children is the "asynchronous development", which refers to the coordination problems in their development as a result of the fact that gifted children exhibit characteristics that are qualitatively and quantitatively different from the specified development standards, especially in early childhood, and that their cognitive abilities develop faster and earlier than other areas (Morelock, 1992). These coordination problems experienced in the development of gifted children cause to various unwanted behaviours such as burst of rage, anger and aggression (Ataman, 2003; Çitil & Ataman, 2018; Rinn & Majority, 2018; Saranlı & Metin, 2012). These problems experienced by gifted children in the field of social-emotional development highlight SRSs that are affected by individual differences, including adaptation, prevention of undesired behaviours, delaying gratification, emotional and attention control as well as regulation of behaviours (Risemberg & Zimmerman, 2010).

SRSs are crucial for individuals to know themselves and to keep their own learning and development at the highest level. Individual with high SRSs can set their own goals and carry out their studies in this regard. They can establish efficient communication with their environment by regulating attention, emotions and behaviours in social life. Individuals with SRSs can plan and organize every stage of their own learning process. Besides, they can observe and evaluate their learning processes, consider themselves as sufficient, effective and independent in motivational sense and make behavioural choices. They can also create an environment in which learning will be at the highest level that is suitable for them (Özmenteş, 2008).

SRSs can be learned and controlled. They can be developed personally and they can bring success when their level is increased. In this regard, the need for external support emerges (Çiltaş, 2011). On the other hand, children whose SRSs are not developed tend to have behavioural problems and thus, they experience problems such as disobeying the rules and disrupting the group dynamic (Tozduman Yaralı & Güngör Aytar, 2017).

In the literature, it is seen that there are very few studies on SRSs in gifted children, and these studies are generally conducted on children in primary school and beyond (Risemberg & Zimmerman, 2010; Stoeger & Ziegler, 2010). The results of these studies revealed that SRSs may be a mediating factor in the diagnosis of giftedness and that education that supports these skills may further improve gifted children's academic achievement. A longitudinal study on SRSs in preschool gifted children examined the developmental course of children's SRSs and showed that children's self-regulation levels increased from 4-5 years old to 8-9, but not from 8-9 years old to 11-12. Besides, girls were noted to exhibit significantly higher levels of self-regulation than did boys at all three time points (Raffaelli, Crocket & Shen, 2005). There is no such a study on examining the gifted preschool children's SRSs in Turkey. However, a study was conducted on the preschool children's motivation and their SRSs; accordingly, a positive and medium level significant relationship was noted between children's motivation levels and their SRSs (Özbey, 2018)..

One of the basic principles of special education is the early diagnosis of children with different developmental characteristics in early childhood and beginning at a younger age (MoNE, 1997; Metin, 2012). Early diagnosis of high-potential children, who are naturally curious and full of passion for discovery, who are constantly hungry for learning and who learn many things faster and easier than their peers, is of upmost paramount in enabling them to discover and use their potential at the highest level. Adults in close contact with the child, such as parents and teachers, play a significant role in this regard. The research results demonstrated that parents and teachers make accurate decisions in identifying children with gifted potential, yet families tended to show their children's abilities below the child's real performance although both parents and teachers make more accurate decisions when they are informed by an expert

(Dağlıoğlu, 2002; Dağlıoğlu & Suveren, 2013; Farmer, 1997; Kord, 2000; Smuthy, 2000). In this context, the results of this study are expected to shed light onto the relevant literature in terms of improving parents' and teachers' knowledge and awareness level in order to improve gifted children's motivation towards learning and to support their SRSs to become much more successful and self-confident.

**Problem of Study**

This study is an attempt to analyse the relationship between SRSs and motivation of PGCin the preschool period. In service of this aim, answers to the following research questions were sought.

> ➢ What is the motivation level of the potentially gifted preschool children?
> ➢ What is the level of SRSs of the potentially gifted preschool children?
> ➢ What is the relationship between SRSs and motivation of the potentially gifted preschool children?
> ➢ To what extent does the motivation of the potentially gifted preschool children predict their SRSs?

## Method

**Research Model**

This study examined the relationship between children's self-regulation and their motivation levels. Thus, the research was designed in relational screening model. Studies examining relationships and connections are considered as relational research (Fraenkel & Wallen, 2006). The dependent variable of the study is the children's self-regulation levels and the independent variable is the motivation of the children.

**Study Group**

The study was conducted in Çorum, which is in the country average in terms of population and development and located in the Middle Black Sea region. A short-term training on giftedness was given by the researchers to the teachers and parents of the children attending pre-school education in the city center of Çorum while choosing the study group. Afterwards, teachers and families were requested to nominate potentially gifted children. In this context the working group consisted of a total of 50 to 76 months 45 children, who were chosen by their teachers and parents to potentially demonstrate giftedness, among 3775 children attending official independent kindergartens affiliated to the Ministry of National Education and primary/secondary school/vocational and technical Anatolian high school within the city centre of Çorum.

**Table 1.** Characteristics of Study Group

| Characteristic | f | % |
|---|---|---|
| **Gender** | | |
| Girls | 11 | 24.4 |
| Boys | 34 | 75.6 |
| **Age (Month)** | | |
| 50-59 months | 6 | 13.3 |
| 60-71 months | 25 | 55.6 |
| 72-76 months | 14 | 31.1 |
| **Type of School** | | |
| Kindergarten | 42 | 93.3 |
| Nursery Class | 3 | 6.7 |
| Total | 45 | 100 |

Table 1 shows that 24.4% of the children are girls and 75.6% are boys. 55.6% are in the 60-71 months age group, and 93.3% receive pre-school education in independent kindergartens.

**Data Collection Tools**

**Preschool Motivation Scale (The Dimensions of Mastery Questionnaire DMQ18)**

Preschool Motivation Scale (The Dimensions of Mastery Questionnaire DMQ18) was developed as DMQ17 by Morgan, Maslin-Cole, Harmon, Busch-Rossnagel, Jennings, HauserCram and Brockman in 1993. It was revised by Jozsa and Morgan (2015) and got the final version as DMQ18. The scale was revised for infants, preschool and school-age children. The tool has different versions for children with developmental disabilities. It includes 39 items and 7 subscales that are cognitive persistence, gross motor persistence, social persistence with adults, social persistence with children, mastery pleasure, negative reactions (frustration and anger - sadness and shame) and general competence. The loading values of the items varied between .51 and .94. The total variance explained by the factors was .71.

The Preschool Motivation Scale was adapted to Turkish by Özbey and Dağlıoğlu (2017). Six linguists examined the language validity of the scale. The consistency between the scale and its original form was examined by translating it from English to Turkish and then translating again from Turkish to English. The results revealed consistency between the items in the translation and those in the original form. The next step in the language validity of the scale included the views of three academicians who are experts in the field of preschool education and who work at the university with the command of both languages. In the next stage, experts evaluated the scale items with respect to meeting the meaning in the original language and conformity to field and culture, and they made the necessary corrections. In the last stage, four academicians working in the field of preschool education at universities were requested to share their opinions by evaluating the scope of the items in the scale and their suitability for Turkish culture. Thus, the scale items were ready for implementation. Five preschool teachers were requested to fill in the scale to ensure clarity. The tool got its final version after testing the scale items in relation to scope, clarity and cultural conformity.

The 7-factor structure of the scale was confirmed through the confirmatory factor analysis. The confirmatory factor analysis examined t values and standardized solutions. Standardized solutions were found to be significant at the .05 level. The t values of the items were found to be significant at the .01 level. Alpha reliability coefficients of the scale vary between .84 and .91. The Spearman Brown Two Half Test reliability coefficients also differ across .77 and .90. The test-retest reliability value is .85 (Özbey & Dağlıoğlu, 2017).

**Self Regulation Skills Scale (SRSS)**

SRSS was developed by Bayındır and Ural in 2016 in Turkey. In the implementation phase, the scale was built on the evaluation of children with regard to the observations of their teachers. Being a 5-point Likert type structure, the scale includes 33 items and two dimensions. The first dimension, regulation skills, consists of 21 items, while the second, control skills, has 12 items.

Test-retest, internal consistency coefficient and item analysis were performed to ensure reliability. The alpha reliability coefficient was found to be .96 in total, .96 for the regulation skills dimension and .91 for the control skills dimension. The test-retest results found the correlation coefficient as .99.

The Preschool Self-Regulation Scale (PSRS) was used to determine the criterion validity of the scale. The scores obtained from the PSRS and the scores related to the developed scale were determined. The Pearson Correlation Coefficient between scores was calculated. Thus, a positive and significant relationship was noted between the total scores, which is likely to be at a high level. A high level of positive and significant correlation was found between the "Attention and Impulse Control" dimension of the Preschool Self-Regulation Scale and the total score, and factor mean scores of the developed scale revealed that the scales measured similar structures (Bayındır & Ural, 2016).

**Data Collection Process**

Prior to the data collection process, permission was obtained from the owners of the scales. In addition, this study was ethically approved with the number E-77082166-604.01.02-321492 at the meeting of Gazi University Ethics Commission dated 08.03.2022 and numbered 5. Necessary permissions were obtained from Çorum Provincial Directorate of National Education for the data collection process. 206 teachers working in the central district of Çorum were given a six-hour training in five groups by the second researcher on recognizing gifted children. Afterwards, the

teachers filled in the relevant scales for the children with gifted potential in their classes. Approval was obtained from the parents of the children and the process was initiated for the children having permission.

### Data Analysis

Detailed descriptive statistics, box plots, histogram and Q-Q Plot graphics were used for the normality analysis regarding the mean scores of children's motivation and SRSs. Besides, Kolmogorov-Smirnov test was also performed. It is recommended to use the Kolmogorov-Smirnov test when the number is higher than 30. The test indicates that data are normally distributed when p value is higher than 0.05 (Can, 2022). The normality analysis suggested that the data provided the normality assumption to a large extent. Thus, parametric tests were used during data analysis. The arithmetic mean and standard deviations of the independent and dependent variables were obtained in the statistical analysis, and the relationships between motivation and SRSs of children with gifted potential were examined through use of Pearson moment multiplier correlation analysis. Linear regression analysis was used to determine how motivation predicted children's SRSs.

## Findings

The study examined the relationship between the self-regulation and motivation of the potentially gifted preschool children, and to what extent their motivation predicted their SRSs. The findings were presented in line with the research questions.

**Table 2.** Distribution of Motivation Scale Dimensions for the Potentially Gifted Children

|  | Minimum | Maximum | $\bar{X} \pm$ SD |
|---|---|---|---|
| **Cognitive Persistence** | 2.00 | 5.00 | 4.062 ± 0.671 |
| **Gross Motor Persistence** | 1.40 | 5.00 | 3.964 ± 0.810 |
| **Social Persistence with Adults** | 1.40 | 5.00 | 3.538 ± 0.879 |
| **Social Persistence with Children** | 1.50 | 4.83 | 3.489 ± 0.848 |
| **Mastery Pleasure** | 1.40 | 5.00 | 4.502 ± 0.680 |
| **Negative Reactions** | 1.88 | 4.75 | 3.480 ± 0.658 |
| **General Competence** | 1.80 | 5.00 | 4.213 ± 0.646 |

$\bar{X}$: Arithmetic Mean, SD: Standard Deviation

On analysing teachers' views regarding the potentially gifted children, the motivation scale dimensions were ranked as mastery pleasure (4.502±0.680), general competence (4.213±0.646), cognitive persistence (4.062±0.671), gross motor persistence (3.964±0.810), social persistence with adults (3.538±0.879), social persistence with children (3.489±0.848) and negative reactions (3.480±0.658). While the scores of the children with regard to the motivation scale dimensions were generally above the medium level, mastery pleasure had the highest score and negative reactions had the lowest. This indicates that mastery pleasure is at the top in ensuring the motivation of children.

**Table 3.** Distribution of Potentially Gifted Children's SRSs and Dimensions

|  | Minimum | Maximum | $\bar{X} \pm$ SD |
|---|---|---|---|
| **Self-Regulation Total** | 2,94 | 4,91 | 3.986 ± 0.486 |
| **Regulation Skills** | 3,24 | 4,95 | 4.235 ± 0.441 |
| **Control Skills** | 2,00 | 4,75 | 3.513 ± 0.708 |

$\bar{X}$: Arithmetic Mean, SD: Standard Deviation

As seen in Table 3, the total score of self-regulation was identified as 3.986±0.486, meaning that potentially gifted children's SRSs were generally at a satisfactory level. With regard to dimensions, the mean score of the regulation skills was found to be 4.235±0.441. Teachers' views confirmed that children had a satisfactory level of regulation skills. Besides, the mean score of the control skills dimension was found to be 3.513±0.708. It can be expressed that the control skills of the PGCwere above the medium level.

**Table 4.** Pearson Correlation Test regarding the Relationship between Potentially Gifted Children's SRSs and Their Motivation Levels

|  | **Self-Regulation Total** | **Regulation Skills** | **Control Skills** |
|---|---|---|---|
| **Cognitive Persistence** | 0.630** | 0.661** | 0.454** |
| **Gross Motor Persistence** | 0.612** | 0.692** | 0.385** |
| **Social Persistence with Adults** | 0.395** | 0.531** | 0.172 |
| **Social Persistence with Children** | 0.346* | 0.494** | 0.128 |
| **Mastery Pleasure** | 0.475** | 0.498** | 0.327* |
| **Negative Reactions** | 0.128 | 0.249 | -0.011 |
| **General Competence** | 0.732** | 0.725** | 0.554** |

*p<0.05, **p<0.01

Upon examining Table 4 in terms of the correlations between the dimensions of the motivation scale and the total score of SRSs, the highest correlation was noted between the general competence dimension and the total score of SRSs (r=0.732; p<0.01). Hence, a strong linear relationship was identified between general competence and SRSs total score.

Cognitive persistence dimension (r=0.630; p<0.01) was found to have the second highest correlation with the total score of SRSs, while gross motor persistence dimension had the third highest correlation (r=0.612; p<0.01). Thus, it can be mentioned that cognitive persistence and gross motor persistence scores also had a strong linear relationship with the total score of SRSs. In addition, the SRSs total score had a linear and medium level relation with mastery pleasure (r=0.475; p<0.01), while a linear and weak correlation with the scores of social persistence with adults (r=0.395; p<0.01) and social persistence with children (r=0.346; p<0.05). No statistically significant correlation was found between the total score of SRSs and negative reactions (r=0.128; p<0.05).

Considering the correlations between the dimensions of the motivation scale and the regulation skills dimension, general competence dimension was found to have the highest correlation (r=0.725; p<0.01).

Gross motor persistence dimension (r=0.692; p<0.01) had the second highest correlation with the total score of regulation skills, while cognitive persistence dimension ranked as the third highest correlation (r=0.661; p<0.01). Accordingly, there may be a strong linear relationship between general competence, gross motor persistence and cognitive persistence dimensions as well as regulation skills dimensions.

Besides, the regulation skills dimension had a linear and medium level relation with the social persistence with adults (r=0.531; p<0.01), mastery pleasure (r=0.498; p<0.01) and social persistence with children (r=0.494; p<0.01), respectively. No significant relationship was found between the negative reactions dimension and the regulation skills dimension (r=0.249; p<0.05).

When the correlations between the control skills dimension and those of the motivation scale were examined in Table 4, the highest correlation was noted across the control skills dimension and general competence dimension (r=0.554; p<0.01), followed by the cognitive persistence (r=0.454; p<0.01). In this regard, the dimension of control skills may be said to have a linear and medium level relationship with the dimensions of general competence and cognitive persistence. However, a weak correlation was identified with gross motor persistence (r=0.385; p<0.01) and mastery pleasure (r=0.327; p<0.05). No significant relationship was found between the dimensions of control skills and social persistence with adults, social persistence with children and negative reactions.

Regression analyses were performed with the backward elimination method, one of the enter and stepwise regression methods, respectively, with a view to determining the variables that predict SRSs and the dimensions of regulation and control skills.

Self-regulation total score, dependent variable and each of the dimensions of the motivation scale were taken as independent variables. Regression analysis was conducted through the enter method. Table 5 shows the statistical results of the regression model.

**Table 5.** Multiple Regression Model regarding the Predictive Role of Motivation Scale Dimensions in Self-Regulation Total Score (Enter method)

| Model | β | t | p | ANOVA | $R^2$ |
|---|---|---|---|---|---|
| **Constant** | 1.764 | 4.289 | 0.000*** | | |
| **Cognitive Persistence** | 0.046 | 0.302 | 0.765 | | |
| **Gross Motor Persistence** | 0.094 | 0.777 | 0.442 | | |
| **Social Persistence with Adults** | 0.108 | 1.085 | 0.285 | F=7.224 | 0.577 |
| **Social Persistence with Children** | -0.074 | -0.704 | 0.486 | p=0.000*** | |
| **Mastery Pleasure** | 0.031 | 0.249 | 0.804 | | |
| **Negative Reactions** | -0.103 | -1.054 | 0.299 | | |
| **General Competence** | 0.418 | 2.649 | 0.012** | | |

**t**: Parameter significance test statistic, **F**: Model Significance Test statistic, $R^2$: Explanation Coefficient, ***$p<0.01$, **$p<0.05$, *$p<0.10$

Upon examining the effects of all variables, the resulting model was significant, and the variables apart from general competence did not have a statistically significant effect on regulation skills. Along with the effect of other variables, the general competence affected self-regulation total score at the .05 significance level.

Dependent variable self-regulation total score and each of the dimensions of the motivation scale were considered as independent variables, and hence regression analysis was performed by using the backward elimination method. Table 6 presents statistical outputs of the regression model obtained in 7 steps.

**Table 6.** Regression Model regarding the Predictive Role of Motivation Scale Dimensions in Self-Regulation Total Score (Backward elimination method)

| Model | β | T | p | ANOVA | $R^2$ |
|---|---|---|---|---|---|
| **Constant** | 1.664 | 4.996 | 0.000*** | F=49.754 | 0.536 |
| **General Competence** | 0.551 | 7.054 | 0.000*** | p=0.000*** | |

**t**: Parameter significance test statistic **F**: Model Significance Test statistic **$R^2$**: Explanation Coefficient ***$p<0.01$, **$p<0.05$, *$p<0.10$

Table 6 demonstrates that only general competence dimension predicted the total self-regulation score. The regression model was found to be significant ($p=0.000<\alpha=0.01$), and that the general competence score alone accounted for 53.6% of the self-regulation total score. Table 6 also highlights that the total self-regulation score increases by .55 on average when a child's general competence score mean increases by one unit.

Graphs of the regression estimation and scatter diagram graphs obtained according to Table 6 are presented together in Figure 1.
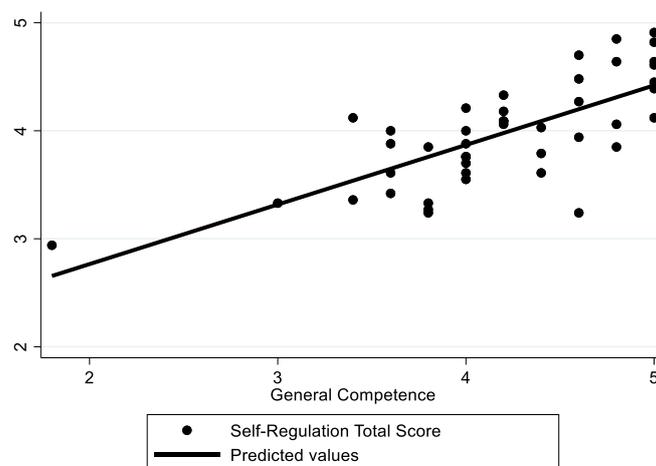


**Figure 1.** The Graph of Regression Model in Given Table 6

When Figure 1 is examined, it can be seen that the general competence, one of the motivation scale sub-dimensions, predicts the total self-regulation score with a linear relationship.

Regression analysis was carried out with the enter method considering regulation skills score as a dependent variable and each of the dimensions of the motivation scale as independent variables. Table 7 presents regression model.

**Table 7.** Multiple Regression Model regarding the Predictive Role of Motivation Scale Dimensions in Regulation Skills (Enter method)

| Model | β | t | p | ANOVA | $R^2$ |
|---|---|---|---|---|---|
| **Constant** | 2.060 | 5.821 | 0.000*** | | |
| **Cognitive Persistence** | -0.009 | -0.072 | 0.943 | | |
| **Gross Motor Persistence** | 0.144 | 1.385 | 0.174 | | |
| **Social Persistence with Adults** | 0.125 | 1.454 | 0.154 | F= 8.617 | |
| **Social Persistence with Children** | -0.017 | -0.185 | 0.854 | p=0.000*** | 0.620 |
| **Mastery Pleasure** | 0.010 | 0.089 | 0.929 | | |
| **Negative Reactions** | -0.032 | -0.381 | 0.706 | | |
| **General Competence** | 0.316 | 2.327 | 0.026** | | |

**t**: Parameter significance test statistic **F**: Model Significance Test statistic $R^2$: Explanation Coefficient, ***p<0.01, **p<0.05, *p<0.10

When the effects of all variables were examined together, the model in Table 7 was significant, and that the variables did not have a statistically significant effect on regulation skills except for general competence.

Regression analysis was performed through the backward elimination method by determining regulation skills as a dependent variable and each of the dimensions of the motivation scale as independent variables. Table 8 summarizes the regression model obtained in 6 steps.

**Table 8.** Regression Model regarding the Predictive Role of Motivation Scale Dimensions in Regulation Skills (Backward elimination method)

| Model | β | T | p | ANOVA | $R^2$ |
|---|---|---|---|---|---|
| **Constant** | 1.978 | 6.729 | 0.000*** | F=30.544 | |
| **Social Persistence with Adults** | 0.142 | 2.629 | 0.012** | p=0.000*** | 0.593 |
| **General Competence** | 0.416 | 5.655 | 0.000*** | | |

**t**: Parameter significance test statistic **F**: Model Significance Test statistic $R^2$: Explanation Coefficient ***p<0.01, **p<0.05, *p<0.10

As it is seen in Table 8 the dimensions of motivation scale, primarily general competence and social persistence with adults predicted regulation skills. Contrary to Table 7, Table 8 illustrates that social persistence with adults also predicted regulation skills. The regression model was noted as significant, and that social persistence with adults (p=0.012<α=0.05) and general competence score (p=0.000<α=0.01) accounted for 59.3% of the regulation skills. In this context, it can be stated that when a child's general competence score increases by one unit, the regulation skills score increases by .416 on average, and when the mean social persistence with adults score increases by one unit, the regulation skills score increases by .142 on average.

According to Table 8, it is seen that both Social Persistence with Adults and General Competence variables affect the Regulation Skills Score. Therefore; The graphs of the regression of these two independent variables with the Regulation Skills variable are presented in Figure 2 and Figure 3.
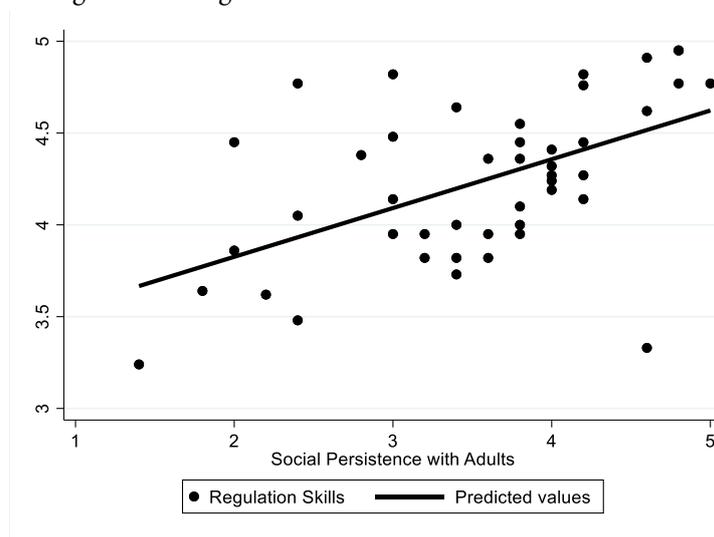


**Figure 2.** The Graph of Regression line between Variables of Social Persitence with Adults and Regulation Skills
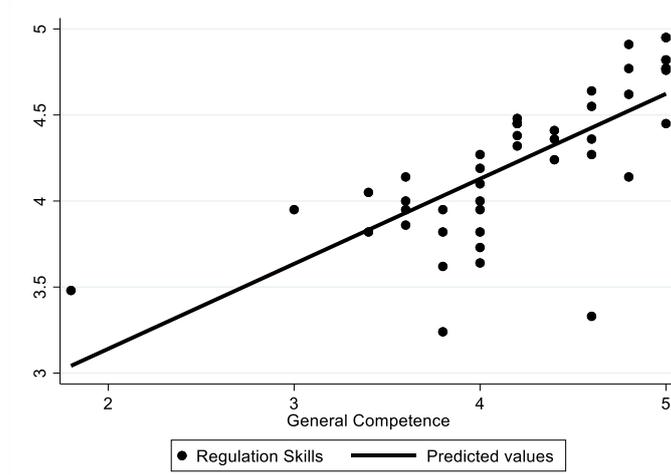
**Figure 3.** The Graph of Regression line between Variables of General Competence and Regulation Skills

When Figure 2 and Figure 3 are examined, it can be seen that both of the social Persistance with Adults and the general competence predict the regulation skills score with a linear relationship.

Regression analysis was carried out with the enter method considering control skills score as a dependent variable and each of the dimensions of the motivation scale as independent variables. Table 9 presents the results of regression model.

**Table 9.** Multiple Regression Model regarding the Predictive Role of Motivation Scale Dimensions in Control Skills (Enter method)

| Model | β | t | p | ANOVA | $R^2$ |
|---|---|---|---|---|---|
| Constant | 1.316 | 1.773 | 0.084* | | |
| Cognitive Persistence | 0.168 | 0.609 | 0.546 | | |
| Gross Motor Persistence | -0.001 | -0.006 | 0.995 | | |
| Social Persistence with Adults | 0.062 | 0.344 | 0.733 | F= 2.865 | 0.351 |
| Social Persistence with Children | -0.138 | -0.726 | 0.472 | p=0.017* | |
| Mastery Pleasure | 0.040 | 0.178 | 0.860 | | |
| Negative Reactions | -0.194 | -1.098 | 0.279 | | |
| General Competence | 0.541 | 1.901 | 0.065* | | |

**t**: Parameter significance test statistic **F**: Model Significance Test statistic $R^2$: Explanation Coefficient ***p<0.01, **p<0.05, *p<0.10

Considering the effects of all variables together, the model in Table 9 was significant, and that the variables did not have a statistically significant effect on control skills except for general competence. The dimension of general competence also affected control skills at the .10 level.

Regression analysis was performed through the backward elimination method by identifying control skills as a dependent variable and each of the dimensions of the motivation scale as independent variables. Table 10 summarizes the regression model obtained in 7 steps.

**Table 10.** Regression Model regarding the Predictive Role of Motivation Scale Dimensions in Control Skills (Backward elimination method)

| Model | β | T | p | ANOVA | $R^2$ |
|---|---|---|---|---|---|
| Constant | 0.955 | 1.610 | 0.115 | F=19.025 | 0.307 |
| General Competence | 0.607 | 4.362 | 0.000*** | p=0.000*** | |

**t**: Parameter significance test statistic **F**: Model Significance Test statistic $R^2$: Explanation Coefficient ***p<0.01, **p<0.05, *p<0.10

Table 10 displays that the general competence dimension was the only variable predicting control skills. The regression model was significant and general competence (p=0.000<α=0.01) explained 30.7% of the control skills. When a child's general competence score increases by one unit, control skills score also increases by .607.

Graphs of the regression estimation and scatter diagram graphs obtained according to Table 10 are presented together in Figure 4.
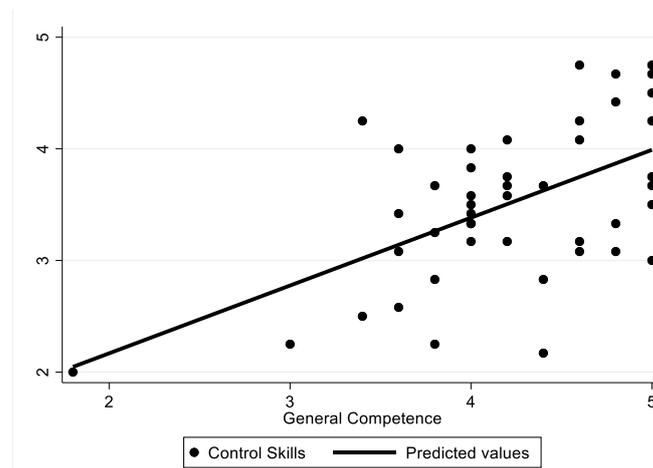
**Figure 4.** The Graph of Regression Model in Given Table 10

When Figure 4 is examined, it can be seen that the general competence, one of the motivation scale sub-dimensions, predicts the total self-regulation score with a linear relationship.

## Result and Discussion

This study sought to analyse the relationship between potentially gifted children's SRSs and their motivation during the preschool period. The results were discussed in line with the relevant literature.

The findings revealed that the motivation of the PGCwho were nominated by their teachers and parents, was above the medium level. Indeed, motivation is emphasized as one of the main features of giftedness in Renzulli's three ring theory (Renzulli, 1986; Topçu, 2020); moreover, the studies suggested that gifted children's intrinsic motivation levels are higher than their peers (Gross, 2004; McAlpine & Reid, 1996; MoNE, 2018). This result is in parallel with the popular literature.

Potentially gifted children's motivation was found to be above the medium level, and that social persistence with adults and social persistence with children had the lowest scores obtained from the 7 dimensions of the scale. Since gifted children have a much higher potential in social skills than their peers, it is most likely that they experience outbursts of anger, rage, aggression, etc. (Ataman, 2003; Çitil & Ataman, 2018; Rinn & Majority, 2018; Saranlı & Metin, 2012). This result is congruent with the literature though several studies found different results. Öğretici (2017) examined the social adaptation status of gifted children and found no sign that the social adaptation of gifted children was lower than others in any way. Besides, Özbey and Aktemur Gürler (2019) revealed a positive relationship between the motivation and social skill scores of children attending preschool education institutions.

On examining the scores obtained from the motivation scale, children were determined to get the highest score from mastery pleasure dimension. On that point, Topçu (2015) conducted a study with gifted and typically developing children and found a positive relationship between children's self-esteem levels and their motivation. This result is in line with those in the related literature.

Considering the potentially gifted children's SRSs, their regulation skills were satisfactory in terms of dimensions, their control skills were above the medium level, and their SRSs are at a satisfactory level in general. Kurnaz (2018) implicated that gifted children had less self-control and patience in terms of regulation and control skills. This result may explain the lower scores of control skills compared to regulation skills. Studies also uncovered that gifted children had more self-regulated learning strategies compared to those with typical development (Yazgan-Sağ, 2014); besides, self-regulated learning strategies should be included in the curricula prepared for gifted students with a great emphasis on the significance of SRSs (Tortop & Eker, 2014). Likewise, in an another study it is suggested that gifted children's SRSs are higher than those with typical development (Calero, Garcia-Martin, Jimenez, Kazen & Araque, 2007).

Upon investigating the relationship between motivation and SRSs of the preschool children, who were nominated by their parents and teachers to have gifted potential, a strong linear relationship was noted between general SRSs and cognitive persistence. Relevant literature clarified that self-regulation and motivation predicted academic achievement

(Berhenke, 2013) and the cognitive dimension was emphasized when talking about the preschool children's SRSs (Adagideli & Ader, 2014). A strong correlation was found between the cognitive persistence dimension, which would support academic achievement, and SRSs. This result is in line with those of similar studies.

This study also analysed the correlations between the dimensions of the motivation scale and the total score of SRSs and found high, medium level and positive correlations with the dimensions of the motivation scale except for the negative reactions dimension. Unfortunately, there is no such a study specifically published on gifted preschool children. However, Özbey (2018) highlighted the relationship between preschool children's self-regulation and their motivation. The results are similar in the this study. But, differently, negative reactions dimension of the motivation scale had a positive relationship between the total score of the SRSs scale and the scores obtained from the regulation skills dimension. Given that the gifted children' self-regulation and their motivation are higher than those of typically developing children, it is can be mention that this result is similar to those of the research in the popular literature.

The findings also demonstrated a medium level and weak correlation between the total score of regulation skills dimension and SRSs related to social persistence with adult dimension. Özsoy Yanbak (2020) concluded that the positive relationships that children establish with their father, one of the closest adults, affect their self-regulation skill levels positively. This may be because there is a connection between positive social relations with adults and SRSs.

A positive relationship was found between mastery pleasure dimension of preschool children who were nominated for gifted potential, and the dimensions of the self-regulation scale and the total scores. In a study conducted by Özbey, Mercan, and Alisinanoğlu (2018), a medium level and positive relationship was noted between preschool children's SRSs and their life quality. The fact that the mastery plesure dimension, which provides satisfaction with what one does and motivates oneself and which will positively affect the quality of life, has a positive relationship with the scores of the self-regulation scale can be evaluated as similar to those obtained by Özbey et al. (2018).

As for the correlation values of the scores obtained from the dimensions of the motivation scale of the children, the control skills dimension had lower values than the self-regulation total and regulation skills dimensions. Besides, a positive correlation was found between the control skills dimension of the self-regulation scale and the scores obtained from the general competence and cognitive persistence dimensions of the motivation scale. As mentioned above, self-control and patience are the least observed skills in gifted children (Kurnaz, 2018). Considering that a significant but negative relationship was found between the preschool children's motivation and their problem behaviours (Özbey & Aktemur Gürler, 2019), it is most probable that problem behaviours preventing the development of control skills will emerge, which results in a negative impact on the development of children's motivation.

The results of regression analysis regarding the scores of the motivation and self-regulation scales suggested that general competence of the motivation scale dimensions was the only variable that predicted self-regulation total score, all of the regulation skills and control skills. Social persistence with adults dimension also predicted regulation skills together with general competence. In addition, Pearson Correlation Test results revealed that there was a high level and positive correlation between self-regulation total score, control skills and the general competence dimension.

Overall, there are very few studies on preschool gifted children, especially on motivation and SRSs, yet some studies showed that motivation in gifted children is one of the main features, SRSs and motivation are interrelated, both of them provide high academic achievement, and the level of children's use of self-regulation strategies increases motivation (Aktan, 2012; Dağlıoğlu, 2018; Demir & Budak, 2016; Yıldız, 2010).

## Recommendations

Based on the research findings, various recommendations were provided:

This study was carried out in the central district of Çorum. Similar studies can be conducted in different provinces and with larger samples.

Longitudinal studies examining the relationship between SRSs and motivation in gifted children can be conducted to observe how this relationship takes place at certain time intervals.

Mixed method studies can be planned to examine the relationship between gifted children's SRSs and their motivation.

Some studies can be designed through using measurement tools seeking for the views of parents and teachers in order to determine children's motivation and their SRSs. In addition, scales measuring these skills for children can be used to examine the relation between the views of teachers and families and these skills of children.

Further detailed studies can be conducted to reveal the reasons why the dimensions of motivation except for general competence do not predict SRSs.

The pre-school curriculum can include learning objectives in the section of learning outcomes and indicators to increase the children's self-regulation and their motivation.

Curricula can be designed for children with gifted potential to gain self-regulated learning strategies by keeping their SRSs at a high level.

Curricula can be prepared to increase the potentially gifted children's motivation levels.

Training programs or informative bulletins can be prepared by experts so that parents use them to support children's self-regulation and their motivational skills.

## Limitations of the Study

This study is limited to the teachers′ views on motivation and SRSs of preschool children who are nominated by their parents and teachers regarding the potential for giftedness in the central district of Çorum.

## Acknowledgment

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