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A study of school adjustment related variables of young children

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The school adjustment of children is the cornerstone of their development, and has been known to be influenced by a variety of factors. This study investigated the effects of peer relationships, theory of mind (ToM), hot executive function (hot EF), and cognitive ability on young children's school adjustment. Participants were 183 children with a mean age of 62.6 months attending ten kindergartens in Korea. Data was collected using the Preschool Adjustment Questionnaire, the Penn Interactive Peer Play Scale, three theory of mind tasks, two hot executive function tasks, and the Korean version of the Kaufman Assessment Battery for Children. School adjustment was found to correlate with peer relationships, cognitive ability, hot EF, and ToM. Using Hierarchical Regression analyses, hot EF was found to contribute unique variance in predicting school adjustment, even when variance due to peer relationships and cognitive abilities was excluded. This study has implications for identifying relevant variables that affect the school adjustment of young children, which can have a significant impact on future research on school adaptation.

Keywords: cognitive ability; hot executive function; peer relationships; school adjustment; theory of mind

Introduction

In recent years, many studies have reported that national investment in quality early childhood education is effective in reducing national social costs and has a long-term effect on children's development (Heckman, Moon, Pinto, Savelyev & Yavitz, 2010; Schweinhart, Montie, Xiang, Barnett & Nores, 2005). To this end, the Organisation for Economic Co-operation and Development (OECD) countries are seeking to provide free kindergarten education with higher quality education (OECD, 2012). Following the global trend, there has been a tremendous increase in governmental support for early childhood education and the rate of enrollment in kindergarten over the last decade in Korea. As a result, many children begin to spend time out of their homes engaged with other children and adults in kindergarten and children's adjustment has become an issue.

During the earliest stages of their lives, children learn how to conform to various roles and expectations, including building relationships with teachers and peers, sharing their space and play materials, and following daily routines (Yoleri, 2014). Children's experiences in kindergarten can provide a foundation to support their enjoyment of building social relationships with others, but may also be associated with adjustment problems later in life if they fail to overcome difficulties (Ladd, Birch & Buhs, 1999). Young children can develop and maintain trust, positive interactions and relationships with adults and peers in kindergarten, and develop skills necessary to understand the role of social interaction and control behaviour.

Previous research suggests that children's relationships with peers (Betts, Rotenberg, Trueman & Stiller, 2012; Buhs, 2005; Coie, Dodge & Kupersmidt, 1990) play an important role in children's school adjustment, both academic and socio-emotional. Children's relationships with peers are closely associated with later school adjustment patterns (Betts et al., 2012; Ladd et al., 1999) and are highly related to children's intra- and interpersonal relationships in later life. Children's positive attitudes towards school and the ability to participate actively and cooperatively in classroom activities are related to their learning (Ladd et al., 1999), and a range of different social skills developed as children play with peers are correlated with one another.

Children who build secure peer relationships have fewer problem behaviours and exhibit high levels of self-value (Cillessen & Mayeux, 2007; Venter & Rambau, 2011). Thus, children's relationships with classroom peers may play significant support roles for young children in their challenges in adjusting to school (Wentzel, 1999). Children with high levels of peer acceptance tend to form a positive self-concept, exhibit leadership, and engage in pro-social skills compared to those who experience rejection by peers, which is associated with aggressive behavior and low academic achievement (Coie et al., 1990). Likewise, rejected children consistently exhibit behavioral patterns associated with low levels of adjustment, such as low self-competence and hesitance to participate in classroom activities (Buhs, 2005). If they do not play or cooperate with their peers, children tend to act independently and have fewer positive feelings about their kindergartens. These findings clearly highlight the fact that peer relationship skills may facilitate children's school adjustment.

Furthermore, cognitive development in childhood is closely related to the development of social ability. High levels of school adjustment require effective cognitive control in multiple ways (Masten, Herbers, Desjardins, Cutuli, McCormick Sapienza, Long & Zelazo, 2012). Cognitive ability facilitates proficient self-

control and enables better understanding of others. It helps children to manage conflicts based on the interpretation of social cues (Chi, Kim & Kim, 2016; Zupančič & Kavčič, 2011) and to understand social conditions and the emotional factors or minds present in such conditions (Cutting & Dunn, 1999). On the other hand, children with low cognitive abilities may not be able to understand others' minds fully; they might concentrate on only a specific condition or cue, leading to a limited understanding of their own and others' emotions. Moreover, early difficulties with peers due to a lack of social awareness and failure to interpret the cues and intentions of others accurately are associated with children's school adjustment problems. Therefore, a moderate to high level of cognitive capability is an individual resource that could be an important protective factor in adaptation (Masten, 2007).

As mentioned earlier, cognitive deficits may lead to academic difficulties, and to increased risk of social and emotional problems (Hooper, Roberts, Zeisel & Poe, 2003). In particular, cognitive processing deficits may be related to impaired emotional and social development, where they interfere with interpersonal problem-solving skills and emotional understanding (Denham & Burton, 2003). Children with high levels of cognitive ability tend to have a better understanding of social conditions and relevant emotional factors in such conditions. They can express their emotions, desires, and wishes more clearly and establish positive relationships and social interactions (Cutting & Dunn, 1999). Thus, cognitive ability fosters children's development of cognitive self-control, accurate interpretation of social cues, and conflict management skills, which contributes to a sense of competence and facilitates adjustment (Zupančič & Kavčič, 2011). Peer relationships and cognitive ability serve important support functions for children's school adjustment; however, they are not the only factors consistently affecting the quality of children's early school performance. Accordingly, it is important to study what other features are related to various aspects of children's school adjustment.

Many researchers have examined how social cognition and regulatory ability are related to children's adjustment to school (Caputi, Lecce, Pagnin & Banerjee, 2012; Denham & Burton, 2003; Peterson & Siegal, 2002). These studies suggest that diverse aspects of social cognition and the ability to self-regulate play a major role in many aspects of children's school adjustment. First, the development of the theory of mind (ToM) occurs simultaneously with that of school adjustment and social competence. ToM pertains to the understanding of beliefs, intents, desires, and pretending, and to knowing oneself as well as others. This is a core competence for sustaining relationships and adjusting to society by acknowledging that each individual might have differences with respect to their minds (Lillard & Kavanaugh, 2014). For children to understand the difference between their own beliefs and those of others, they must take account of others' behaviours and sometimes restrict their own understanding to speculate about the phenomena in others' minds. However, children lacking ToM may reveal various behavioural and social maladjustments. Thus, ToM develops an understanding of other people's emotions (Denham & Burton, 2003) and social cognition provides a basis for developing social and emotional skills and cognitive development (Cutting & Dunn, 1999). As such, ToM has been known to be highly influenced by cognitive abilities and peer relationships. Studies of the relationships between ToM and peer popularity have reported a close relationship between the two variables, and children with difficulties adjusting to kindergarten, including those who are ostracised by peers, have low scores on ToM tasks (Peterson & Siegal, 2002). However, several studies have reported no significant relationship between ToM and school adjustment (Newton & Jenvey, 2011). Therefore, it is important to examine the influence of ToM on peer relationships and cognitive abilities.

Previous studies suggest that the development of attention control and adaptive behaviour occurs during early childhood, and these factors form a core element in developing academic and social-behavioral adaptation (Blair, KA, Denham, Kochanoff & Whipple, 2004) and may impact children's school adjustment (Rimm-Kaufman, Pianta & Cox, 2000). In particular, these factors are part of executive function (EF). Processes associated with EF are numerous, but the principal elements include anticipation, goal selection, planning, initiation of activity, self-regulation, mental flexibility, deployment of attention, and utilisation of feedback (Anderson, 2002). To facilitate effective school adjustment, children should use various methods of control and EF skills that are highly relevant to adjusting to the school (Masten et al., 2012). Emerging research investigates distinct cool EF, which requires a relatively smaller amount of emotional control and abstract problem-solving capability, and hot EF, which involves emotional reactions or excitement, delaying satisfaction, and resisting temptation (Masten et al., 2012). Hot EF plays an important role in children's cognitive function, emotional control, and social interaction (Anderson, 2002), although there is significant controversy over the degree to which cool and hot EF tasks depend on dissociable cognitive and neural processes. Children's individual differences in hot EF are predictive of concurrent and long-term measures of their cognitive and socio-emotional functioning, including social competence, externalising disorders, stress resilience, and academic

achievement (Hodel, Brumbaugh, Morris & Thomas, 2016). Thus, hot EF is related to children's sense of competence in the classroom, pro-social skills, and the formation of positive peer relationships in the institution (Blair, KA et al., 2004). In particular, hot EF defects are known to have a stronger effect on attention deficit hyperactivity disorder (ADHD) than cool EF (Hobson, Scott & Rubia, 2011) and may influence children's school adjustment problems. Furthermore, as hot EF might relieve various stressors that are present in kindergartens, it is an essential factor in children's school adjustment.

Most studies on children's school adjustment focus on their peer relationships and cognitive abilities. According to these studies (Betts et al., 2012; Ladd et al., 1999), peer relationships are one of the most influential variables for school adjustment. However, there is a need to investigate what other factors may affect children's school adjustment. In one of the few studies addressing this issue, Masten and colleagues (2012) found that children's school adjustment and executive function are highly related even when cognitive abilities are excluded. In particular, social cognitive factors such as ToM are considered to have different influences depending on children's age and what tasks are provided.

Therefore, the purpose of this study was to identify and analyse the relationships among the factors that affect children's school adjustment: namely, peer relationships, ToM, hot EF, and cognitive abilities. Hierarchical regression, the focus is on the change in predictability associated with predictor variables entered later in the analysis over and above that contributed by predictor variables entered earlier in the analysis (Petrocelli, 2003). In this study, hierarchical regression was performed to examine whether ToM and hot EF predicted school adjustment, even when the contributions of peer relationships and cognitive ability had been taken into account. Consequently, the present study's objectives were to: (a) analyse the relationships between school adjustment and its predictor variables; and (b) examine how ToM and hot EF affect children's school adjustment apart from peer relationships and cognitive abilities.

Method

Participants

Two hundred and ten children were recruited from 10 kindergartens located in urban areas of Korea. A total of 183 children participated in the study. Before asking for their consent to participate, teachers, children and their families were well informed about the purpose of the study, voluntary participation, and confidentiality of their responses. The data was then collected from the teachers and children who agreed to participate in the research. At the study's onset, the participants were 62.6 months old (*SD* = 3.21) on average. The gender distribution of the children was approximately equal (50.7% boys). For the majority of children (96.8%), both parents were of Korean nationality, and the other 3.2% had multicultural backgrounds.

Measures

In this study, research tools were selected based on the child's age and the suitability of measurement contents.

Children's school adjustment

To assess the children's adjustment, the Preschool Adjustment Questionnaire (PAQ; Jewsuwan, Luster & Kostelnik, 1993) was adapted and modified to fit the Korean early-childhood educational setting. Teachers provided complete questionnaires for all subjects. Each item is rated on a five-point scale ranging from one (not at all like the child) to five (a lot like the child). There are five subscales: pro-social behaviour, positive affect within the school setting, peer competence, ego strength, and adjustment to kindergarten routines. Adding the 28 item scores together produces a total score. In another study, this measure has demonstrated a high test–retest correlation of .97 and a Cronbach's alpha of .63 (Bates, Viken, Alexander, Beyers & Stockton, 2002). In the present study, the internal consistency of the total scale was .87.

Children's peer relationships

To assess the children's peer relationships, the Penn Interactive Peer Play Scale (PIPPS; Fantuzzo, Coolahan, Mendez, McDermott & Sutton-Smith, 1998) was adapted. The PIPPS is a 32-item teachers' rating scale of preschool children's interactive peer play. Teachers indicate how frequently they have observed a child's various peer-interactive behaviors during free-play periods. Each item is rated on a five-point scale, ranging from one (not at all like the child) to five (very much like the child). There are three subscales: play interaction, play disruption, and play disconnection. The present study's internal consistency of the instrument's subscales ranged from .83 to .95. The reliability of the original study was .89 to .92.

Children's cognitive ability

To assess young children's cognitive ability, the Kaufman Assessment Battery for Children (K-ABC; Kaufman & Kaufman, 1983) was adapted. The K-ABC is designed to assess the cognitive abilities of children between 2.5 and 12.5 years of age. In this study, the Korean standardised version of the K-ABC (K-ABC-K) was used. Like the K-ABC, the K-ABC-K consists of 16 subtests: three Sequential, seven Simultaneous, and six Achievement subtests. Items were not chosen from the achievement subtest because the study aimed to explore young children's problem-solving processes. The K-ABC's scoring system follows a

standardized process. The internal consistency of the K-ABC-K subscales in the present study ranged from .87 to .92. The reliability of the original version of K-ABC-K was higher than .89.

Children's theory of mind

To assess children's false beliefs based on the ToM, the Representational Change Task (Gopnik & Astington, 1998), Location False Belief Task, and Second-Order False Belief Task (Perner & Wimmer, 1985) were used. These instruments were highly reliable regarding individual differences in previous studies (Gopnik & Astington, 1998; Hughes, Adlam, Happé, Jackson, Taylor & Caspi, 2000; Perner & Wimmer, 1985). In the present study, the internal consistency was .85. The child was shown a candy box, and asked what he thought was inside. After opening the box, he found an eraser. The lid was closed and child was asked regarding his own previously false belief: "When you first saw this box, what did you think was inside?" The researcher then asked the child, "Lee [puppet] never looked inside the box. What does he think is inside, candy or an eraser?" Later, the child was scored for his knowledge of his own former belief, as well as of Lee's current false belief. For the Second-Order False Belief Task, two puppets (Sean and Min), a pouch, a die, and a container were used. The child watched Sean and Min play with the die briefly, then saw Sean put the die in a blue container and leave. Min played with it briefly and then put it in a red container and left. Then Sean returned to play with the die, and the child was asked false-belief questions, such as "Where is the die really?" and "Where does Sean think the die is?" Next, the child was told a story about two characters (Sue and Jin). Sue is going home while an object is transferred from Place A to Place B. Jin watches the transfer but is not informed that Sue independently finds out that the object has been transferred to Place B. The child was then asked, "Where does Jin think that Sue will look for the object?"

Children's hot executive function

To assess children's hot EF, the Less is More (Carlson, Davis & Leach, 2005) and Sticker Search Tasks (Choi & Song, 2013) were used. The present study's internal consistency on the two tasks was .91. The task for cool EF differs from that for hot EF, which measures the ability to perform rules within an emotional context. The Less Is More Task is a reverse-reward contingency task. Each child chooses between a larger and a smaller tray, each containing an array of candies (e.g., five vs. two jellybeans). The task has two levels. For the lower-level task, 12 test trials were implemented. The child was credited if they selected the correct (smaller) treat selections. For the upper level task, two additional puppets (e.g., bird vs. monkey) were used. The child was told to follow the same rule when the bird puppet was shown. However, when the specific puppet (e.g. monkey) was shown, a different rule applied. The child was told to select the bigger tray to receive a bigger reward when the specific puppet was shown. For the upper-level task, 16 test trials were conducted. The Sticker Search Task, which is also referred to as the Box Search Task, uses 16 boxes with clear lids: eight boxes have yellow marks on the lid, while the other eight do not. Some boxes contain stickers and some do not. Through this task, the child receives stickers as a reward when they select the correct box. First, the child was shown 16 different boxes with clear lids that enabled them to see inside the box. The child was told to open the yellow-marked boxes that were empty. If the child opened the yellow-marked boxes with the stickers inside, they did not receive a reward. The child was then told to open the boxes without a yellow mark with a sticker. If the child opened unmarked boxes that were empty, they did not receive a reward. Each box was scored on a pass-fail basis, and the child received rewards based on the score achieved.

Intra-Correlation Coefficients

The school adjustment and peer relationships were measured by teachers' reports. The data for ToM, hot EF, and cognitive ability were collected using direct reports from the children. The researchers interviewed the children. Prior to the actual data collection, the researchers participated in workshops. To ensure inter-rater reliability, rater-training sessions were provided for four weeks regarding the procedures for each test. In order to collect data with high reliability, the researchers checked the intra-correlation coefficient (ICC). Based on our pilot study, the ICCs were .96 for ToM, .97 for hot EF, and .99 for the K-ABC cognitive ability, respectively.

Data Collection

The data in the current study were collected from August to September 2015. The researchers visited the participating institutions and received written consent from the parents and verbal consent from the children. First, the teachers completed the PAQ and PIPPS to obtain data regarding the children's school adjustment and peer relationships. Questionnaires were distributed with explanations and were returned after three weeks. Of the 220 questionnaires that were distributed, 183(83.18%) were returned. Second, data regarding ToM, hot EF, and K-ABC-K were collected by the researchers, who conducted face-to-face tests with each participant in a quiet classroom in the institution. The interviews took 23 minutes on average for the ToM tasks, 18 minutes on average for the hot EF tasks, and 40 minutes on average for K-ABC-K. Raw scores were used in the analysis.

Data Analysis

The data were analysed using the Statistical Package for Social Sciences software (version 18.0; SPSS Inc., Chicago, IL, USA). Pearson's correlation coefficients were calculated between all of the measures. Hierarchical regression analysis was also performed to analyse each variable's contribution to school adjustment. In order to examine the multicollinearity in the hierarchical regression procedure, the tolerance limits were all less than 1, to-wit .78 ~ .98, and since the VIF is 1.02 ~ 1.28, there is no multicollinearity. The models had the following predictors: (a) peer relationships; (b) cognitive ability composite added to (a); and (c) ToM, hot EF. This a priori ordering of models explicitly tested the variance that could be attributed to ToM and hot EF after peer relationships and cognitive ability were controlled.

Results

Correlation Analysis

Correlations between the variables are presented in Table 1. School adjustment was positively correlated with peer relationships (r = .481, p < .01), cognitive ability (r =. 380, p < .01), ToM (r = .244, p < .01) and hot EF (r = .383, p < .01) (see Table 1).

Table 1 The relationship between variables (N = 183)

		1	2	3	4	5
1.	School Adjustment	1				
2.	Peer-Relationships	.481**	1			
3.	Cognitive Ability	.380**	.290**	1		
4.	Theory of Mind	.244**	.222**	.552**	1	
5.	Hot Executive Function	.383**	.158*	.404**	.287**	1

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

Do peer relationships, cognitive ability, and theory of mind uniquely predict school adjustment?

ToM helps to predict children's school adjustment. This could be a result of shared variance between peer relationships, cognitive ability, and ToM, or ToM could predict school adjustment after the variance due to peer relationship and cognitive ability has been removed. A hierarchical regression was performed with school adjustment as the dependent variable. Peer relationship was entered on the second Step 1, cognitive ability on the second Step 2 and ToM on the second Step 3. Peer relationships and cognitive ability were implicitly predictive of children's school adjustment in their own right. ToM accounted for non-significant variance after peer relationship and cognitive ability had been entered (see Table 2).

Table 2 Hierarchical regression predicting school adjustment from peer relationships, cognitive ability, and theory of mind (N = 183)

	B	*SE*	*t*	R^2	ΔR^2	*F*
Step 1	.49	.13	7.34***	.24	.24	238
Peer Relationships						
Step 2	.41	.13	6.13***	.30	.06	18.16***
Peer Relationships						
Cognitive Ability	.26	.12	3.88***			
Step 3	.41	.13	6.08***			14.71***
Peer Relationships						
Cognitive Ability	.25	.14	3.16**			
Theory of Mind	.02	.85	.24	.30	.00	

Note. **p < .01, ***p < .001.

Do peer relationships, cognitive ability, and hot EF uniquely predict school adjustment?

When hierarchical regressions were performed to examine peer relationships entered in Step 1, cognitive ability in Step 2, and hot EF in Step 3, hot EF accounted for significant variance after peer relationships and cognitive ability had been entered. Consequently, hot EF adds to the prediction of school adjustment once peer relationships and cognitive ability have been accounted for (see Table 3).

Discussion

This study analysed the relationships between children's school adjustment and peer relationships, cognitive ability, ToM, and hot EF. The results are consistent with previous studies that revealed that stable peer relationships emerged as an essential component of children's school adjustment (Ladd et al., 1999). Peer relations and cognitive ability were statistically predictive variables of school adjustment. The ability to build positive and constructive relationships is important for pre-

dicting children's successful school adjustment, as this helps children to have more opportunities to interact with peers and to learn social skills. Accordingly, children who are widely accepted by peers participate in various activities and further develop social skills through these interactions (Betts et al., 2012). Peer relationships also affect children's motivation to attend school (Wentzel, 1999). Adapting well to kindergarten implies an ability to establish better peer relationships by accommodating teachers and peers and obtaining positive feedback (Ladd et al., 1999).

Table 3 Hierarchical Regression Predicting School Adjustment from Peer Relationships, Cognitive Ability, and Hot Executive Function (N = 183)

	B	*SE*	*t*	R^2	ΔR^2	*F*
Step 1	.49	.13	7.34***	.24	.24	18.16***
Peer Relationships						
Step 2	.41	.13	6.13***	.30	.06	18.47***
Peer Relationships						
Cognitive Ability	.26	.12	3.88***			
Step 3	.40	.12	6.18***			
Peer Relationships						
Cognitive Ability	.15	.12	2.22**			
Hot Executive Function	.27	.24	3.96***	.36	.06	19.16***

Note. **p < .01, ***p < .001.

In addition, it is revealed that cognitive ability is a statistically significant predictor for young children's school adjustment. A child with high cognitive ability also has a better understanding of cause-and-effect relationships within social contexts (Shure, 2001). In fact, the ability to understand others' feelings and emotions is associated with children's levels of cognitive ability. Denham and Burton (2003) have argued that cognitive ability involves integrating various types of information based on a child's understanding of emotion, noting that it helps the child to adapt to psychosocial contexts. Children with high cognitive ability can understand social situations and the emotional factors involved in them. Further, cognitive ability positively affects children's social interactions, leading to successful school adjustment (Cutting & Dunn, 1999).

As mentioned above, this study proved that the cognitive abilities of children are predictive of their school adjustment, which is consistent with the results from Hooper and colleagues' (2003) and Masten's (2007) studies of the relative contributions of cognitive abilities to children's early school adaptation. Masten (2007) noted that a high level of cognitive ability is an important factor in children's resilience in controlling stress, which eventually affects school adjustment. Peer relations and cognitive ability were statistically predictive variables of school adjustment.

This study also found a positive correlation between school adjustment and ToM. ToM is a significant predictor of peer popularity, and social sensitivity may increase one's popularity among peers (Peterson & Siegal, 2002). As the ability to understand other perspectives develops, the ability to support and cooperate with others improves within familiar contexts, such as the school setting. The results of this investigation, however, did not find a significant correlation between performance on the second-order false belief task and school adjustment.

In addition, this study found a significant positive correlation between school adjustment and hot EF, which is consistent with the results of other studies that examined these variables (Masten et al., 2012). In particular, EF is a necessary medium for children's cognitive function, behavioural regulation in an emotional context, and social interactions (Anderson, 2002). Furthermore, the results of this study indicate that hot EF is reliably related to school adjustment and is also predictive of school adjustment when the variance shared with peer relationships and cognitive ability is controlled. However, ToM did not appear to be a significant predictor when excluding the influence of peer relationships and cognitive ability. The results suggest that hot EF is a significant predictor variable when other variables are excluded, and reveal that hot EF is linked to the formation of relationships with others and to the behaviours that children exhibit in the classroom (Brock, Rimm-Kaufman, Nathanson & Grimm, 2009).

Hot EF, which includes the ability to suppress emotion and delay gratification, is an essential factor in psychological and social adaptation. Teachers recognise the ability to control one's own emotions or actions as essential to school adjustment (Rimm-Kaufman et al., 2000). If the brain is associated with hot EF is not activated, impulsivity may lead to lack of perspective-taking ability and inappropriate behaviors may occur (Ward, 2006). As hot EF develops, the ability to control impulsivity, motivation, and attention also develops. Therefore, children with higher levels of hot EF are more likely to demonstrate pro-social skills and learn socially appropriate skills more easily (McIntyre, Blacher & Baker, 2006). The

level of hot EF refers to children's social competence and may function as a support for children in the school environment.

Cool EF is intimately associated with fluid intelligence (Blair, C 2006). This perspective provides unique information, and with the exception of cognitive processes, hot EF seems to affect the school adjustment ability of children independently. Likewise, Masten and colleagues (2012) found that similar variables, such as attention, control, and following instructions, were split between the categories of EF and cognitive ability; but EF affected school adjustment uniquely, after controlling for peer relationships and cognitive ability. Masten and colleagues (2012) have also attempted to analyse homeless children's school adjustment and EF without distinguishing between cool and hot EF. Therefore, in this study, subjects were collected more broadly and the task of hot EF was more distinctly separate from the task of cool EF. The results of the present study show that hot EF plays an important role in children's adjustment in school. Previous studies have addressed EF at a cognitive level, or at an integrated level of cognition and emotion. There are still controversial elements of EF classification. However, the results of this study show that cool EF and hot EF of children showed different effects, depending on the task given. In other words, this study suggests that children's kindergarten adaptation requires hot EF used in contextual situations including their emotion and motivation rather than cool EF, used to solve cognitive problems in non-contextual situations. Therefore, in order to help children adapt to a school setting, we ought to provide time for children to think and practice how to control their own impulse and desire, as well as their emotions, under the new settings of kindergarten.

On the other hand, the results show that ToM is a significant predictor, even when the influence of peer relationships and cognitive ability is controlled. Slaughter, Dennis and Pritchard (2002) have found that when variance in linguistic intelligence is controlled, ToM does not affect the ability of children to adjust to school. Drawing upon work by Slaughter et al. (2002), this study measured cognitive processing intelligence rather than language intelligence; but there was no significant predictivity when the influence of peer relationships and cognitive ability were controlled. In sum, the relationship between ToM and school adjustment has been contradicted. Because ToM affects school adjustment, it has a significant relationship with the variables related to school adjustment (Dockett, Perry & Tracey, 1997; Peterson & Siegal, 2002). In other studies, however, there was no correlation between ToM and social competence for school adjustment (Badenes, Estevan & Bacete, 2000; Slaughter et al., 2002). The influence of ToM gradually increases as the children come of school age (Badenes et al., 2000; Slaughter et al., 2002). It seems plausible that ToM might confer benefits to social relations after rather than before five years of age, paralleling the myriad social and cognitive challenges posed by children's transition into primary school (McIntyre et al., 2006). Indeed, even if the child develops ToM, it cannot to be connected to actual social skills in early years.

Caputi and colleagues (2012) found that while ToM is essential to pro-social behaviour, it also has a more meaningful relationship when it is linked to understanding others, sensitivity to others, social co-operation, or practical actions that help others. Therefore, the influence on school adjustment, excluding the variable of peer relationships, is not significant. Doherty (2009) conducted an analysis of ToM, and the relation between ToM and various variables shows opposite results according to the task. Therefore, it is necessary to measure the relationship between various variables and make adjustments by providing various tasks in a follow-up study. Furthermore, it is necessary to explore the process of how children's ability to see others' minds can be linked to school adaptation in practice.

Results from this study revealed that peer relationships and cognitive ability statistically predicted the school adjustment ability of young children, but in the hierarchical regression analyses, hot EF is found to be a significant predictor except for peer relationships and cognitive ability, whereas ToM was not significant. The outcomes of this study indicate that these variables should be structuralised and syntagmatically associated in order to facilitate children's school adjustment. In particular, this study showed that children use cool EF and hot EF independently depending on their target behaviour, thereby proving that children use hot EF by intentionally adjusting their motivation or desire in the school adaptation process where there are required to form new relationships with others.

However, this study is limited in that school adjustment and peer relationships were measured via teacher-rated questionnaires. Future in-depth studies involving direct observation of children's school adjustment and peer relationships in natural school settings are required. Further research is needed to additional investigate how children's relationships with their peers, cognitive abilities, and hot EF influences school adaptation. For example, additional research is needed to explore moderators or mediators that can affect children's school adaptation. As mentioned earlier, there is a need to evaluate the child's abilities using a variety of tools. In this study, we also analysed the elements of EF only. For this reason it would be necessary to carry out the tests of cool EF at the

same time, as well as to study how each factor influences the school adaptation of young children.

Despite its limitations, the findings of this research have played a role in discovering the reasons behind a child's school adjustment problems arising from a worldwide increase of early childhood institutions due to recent government support during early childhood years.

Note

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