

How do Teacher Structure and Autonomy-support Affect Learners' Perceived Psychological Needs, Engagement and English Proficiency?

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This study investigated how teacher structure and autonomy-support in English instruction affect learners' perceived needs, engagement and English proficiency for Japanese learners of English, as well as how relevant variables are related, in the framework of the self-system model of motivational development (SSMMD). A survey was conducted with university students ($n = 84$) in the 2021 fall semester in western Japan. The questionnaire in a 6-point-Likert-scale ($k = 55$) retrospectively inquired into variables in three components of SSMMD, i.e., teacher ($k = 20$), self-perceptions ($k = 12$), engagement ($k = 22$), in their senior high English classes, and English proficiency ($k = 1$) at their entrance into university. The data were examined with correlation, SEM and path analyses, mainly showing: (a) teacher autonomy-support predicts learners' perceived needs, engagement and English proficiency in this order for Japanese learners of English; and (b) teacher structure affects them more than autonomy-support in a causal relationship of teacher structure, learners' perceived competence, cognitive engagement and English proficiency in this order.

1. Introduction

English teachers experientially know that students are learning things when they are engaged in activities and tasks in the classroom, which is supported by research showing an important role that engagement plays in positively affecting their academic performance as well as their psychological well-being (Fredricks, et al., 2004; Shernoff, et al., 2017). Here, engagement means how learners are involved and feel during a learning task (Reeve, et al., 2004, p. 147). Consequently, it is suggested that learners' engagement in the classroom helps develop their English proficiency, raising questions concerning how we can enhance students' engagement in our English instruction and what variables are involved and related with their engagement. In answering these questions, an appropriate framework may be the self-system model of motivational development (SSMMD; Skinner, et al., 2008) because this model addresses a causal relationship between relevant variables including teaching, which is not taken into account in other models, as follows: instruction \rightarrow psychological needs \rightarrow engagement \rightarrow learning. In this framework, this study looks into causal relationships between the variables for Japanese learners of English.

2. Literature Review

2.1 Engagement

Engagement, pertaining to students' involvement and feelings while they are learning, is a meta-concept composed of behavioral, emotional and cognitive engagement. According to Dincer, et al. (2019a), behavioral engagement means learners' behavior observed in learning such as raising hands, talking about a task topic in groups and doing homework. Emotional engagement refers to how learners feel in learning. They usually show positive feelings such as pleasantness and joy when emotionally engaged. Cognitive engagement concerns how deeply learners are involved in learning. They are likely to use self-regulation strategies and sophisticated learning strategies such as self-testing and self-explaining when cognitively engaged. More recently, agentic engagement (Reeve & Tseng, 2011) was added to them as a fourth component of engagement, regarding learners' initiative for the betterment of their learning. Learners may make comments and suggestions for instruction when agentially engaged.

Engagement has been shown to be affected by psychological needs for autonomy, competence and relatedness (Dincer, et al., 2019a; Dincer, et al., 2019b; Noels, et al., 2020; Reeve, et al., 2004; Reeve & Tseng, 2011). When these psychological needs are met, learners are more likely to be engaged. This relationship between engagement and psychological needs may remind you of that between intrinsic-extrinsic motivation and psychological needs revealed in the self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000a, 2000b), suggesting that teachers should develop learners' extrinsic regulations toward intrinsic motivation because intrinsic rather than extrinsic motivation helps promote learning (La Guardia & Ryan, 2002). SDT also acknowledges that this motivational development is usually accompanied by the fulfilment of those psychological needs (Ryan & Deci, 2000a, 2000b). Moreover, the theory addresses a model explaining relationships between learners' motivation, psychological needs, engagement and learning outcomes in their contexts (Noels, et al., 2020).

However, this model's main interest naturally lies in learners' motivational orientations and psychological needs, without paying much attention to what role teaching plays in the development of learners' motivational system. Instead, SSMMMD (Skinner, et al., 2008), whose correspondence with the model is acknowledged in SDT, seeks to account for a causal relationship between teaching, learners' perceived psychological needs, engagement and learning outcomes in this order. This framework is appropriate in investigating how engagement mediates between English teaching that affects learners' psychological needs, and English learning.

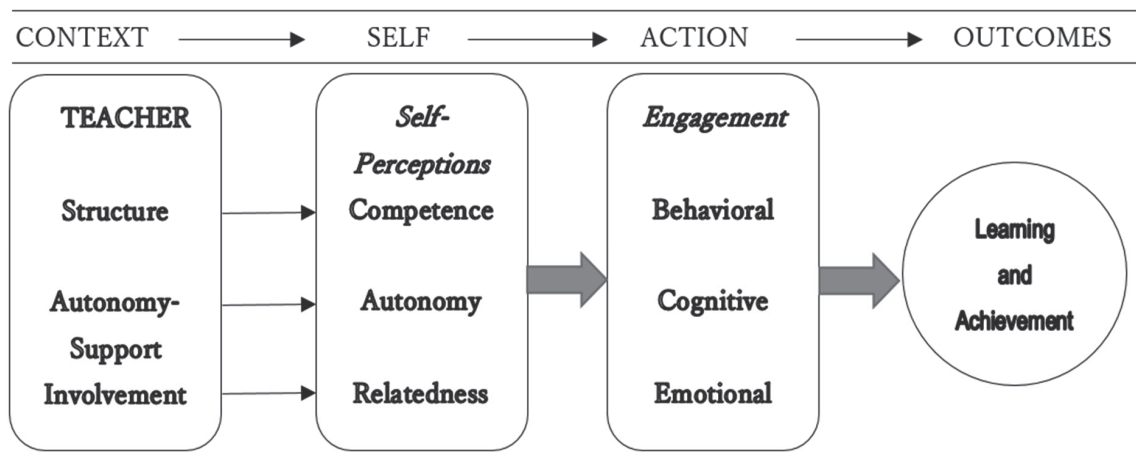
2.2 Self-system Model of Motivational Development (SSMMMD)

SSMMMD (Figure 1) displays how learner motivation is developed in teaching, revealing a causal relationship between four components, which are context, self, action and outcomes. Here, self-system means a collection of one's perceptions (Clark, 2014). Context on the left pertains to instruction, consisting of three teacher variables, i.e., structure, autonomy-support and involvement. The second component, self, concerns learners' perceptions of competence, autonomy and relatedness, respectively representing their psychological needs for competence, autonomy and relatedness. The third component, action, regards how learners are engaged in learning, behaviorally, cognitively and emotionally. The fourth component, outcomes, is about what learners have learned and achieved.

This model addresses a threefold account of causal relationships between the components. First, structure in the context refers to information, guidance and feedback given by teachers (Dupont, et al., 2014) or simply said teaching. It can affect learners' perceived psychological need for competence. When they feel competent, learners are likely to be engaged in activities and tasks, leading to their learning. This account is in line with a bundle of self-efficacy research that Bandura and his colleges conducted (Bandura, 1977, 1989, 1999, 2012; Bandura & Schunk, 1981).

Next, autonomy-support literally means teachers' behavior trying to support and develop learners'

Figure 1.
The Self-system Model of Motivational Development



Notes: This figure is adapted from “Engagement and disaffection in the classroom: Part of a larger motivational dynamic?,” by E. Skinner, et al., 2008, *Journal of Educational Psychology*, 100, pp. 765-781. Copyright 2008 by the American Psychological Association; Context includes parents, peers, school and neighborhood community as well as teachers.

autonomy. This variable may have an impact on learners' perceived psychological need for autonomy. When autonomous, learners can be more engaged in their work, which may result in achieving some learning goals. Third, involvement means teachers' behavior trying to get involved with learners in teaching by working together and giving help. This variable can influence on learners' perceived psychological need for relatedness. When connected, learners may engage themselves more in activities and tasks, which may generate their learning.

Research on engagement in general academic learning has acknowledged relationships between teaching and learners' engagement, between learners' perceived psychological needs and engagement, and between learners' engagement and learning outcomes and well-being (Dincer, et al., 2019a; Dincer, et al., 2019b; Dupont, et al., 2014; Fredricks, et al., 2004; Shernoff, et al., 2017; Skinner, et al., 2008), which is generally in line with the framework of SSMMD. For example, Fredricks, et al. (2004) reviewed 44 studies pertaining to engagement in learning, which were conducted in a variety of researching methods, including cross-sectional and longitudinal surveys, multimethod studies, case studies and ethnographic studies. Most of the reviewed studies show one or two causal relationships between the components, i.e., instruction, learners' perceptions, engagement and learning outcomes, of SSMMD, even though relationships between variables of the components have not been consented because of their multidimensional and situated nature.

Research on engagement and SSMMD in the field of language learning is still in its burgeoning stage. Although well-studied concepts such as motivational intensity and attitudes toward learning English may be similar to behavioral and emotional engagement respectively (Dincer, et al., 2019b), much research has not been conducted. It centers on self-determined motivational orientations, usually accompanying a certain level of fulfillment of learners' psychological needs, a vital component of SSMMD. Noels (2009) shows that intrinsic orientation positively affected university students' engagement in English learning. Chen and Kraklow (2014) reveal that intrinsic motivation as well as extrinsic orientation predicted behavioral engagement of EFL university students in Taiwan. Noels, et al. (2019) report that university students' motivation and behavioral engagement affected each other in a French course. McEown, et al.

(2014) show that self-determined orientations predicted learning engagement and outcomes for Japanese EFL learners. Zhang, et al. (2017) indicate that engagement mediated between learners' motivation and learning outcomes. Moreover, Oga-Baldwin and Nakada (2017) report a reversely directed influence of English learning engagement on intrinsic motivation for Japanese elementary school students, pointing out the significance of teacher autonomy-support in enhancing learners' engagement.

The importance of teacher autonomy-support has been also underscored in other studies, implying that teacher autonomy-support in student-centered instruction may be key to meet learners' psychological needs, affecting their engagement (Dincer, et al., 2019a; Dincer, et al., 2019b; Jang, et al., 2010; Ryan & Deci, 2000, Thaliar & Hashim, 2008). Empirically, Thaliar and Hashim (2008) report that teacher autonomy-support predicted Malaysian ESL students' behavioral and cognitive engagement. Dincer, et al. (2019a) reveal a causal relationship between teacher autonomy-support, learners' perceived psychological needs and engagement in this direction for adult learners of English in Turkey. Dincer, et al. (2019b) show that teacher autonomy-support predicted Turkish EFL learners' psychological needs, affecting their self-determined engagement, which finally led to their learning outcomes.

So far, research on engagement and SSMMD has unveiled that learners' self-determined orientations positively affect engagement, implying a causal relationship between learners' perceived psychological needs and engagement. Also shown is an important role that teacher autonomy-support plays in the framework of SSMMD. However, these research findings have not been examined much in the field of ELT in Japan. Moreover, the second finding may not be smoothly taken in here because English has been traditionally taught in a teacher-centered manner. Although English teaching practitioners may have acknowledged the significance of enhancing learners' autonomy under a slogan of the Ministry of Education, Culture, Sports, Science and Technology (MEXT, 2017, 2018) to promote *proactive, interactive and deep learning*, it is widely known that teacher autonomy-support in a student-centered instruction has not prevailed yet.

3. Study

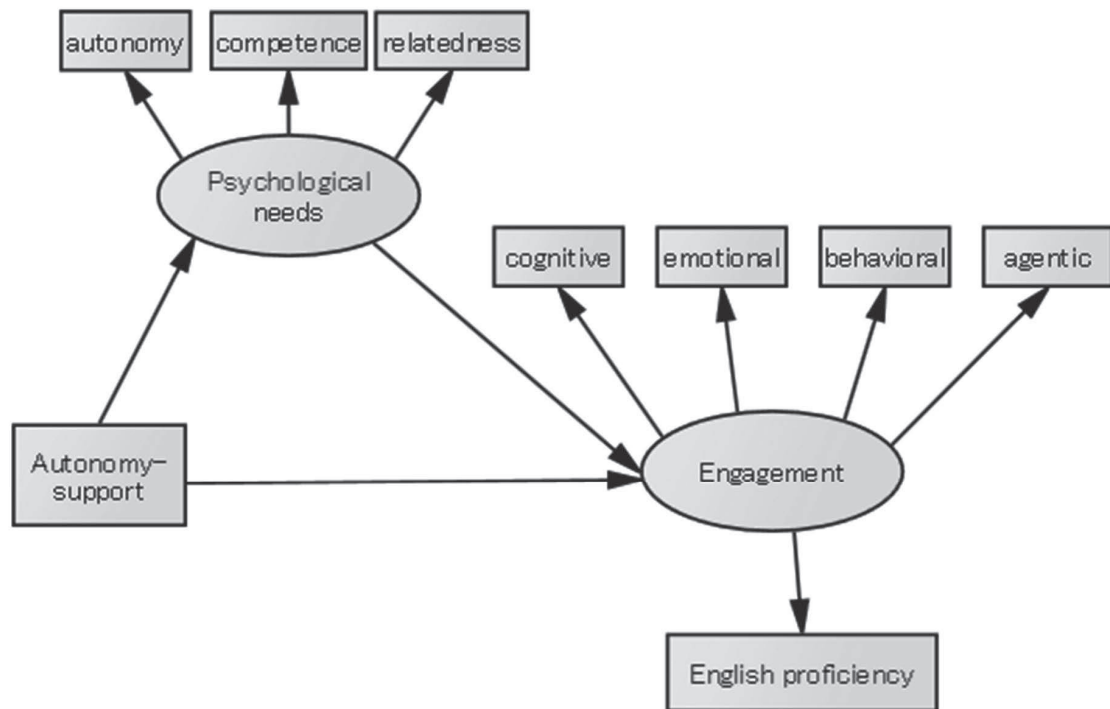
Despite the aforementioned research, it has not fully shown what teacher variables help enhance learners' perceived psychological needs and engagement, particularly here in Japan, nor what type of engagement is more likely to improve English proficiency. In the course of answering these questions, this study sought to examine causal relationships of teacher structure and autonomy-support with learners' perceived psychological needs, engagement and English proficiency in the framework of SSMMD. The reason for examining teacher structure as well as autonomy-support lay in a more vital role that structure was assumed to play than autonomy-support in teacher-centered instruction of English in Japan.

First, Japanese learners' perceptions of teacher variables, their perceived psychological needs, engagement and English proficiency were looked into. Second, it was examined whether teacher autonomy-support predicts learners' perceived psychological needs, engagement and English proficiency in this order in a hypothesized structural equation modeling (SEM; Figure 2). Third, it was exploringly investigated how teacher structure affects variables of learners' perceived psychological needs, engagement and English proficiency.

Consequently, concerning Japanese learners of English, research questions were addressed as follows: (1) how are learners' perceptions of teacher variables, their perceived psychological needs, engagement and English proficiency?; (2) does teacher autonomy-support predict learners' perceived psychological needs, engagement and English proficiency in this order?; (3) how does teacher structure causally affect variables in learners' perceived psychological needs, engagement and English proficiency in this order?

Figure 2.

Hypothesized Autonomy-support Model



4. Method

4.1 Participants

The participants were 84 university students, mainly sophomores, majoring and minoring in ELT, who took ELT certificate classes in the 2021 fall semester at a university in western Japan. Before the survey was taken, they were informed of its purposes and our ethical treatment of the data, to which the students gave consent.

4.2 Survey

The questionnaire survey was performed at the end of the classes. In the survey, they were retrospectively inquired as to their English learning at their senior high schools, using a 59-item 6-point-Likert-scale questionnaire in Japanese (Appendix), concerning three components, i.e., context (teacher), self (self-perceptions), action (engagement), of SSMMD (Figure 1), as well as the fourth component, outcomes (English proficiency), at their entrance into university.

The first component, teacher ($k = 24$), contained three variables, i.e., structure ($k = 4$; e.g. *The teachers helped us to improve.*), autonomy-support ($k = 15$; e.g. *The teachers provided us with choices and options.*), and involvement ($k = 5$; e.g. *The teachers were interested in us.*). These question items were based on the “Learning Climate Questionnaire” (Black & Deci, 2000; Standage, et al., 2005; Williams & Deci, 1996).

The second component, self-perceptions ($k = 12$), consisted of three variables, i.e., psychological need for autonomy ($k = 4$; e.g. *I could study without feeling pressed in class.*), that for competence ($k = 4$; e.g. *I felt a sense of accomplishment in class.*), and that for relatedness ($k = 4$; e.g. *I got along with other students in class.*), which were devised by Tanaka and Hiromori (2007).

The third component, engagement ($k = 22$), was composed of four variables, i.e., agentic engagement ($k = 5$; e.g. *I told the teacher what I liked and what I didn't like.*), behavioral engagement ($k = 5$; e.g. *I tried very hard in school.*), emotional engagement ($k = 4$; e.g. *I enjoyed learning new things in class.*), and cognitive engagement ($k = 8$; e.g. *When I studied, I tried to connect what I was learning with my own experiences.*), which were developed by Reeve and Tseng (2011).

The fourth component, outcomes, concerned the participants' English proficiency ($k = 1$) in terms of their self-reported *EIKEN* Grade levels at their university entrance. Their reported *EIKEN* Grade levels, which were below 3rd-G, about 3rd-G, about pre-2nd-G, about 2nd-G, about pre-1st-G or above pre-1st-G, were respectively converted into a six-point scale (e.g. one for below 3rd-G and six for above pre-1st-G).

4.3 Analyses

In order to answer the research questions, the following analyses were performed with the surveyed data. First, the descriptive statistics were looked into with correlation analysis for the first research question. Second, structural equation modeling (SEM) analysis was conducted for the second question to examine whether teacher autonomy-support predicts learners' perceived psychological needs, engagement and English proficiency in this order. Third, path analysis was performed to explore how teacher structure causally affects learners' English proficiency through the mediation of their perceived psychological needs and engagement.

5. Results and Discussion

5.1 Descriptive Statistics

Table 1 shows the participants' means, standard deviations, skewness, kurtosis and Cronbach's coefficients alpha of the variables surveyed in the questionnaire. They were reliable ($\alpha s \geq .70$) after items for structure and involvement were adjusted into three and four respectively. The data were balanced in terms of skewness and kurtosis ($z < 2.58$), except for English proficiency (skewness = -1.82, $z = 7.00$; kurtosis = 5.80, $z = 11.15$) and structure (skewness = -.73, $z = 2.81$). English proficiency had its scores centering on its median, 4, and lower scores were more frequent than higher ones, showing that their average English proficiency ($M = 3.86$, $SD = .64$) was close to 2-G level in *EIKEN* or B1 level in CEFR. Structure had its median and mode, 5, with more scores below the value.

In the component of teacher, all of the means of structure ($M = 4.91$, $SD = .61$), involvement ($M = 4.81$, $SD = .87$) and autonomy-support ($M = 4.31$, $SD = .73$) were higher. Seemingly, many of the students perceived that their English teachers were trying to teach and work with them fairly earnestly, at the same time trying to develop their autonomy. This may be different from a view of traditionally teacher-centered ELT in Japan, where learners are just passively taught.

In the second component, means for the students' perceived psychological needs for competence ($M = 4.66$, $SD = .75$) and relatedness ($M = 4.14$, $SD = 1.00$) were higher, and that for autonomy ($M = 3.50$, $SD = 1.03$) was not. However, since ranks of the means correspond to those of the teacher variables, it looks that the teacher and self-perceptions variables are related respectively between structure and competence, between autonomy-support and autonomy, and between involvement and relatedness, as addressed in SSMMD.

In the third component, means of behavioral ($M = 4.91$, $SD = .73$), cognitive ($M = 4.35$, $SD = .68$) and emotional ($M = 4.64$, $SD = .73$) engagement were higher, and that of agentic engagement ($M = 3.30$, $SD = .92$) was lower. Here, again, agentic engagement, which is conceptually more relevant to teacher autonomy-support and learners' perceived need for autonomy, appears to be related with these variables.

Table 1

Means and SDs for the Variables in SSMMD

	<i>k</i>	<i>M</i>	<i>SD</i>	<i>skewness</i>	<i>kurtosis</i>	<i>α</i>
<i>Teacher</i>						
(a) Structure	3	4.91	.61	-.73	1.10	.70
(b) Autonomy-support	15	4.31	.73	-.30	-.48	.88
(c) Involvement	4	4.81	.87	-.64	.43	.90
<i>Self-perceptions</i>						
(d) Competence	4	4.66	.75	-.49	-.21	.83
(e) Autonomy	4	3.50	1.03	.21	.04	.72
(f) Relatedness	4	4.14	1.00	-.36	-.81	.85
<i>Engagement</i>						
(g) Behavioral E	5	4.91	.73	-.42	-.38	.85
(h) Cognitive E	8	4.35	.68	.03	-.44	.79
(i) Emotional E	4	4.64	.73	-.43	.35	.74
(j) Agentic E	5	3.30	.92	-.12	-.90	.75
<i>Learning</i>						
(k) English proficiency	1	3.86	.64	-1.82	5.80	-

Notes: $n = 84$; E represents engagement; standard errors for skewness and kurtosis were .26 and .52 respectively; k s for structure and involvement were adjusted to achieve reliability, where structure item 4 and involvement item 2 in Appendix were excluded.

5.2 Correlations

In order to look into relationships between the variables, Pearson's product-moment correlation analysis was performed. First, the teacher variables, i.e., structure, autonomy-support and involvement, were significantly correlated with each other ($r \geq .62$, $p < .01$). Particularly, autonomy-support and involvement were correlated strongly ($r = .79$, CI [.68, .86], $p < .01$), implying that these two apparently conflicting variables share common elements to enhance learners' learning.

Second, structure and autonomy-support were moderately correlated respectively with learners' perceived competence ($r = .50$, CI [.31, .64], $p < .01$) and autonomy ($r = .51$, CI [.33, .65], $p < .01$), but involvement was not correlated with their perceived relatedness. The first two significant correlations confirm the relationships that were apparently seen in the descriptive statistics, in line with SSMMD. Also, autonomy-support was moderately correlated with learners' perceived relatedness ($r = .42$, CI [.22, .58], $p < .01$). This relationship and the non-relationship between teacher involvement and learners' perceived relatedness suggest that learners may feel more connected when teachers try to support and develop their autonomy than when teachers are actually working with them, complying with above-reviewed research underlining the importance of autonomy-support.

Third, the self-perceptions variables, i.e., learners' perceived needs for competence, autonomy and relatedness, were significantly correlated with each other ($r \geq .35$, $p < .01$). The small correlation between competence and autonomy ($r = .35$, CI [.14, .52], $p < .01$) may show that learners taught in usually teacher-centered instruction do not have to exercise autonomy much. Instead, the moderate correlations of relatedness with competence ($r = .46$, CI [.27, .61], $p < .01$) and autonomy ($r = .52$, CI [.34, .66], $p < .01$) may show the importance of learners' mental security. When securely connected with others,

Table 2
Correlations Between the Variables in SSMMMD

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
(a) Structure	-										
(b) Autonomy-support	.62**	-									
(c) Involvement	.64**	.79**	-								
(d) Competence	.50**	.38**	.24*	-							
(e) Autonomy	.21	.51**	.21	.35**	-						
(f) Relatedness	.23*	.42**	.19	.46**	.52**	-					
(g) Behavioral engagement	.35**	.29**	.18	.54**	.16	.48**	-				
(h) Cognitive engagement	.37**	.25*	.06	.53**	.39**	.38**	.63**	-			
(i) Emotional engagement	.38**	.35**	.18	.61**	.43**	.52**	.67**	.68**	-		
(j) Agentic engagement	.09	.24*	-.01	.21	.47**	.41**	.33**	.41**	.48**	-	
(k) English proficiency	.28*	-.04	.01	.06	-.01	.17	.27*	.36**	.27*	.09	-

Notes: $n = 84$; ** $p < .01$, * $p < .05$.

learners may be able to be efficacious and autonomous, which may lead to their engagement as shown in the moderate correlations of relatedness with behavioral ($r = .48$, CI [.29, .63], $p < .01$), emotional ($r = .52$, CI [.34, .66], $p < .01$) and agentic ($r = .41$, CI [.21, .57], $p < .01$) engagement.

Noticeably, here, learners' perceived competence was more strongly correlated with behavioral ($r = .54$, CI [.37, .67], $p < .01$), cognitive ($r = .53$, CI [.35, .67], $p < .01$) and emotional ($r = .61$, CI [.46, .73], $p < .01$) engagement, implying that learners' sense of competence or self-efficacy may affect their engagement. Additionally, learners' perceived autonomy was moderately correlated with emotional ($r = .43$, CI [.24, .59], $p < .01$) and agentic ($r = .47$, CI [.28, .62], $p < .01$) engagement. When learners perceive to be autonomous, they may be more likely to be pleasant and make suggestions for making their learning better.

Fourth, behavioral, cognitive and emotional engagement were moderately correlated with each other ($r \geq .63$, $p < .01$), and agentic engagement was less strongly correlated with behavioral ($r = .33$, CI [.12, .51], $p < .01$), cognitive ($r = .41$, CI [.21, .57], $p < .01$) and emotional ($r = .48$, CI [.30, .63], $p < .01$) engagement. Again, it may be disclosed that learners are less likely to be agentially engaged when usually taught passively in a teacher-centered manner.

One thing that should be paid attention to here concerns the significant correlations of behavioral ($r = .27$, CI [.06, .46], $p < .05$), cognitive ($r = .36$, CI [.16, .54], $p < .01$) and emotional ($r = .27$, CI [.06, .46], $p < .05$) engagement with English proficiency, which the other valuables did not have. These correlations seem to support English teachers' experiential belief that learners are learning when engaged.

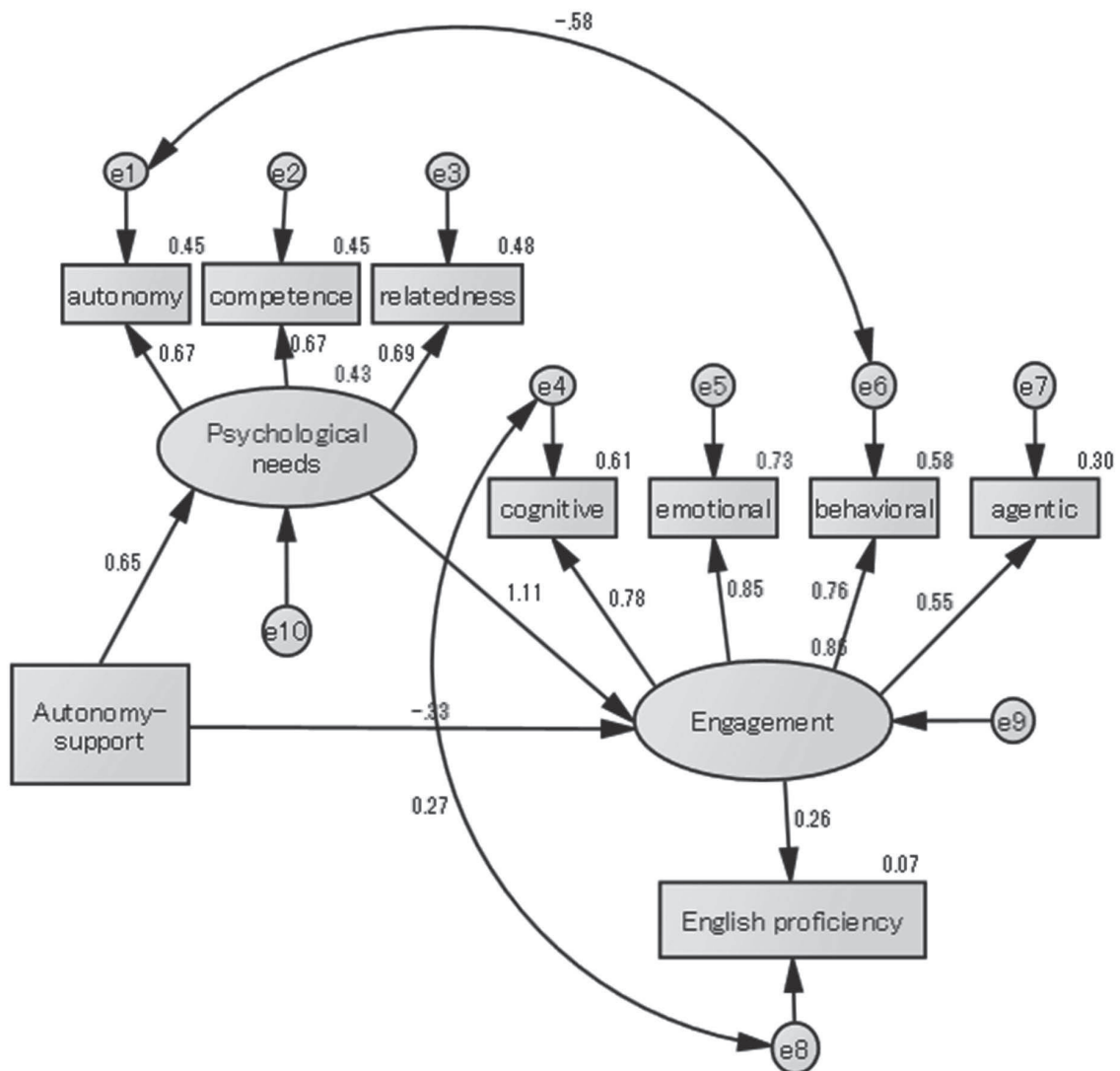
5.3 Autonomy-support Model

So far, the surveyed variables have been examined and discussed for the first research question. In order to further investigate the causal effect of teacher autonomy-support on English proficiency through learners' perceptions and engagement, SEM analysis was performed on the hypothesized model (Figure 2), using SPSS Amos Ver. 28.

Figure 3 shows the autonomy-support model. Since the initial analysis of the hypothesized model did not fit well, modifications were made by adding two correlations: between learners' perceived autonomy and behavioral engagement; and between cognitive engagement and English proficiency. Consequently, the model barely fitted ($X^2(84) = 35.69$; $df = 23$; $p < .05$; GFI = .92; AGFI = .83; CFI = .96; RMSEA = .08), with all regression coefficients for all paths were significant, except for a path of autonomy-support to engagement ($\beta = -.33$, $p = .05$). The model reveals a causal relationship where teacher autonomy-support affects the learners' psychological needs, which in turn influences their engagement, slightly improving their English proficiency. It explained 43%, 86% and 7% of the variances of the learners' psychological needs, engagement and English proficiency respectively.

More specifically, teacher autonomy-support had a significant direct effect on learners' psychological needs ($\beta = .65$, $p < .01$), and a nearly significant indirect effect on engagement ($\beta = -.33$, $p = .05$). Since learners' psychological needs had a significant direct effect on learners' engagement ($\beta = 1.11$, $p < .01$), autonomy-support had a total effect on engagement ($\beta = .39$, $p = .05$). Also, learners' engagement had a direct effect on English proficiency ($\beta = .26$, $p < .05$), meaning that autonomy-support had a total effect on English proficiency ($\beta = .10$, $p = .05$) through psychological needs and engagement. Additionally, this model contains two significant correlations: between learners' perceived need for autonomy and behavioral engagement ($r = -.58$, $p < .01$); and between their cognitive engagement and English proficiency ($r = .27$, $p < .05$).

Figure 3.
Autonomy-support Model



Notes: Values attached to \rightarrow and \leftrightarrow show significant standardized coefficients (β) and correlation coefficients (r) respectively; the alpha level is .01, except for autonomy-support \rightarrow engagement (.05), engagement \rightarrow English proficiency (.05), and autonomy-support \leftrightarrow engagement ($p = .05$); an upper right value for each variable shows its coefficient of determination.

Now, these results are discussed. First, since this model confirms the causal relationship of autonomy-support \rightarrow psychological needs \rightarrow engagement \rightarrow English proficiency, it answers the second research question positively. The model is in line with Dincer, et al. (2019b), showing that university students' psychological needs mediate between teacher autonomy-support and their engagement. The present finding is significant because the effect of teacher autonomy-support on learners' psychological needs and engagement was established even in a context where autonomy-support ($M = 4.31$, $SD = .73$) was weaker than structure ($M = 4.91$, $SD = .61$) and involvement ($M = 4.81$, $SD = .87$), which is presumably common in English instruction conducted in a teacher-centered manner here in Japan. Relevantly, this teacher-centered instruction may have generated the negative direct effect of autonomy-support on engagement (β

= -.33, $p = .05$) because it usually generates learners' passive learning attitudes, dismissing their autonomy.

Consequently, it is implied that the effect of autonomy-support on learners' psychological needs, engagement and English proficiency will be greater when teachers try to support and develop learners' autonomy more in a more student-centered instruction. This implication is congruous with the slogan of *proactive, interactive and deep learning* (MEXT, 2017, 2018), where developing learner autonomy is one of ultimate educational goals at all the level. It seems that the value of autonomy-support is confirmed, complying with the past research (Dincer, et al., 2019a; Dincer, et al., 2019b; Reeve, 2010; Ryan & Deci, 2000).

Second, concerning English proficiency, this model shows the contribution of learners' engagement to it, affected by teacher autonomy-support and learners' psychological needs. At the same time, the correlation of English proficiency with cognitive engagement ($r = .27$, $p < .05$) was not dismissed. These results indicate that cognitive engagement rather than the other three variables of engagement had a greater impact on English proficiency, complying with Dincer, et al.'s (2019b) finding that English learning university students' cognitive engagement: (a) negatively affected their absenteeism; and (b) positively affected their achievement in an indirect manner. Since cognitive engagement pertains mainly to self-regulation and deeper learning strategies, the present finding suggests that developing learners' effective strategy use in a self-regulated manner can lead to the improvement of English proficiency, which may be what *proactive, interactive and deep learning* seeks to achieve in English pedagogy.

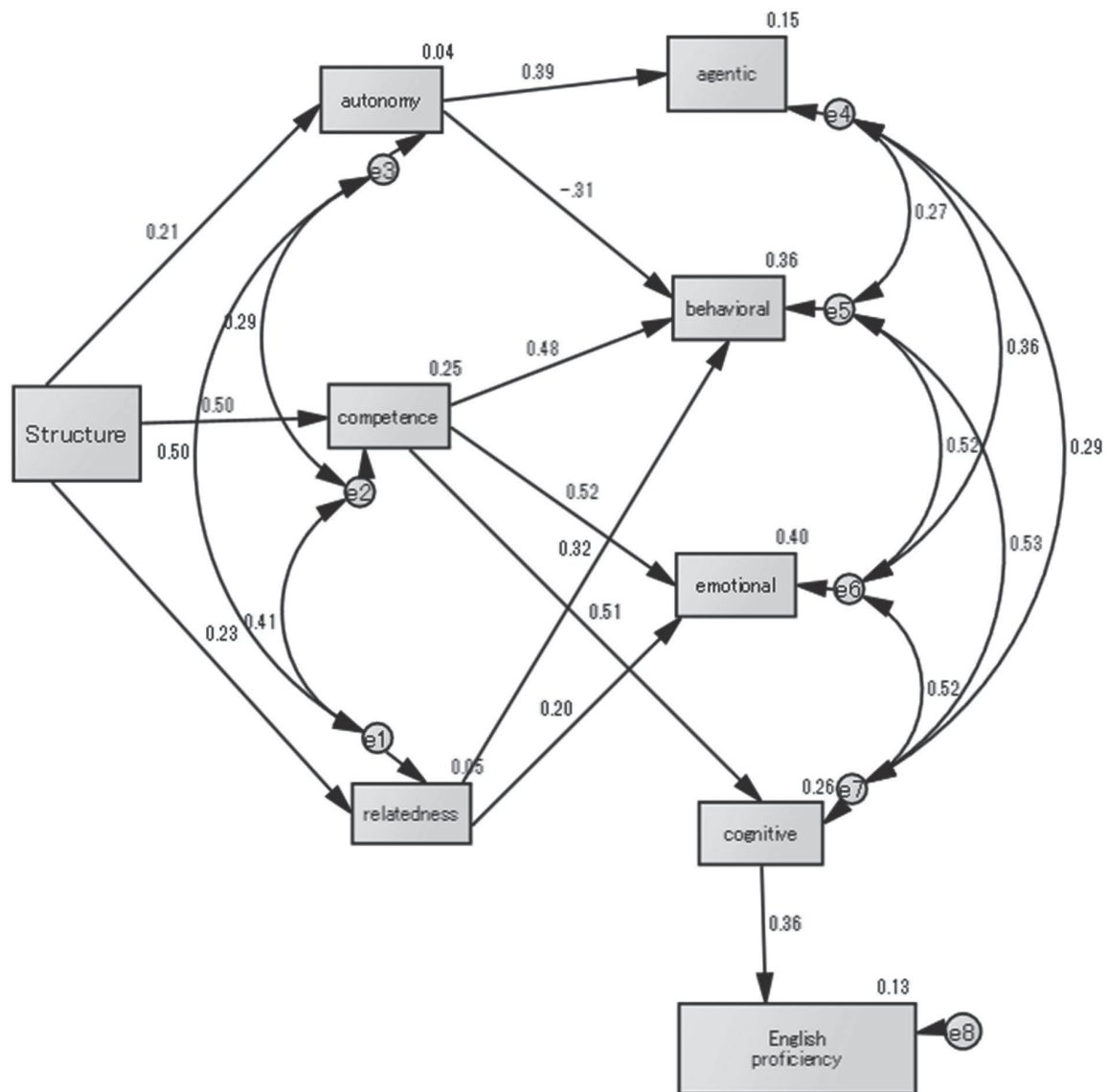
Third, the negative correlation between learners' autonomy and behavioral engagement ($r = -.58$, $p < .01$) shown in this model clarifies the non-significant correlation between them in the above correlation analysis (Table 2). This relationship can be interpreted as showing that learners are less likely to behaviorally engage themselves in learning activities when autonomous, because behavioral engagement in teacher-centered instruction often means passively following what teachers tell them to do. This explanation applies to the above-mentioned negative direct effect of autonomy-support on engagement ($\beta = -.33$, $p = .05$).

5.4 Exploratory Structure Model

Although the autonomy-support model was established, path analysis was exploringly performed, for the third research question, to examine how teacher structure causally affects variables in learners' perceived needs, engagement and English proficiency in this order. This analysis was run, using SPSS Amos Ver. 28, based on the descriptive statistics and correlation analysis, implying that structure has a greater impact on the variables than autonomy-support.

Figure 4 shows the exploratory structure model in the framework of SSMMMD. The fitness of this model was barely acceptable ($\chi^2(84) = 28.35$; $df = 16$; $p < .05$; GFI = .93; AGFI = .81; CFI = .96; RMSEA = .096), with all regression coefficients for all paths were significant. The model confirms a causal relationship between teacher structure and English proficiency through mediating variables in learners' perceived psychological needs and engagement, answering the third research question positively. It explains the variances of the following variables: 25%, 4% and 5% of competence, autonomy and relatedness respectively, 36%, 26%, 40% and 15% of behavioral, cognitive, emotional and agentic engagement respectively, and 13% of English proficiency.

Figure 4.
Exploratory Structure Model



Notes: Values attached to \rightarrow and \leftrightarrow show significant standardized coefficients (β) and correlation coefficients (r) respectively; the alpha level is .01, except for structure \rightarrow autonomy (.05), structure \rightarrow relatedness (.05), relatedness \rightarrow emotional (.05); an upper right value for each valuable shows its coefficient of determination.

Table 3 shows standardized total effects of the variables. Teacher structure had a total effect on English proficiency ($\beta = .09$, $p < .01$) through its direct effect on competence ($\beta = .50$, $p < .01$), a direct effect of competence on cognitive engagement ($\beta = .51$, $p < .01$) and a direct effect of cognitive engagement on English proficiency ($\beta = .36$, $p < .01$). Structure also had direct effects on autonomy ($\beta = .21$, $p < .05$), competence ($\beta = .50$, $p < .01$), relatedness ($\beta = .23$, $p < .05$). Moreover, it had total effects on behavioral ($\beta = .25$, $p < .05$), cognitive ($\beta = .26$, $p < .01$), emotional ($\beta = .30$, $p < .01$) and agentic ($\beta = .08$, $p < .05$) engagement.

Table 3

Standardized Total Effects of the Variables (β)

	Structure	Competence	Relatedness	Cognitive	Autonomy
Competence	.50	.00	.00	.00	.00
Relatedness	.23	.00	.00	.00	.00
Cognitive	.26	.51	.00	.00	.00
Autonomy	.21	.00	.00	.00	.00
English P	.09	.19	.00	.36	.00
Agentic	.08	.00	.00	.00	.39
Emotional	.30	.52	.20	.00	.00
Behavioral	.25	.48	.32	.00	-.31

Note: English P, behavioral, cognitive, emotional and agentic represent English proficiency, and behavioral, cognitive, emotional and agentic engagement.

Out of learners' perceived needs, competence was the most affected ($\beta = .50, p = .01$) by structure. Competence subsequently had direct effects on behavioral ($\beta = .48, p < .01$), cognitive ($\beta = .51, p < .01$), emotional ($\beta = .52, p < .01$) engagement, without any effect on agentic engagement. Relatedness had direct effects on behavioral ($\beta = .32, p < .01$) and emotional ($\beta = .20, p < .05$) engagement, and autonomy had direct effects on behavioral ($\beta = -.31, p < .01$) and agentic ($\beta = .39, p < .01$) engagement. It was only cognitive engagement that had a direct effect on English proficiency ($\beta = .36, p < .01$). Moreover, variables for learners' perceived needs were correlated with each other ($.29 \leq rs \leq .50$). Similarly, engagement variables were correlated with each other ($.27 \leq rs \leq .53$), particularly three engagement variables, behavioral, emotional and cognitive engagement, were moderately correlated with each other ($.52 \leq rs \leq .53$).

Now, this model is discussed. First, the coefficient of determination for English proficiency ($R^2 = .13$) was larger than that in the autonomy-support model ($R^2 = .07$; Figure 3). Despite the SEM and path analyses not being compared directly, this result indicates that teacher structure has a greater effect on Japanese learners' English proficiency than autonomy-support in the framework of SSMD, as suggested in the above descriptive statistics and correlation analysis. Although this finding may not be congruous to the above research findings that underscore the importance of teacher autonomy-support (Dincer, et al., 2019a; Dincer, et al., 2019b; Jang, et al., 2010; Ryan & Deci, 2000; Thaliar & Hashim, 2008), it just unveils a de-facto of English instruction conducted in a teacher-centered manner.

Second, this model shows that English proficiency had only one path-line connected to itself: teacher structure \rightarrow competence \rightarrow cognitive engagement \rightarrow English proficiency. Admittedly, here, competence and cognitive engagement were influenced by their correlated variables: correlations of competence with the others in learners' perceived needs ($rs = .29$ and $.41$) and those of cognitive engagement with the others in engagement ($.29 \leq rs \leq .53$). However, it cannot be denied that the path-line between structure and English proficiency can mainly explain how teacher structure influences learners' perceptions, which in turn leads them to engage themselves in learning, finally improving their English proficiency. In more specific terms, when teachers give information, guidance and feedback in their English instruction, this structure helps fulfill learners' psychological need for competence more than their needs for autonomy and relatedness. Succeedingly, learners who feel competent to some extent in learning English are likely to engage themselves in learning tasks and activities behaviorally, emotionally and cognitively. Out of their engagement, cognitive engagement, where learners use sophisticated-learning and self-regulated strategies, primarily contributes to improve their English proficiency. Moreover, this path-line confirms

the strongest relationship that cognitive engagement had with English proficiency ($r = .27, p < .01$) in the latent variable, engagement, in the autonomy-support model.

Third, teacher structure had direct effects on autonomy ($\beta = .21, p < .01$) and relatedness ($\beta = .23, p < .01$), as well. Although teacher structure, autonomy-support and involvement are supposed to affect autonomy, competence and relatedness respectively in SSMMMD (Figure 1), the effects indicate that teacher structure includes elements that enhance learners' perceived autonomy and relatedness. As a matter of fact, their learners' perceived needs were correlated with each other ($.29 \leq rs \leq .50$).

Fourth, effects of three learners' perceived needs are looked at. Autonomy naturally had a direct effect on agentic engagement ($\beta = .39, p < .01$), and it also had a negative direct effect on behavioral engagement ($\beta = -.31, p < .01$). The latter complies with the negative relationship between these variables ($r = -.58, p < .01$) in the autonomy-support model, indicating that when autonomous, learners are not likely to behaviorally engage themselves in passive learning activities in teacher-centered instruction.

Regarding competence, it had direct effects on behavioral ($\beta = .48, p < .01$) and emotional engagement ($\beta = .52, p < .01$), as well as on cognitive engagement ($\beta = .51, p < .01$), with no effect on agentic engagement. These stronger effects indicate the importance of learners' perceived need for competence in learning, which has been shown in self-efficacy research by Bandura and colleagues (Bandura, 1977, 1989, 1999, 2012; Bandura & Schunk, 1981). At the same time, when competent in teacher-centered instruction, learners do not have to take an initiative in changing the way they are taught, which can explain no effect of competence on agentic engagement. Additionally, the third variable, relatedness, had direct effects on behavioral ($\beta = .32, p < .01$) and emotional engagement ($\beta = .20, p < .05$), implying that learners are likely to work as others do, feeling securely when connected.

6. Conclusion

This study looked into how teacher structure and autonomy-support in English instruction affect learners' perceived needs, engagement and English proficiency for Japanese learners of English in the framework of SSMMMD, as well as how variables in these components are related. Main findings were: (a) teacher autonomy-support predicts learners' perceived needs, engagement and English proficiency in this order for Japanese learners of English; and (b) teacher structure affects them more than autonomy-support in a causal relationship of teacher structure \rightarrow learners' perceived competence \rightarrow cognitive engagement \rightarrow English proficiency.

The first finding is significant because the importance of autonomy-support in the development of learners' English proficiency through their motivational self-system and engagement was recognized in traditionally teacher-centered English instruction, not in student-centered instruction where learners' autonomy is more supported and developed.

The second finding, which highlights the status quo of ELT in Japan, is also significant in specifying that learners' cognitive engagement in the engagement component primarily contributes to the development of English proficiency, as well as in confirming the value of their perceived competence. The latter may be just another finding supporting piles of self-efficacy and SDT research, but it is vital in showing that learners' perceived competence mediates between teacher structure and their cognitive engagement. The former is crucial in indicating that it is not behavioral but cognitive engagement that matters more in learning tasks and activities, against an often-held belief of English teaching practitioners' that highly regards behavioral engagement. Sophisticated or deeper learning strategies used in a self-regulated manner, i.e., cognitive engagement, can generate meaningful learning to improve learners' English proficiency.

An implication of these findings is that we teachers can improve learners' English proficiency by supporting and enhancing their autonomy more in student-centered instruction, complying with MEXT's *proactive, interactive and deep learning*. At the same time, however, the value of teacher structure should

not be ignored in Japan, where traditionally teacher-centered English pedagogy, for example, GT method and PPP approach, does not easily give way to communicative or task-based approach. Another reason for this lies in a mediating role that cognitive engagement plays between learners' perceived competence and English proficiency in English instruction with effective teacher structure.

Despite the significance, this study has limitations including: (a) the numbers of the participants were not large enough; (b) the survey of the university students were retrospectively made on English learning during their senior high school days; and (c) the numbers of question items were not balanced among teacher variables, i.e., structure, autonomy-support, involvement; (d) the established SEM and path models were barely fit. These points should be ameliorated in future studies.

Finally, although research on engagement and SSMMD in the field of ELT is just in an early stage of development, it can make a contribution to the betterment of ELT by revealing the process between teaching and learning outcomes in learners. Studies on these topics should be expanded.

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Appendix: survey question items

Structure

1. The teachers helped us to improve.
2. The teachers made us feel like we are good at physical activity.
3. I felt that the teachers liked us to do well.
4. The teachers made us feel like we are able to do the activities in the program.

Autonomy-support

1. I felt that the teachers provided us with choices and options.
2. I felt understood by the teachers.
3. I was able to be open with the teachers during the sessions.
4. The teachers showed confidence in our abilities to do well.
5. I feel that the teachers accepted us.
6. The teachers helped us to really understand the goals of the session and what we need to do.
7. The teachers encouraged us to ask questions.
8. I feel a lot of trust in our teachers.
9. The teachers answered our questions fully and carefully.
10. The teachers handled our emotions very well.
11. I felt that the teachers care about us as people.
12. I don't feel very good about the way the teachers talked to us (reverse item).
13. The teachers tried to understand how we see things before suggesting new ways to do things.
14. I felt that I could share my feelings with the teachers.
15. The teachers listened to how we would like to do things.

Involvement

1. The teachers supported us.
2. The teachers encouraged us to work together in practice.
3. The teachers had respect for us.
4. The teachers were interested in us.
5. I felt that the teachers were friendly towards us.

Autonomy

1. In English classes, I think that we are given freedom of choice to some extent concerning learning materials, procedure and content.
2. In English classes, I think that our teachers respect our opinions of our classes.
3. In English classes, I think that we are given opportunities to tell teachers our preferences in teaching

procedure.

4. In English classes, I think that we can study without feeling pressured.

Competence

1. In English classes, I think that I can achieve a feeling of accomplishment, like "I did it."
2. In English classes, I think that we can receive good feedback, like "Well done," from our teachers and classmates.
3. In English classes, I think that I can get a sense of satisfaction, like "I did my best."
4. In English classes, I think that I can get a sense of fulfillment, like "I got it."

Relatedness

1. In English classes, I think that I get along with my classmates.
2. In English classes, I think that pair and group work generates an atmosphere in which we cooperate with each other.
3. In English classes, I think that we are in a harmonious atmosphere.
4. In English classes, I think that we are in an atmosphere in which we learn from each other.

Agentic engagement

1. During class, I ask questions
2. I tell the teacher what I like and what I don't like
3. I let my teacher know what I'm interested in
4. During class, I express my preferences and opinions
5. I offer suggestions about how to make the class better

Behavioral engagement

1. I listen carefully in class
2. I try very hard in school
3. The first time my teacher talks about a new topic, I listen very carefully
4. I work hard when we start something new in class
5. I pay attention in class

Emotional engagement

1. I enjoy learning new things in class
2. When we work on something in class, I feel interested
3. When I am in class, I feel curious about what we are learning
4. Class is fun

Cognitive engagement

1. When doing schoolwork, I try to relate what I'm learning to what I already know
2. When I study, I try to connect what I am learning with my own experiences
3. I try to make all the different ideas fit together and make sense when I study
4. I make up my own examples to help me understand the important concepts I study
5. Before I begin to study, I think about what I want to get done
6. When I'm working on my schoolwork, I stop once in a while and go over what I have been doing
7. As I study, I keep track of how much I understand, not just if I am getting the right answers
8. If what I am working on is difficult to understand, I change the way I learn the material