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The Relationships between Children's Ego Function and Fear of Negative Evaluation Affecting Academic Failure Tolerance in Early School Age: Analysis by Grade Level Considering Sustainability of Academic Motivation

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Abstract: This study identified the relational paths between children's ego function and fear of negative evaluation affecting academic failure tolerance across three grades. The ego function consisted of four factors: competence, initiative, resilience, and sociality. In total, data of 872 elementary school students (Grade 1–3) in South Korea were collected through parent-reported questionnaires. Results reflected various paths between these variables. Firstly, in all three grades, greater initiative and resilience and less fear of negative evaluation resulted in higher tolerance for academic failure. In particular, fear of negative evaluation was found to fully mediate the effect of academic failure tolerance on resilience. Secondly, notable differences in paths were found among grade levels. For first grade students, competence lowered the fear of negative evaluation and academic failure tolerance. For second grade students, initiative had an indirect effect on academic failure tolerance through fear of negative evaluation. For third grade students, sociality lowered the fear of negative assessment and increased academic failure tolerance. Fear of negative evaluation partially mediated the relationship between first graders' competence, second graders' initiative, and third graders' sociality and academic failure tolerance. Conclusively, children's ego function is an important factor affecting academic failure tolerance, and the fear of negative evaluation mediates the relationship between the two variables. The four factors of ego have been found to have a different impact on each grade level. In consideration of effectiveness and sustainability, viable methods of psychological intervention to improve children's academic motivation, specifically created to meet the needs of children at each grade level, are necessary. This study is meaningful in that it provides applicable results for sustainability-based psychological interventions to improve children's academic failure tolerance.

Keywords: academic failure tolerance; ego function; fear of negative evaluation

1. Introduction

In an information-rich society saturated with trending networks and big data, the current education system is focused on the development of active learning attitudes and competencies that go beyond the simple transfer of knowledge and skills. Learners establish their own goals and proactively solve a wide range of problems [1]. In fact, various teaching strategies such as Project-Based Learning (PBL), which aims at improving problem-solving, have been expanded and applied in recent years

for helping learners to become self-motivated in training oneself on "how to catch rather than to be given the fish to eat" [2]. In light of this trend, the present study focuses on academic failure tolerance, a more fundamental approach for sustainability-based learning [3]. Within the social-institutional setting of the school environment, we examine ego-function and the fear of negative evaluation that affects academic failure tolerance for early school-age children (Grades 1-3), who form the basis of academic motivation [3–6]. In consideration of sustainability, this study ultimately aims to identify individualized psychological interventions at the preventive and developmental levels to improve children's academic motivation. For this purpose, the effects of ego-function, fear of negative evaluation, and the relationship between these variables are closely examined.

Academic failure tolerance, which is closely related to academic motivation, is a characteristic that responds positively and constructively to failure in an academic situation [3]. An individual with higher resistance to failure experiences less negative emotions after failure and acts to overcome this challenge in a concrete and realistic way. Research has claimed that such individuals have a tendency to prefer tasks of greater difficulty [5]. Preceding studies have reported that children with higher academic failure tolerance were more capable of adjusting to their classes, and academic failure tolerance had a positive influence on academic achievement [3,5–9]. To add, the early school-age marks the beginning of a critical developmental period of psychological characteristics such as internal motivation, which forms the basis of school work and study [4]. A firm establishment of an individual's basic learning motivation at the beginning of school age will allow a continuous learning disposition to be maintained beyond higher education to lifelong education. Therefore, an investigation of factors influencing failure tolerance of early school-age children and the discovery of intervention methods to reinforce failure tolerance will be meaningful in supporting sustainable academic motivation and school adaptation.

Previous studies have found that academic failure tolerance is influenced by both environmental and internal factors. Environmental variables such as a teacher's beliefs [8], social support [9], and receptive care [10] positively affect failure tolerance. Intrapersonal variables are related to psychological factors including controlling temperament [11], ego strength, the strength of the ego function [3], and neurodevelopmental effects (e.g., Attention Deficit Hyperactivity Disorder (ADHD)) [12]. Therefore, the current study focuses on these psychological aspects and examines their relationship with ego function. The early years of elementary school (Grades 1–3) is the developmental period for the foundation of ego, as the strengthening of ego function begins [13]. By gaining more insight on how these variables operate within a specific grade level, stable and effective interventions can be planned for the formation of academic failure tolerance, which forms the basis of learning capacity and academic attitude among early school-age children.

Children's ego function is divided into competence, initiative, resilience, and sociality [13]. Competence is the aspect of the ego that allows an individual to think that one is capable enough to exert one's own abilities with high confidence. Initiative is the function of the self to think and make decisions through inner control, to plan out behaviors and to achieve goals. Resilience is a function of the self that can withstand psychological stability, crisis, or stressful situations, to "flexibly" restore normal feelings. Sociality is an aspect of ego function that forms healthy relationships based on trust in others, actively participates in extroverted expressions and social situations, and copes with genuine responses [3]. Refs. [14,15] claimed that an individual with stronger ego function revealed higher resistance to failure, and creatively and effectively coped with failure based on the belief that one has the resources to overcome such obstacles. In other words, the stronger the ego function, the higher the failure tolerance [3].

However, studies have only established that ego function is a major variable affecting failure tolerance. Specific aspects of ego function, which are essential to failure tolerance, have not yet been identified. Some studies examined the relationship with sub-factors (e.g., resilience) of the ego function and have confirmed its influence [16]. However, these studies also failed to comprehensively identify the multidimensional aspects of ego function, and there are limitations to the restrictive relationship

of certain variables. In addition, early school-age is the period when children's ego function begins to strengthen [13], and children's perceptions and internal attitudes regarding academic motivation and failure tolerance rapidly change [4]. Based on these findings, differences in the factors of ego function that affect academic failure tolerance by grade level must also be considered. Therefore, by examining factors of ego function that impact academic failure tolerance, this study attempts to clarify the relationship between ego function and academic failure tolerance at each grade level.

Among psychological variables affecting academic failure tolerance, attention should also be given to the fear of negative evaluation as a factor related to anxiety. Fear of negative evaluation is anxiety about receiving an unfavorable judgment in social interpersonal relationships [17]. Early school age is a period of increased sensitivity to other people's evaluations in developmental processes, and children may experience various social anxiety symptoms due to negative evaluations in social situations [18,19]. Furthermore, such evaluations have been reported to affect various parts of school life, a social domain of children [20]. Fear of negative evaluation has been reported to have influences on performance insecurity in school life [19], to increase anxiety about academic failure and to reduce academic motivation [21]. Based on these results, this study aims to verify the hypothesis that the fear of negative evaluation in early school-age children, who are beginning to gain awareness of other people's evaluation and social feedback, will affect academic failure tolerance in the learning atmosphere.

Considering previous studies, a relationship between ego function and fear of negative evaluation is hypothesized. It has been suggested that the ego function of children affects social anxiety and fear of negative evaluation [22]. When healthy ego-development is achieved and ego function is fully utilized, anxiety and fear of negative evaluation are reduced [13]. In other words, the fear of negation mediates the effect of children's ego function on academic failure tolerance (Figure 1). If the mediating effect is verified, diverse strategies can be established in mediation to increase academic failure tolerance of early school-age children.

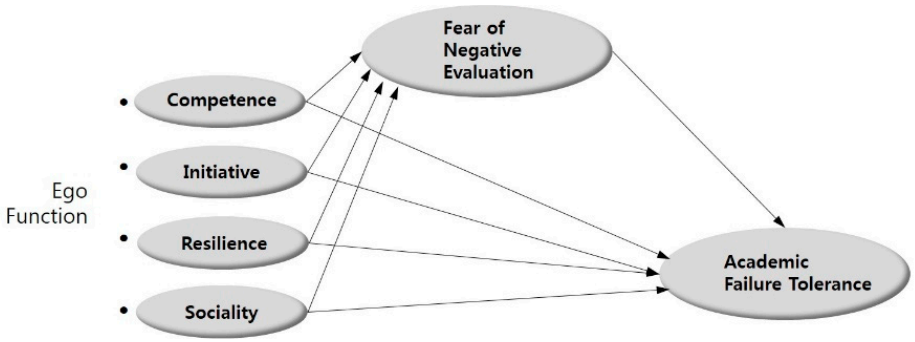


Figure 1. Research model.

In summary, this study aims to examine the effects of ego function and fear of negative evaluation and identify possible relational models to verify paths that affect academic failure tolerance by grade level for early school-age children who are beginning to develop motivation and attitude toward academics. Based on the results of this study, we will discuss effective intervention measures that can improve academic failure tolerance, an internal motivation of individuals for a sustainable academic adjustment.

Our main research question seeks to gain insight into the relationship model between ego function and fear of negative evaluation on academic failure tolerance by grade level. The hypothesis is as follows. Hypothesis 1. Ego function (competence, initiative, resilience, sociality) and fear of negative evaluation will have a significant effect on academic failure tolerance, and the significant path will be different in Grades 1–3. Hypothesis 2. Fear of negative evaluation in early school-age mediates the relationship between ego function (competence, initiative, resilience, sociality) and academic failure tolerance, and the significant mediation paths will differ between Grades 1–3.

2. Methods

2.1. Subjects and Procedures

Subjects were 872 elementary school children in Grades 1–3 (323 in first grade, 252 in second grade, and 297 in third grade). Initially, a convenience sampling method was used, with the school as a cluster unit. We contacted elementary schools in Seoul and Gyeonggi-do province, South Korea via e-mail for participant recruitment. Two elementary schools agreed to participate and were selected for the study. Ref. [23] believes that an evaluation utilizing self-report questionnaires are reliable when the subject's literacy ability is above a certain level and is most likely able to do so when the student is in third grade of elementary school. Therefore, a survey was conducted by using a parent questionnaire, in which parents observe and report their children's behavior. The homeroom teacher was asked to distribute the questionnaire packets to the students. Completed and sealed parent questionnaires were returned to the teacher. A thorough explanation of the research, including the purpose and method of the study, was provided to the parents. Agreement for research participation, consent for the use of personal information, an option of voluntary participation and abandonment, and the scope of use of the data was established. A total of 897 questionnaires were sent out, of which 97.2% were collected and used for analysis. Taking into account the ethical aspects of the research, all aforementioned processes were conducted with the approval of the Institutional Bioethics Committee (IRB No. P0 1-201708-22-004) in South Korea.

2.2. Measurement

There were three measurement tools included in the survey questionnaire. Firstly, the ego function of early school-age children was measured through Ego Strength Test Scale for Children (EST-C). EST-C is a parent-reported questionnaire based on a 5-point Likert scale designed by [13] to measure the ego function of children's competence, initiative, resilience, and sociality. A total of 24 questions (6 questions for each factor) was used for assessment. The higher the score, the stronger the ego function. Representative questions for each factor are as follows. Competence: "My child has the confidence to do well on her/his own."; Initiative: "My child does well in what he/she decides to do on her/his own."; Resilience: "My child tends to be upset or angry for a long time."; Sociality: "My child enjoys competing or cooperating with friends." Cronbach's α values were 0.91 for competence, 0.83 for initiative, 0.86 for resilience, and 0.90 for sociality. Secondly, the fear of negative evaluation was evaluated using eight items on a 5-point Likert scale developed by [24], measuring the degree of anxiety that children feel about the negative evaluation by others in the context of social anxiety. We used questions that were translated into Korean and validated. The higher the score, the higher the fear of negative evaluation. The measure included items such as, "My child is worried about what others think of him." Cronbach's α was 0.88. Lastly, academic failure tolerance was evaluated on a 5-point Likert scale using 18 items developed by [25] to measure the tendency of children to respond with a positive attitude to failure experiences in academic situations. The measure included items such as, "My child likes to do difficult homework even though he/she may be slightly wrong". A higher score indicated a higher level of failure tolerance. Cronbach's α was 0.85.

2.3. Data Analysis

Collected data were analyzed using SPSS 24.0 (IBM Co., Armonk, NY) and AMOS 24.0 (IBM Co., Armonk, NY). Frequency analysis was conducted to investigate the demographic characteristics of the subjects, and Cronbach's α, an internal consistency coefficient between items, was calculated to determine the reliability of the measurement tool. The validity of the items was verified through item analysis and exploratory factor analysis, and the skewness and kurtosis of each variable were examined to verify the assumption of multivariate normal distribution. The hypothesis model was verified by modeling the structural equations with the maximum likelihood estimation for each grade. The fear of negative evaluation and failure tolerance were constructed using the item parcels method in

consideration of model suitability. Model verification was a two-step approach followed by verification of the measurement model and estimation of the structural regression model. The goodness-of-fit of the model was verified through the root mean square error of approach (RMSEA), the Comparative Fit Index (CFI), and the Tucker-Lewis Index (TLI). Bootstrapping was used to verify the significance of the indirect effect path at the 0.05 level.

3. Results

3.1. Measurement Model Verification

According to the two-step approach proposed by [26], the validity of the measurement model for each grade was verified through confirmatory factor analysis (Table 1). As a result, the model fit index meets the criteria for all three grades, and the model fit of the data was confirmed (Grade 1: RMSEA = 0.08 < 0.10, CFI = 0.90 > 0.90, TLI = 0.90 > 0.90; Grade 2: RMSEA = 0.07 < 0.10, CFI = 0.90 > 0.90, TLI = 0.90 > 0.90; Grade 3: RMSEA = 0.06 < 0.10, CFI = 0.91 > 0.90, TLI = 0.90 > 0.90). Next, we verified convergent validity to confirm the unidimensionality of the measurement variables for the latent variables. Convergent validity was verified through factor loading (β) and significance of the measured variables, Average Variance Extracted (AVE), and Construct Reliability (C.R.). As a result, the factor loading of the observed variable for the latent variable was found to be at an appropriate level of 0.5 or more ($p < 0.05$), the variance extraction index of 0.5 or more, and the concept reliability of 0.7 or more [27]. Finally, the correlation coefficient between the latent variables and AVE was compared to secure discriminant validity. In general, if the AVE is larger than the square of the correlation coefficient of the pair with the highest correlation, discrimination validity can be considered [27]. As a result, discrimination validity among potential variables was confirmed for all grades (Grade 1: (competence ↔ sociality)^2 = 0.72 < AVE = 0.80; Grade 2: (competence ↔ initiative)^2 = 0.55 < AVE = 0.97; Grade 3: (competence ↔ initiative)^2 = 0.42 < AVE = 0.97).

Table 1. Confirmatory factor analysis by grade.

Grade	Latent Variables	λ	AVE	C.R.	Model Fit
1st	Competence	0.92~0.81	0.97	0.99	$\chi^2(df)$ = 1181.86(417) ***; RMSEA = 0.08(0.07~0.08); CFI = 0.90; TLI = 0.90
	Initiative	0.77~0.67	0.87	0.98	
	Resilience	0.86~0.59	0.84	0.97	
	Sociality	0.87~0.51	0.80	0.96	
	Fear of Negative Evaluation	0.88~0.66	0.94	0.98	
	Academic Failure Tolerance	0.92~0.73	0.93	0.97	
2nd	Competence	0.77~0.63	0.84	0.97	$\chi^2(df)$ = 863.32(417) ***; RMSEA = 0.07(0.06~0.07); CFI = 0.90; TLI = 0.90
	Initiative	0.83~0.58	0.89	0.98	
	Resilience	0.83~0.54	0.87	0.97	
	Sociality	0.82~0.70	0.89	0.98	
	Fear of Negative Evaluation	0.92~0.74	0.93	0.98	
	Academic Failure Tolerance	0.93~0.71	0.90	0.96	
3rd	Competence	0.72~0.65	0.86	0.97	$\chi^2(df)$ = 823.67(417) ***; RMSEA = 0.06(0.05~0.06); CFI = 0.91; TLI = 0.90
	Initiative	0.76~0.60	0.87	0.98	
	Resilience	0.86~0.50	0.80	0.96	
	Sociality	0.79~0.68	0.88	0.98	
	Fear of Negative Evaluation	0.88~0.76	0.95	0.99	
	Academic Failure Tolerance	0.86~0.77	0.93	0.97	

*** $p < 0.001$.

3.2. Structure Regression Model Verification

Before conducting the structural regression model verification, multicollinearity was first confirmed through the VIF index. As a result, values were less than 10 (below 1.06 in Grade 1, below 1.96 in Grade 2, and below 1.71 in Grade 3), confirming that there were no issues with multicollinearity. On the basis of securing the validity of the measurement model, the path between potential variables according to the research model was estimated for each grade. As a result, insignificant paths were found among the hypothetical paths established for all grades. Therefore, by constructing an alternative model that eliminated insignificant paths and comparing the estimated results according to the research model with the χ^2 index, in Grade 1, the degree of freedom increased by 4, but the χ^2 difference was 3.91, which was smaller than 9.49 [research model: χ^2 (df) = 1181.86 (417), alternative model: χ^2 (df) = 1185.77 (421)]. In Grade 2, the degrees of freedom also increased by 5, but the χ^2 difference was 4.05, less than 11.07 [study model: χ^2 (df) = 863.32 (417), alternative model: χ^2 (df) = 867.37 (422)]. Lastly, in Grade 3, the degree of freedom increased by 5, but the χ^2 difference was 6.21, which is smaller than 11.07 [study model: χ^2 (df) = 823.67 (417), alternative model: χ^2 (df) = 829.88 (422)]. For all three grades, the alternative model, which is simple and maintains a good level of fitness, was adopted as the resulting model.

The model fit index was validated in that the model fits the data properly with RMSEA 0.10, CFI 0.90, and TLI 0.90 for all grades [27]. For each grade, the explanatory power of the reference variables was: 61% for fear of negative evaluation in Grade 1, and 45% for academic failure tolerance; 46% for fear of negative evaluation for Grade 2, and 34% for academic failure tolerance; and 47% for fear of negative evaluation for Grade 3, and 41% for academic failure tolerance.

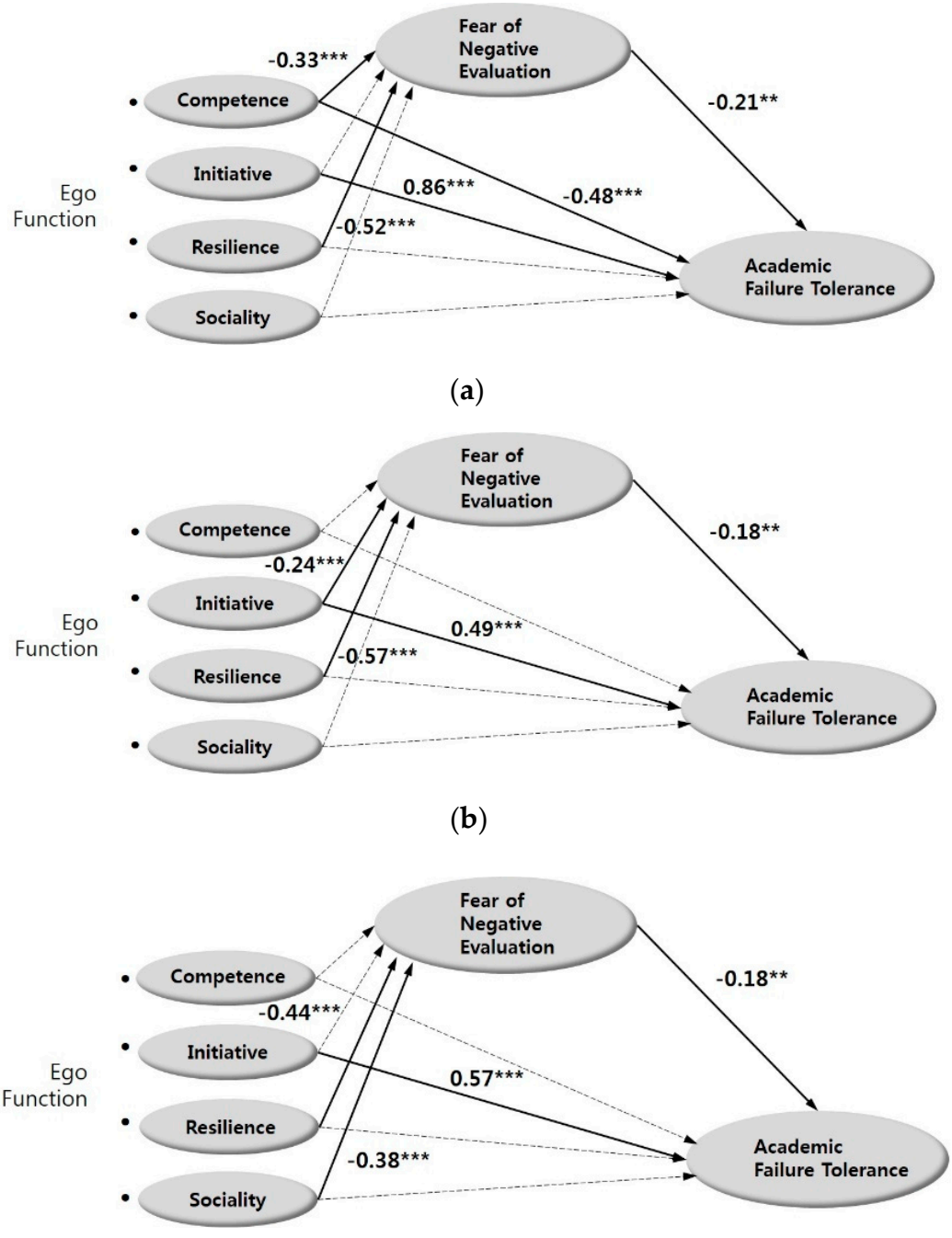
There were significant differences between grades when the significant paths were organized by grade level (refer Figure 2 and Table 2). In all three grades, initiative had the most direct effect on academic failure tolerance. For Grade 1, significant direct effects were found for initiative, competence, and fear of negative evaluation, while fear of negative evaluation was found to have direct effects for Grade 2 and Grade 3. In detail, for Grade 1, results indicated a significant positive effect on academic failure tolerance ($\beta = 0.86$, $p < 0.001$), while competence ($\beta = -0.48$, $p < 0.001$) and fear of negative evaluation (β). $= -0.21$, $p < 0.01$) displayed negative effects, and initiative was found to have the greatest effect. Thus, the higher the initiative, the higher the academic failure tolerance. The lower the competence and fear of negative evaluation, the higher the academic failure tolerance. Next, resilience ($\beta = -0.52$, $p < 0.001$) and competence ($\beta = -0.33$, $p < 0.001$) showed a significant negative relationship in the path to fear of negative evaluation of ego function. This means that the higher the resilience and competence, the lower the fear of negative evaluation. Notably, resilience had a relatively higher impact on lowering the fear of negative evaluation.

Variables that directly affect academic failure tolerance in Grade 2 were initiative ($\beta = 0.49$, $p < 0.001$) and the fear of negative evaluation ($\beta = -0.18$, $p < 0.01$). The higher the initiative, the lower the fear of negative evaluation, and the higher the academic failure tolerance. In this case, the relative impact of initiative was greater. In relation to the fear of negative evaluation, significant negative effects were found in the order of resilience ($\beta = -0.57$, $p < 0.001$) and initiative ($\beta = -0.24$, $p < 0.001$).

Variables that directly affect academic failure tolerance in Grade 3 are initiative ($\beta = 0.57$, $p < 0.001$) and fear of negative evaluation ($\beta = -0.18$, $p < 0.01$). Corresponding with Grade 2, the effect of initiative for Grade 3 was relatively high. In the path to the fear of negative evaluation, resilience ($\beta = -0.44$, $p < 0.001$) and sociality ($\beta = -0.38$, $p < 0.001$) of ego function were significantly positive.

Next, as a result of verifying the mediating effect of fear of negative evaluation in the relationship between ego function and academic failure tolerance, fear of negative evaluation was found to completely mediate the relationship between resilience and academic failure tolerance in ego function for all grade levels. Differences were found according to grade level. Specifically, partial mediation with competence was found for Grade 1, partial mediation in the relationship between initiative and academic failure tolerance was found for Grade 2, and a complete mediation with sociality was found for Grade 3.

In all grades, a higher resilience resulted in a higher academic failure tolerance by reducing the fear of negative evaluation (Indirect effect = Grade 1: 0.11; Grade 2: 0.11; Grade 3: 0.08). Bootstrapping verified a statistically significant mediation path ($p < 0.05$).



** $p < 0.01$; *** $p < 0.001$.

Figure 2. Significant path and standardization coefficient by grade: (**a**) Grade 1; (**b**) Grade 2; (**c**) Grade 3.

Table 2. Standardized estimates of effects by grade.

Grade	Latent Variables		Direct Effect (β)	Indirect Effect	Total Effect
1st	Competence →	Fear of Negative Evaluation	−0.33 ***		−0.33 *
		Academic Failure Tolerance	−0.48 ***	0.07 *	−0.41 *
	Initiative →	Fear of Negative Evaluation	-		-
		Academic Failure Tolerance	0.86 ***		0.86 *
	Resilience →	Fear of Negative Evaluation	−0.52 ***		−0.52 *
		Academic Failure Tolerance	-	0.11*	0.11 *
	Sociality →	Fear of Negative Evaluation	-		-
		Academic Failure Tolerance	-		-
	Fear of Negative Evaluation →	Academic Failure Tolerance	−0.21 **		−0.21 *
	SMC	Fear of Negative Evaluation = 0.61; Academic Failure Tolerance = 0.45			
	Model Fit	$\chi^2(df)$ = 1185.77(421) ***; CFI = 0.90; TLI = 0.90; RMSEA = 0.08(0.07~0.08)			
2nd	Competence →	Fear of Negative Evaluation	-	-	-
		Academic Failure Tolerance	-	-	-
	Initiative →	Fear of Negative Evaluation	−0.24 ***	-	−0.24 *
		Academic Failure Tolerance	0.49 ***	0.05 *	0.53 *
	Resilience →	Fear of Negative Evaluation	−0.57 ***	-	−0.57 *
		Academic Failure Tolerance	-	0.11 *	0.11 *
	Sociality →	Fear of Negative Evaluation	-	-	-
		Academic Failure Tolerance	-	-	-
	Fear of Negative Evaluation →	Academic Failure Tolerance	−0.18 **	-	−0.18 *
	SMC	Fear of Negative Evaluation = 0.46; Academic Failure Tolerance = 0.34			
	Model Fit	$\chi^2(df)$ = 867.37(422) ***; CFI = 0.90; TLI = 0.90; RMSEA = 0.07(0.06~0.07)			
3rd	Competence →	Fear of Negative Evaluation	-	-	-
		Academic Failure Tolerance	-	-	-
	Initiative →	Fear of Negative Evaluation	-	-	-
		Academic Failure Tolerance	0.57 ***	-	0.57 *
	Resilience →	Fear of Negative Evaluation	−0.44 ***	-	−0.44 *
		Academic Failure Tolerance	-	0.08 *	0.08 *
	Sociality →	Fear of Negative Evaluation	−0.38 ***	-	−0.38 *
		Academic Failure Tolerance	-	0.07 *	0.07 *
	Fear of Negative Evaluation →	Academic Failure Tolerance	−0.18 **	-	−0.18 *
	SMC	Fear of Negative Evaluation = 0.47; Academic Failure = 0.41			
	Model Fit	$\chi^2(df)$ = 829.88(422) ***; CFI = 0.91; TLI = 0.90; RMSEA = 0.06(0.05~0.06)			

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Additional paths were identified by grade level. For Grade 1, the partial mediating effect of increasing academic failure tolerance by decreasing the fear of negative evaluation was significant when competence was high. However, the indirect effect was weak. Furthermore, due to the direct path of a higher competence resulting in lower academic failure tolerance, the overall effect of competence on academic failure tolerance was found to be negative (Total effect = −0.41). In other words, competence lowers the fear of negative evaluation and has a positive effect on academic failure tolerance. Therefore, high competence can be summarized as having a negative impact on academic failure tolerance, which is generally characterized by the lack of fear in failure when attempting to overcome challenges in an academic setting.

In Grade 2, the partial mediating effect of initiative was significant (Indirect effect = 0.05, $p < 0.05$). Initiative directly affects academic failure tolerance, and the process of reducing the fear of negative evaluation has been identified as a major variable that also indirectly affects academic failure tolerance.

In Grade 3, the full mediating effect of sociality was newly identified (Indirect effect = 0.07, $p < 0.05$). In Grade 1 and 2, the impact of academic failure tolerance and fear of negative evaluation of sociality was insignificant. Contrastingly, in Grade 3, a higher sociality resulted in higher academic failure tolerance by reducing the fear of negative evaluation.

In summary, the ego function component that most directly affects academic failure tolerance in all three grade levels is initiative. The fear of negative evaluation has also been found to affect academic failure tolerance for all grade levels. In addition, resilience was found to have the greatest impact on the mediating effect of increasing academic failure tolerance by reducing the fear of negative evaluation. In addition, depending on the grade, first-grade competence and third-grade sociality had direct and indirect effects on academic failure tolerance.

4. Discussion

The aim of this study was to explore possible intervention strategies to improve academic motivation based on the individualized psychological approach considering children's sustainability. For this purpose, the effects and relationships between ego function of academic failure tolerance, its variables, and the influence of fear of negative evaluation were examined. The major findings of our research are presented below.

Firstly, among the four ego functions, initiative was identified as having the most impact on academic failure tolerance for all grades. This is consistent with the study of sixth graders [3], which found that the stronger the initiative, the lower the academic failure tolerance and the higher the school adaptability. Initiative is a concept that includes performance, drive, self-control, and control over the initiative to achieve goals [15]. Initiative is a psychological feature established in infancy and fully reinforced at school-age, and is referred to as a major variable that affects not only academic motivation but also lifelong learning after adolescence and adulthood [3,28,29]. Indeed, ref. [29] also argued that initiative and self-directed learning abilities of college students had a major effect on cultivating professional capabilities. These findings further emphasize the necessity of giving more attention to the effects of initiative. Considering sustainability, this study investigated the relationships among these variables for early school-age children whose attitudes and motivations for learning are beginning to develop. In particular, significant effects of initiative on academic failure tolerance were identified. Based on the findings of the current study, seeking interventions to reinforce early childhood initiation will not only improve immediate academic failure tolerance but also offer meaningful mediation contributing to the strengthening and sustaining learning motivation of later life.

Secondly, the fear of negative evaluation had a negative effect on academic failure tolerance for all grade levels. Correspondingly, ref. [30] argued that a high fear of negative evaluation weakens academic motivation. Children who sensitively respond to negative evaluations and experience anxiety have been found to be denied interpersonal relationships and face difficulty in adapting to social situations (e.g., schools) [22]. Furthermore, the results of this study show that the fear of negative evaluation negatively affects academic failure tolerance, which is closely related to academic motivation. These findings suggest that more focus should be given to the fear of negative evaluation associated with psychological anxiety in order to create sustainable academic motivation for children. Previous studies have shown that the fear of negative evaluation is largely due to the cognitive characteristics and beliefs of individuals [17,18]. Therefore, efforts to develop cognitive psychological intervention strategies to reduce the fear of negative evaluation may also be an effective approach to reinforce children's academic failure tolerance in the short term.

Thirdly, resilience in all grades had an indirect effect on academic failure tolerance through the mediation of negative evaluation. In [31] research, resilience is identified as a factor affecting academic motivation and achievement. Likewise, it is meaningful that the relationship between resilience and

academic failure tolerance is completely mediated by the fear of negative evaluation. Resilience is the ability to flexibly protect and maintain balanced stability of one's feelings and to recover from psychological stress and crisis [28]. In general, resilience is known to be a major variable affecting psychological anxiety. However, the results of this study go beyond the function of reducing anxiety and extend to constructively coping with and overcoming failures in academic situations. In view of the fundamental approach over time, enhancing children's resilience would be an effective intervention method in reducing negative evaluation as well as in promoting academic failure tolerance.

Fourth, there were slight differences in variables affecting academic failure tolerance by grade level. In Grade 1, lower competence resulted in higher academic failure tolerance. The first year of elementary school is a time when the concept of the self is formed based on the feedback of one's surroundings, and the strength of the self is relatively weak compared to children in upper-grade levels. If a child forms an idealistic image of oneself based on outcome- or achievement-driven feedback or overestimates one's abilities, there is a possibility that the child will continue to seek their competence through easy tasks rather than selecting challenging, difficult tasks. This may be a natural phenomenon that can be experienced during the unstable process of ego development [32]. Therefore, in the first year of elementary school, it is necessary to enhance academic failure tolerance based on process-oriented feedback. Children should be encouraged to improve academic motivation in the achievement of actively challenging and solving a variety of tasks rather than fearing failure. Contrastingly, in the third year, sociality was found to influence academic failure tolerance. In conjunction with the school and social environment, adaptation and peer relationships are key developmental tasks. Experience and confidence in social situations and relationships, in addition to the fear of negative evaluation, are all positively linked to academic failure tolerance. This is consistent with the findings of [33], which found that peer relationships are related to academic achievement for eighth-grade students. In other words, in order to improve children's academic motivation and academic failure tolerance, it is necessary to consider the child's age, developmental stage, and major domains of development. Especially for children in third grade and above, taking into account sociality in relation to academic motivation and academic failure tolerance may result in more efficient outcomes.

5. Conclusions

The present study investigated the effects of ego function and fear of negative evaluation that affect academic failure tolerance, and relationship models among children of early school age, a developmental period in which academic motivation and attitudes are formed. Conclusions based on the findings from our examination are as follows.

First, children's ego function is an important factor that affects academic failure tolerance, and fear of negative assessment mediates the relationship between ego function and academic failure tolerance. For all grades, increasing initiative can directly and reliably contribute to increasing academic failure tolerance. Specifically, psychological support, activities that allow children to experience their own choices and responsibilities, and teaching and learning methods that ensure and encourage initiative may all be effective ways of strengthening initiative. Reducing the fear of negative evaluation can also be beneficial. Intervention in shorter periods through cognitive-behavioral programs such as cognitive psychotherapy and group interaction programs may provide support in reducing the fear of negative evaluation among children. Resilience also affects academic failure tolerance through the fear of negative evaluation. Thus, strategies of enhancing resilience should be considered to effectively reduce the fear of negative evaluation. For example, self-reinforcement programs can be effective trade-offs in situations for more short-term structured programs, such as school counseling and welfare centers, that require a more sustainable approach.

Second, differences were found among the factors that displayed a greater impact in various grade levels. Therefore, psychological interventions for improving children's academic motivation need to be prepared according to grade level in consideration of sustainability and effectiveness. In the case of first graders, it was confirmed that over-recognizing one's abilities, having high expectations

of oneself through result-oriented feedback and idealizing oneself could negatively affect academic motivation. Predictably, when one experiences personal shortcomings through mistakes, it is difficult to acknowledge these failures, suggesting the possibility of inducing the person to avoid difficult tasks. Therefore, in terms of improving academic failure tolerance, it may be helpful for first-grade children to experience self-worth at an appropriate level, rather than providing excessive result-based praise and idealization. Additionally, third grade is a time when the influence of sociality on academic failure tolerance increases. As such, supporting self-confidence in social relations and strengthening social skills through training and group programs may help to develop sustainable learning motivation.

This study is meaningful in that it has identified psychological intervention factors that can improve academic failure tolerance, an internal motivation, for the purpose of sustainable academic adaptation. However, there are limitations of interpreting our findings in that the sampling of the subjects for this research is restricted to specific regions of South Korea, and the collection of data strictly relies on responses of parent-reported questionnaires. In addition, in the first grade, the likelihood of interference effects is suggested in the relationship between competence, fear of negative evaluation, and academic failure tolerance. Therefore, for considering the possibilities of interference, further research is recommended.

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