THE EFFECTS OF THE FAMILY-INVOLVED SDLMI ON ACADEMIC ENGAGEMENT AND GOAL ATTAINMENT OF MIDDLE SCHOOL STUDENTS WITH DISABILITIES WHO EXHIBIT PROBLEM BEHAVIOR

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The purpose of this study is to investigate the effects of the Family-Involved Self-Determination Learning Model of Instruction (SDLMI) on academic engagement and goal attainment of middle school students with disabilities who exhibit problem behavior. Intervention was provided to the experimental group (12 students with their families and special educators) in Korean language classes for seven months while no treatment was provided to the control group (12 students). As a result, academic engagement in the experimental group, measured by behavior rating and direct observation, increased at a significantly higher rate than that of the control group. Also, the goal attainment of Korean language in the experimental group improved significantly compared to the control group. Finally, discussions of the results, limitations of the study, and suggestions for future studies are presented.

Many students with disabilities show problem behavior that may impede not only their learning but also others' learning when compared with their typically developing peers. When their problem behavior is very serious, their education tends to focus extensively on compliance. However, it is highly probable that the educational practice focusing on compliance depends on external reinforcements or prompts, which may lead to difficulties in students setting their own goals and pursuing them independently. The students with disabilities who exhibit problem behavior, because of passivity and dependence, neither reach the appropriate level of independence nor apply newly acquired skills to new situations. In this way, the students cannot do without others' help and management (Peterson, Young, Salzberg, West, & Hill, 2006). In addition, their difficulties in understanding themselves and their environments and in making efforts to adjust to the environments worsen their internalizing problems such as withdrawal, anxiety, and depression as well as externalizing problems such as showing aggressive and impulsive behavior (Shepherd, 2010).

The ability to make a judgment about oneself and one's environment and to choose between a desirable behavior and an undesirable behavior can be improved through instruction on self-determination, which means *acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influence or interference*. (Wehmeyer, 1996, p. 22). Self-determination, which enables students to adjust their goals and behaviors according to their circumstances, can be promoted through repeated learning (Carter, Lane, Pierson, & Glaeser, 2006; Wehmeyer, Field, Doren, Jones, & Mason, 2004). Students with disabilities who exhibit problem behavior will acquire not only an awareness of situations but also self-management of their behavior if we provide ongoing opportunities to determine their behavior and to anticipate the results of it.

The impulsivity, lack of self-control, and aggressiveness that the students with disabilities show may hinder their ability to participate in the activities that occur in their classrooms. Due to their problem behaviors, they experience frustration and refusal in their classrooms that, in turn, leads to inappropriate behavior (Rogevich & Perin, 2008). After all, this vicious cycle keeps them from being engaged in class activities. Because most of teachers' time in class is devoted to behavior management, actual time and opportunities for instruction is significantly reduced for these students. This problem becomes more

serious when these students enter middle schools where academic tasks are very demanding and individual attention from teachers and families are reduced (O'Shea, O'Shea, Algozzine, & Hammitte, 2001; Seyfried & Chung, 2002). Consequently, their participation in class becomes more limited than before.

The Self-Determination Learning Model of Instruction (SDLMI) is an innovative instruction model that enables teachers to achieve educational goals and students to employ self-regulated problem-solving strategies and to achieve self-selected goals. The model consists of 1) setting a goal 2) taking action and 3) adjusting the goal and plan (Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000). The principle of this model is that teachers encourage students to analyze problematic situations using a problem-solving process and to deal with it in a self-directed way. When applied to students with disabilities who exhibit problem behaviors, this model would help them to heighten their awareness of their environment, to choose to engage in a desirable behavior, and to learn how to express their needs and interests in an appropriate way through setting goals and implementing the problem-solving processes by themselves. In each instructional phase of the SDLMI, a teacher asks questions and works with students to answer them, which optimizes students' communication skills including expression and comprehension abilities. In this aspect, applying the SDLMI in language classes seems to have synergistic positive effects considering that these classes are organized to enhance language use, communication, meaning, expression, and comprehension abilities. In Korea, students with disabilities who attend general middle schools usually come to resource rooms to work with special educators on Korean language and math while they are included in general classrooms for studying other subject areas. Therefore, Korean language class is one of the best opportunities for special educators to apply the SDLMI.

In addition, family involvement in the SDMLI process would be conducive to the generalization of new skills learned in schools considering that the ultimate goal of the SDLMI is to have students apply self-directed learning strategies to their daily lives. When families work collaboratively with schools as partners for the education of their children, the achievement of their children can be improved in a meaningful way. This is because students spend most of their time either in school or at home and their experiences in these places significantly influence their behavior and learning (Cole, 2007; Epstein & Salinas, 2004; Lam, 2005). Research has shown that family involvement is closely related with academic achievement (Callahan, Rademacher, & Hildreth, 1998), desirable attitudes, and peer relationships (Carter & Horner, 2007; Epstein & Salinas, 2004; Greene & Tichenor, 2003; Patton, Jayanthi, & Polloway, 2001; Sinclair & Christenson, 1992). Though many theoretical papers emphasize the importance of family involvement in teaching self-determination for students with disabilities (Brotherson, Cook, Erwin, & Weigel, 2008; Peralta & Arellano, 2010), the number of existing experimental studies involving families in the SDLMI process is very limited. When teachers and parents provide consistent guidance for the self-determined way of learning, however, the behavior and learning of the students with disabilities are significantly enhanced. The purpose of this study was to evaluate the effects of the family-involved SDMLI on academic engagement and goal attainment of middle school students with disabilities who exhibit problem behavior.

Method

Participants

Twenty-four middle school students with disabilities who exhibit problem behavior participated in the study (12 in the experimental group and 12 in the control group). The students were recruited from 11 general middle schools located in Seoul, Korea. The students were educated in general classrooms half of the time and were taught by special educators in self-contained classrooms for the other half of the time. The selection criteria for participating students were as follows: (a) getting a score of 63 or above on the internalizing behavior scale or the externalizing behavior scale of the K-CBCL (Korean-Child Behavior Checklist; Oh, Lee, Hong, & Ha, 1997), (b) having no previous instruction related with self-determination, and (c) showing at least a 90% turnout rate in the previous semester. Table 1 provides information about students' characteristics.

The teachers of the students were also participants of this study. Because some students belonged to the same teachers, the number of teachers (i.e., 11) was less than the number of students. Table 2 shows information about the teachers. The teachers in the experimental group played a role in the implementation of the intervention and behavior rating while those in the control group participated only in behavior rating.

The family members of the students in the experimental group also participated in the study. There were ten mothers, one father, and one grandmother and their ages ranged from 39 to 72 years.

Table 1. Participant Information (Students)

Experimental Group					Control Group				
Code	Sex	Grade	Disability	K-CBCL	Code	Sex	Grade	Disability	K-CBCL
A	M	8	ID	71 (E)	a	F	8	ID	75 (E)
B	M	8	ID	65 (I)	b	M	8	ID	63 (I)
C	F	9	ID	66 (E)	c	F	7	ID	64 (E)
D	M	7	ID	63 (E)	d	F	7	ID	65 (E)
E	F	9	ID	63 (E)	e	M	8	ID	66 (E)
F	M	9	ID	63 (E)	f	M	9	ID	65 (E)
G	F	9	ID	68 (I)	g	M	9	ID	65 (I)
H	M	9	Autism	73 (E)	h	M	9	Autism	76 (E)
I	M	9	Autism	66 (E)	i	M	8	Autism	63 (E)
J	F	8	ID	65 (I)	j	M	9	ID	63 (I)
K	F	7	ID	66 (I)	k	M	7	ID	65 (I)
L	M	8	ID	64 (E)	l	M	8	ID	67 (E)

Note. ID = intellectual disability, E = externalizing problems T score, I = internalizing problems T score.

Table 2. Participant Information (Teachers)

Experimental Group				Control Group			
Name	Sex	Career[a]	Students[b]	Name	Sex	Career	Students
InHee	F	23	A	AeJung	F	21	e, k, l
JiEun	F	3	B, C	DoYun	F	25	i
HyeRim	F	24	D, E, F	SuJin	F	20	j
Young	F	7	G, H, I, J	Min	F	20	f, g
Hyun	F	3	K, L	WonJu	F	7	c, d
				SunWoo	F	18	a, b, h

[a] # of years for which the teacher has been working as a special education teacher. [b] the code of the participating students (specified in Table 1) that the teacher was in charge of.

Dependant Variables

Academic Engagement Behavior. Both a behavior checklist and direct observation were used to measure the students' academic engagement behavior. The items of the checklist were drawn from the literature on academic engagement and revised based on the reviews from ten secondary special education teachers and nine special education researchers. The items are shown in Appendix A. The checklist is a 3-point Likert scale and includes eight domains: attention, task participation, activity participation, presentation, note taking, reading, attitude, and material preparation.

Direct observation data were collected on four behaviors to measure academic engagement behavior: attention, task participation, activity participation, and presentation. Attention was defined as participants facing either the teacher and instructional materials or a peer's presentation. Task participation was defined as participants performing individual tasks and asking for help with the tasks. Activity participation was defined as participants taking part in class activities. Presentation was defined as participants speaking about the tasks that they have done and responding to the teachers' questions. The behaviors were recorded using a partial 15-s interval recording procedure (10-s of observation and 5-s of recording).

Goal Attainment. The Goal Attainment Scale (GAS) developed by Kiresuk, Smith, and Cardillo (1994) was used to measure students' goal attainment in Korean language. Five levels of performance were identified by the special education teachers based on each student's IEP goals and objectives in Korean language. That is, based on the IEP objectives (*adequate and acceptable outcome*), teachers identified a *less favorable outcome*, *least favorable outcome*, and then *more favorable outcome*, and *most favorable outcome*. The GAS was measured for five times throughout the experiment (pretest, three times during intervention, and posttest).

Independent Variable

The family-involved SDLMI conducted in this study consisted of two phases: the preparation and the implementation phase. The core contents of the SDLMI were based on Agran, Blanchard, & Wehmeyer (2000), Agran, Cavin, Wehmeyer, & Palmer (2006), and Wehmeyer, Palmer, et al., (2000), but additional components were added to involve families.

Preparation Phase. In this phase, various forms and instructional materials to be used during the implementation phase were constructed and training for teachers and families was provided. First, the activity sheets and worksheets for the students, the objective checklist for the teachers, and the CICO (Check-in & Check-out) cards for the families were constructed. A website was created and used to distribute these forms and materials to the teachers.

Second, training was provided to the teachers of the experimental group in order to prepare them for the SDLMI application. Two, 70-minute sessions of teacher training were conducted by the first author. The teacher training addressed (a) the relationship between behaviors and learning, (b) the importance of family involvement for middle school students with disabilities, (c) the introduction of the SDLMI, (d) instructional strategies to be used in the family-involved SDLMI for Korean language classes and, (e) how to prepare families for the intervention.

Third, family training was provided by the teachers of the participating students. In the training, homework sheets, activity sheets, and activity folders were presented to the families with a description of the SDLMI procedures and explanations about family roles during the procedure. Also, teachers and families discussed the target behavior included in the CICO card and agreed upon 3-4 target behaviors for the cards. About half of the target behaviors were the behaviors students exhibited at home and the other half were the behaviors students exhibited at school.

Implementation Phase. In this phase, the special education teachers from the experimental group applied the SDLMI in Korean language classes. The students were taught how to set a goal (Step 1), take action (Step 2), and adjust the goal and plan (Step 3) using 12 questions (See Table 3). These questions enabled students to identify the problem related to their learning and behavior in Korean language classes, explore solutions, and evaluate the solutions. The 12 questions were written on the student worksheets so that the students could refer to them as needed. Instructional materials such as activity sheets for Korean language classes were continuously offered to these teachers using the website.

Table 3. The 12 Questions Used in the SDLMI Implementation Phase

Step	Questions
Set a goal	• What do I want to learn in this Korean language class? • What do I know about it now? • What must change for me to learn in Korean language what I don't know? • What can I do to make this happen?
Take action	• What can I do to learn what I don't know? • What could keep me from taking action? • What can I do to remove these barriers? • When will I take action?
Adjust the goal and plan	• What action have I taken? • What barriers have been removed? • What has changed about what I don't know? • Do I know what I want to know?

The families of the experimental group were involved in three ways. First, the families helped and checked their child's homework assigned by the special education teachers during Korean language classes. Second, the families had conversations with their children about what they had learned in Korean language classes using the activity sheets that the children brought home. After the conversations, the families signed the activity sheets and the students brought them back to school the next day. Special education teachers compiled the activity sheets and homework signed by the families in the students' folders. At the end of each week, the teachers had students mark the number of family signatures on their self-monitoring forms. Third, the families marked on the CICO card if their children showed the target behavior at home and signed it. The families also praised their children if the CICO card showed that their children demonstrated the target behavior at school.

Procedures

All the procedures of this study were implemented in the self-contained classrooms where the participating students spent some hours of the day with their special educators. This intervention was implemented for seven months. A pretest-posttest control group design was used to investigate the effects of the family-involved SDLMI on academic engagement behavior and goal attainment in middle school students with disabilities who exhibit problem behavior.

Pretest. A pretest on academic engagement behavior and goal attainment was conducted within one week before the intervention began. The checklist on academic engagement behavior was completed by the teachers. The teachers from the experimental group completed the checklist at the first teacher training session and the teachers from the control group completed the checklist via e-mail. For direct observation, two, 45-minute classes for each student were videotaped. The first 20 minutes, minus the first 5 minutes of the class, was used for partial interval recording. The teachers of both groups measured their students' current level in Korean language using GAS.

Intervention. The students, their families, and their teachers from the experimental group participated in the family-involved SDLMI while those of control group did not. In the preparation phase, training was provided to the teachers and families and the forms and materials were made. In the implementation phase, special education teachers applied the SDLMI to Korean language classes. Students were taught the three steps of the SDLMI (set a goal, take action, and adjust the goal and plan) and were supported by the teachers to practice the steps independently when they were doing tasks (i.e., activity sheets) in the class. The families from the experimental group were involved in homework assistance, engaged in conversations using the activity sheets, and applied CICO.

During intervention, the Goal Attainment Scale (GAS) was conducted three times to see the trend of the students' progress. A reminder call was made to each teacher to gather the GAS data in time.

Posttest. The behavior checklist rating, direct observation, and GAS rating were conducted one week after the intervention was terminated. The procedures were the same as in the pretest.

Social Validity

All of the experimental group members including students with disabilities, families, and special education teachers were asked to report their perceptions about the intervention at the conclusion of the study. Teachers and families responded to the intervention rating profile (IRP-15) developed by Gureasko-Moore, Dupaul, and White (2006). The IRP is 6-point Likert scale and includes 15 items. An average of 4 or above is regarded as acceptable according to this scale. The average teacher rating was 5.19 and the average family rating was 5.47.

The students responded to five questions (*I learned how to solve problems*. *I learned that I didn't know*. *I learned that I wanted to learn*. *I had fun in Korean language classes*. and I would like to use this method in future Korean language classes.) using a 3-point scale. The average from the student responses was 1.62.

Intervention Integrity

Intervention integrity was self-monitored by the teachers and families using a checklist. The teacher integrity checklist included 13 items and the family integrity checklist included 10 items regarding the SDLMI procedures and teacher-family collaboration. Intervention integrity was measured for 20% of the sessions. Intervention integrity scores were 81.03% for teachers and 80.23% for families, which were fairly high for both groups.

Inter-observer Agreement

Because direct observation was used to measure academic engagement behavior, agreement data among observers were calculated in around 25% of the observation sessions. The first author and a trained graduate student independently recorded the target behaviors. The percentage of agreement was computed by dividing the total number of agreement by the total number of agreements plus disagreements and multiplying by 100. The range of the agreement was between 90% and 94%.

Data Analysis

An independent t-test was used to see if there were any differences between groups in behavior rating, direct observation and GAS. In addition, the trend of the students' progress in the experimental group was summarized using a graph.

Results

Academic Engagement Behavior

The means and standard deviations of academic engagement behavior were measured according to the checklist for the two groups before and after the intervention. These measurements are shown in Table 4. An independent t-test was conducted to compare the changes in scores of the experimental group and the control group. There was a significant increase in academic engagement behavior in the experimental group compared to the control group ($t=2.29$, $p<.05$).

Table 4. Academic Engagement Behavior Measured by Checklist

	Experimental Group [a]		Control Group [b]		*t*
	M (SD)		M (SD)		
Attention	.67	(.65)	.17	(.58)	1.99
Task participation	1.00	(.74)	.17	(.58)	3.08**
Activity participation	.58	(.69)	.08	(.51)	2.05
Presentation	.50	(.67)	.17	(.39)	1.48
Note taking	.25	(.45)	.00	(.43)	1.39
Reading	.33	(.78)	.42	(.79)	-.26
Attitude	.17	(.39)	.17	(.58)	.00
Material preparation	.67	(.65)	.42	(.67)	.93
Total	4.00	(2.22)	1.67	(2.74)	2.29*

Note. $n^a=12$ $n^b=12$ $^*p<.05$ $^{**}p<.01$

Table 5 shows the means and standard scores of academic engagement behavior measured by the direct observation of the two groups. The difference between the mean change in score of the experimental group and the control group was significant ($t=5.54$, $p<.01$). From the two, independent, t-test results, it can be concluded that the intervention had positive effects on students' academic engagement behavior.

Table 5. Academic Engagement Behavior Measured by Direct Observation

	Experimental Group [a]		Control Group [b]		*t*
	M (SD)		M (SD)		
Attention	14.10	(13.10)	3.13	(13.14)	2.05
Task participation	13.12	(20.68)	-12.60	(17.12)	3.32**
Activity participation	-1.05	(20.94)	3.13	(14.00)	-.57
Presentation	8.59	(9.79)	.99	(1.47)	2.66*
Total	34.77 (19.73)		-5.26 (15.37)		5.54***

Note. $n^a=12$ $n^b=12$ $^*p<.05$ $^{**}p<.01$ $^{***}p<.001$

Goal Attainment

As shown in Table 6, there was a significant difference in goal attainment between the two groups ($t=3.12$, $p<.01$). The students in the experimental group showed significantly higher attainment in Korean language compared to those in the control group.

Table 6. Goal Attainment

	Experimental group [a]	Control group [b]	*t*
	M (SD)	M (SD)	
Goal attainment	55.00 (7.98)	44.17 (9.00)	3.12**

Note. n^a=12 n^b=12 **p<.01

Figure 1 shows the progress of the students in the experimental group in their goal attainment of Korean language. The students in the experimental group showed a gradual increase as the intervention proceeded. Ten students among 11 in the experimental group reached an acceptable score (50 points).

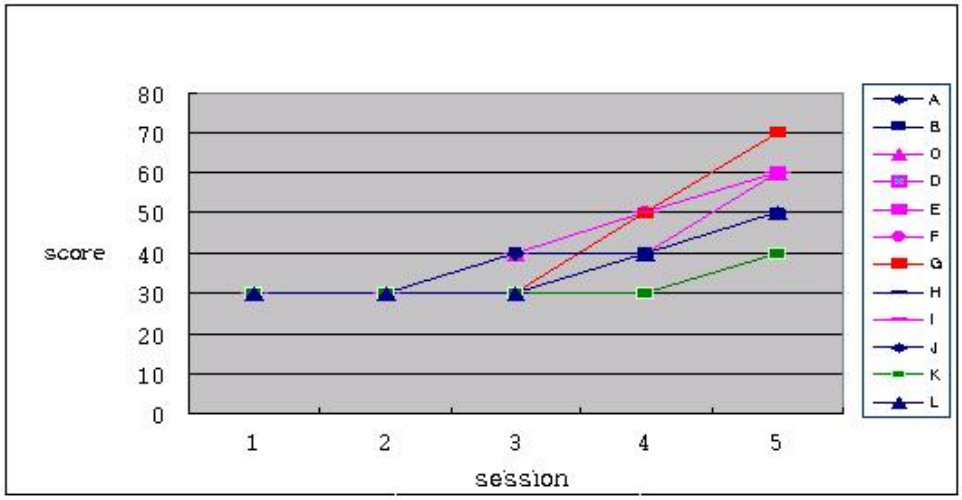

Figure 1. Progress of the students in the experimental group in the goal attainment of Korean language

Discussion

The Effect of the Family-Involved SDLMI on Academic Engagement

The findings of the present study showed that the Family-Involved SDLMI had positive effects on students' academic engagement. Both in teachers' ratings and direct observation, there was a statistically significant difference in students' academic engagement behavior between groups. The result is consistent with previous findings on the effectiveness of the SDLMI and family involvement on students' academic engagement behavior (Agran, Wehmeyer, Cavin, & Palmer, 2008; Linnenbrink & Pintrich, 2003; Woolley, Kol, & Bowen, 2009).

In the classes where the teachers guided the three stages of the SDLMI, the participating students who exhibited problem behavior had a chance to think and to plan what to do as well as to regulate their own learning in the classes. The students actively tried not to be engaged in disruptive behavior that they had shown in the past, such as daydreaming or shaking their legs, after their teachers had given them a simple reminder of the goal they had set. The teachers encouraged the students to discover their own strengths and to utilize them in the three stages of the SDLMI. Through these procedures, the students experienced self-confidence and a sense of accomplishment, and this in turn heightened their attention and participation in classes (Linnenbrink & Pintrich, 2003).

This study extends the SDLMI literature in that it involved families in the effort. Families were able to participate in their children's learning process by providing support with their homework, checking students' activity sheets, talking about the activities with the students, and partnering with teachers using CICO. First, because the opinions from the students and their families were incorporated in the content of the homework, the families were actively engaged in providing support with homework. As a result, this developed desirable learning habits for the students. Second, the families were informed of their children's learning at school through the activity sheets that their children brought home, which increased families' interest in the education of their children. Because the activity sheets included the

components of the SDLMI, the families were able to apply the model when they taught their children at home. By talking about what the students have learned at school using the activity sheets, the students had a chance to review the content of the classes and to get positive attention from their families. Third, the implementation of CICO between homes and schools helped the students maintain appropriate behavior across both settings through consistent feedback and reinforcement from both teachers and families, which supports the results of previous studies on CICO (Fairbanks, Sugai, Guardino, & Lathrop, 2007; Filter, Mckenna, Benedict, Horner, Todd, & Watson, 2007).

After the intervention was completed, the participating teachers commented that it was rewarding to see the students set a goal by themselves and become interested in their own learning even though it was not easy to help the students learn how to set appropriate goals, especially when the students were at the beginning level of Korean literacy. The teachers also pointed out that the students gained confidence as they presented their own strengths to others, implemented the plans they had made, and evaluated their plans. The teachers mentioned that the students continuously checked their own performance during the SDLMI procedure and tried to behave more favorably. The teachers were also satisfied with the family involvement component of the intervention. The teachers said that the combination of homework, activity sheets, and CICO facilitated families' involvement in the intervention and this ultimately improved both the behavior and the learning of the students. Also, teachers compiled all of the materials into individual folders for each student after the students brought the materials back to school, which saved them time in collecting data.

The participating families also reflected on their experiences after the intervention. All of the families were pleased to find out what their children learned and how their children behaved at school. The families also said that the materials that their children brought home informed them what they would need to teach to their children at home, which enforced their trust and appreciation for the teachers. Some families even called teachers to ask for the materials when their children forgot to bring them home, which demonstrated the families' strong acceptance of the intervention. Therefore, this study indicates that the families of middle school students with disabilities can actively participate in the effort to improve student learning and behavior when provided with concrete materials and specific guidance.

The Effects of the Family-Involved SDLMI on Goal Attainment of Korean Language

The results from this study support the efficacy of the family-involved SDLMI for students with behavioral concerns in goal achievement. There was a clear functional relationship between the intervention and the goal attainment of Korean language. Several factors of the intervention seemed to contribute to this result. First, the strategies used to involve the families such as checking the activity sheets, providing support with homework assignments, and using CICO enabled the families and special education teachers to be engaged in frequent communication. The families' involvement in conjunction with active communication between the school and home are known to contribute to students' self-motivation and self-esteem which are important factors for students' academic achievement. Second, the students focused on the goals that they had set in the first stage of the SDLMI procedure, which resulted in the students investing more efforts in achieving their goals. The self-management strategies that were introduced, as a part of the SDLMI, also facilitated students' self-regulation of their learning and behavior (Jitendra, Hoppes, & Xin, 2000; Palmer, Wehmeyer, Gipson, & Agran, 2004; Rock & Thead, 2007). Third, the students had a chance to discover their own strengths and weaknesses and present them to others during the SDLMI procedure, which provided the students with achievement motivation and self-esteem. These positive internal feelings paired with many opportunities to respond and positive reinforcement from teachers seemed to produce improved outcomes in students' Korean language.

This study also analyzed the progress in goal attainment by examining the data taken five times (pretest, three times during intervention, and posttest). The students in the experimental group showed steady improvement as the intervention proceeded. The improvement was somewhat slow in the beginning stage of the intervention because students needed some time to adjust to the class format using the SDLMI and because teachers also needed some time to become accustomed to using the SDLMI procedure skillfully. This indicates the importance of long-term intervention for this population in order to bring about a satisfactory level of goal attainment.

It is worth mentioning the one and only student in the experimental group who did not reach an acceptable level of goal attainment. Because the intervention integrity of her teacher and family was quite high, her underachievement could be explained by her individual characteristics rather than by the intervention itself. Because the student had internalizing problem behaviors, she did not exhibit much

problem behavior when taught one-on-one with the teacher. However, when the teacher tried to elicit a response from her and to keep her attention, she was unwilling to participate. Hence, there is a need for future studies to find a more appropriate approach for those who have passive learning styles.

Limitations of the Study and Implications for Future Research

In spite of achieving the desired changes both in academic engagement behavior and goal attainment, this study is limited in some regards. First, the number of participants was not sufficient enough to generalize the results of this study. Second, family variables such as parenting styles and home environments could not be controlled entirely for practical reasons, although efforts were made to ensure the homogeneity between the two groups. Third, the intervention has multiple components (i.e., family involvement and the SDLMI), which made it difficult to separate the effects of one component from the other. Fourth, although efforts were made to maintain the integrity of the intervention among teachers through teacher training and utilizing the teacher integrity checklist, differences in teacher variables such as instructional styles and interactional patterns with their students could have influenced students' performance.

The results of this study leave questions for future researchers to investigate. First, future research might consider applying the family-involved SDLMI across a wide variety of students with varying age range and different types of disabilities and including additional subject areas other than Korean language. Second, future studies might investigate the effectiveness of the family-involved SDLMI in general classrooms where students with disabilities are included. Because students with disabilities spend considerable time in general classrooms everyday, the behavior and learning of the students could be optimized if we can involve general education teachers as well. In this way, the effect of the intervention would be generalized across all settings and with all teachers. Finally, a qualitative or mixed-method study could be considered in future research in order to examine changes in competence and confidence that students, families, and teachers experienced over the course of the intervention.

In summary, this study provides preliminary support for the family-involved SDLMI as an effective intervention for middle school students with disabilities who exhibit problem behavior. The intervention led to improvements in academic engagement behavior and goal attainment. Although many teachers concentrate most of their efforts on behavioral interventions for students' problem behavior, quality educational instruction can be the most desirable and productive prevention and intervention strategy for students with problem behavior (Gable, Hendrickson, Tonelson, & Van Aker, 2002). When this effort for instruction is supported by families, more benefits for students can be expected. Given the fact that there have been few studies that have implemented the SDLMI in collaboration with families, this study adds significantly to current literature.

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Appendix A. Academic Engagement Behavior Checklist

domain	item	score
attention	Student voluntarily watches the presented materials in class.	2
	Student watches the presented materials in class when teacher directs.	1
	Student looks other place or is engaged in the behavior irrelevant to the class.	0
task participation	Student voluntarily performs tasks (including 'asking for help')	2
	Student performs tasks when teacher provides verbal or physical prompt.	1
	Student does not perform a task in spite of teacher's prompt.	0
activity participation	Student voluntarily participates in class activities.	2
	Student participates in the activities when encouragement from teacher or peers is given.	1
	Student refuses to participate in class activities.	0
presentation	Student voluntarily presents in class.	2
	Student gives a response when teacher gives a chance.	1
	Student speaks something that has nothing to do with class.	0
note taking	Student takes note in class (including copying others' note when the student does not have enough writing skills).	2
	Student takes note with teacher's prompt.	1
	Student doodles in class and the content is not related to the class.	0
reading	Student reads with proper volume of voice in class.	2
	Student reads with help from teacher or peers.	1
	Student does not read in class when teacher directs, student reads too loud	0
attitude	Student sits properly on a chair.	2
	Student sits on a chair, but with improper posture (e.g., shaking his/her legs).	1
	Student stands up or goes around without teacher's permission.	0
material preparation	Student prepares materials required for the class.	2
	Student prepares materials for the class, but forgets to bring them from home from time to time.	1
	Student does not prepare materials.	0