Applying Measurement of Situational Self-Determination Theory to Use of a Self-Access Centre at a Japanese University

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Abstract

One way to promote autonomy in the second language can be through the use of Self-access Centres (SACs). These are spaces for students to engage in activities such as self-study or communication with other learners, or native-speakers of the target language. However, merely having these spaces available does not guarantee that students will use the facility effectively, or even attend at all, so a degree of learner motivation linked with visiting the SAC would be necessary. Deci and Ryan's (1985) Self-Determination Theory (SDT) has been used as the base for numerous studies in second language learning, including those in Japan. Proponents claim SDT is both universal and can be measured on different levels, which are global, situational and state. The authors sought to validate a measure of four subscales of SDT (Intrinsic Motivation, Identified Regulation, Introjected Regulation and External Regulation) written for this study at the situational level among undergraduates using an SAC at a Japanese University ($n = 83$). The rationale for items at this level comes from the field of psychology (Vallerand & Ratelle, 2002) and a study of second language constructs (Robson, 2016). A factor analysis confirmed four reliable factors, as hypothesized. Further, simplex correlations between the subconstructs somewhat confirms the underlying continuum posited by SDT researchers. These results may lead to a body of work that validates SDT theory in second language learning.

Keywords: Self-Determination Theory, foreign language motivation, Self-Access Centres, Japanese university foreign language education, quantitative research

1. Introduction

Autonomy has become an important goal for second language learners (Benson, 2011; Sakai & Takagi, 2009). Autonomy is described as an ability to take charge of one's own learning", and to have "the responsibility for all the decisions concerning all aspects of this learning, (Holec 1981, p. 3). Inherent in this responsibility is the capacity for applying metacognitive abilities like to reflecting, monitoring, and planning, (Holec 1981; Little, 2006) and also an affective dimension (Little, 2006), as well as attitudes towards taking responsibility for learning (Dickinson, 1993).

Some researchers have been apprehensive about fostering autonomy in South East Asian countries, including Japan. There is a belief that autonomy is hindered by the prevailing teacher-centric model of English education (Hughes, Krug, & Vye, 2011). Students are often told what to do, rather than allowing them to discover their own ways to interact with the language.

Now seen extensively in Japan at the university level (Krug, Wurzinger, Hughes, & Vye, 2011; Vye, Krug, Wurzinger, & Hughes, 2011), Self-Access Centres or SACs help to meet needs of learners and develop autonomy (Gardner & Miller, 1999; Serra-Salvia, 2000). Some Japanese universities have set aside areas for learners that may include a free conversation space or materials students could use for extensive reading. SACs have been found to lead to language gains (Krug, Wurzinger, Hughes, & Vye, 2011; Vye, Krug, Wurzinger, & Hughes, 2011) and build a sense of a second language community among the users (Bibby, Jolley, & Shiobara, 2016). Further, considering that becoming proficient in a second language takes a long time, and there may not be enough time available in classrooms to facilitate learners becoming competent users of the language (Nunan, 1989), SACs offer a viable place outside of the class to come into contact with the target language. This is especially relevant in Japan, where actual opportunities to interact in English outside the classroom are limited (Hosoki, 2011).

The mere physical presence of students in SACs; however, may not result in learning that could be construed as meaningful (Fukuda, Sakata & Takeuchi (2011). Therefore, students would need to have motivation to effectively utilize SACs (Hughes, Krug, & Vye, 2012). Research has shown that having students communicate in a second language requires a degree of learner motivation of different kinds, including Integrativeness (Brown, Robson, & Rosenkjar, 2001; Irie, 2005; Watanabe, 2011); Internal Posture (Matsuoka, 2005; Yashima, 2002; Yashima, Zenuk-Nishide, & Shimizu, 2004) and Intrinsic and Extrinsic Motivation (Otoshi & Heffernan, 2011; Robson, 2016).

Intrinsic and Extrinsic Motivation are two ends of a continuum that fall under the Self-Determination Theory (SDT), which is a universal motivation theory related to goals for carrying out an activity, originally derived from second language psychology (Deci & Ryan, 1985). Basically, when learners are intrinsically motivated they carry out an activity for the pleasure that can be derived from it. On the other hand, extrinsically motivated behavior takes place because of the existence of an outside agent or a perceived benefit such as enhanced employment opportunities. SDT theory has not been employed as much as other forms of motivation in Japan, but for an activity such as visiting an SAC, it is clear there will be a number of different goals that students have formulated related to their sense of self.

The instruments that operationalize the constructs in motivation studies tend to concentrate mainly on the trait constructs of motivation that cover general motivational dispositions. There is very little research in motivation that uses more situational or contextual-based items, despite other second language affective disciplines in Japan recognizing that need (Fushino, 2008; Weaver, 2010). Of the above motivational concepts, SDT researchers have hypothesized and validated situational instruments, but these have been in separate disciplines like leisure and interpersonal relationship (see Vallerand & Ratelle, 2002), and much less in second language studies. Considering that people will have general motivation traits, but separate specific situational motivation tied to an activity, devising an instrument that measures students' motivation for visiting an SAC is important. Thus, this study seeks to validate an instrument to measure motivation among Japanese university students to attend an SAC focusing on Self-Determination Theory.

2. Literature Review

This section covers a basic overview of SACs, the tenets of Self-determination Theory and its application in second language study, and research into measuring out-of-class activities.

2.1 Self-Access Centres

Self-access is an approach to language learning, rather than language teaching (Gardner & Miller, 1999). It is a vehicle through which autonomy in learners can be fostered. Through self-access, students learn to move from teacher-directed study and dependency towards autonomy. Self-access centers (SAC) have appeared in language learning to positively promote autonomy and self-directed learning (Malcom, 2004; Rose & Elliott, 2010).

Many universities in Japan now have these facilities, which may include a mix of learners and teachers with an emphasis on an English-only environment (Corker & Torpey, 2004). SACs can provide structure for the development of autonomous learning by providing a space where students can address their needs in a personal manner (Gardner & Miller, 1999).

2.2 Self-Determination Theory

One theory of motivation extensively used in second language has been Self-Determination theory (SDT). This motivation theory deals with how different types of motivation are derived from the reasons or goals that bring forth a particular action. In the case of out-of-class study, what reasons drive students to pursue or not pursue autonomous activities out of class, are important. The main distinction in SDT theory is between Intrinsic Motivation, or goal-oriented behavior that involves "doing something because it is inherently interesting or enjoyable," and Extrinsic Motivation, which is goal-oriented behavior characterized by "doing something that leads to a separable outcome" (Ryan & Deci, 2000, p. 55).

Goal-directed behavior in the SDT theory is dependent on how self-determined, or realized as part of the self, an action is. This theory assumes that all individuals have tendencies to develop a more unified sense of self (Ryan & Deci, 2002). Although the theory claims this to be innate in all humans, social cultural factors may be different in each situation, and can develop or thwart the sense of self.

Through the process of internalization, actions may be increasingly recognized as more or less self-determined and more or less part of the self. Starting at one end of continuum with Intrinsic Motivation, which is the most self-determined orientation and actions in this orientation are engaged in wholly volitionally and endorsed by an individual's sense of self (Deci & Ryan, 1991; Deci, Vallerand, Pelletier, & Ryan, 1991). Deci and Ryan (1985)

also describe four types of Extrinsic Motivation that vary in the degree of self-determination along the continuum the individual feels in relation to the activity or goal. The first type of Extrinsic Motivation, External Regulation, is the least autonomous and behaviors that characterize this motivation are carried because of external demand, force, or possible reward. Importantly, when that force or reward is removed continuation of the action is unlikely. Next is Introjected Regulation, which can be described by behavior where people feel motivated to demonstrate their ability to maintain their self-worth. After that is Identified Regulation, which involves assessing a goal that can be personally important. Even though the goal is performed because of its instrumentality, the person partakes of it willingly (Deci, Vallerand, Pelletier, & Ryan, 1991). Last, the most autonomous kind of Extrinsic Motivation, Integrated Regulation, occurs when the individual has assimilated the regulations into the self, so they have become part of the person's beliefs or personal needs. Integrated Regulation is similar in nature to Intrinsic Motivation, but remains extrinsic because the goals are for extrinsic reasons, and not for the pure enjoyment or interest in the activity.

In second language (Noels, 2003, 2005), and later in foreign language settings in Asia, researchers have addressed how the learning situation can affect intrinsic motivation in China (Peng & Woodrow, 2010; Wu, 2003) and Korea (Pae, 2008) and also in Japan at education before the university level (Carriera, 2012; Hayamizu, 1997; Kimura, Nakata, and Okumura (2001) and at the university level (Otoshi & Heffernan, 2011; Robson, 2016).

The results in some of the above studies show that intrinsic motivation and extrinsic motivation are necessary for learning and that results are dependent to some degree on the situation or research site. There is, however, a lack of studies which focus on the motivation of Japanese students who study out of class. Taking the very clear assumption that motivation is necessary to study out of class, there is value in measuring the motivation of students that clearly are engaged in language learning when the teacher is not present.

2.3 Language Studies Supporting Self Determination Theory

SDT has been applied in second language contexts by Noels and her colleagues (Noels, 2003, 2005; Noels, Pelletier, Clément, & Vallerand, 2003). They developed the Language Learning Orientations Scale – Intrinsic Motivation, Extrinsic Motivation, and Amotivation Subscales (LLOS-IEA). Noels et al. (2003) set out to confirm the existence of an underlying continuum of self-determination in the LLOS-IEA with French speakers in a bilingual Canadian University. A factor analysis identified seven distinct motivation factors with three items each accounting for 67.2% of the total variance. Those seven were Amotivation, External Regulation, Introjected Regulation, Identified Regulation, and three orientations of Intrinsic motivation, which were Intrinsic Motivation for Knowledge, Intrinsic Motivation for Accomplishment and Intrinsic Motivation for Stimulation. Second, each of the factors showed reliability indexes between $\alpha = .67$ and $\alpha = .88$, confirming satisfactory reliability. Last, the authors found mostly higher correlations between extrinsic regulations close to each other on the self-determination scale, so they conclude by stating that the SDT model and the LLOS-IEA offers an "internally consistent framework for systematically describing many different orientations in a comprehensive manner"…and, "offers considerable explanatory power for understanding why certain orientations are better predictors of relevant language learning variables than others" (Noels et al., 2003, p. 35). Similar results, but with poorer reliability indices, were recorded in subsequent studies using the LLOS-IEA (Noels, 2003, 2005).

Studies in Japan and neighboring countries have also shown that the SDT theory can be used reliably and validly. A number of studies have been conducted in South East Asia using SDT at different levels of education. One of the first studies in Japan to employ SDT for research, although not related to second language, was Hayamizu (1997). He used a revised Japanese version of a questionnaire devised by Ryan and Connell (1989) for Canadian school children with 483 Japanese junior high school students. The reliability showed that the Motivational subconstructs of External, Introjected, Identified and Intrinsic had reliability indices above $\alpha = .74$ and a factor analysis showed that a simplex structure of factors existed with Intrinsic correlating with more self-determined factors. The author stated that Introjected and Identified Regulations are different in nature with his sample in that learners with Identified Motivation have been able to internalize their reasons for study making them more self-determined, but learners who have Introjected Motivation do not act in a self-determined manner and passively accept externally-imposed reasons for study.

In another study addressing the Self-Determination continuum, Honda and Sakyu (2004) measured Intrinsic and Extrinsic subscales and their effect on proficiency scores on the TOEIC Test with 435 learners at the tertiary level in Japan. A Japanese version of the LLOS-IEA factored into seven reliable subscales (all above $\alpha = .76$) and were found to explain 58.2% of the variance. The authors found the Intrinsic Motivation constructs to be negatively correlated with Extrinsic Motivation constructs indicating, as the author states, an ability to distinguish between the various types of motivation subconstructs in the SDT model, which means some proof for the existence of a

Self-Determination continuum. However, the results did show that Identified Regulation was not part of any of the factors in the study.

Research addressing the Self-Determination continuum with younger learners of English was investigated by Carriera (2012), who surveyed 505 elementary school students. The author used questionnaires focusing on English study that measured four subscales of Self-Determination (Intrinsic Motivation, Identified, Introjected, and External Regulation). For factor analysis, a Japanese version of the LLOS-IEA for EFL Learners in Japanese for motivational orientations (Ando, Fuse & Kodaira, 2008) accounted for 68% of the variance, but Identified and Introjected Orientations were merged into one factor. Carriera found evidence of a continuum of self-determination with correlations stronger between more closely linked Self-Determination constructs.

At the university level, firstly in China, Peng and Woodrow (2010) undertook an exploratory factor analysis with a Chinese version of the LLOS-IEA as part of an SEM model. Three factors were Intrinsic motivation, External Regulation and Identified Regulation. The three-factor structure accounted for 64.84% of the variance for motivation, but Identified Regulation did not factor as predicted. The authors claim this factor is only pertinent for higher proficiency learners.

Moving to the university level in Japan, a factor analysis by Otoshi and Heffernan (2011) with an *n*-size of 285 and employing a Japanese version of the LLOS-IEA displayed moderate reliability with factors above $\alpha = .67$. Three factors were realized accounting for 58% of the variance. These were Intrinsic Motivation, External Regulation and Introjected Regulation and, as in the Peng and Woodrow study, Identified Regulation was an unreliable factor in the study.

The above studies show that, firstly, evidence supports the notion that SDT exists as a continuum as found in correlation studies in foreign and second language settings. They also show that instruments like the LLOS-IEA have been adapted and used in a number of foreign language settings to encompass activities like speaking English and these have shown good reliability indices. Next, Identified Regulation has not been shown to be a stable factor in many of the foreign language settings. Finally, they show that there is little research using SDT with out-of-class study or with SACs.

Beyond the above studies, researchers of SDT have further proposed a hierarchical model with three levels of generality global, contextual or situational and state (Vallerand & Lalande, 2011; Vallerand & Ratelle, 2002). The global factors are general dispositions to engaging in activities, such as English study. The contextual level addresses more specific activities tied to a situation. At this level, the outcome depends on the type of activity because some people have intrinsic motivation to perform some tasks and extrinsic motivation to perform others. Motivation at this level is somewhat unstable because it is affected by social factors that might change at the contextual level. At the final state level, motivation may be in a state of change because it is related to the here-and-now of doing an activity.

Although conceptions of different levels of SDT have been confirmed in sports (Vallerand & Blanchard, 1998) and science (Lavigne & Vallerand, 2010), very little has been researched on this topic in second language study, except in one study, Robson (2016). As part of a structural model, the author created a situational measure of SDT for classroom communication. In the preliminary study only a two-factor solution was found separating high self-determined items (Intrinsic Motivation and Identified Regulation), with lower self-determined items (Introjected and External Regulations). In the main study (n-size = 461), a factor analysis revealed three clear factors of Intrinsic Motivation, Introjected and External Regulation accounting for 53.48% of the total variance. Identified Regulation did not stand alone as a separate factor, instead one item was combined into the Intrinsic Factor. Some evidence of the continuum was found with Intrinsic Motivation strongly negatively correlated with External Regulation, and External Regulation and Introjected Regulation moderately positively correlated. That study showed an instrument written at the contextual level, namely the speaking activities in the classroom, factored to a reasonable degree with some proof of an underlying continuum of self-determination.

2.4 Research into Measurement of Out-of-Class Activities

Since the growth of self-access centres in the 1990s, out-of-class learning has been equated with autonomy in second language literature. Benson (2006) claims that distinctions between autonomy in the classroom and that which is out of class has become blurred (p. 22). Therefore, the term out-of-class learning has been defined by Benson (2011) as study which is "initiated by the learner, makes use of authentic resources, and involves pleasure and interest, as well as language learning," p. 139. In his synthesis of the research, Benson (2006) calls this a relatively new area of research. His look at studies on the topic found that students tended to be motivated to take part in out-of-class learning activities, even in situations where opportunities for out-of-class learning may be limited.

Addressing research that has been undertaken to measure motivation in out-of-class activities, Gardner and Miller (2010) conducted a meta-analysis of changes in beliefs of stakeholders in self-access language learning in tertiary education in Hong Kong. They found that the vast majority of studies employed self-report questionnaires with students, and of four key areas of focus, including motivation, although there is recognition that SACs should be based on student needs, there is little research available, at least in Hong Kong (p.1).

Research that does exist can be divided into qualitative and quantitative. Qualitative research in Japan has mainly been carried out at the university level. A study by Gillies (2010) employed the Dörnyei's (2005) L2 Motivational Self System as a theoretical framework, and used semi-structured interviews with nine undergraduates. He found that there needs to be a level of support available for those students who see visiting the SAC as part of the *ought-to self*, rather than the *ideal-self*. It could be claimed that this *ought-to self* equates to Extrinsic Motivation in the SDT theory. Although the author states that moving from a stage of *ought-to self* to *ideal-self* is important, the SDT theory offers both a wider range of motivational outcomes than the Dörnyei system and also an explanation of the internalization process to facilitate this change.

In another Japanese university-based study by Rose and Elliott (2010), three interviews were conducted with first year university students over a period of six months. They report that intrinsic motivation may be high to use an on-site SAC, but the most common reasons for non-participation included a lack of confidence and increased nervousness. They conclude that extrinsically-motivated activities are more effective among pre-intermediate level students, but the authors do not explain any more than this about which types of extrinsic behaviors could be addressed.

Quantitative studies of SACs in Japan and South East Asia have addressed learners' activities out-of-class focusing on building learner profiles rather than on dealing with specific motivation outcomes (Chan, 2011; Hyland, 2004; Sakai & Takagi, 2009). The last of these studies (Sakai & Takagi, 2009) was one of the only studies to employ factor analysis and psychometric rigor to its data. However, the researchers did not use a motivation factor, and variance of factors was not reported, so it is difficult to gauge the strength of those factors.

Studies of motivation for using SACs in Japan are scarce and small scale. One such study (Hughes, Krug, & Vye 2012) used an open-ended questionnaire and frequencies counts, and discovered that 48% of respondents appeared to be extrinsically motivated, attending an on-site SAC only to complete a task. Motivation is barely analyzed beyond that. Using a theory like SDT may have helped that study to be more concise with results.

Despite measurement of out-of-class learning being difficult due to the intensely learner-focused nature of a SAC (Morrison, 2005), very little research addresses the specific motivation outcomes of attending SACs. This is particularly true with regard to motivation theories such as the SDT theory. More research needs to explore the psychometric properties underlying structure of scales used to measure motivation in academic contexts (Cockley, Bernard, Cunningham, & Motoike, 2001).

In order to measure SDT in specific situations, appropriate contextual scales should be developed (Vallerand & Ratelle, 2002). As yet, the potential of such SDT instruments has not been fully realized for second or foreign language settings. The objective of this study is to validate a self-determination instrument created for measuring the reasons behind attending an SAC at a Japanese university level. This study hopes to replicate results found in the Robson (2016) study but with a different context. The two research questions in this study are as follows:

1) What is the underlying structure of the four hypothesized factors (Intrinsic Motivation, Identified Regulation, Introjected Regulation and External Regulation) to measure the context?

2) What is the correlational relationship between these four hypothesized factors?

3. Methods

This section describes the setting, participants and instruments used and the assumptions pertaining to those instruments, as well as the procedure.

3.1 Site for this Study

The site for this study is a conversation lounge in a mid-level university in Tokyo, Japan that has an SAC. The university sees the purpose of that SAC as offering home students a place to practice English and for foreign students (mainly from Europe and the U.S.) to meet Japanese students in. The space is mostly staffed by foreign study abroad students visiting the university for periods of up to a year, predominantly. Students used in this study would all be aware of SAC location, and use, and would have had to attend it at some point for credit purposes.

The SAC in this study has been prone to having both insufficient and too many students in the facility at one time. Usually at the start and finish of the semester, students tend to visit the SAC more. Motivations start high at the

start of the term and drops off in the middle, so students visit less. However, towards the end of the semester students who do not want to fail and have not visited there until that point crowd into the facility. In this way, at these times, it does perform the function of a homework centre, as noted by Thompson and Atkinson (2010).

3.2 Participants in this Study

Students in this study are drawn from the second years in one faculty at the university where the SAC is located. During the first year, these students take English classes twice a week, comprising of a reading and communication class. As part of the communication class, students are encouraged to visit the SAC to practice using the language and gain the benefit of the using the materials. These activities are credit-bearing. Generally, the students have an interest in English, and enjoy communicating in English. The average TOEIC Test score for the year group was m = 421.25 (SD = 65.23). This makes the sample group in this study between roughly a low-intermediate to intermediate level.

3.3 Instrumentation

To measure the Self Determination Theory, reasons for visiting the SAC were postulated and students were presented with the stem "*I attend(ed) the SAC because..,*" and required to specify one of the following levels of agreement related to the SDT constructs: 1) disagree strongly; 2) disagree; 3 Slightly Agree; and 4) Strongly Agree). The constructs were Intrinsic Motivation (five items), Identified Regulation (five items), Introjected Regulation (five items) and External Regulation (four items). The items were taken and adapted from previous studies (Honda & Sakyu, 2004; Peng & Woodrow, 2010; Robson, 2016). The last of these studies validated an instrument based on Willingness to Communicate (WTC) in a Japanese classroom. The instrument used in this study again applies the SDT to a specific situation.

3.4 Procedure

The Japanese version of the questionnaire in Appendix A was presented to students during week seven of the spring 2017 semester. One of the co-authors asked for co-operation of the second year students in his English classes in filling out the questionnaire. The purposes were explained and it was further stated that the data were for research purposes and that students' decision to take the questionnaire was voluntary and would in no way affect students' grades. It took approximately ten minutes for the participating students to fill out the questionnaire at the end of their classes, at which point analysis began.

3.5 Assumptions for Factor Analysis

According to Tabachnick and Fidell (2007), six assumptions must be met before factor analysis is carried out. Those are sample size and missing data, normality, linearity, no univariate or multivariate outliers, lack of multicollinearity, and singularity and factorability of R. First, the sample size was less than required for factor analysis, but as this was a preliminary study, the decision to continue with the current data set (n= 83) was made. Second, normality is measured by the standard error of both skewness and kurtosis being less than +/-1.96 standard deviations from the mean. Table 1 shows all the items in this study. Although there were some instances of high skewness particularly among the Identified Regulation items, basic normality was established by reference to histogram charts. Third, the study had no outliers beyond +/-3.29 standard deviations from the mean. Fourth, multicollinearity and singularity were measured by examining a correlation matrix of all the variables. Correlations above .90 are considered too high, and none were found. Last, the assumption of factorability of R is an indication of the covariation between the variables in the study, which is measured by a Kaiser-Meyer-Olkin (KMO) test, of which measures should be above .60. This study yielded a value of .80. Further, one more check was made, as recommended by Field (2005), of the Bartlett's Test of Sphericity available in SPSS. A significant value was expected and reached, signifying that factor analysis is appropriate for the data set.

Once the assumptions were met, the data was factor analyzed to investigate the internal structure and reliability of the factors in the proposed model. A Generalized Least Squares extraction with a Direct Oblimin rotation was used to confirm investigate the factors. This rotation was chosen because it allows for correlations among the variables (Field, 2005), which is likely because the items all deal with visiting an SAC, and thus; may be mildly positively correlated. When investigating the internal structure of each factor, first, the eigenvalues indicate the relative importance of each factor, with values of over one (the PASW default) seen as acceptable (Field, 2005). Second, items factoring above .45 is acceptable for a factor. Lastly, for this study the criterion for communality values is set at above .40, and reliability should ideally reach as close to one as possible.

Table 1. Descriptive statistics for all items

	M	SE	SD	Skewness	SES	Kurtosis	SES
IM-FUN	2.30	.084	.761	-.061	.264	-.487	.523
IM-EXP	2.80	.078	.712	-.304	.264	.122	.523
IM-EXC	2.13	.082	.745	-.039	.264	-.779	.523
IM-FRE	2.33	.084	.767	-.302	.264	-.697	.523
IM-HAP	1.93	.080	.729	.306	.264	-.446	.523
IR-DEV	2.82	.088	.799	-.544	.264	.135	.523
IR-TRY	2.93	.089	.808	-.585	.264	.755	.523
IR-CHO	2.81	.078	.706	-.612	.264	.954	.523
IR-NEC	2.99	.088	.804	-.574	.264	.760	.523
IR-FUT	2.86	.073	.665	-.502	.264	.992	.523
IN-EMB	1.95	.078	.714	.276	.264	-.338	.523
IN-ANX	1.81	.083	.756	.563	.264	.163	.523
IN-REG	1.96	.076	.689	.276	.264	-.095	.523
IN-OTH	1.53	.073	.669	.641	.264	1.014	.523
IN-COO	1.34	.052	.476	.687	.264	-1.17	.523
EX-CRE	3.11	.097	.884	-.510	.264	-.129	.523
EX-ANG	2.61	.105	.961	-.165	.264	-.885	.523
EX-PRE	1.83	.080	.730	.466	.264	-.321	.523
EX-MFU	2.18	.091	.829	.176	.264	-.604	.523

Note. IM = Intrinsic Motivation; IR = Identified Regulation; IN = Introjected Regulation; EX = External Regulation.

4. Results

The results section addresses the underlying factors of the data and the relationship between them. First, after checking the assumptions, a factor analysis was undertaken. A four-factor solution was tested and found to be the best-fitting solution. Of the 19 items in the study, two were removed. One, IM-FRE, was eliminated due to not having sufficient variance on any of the four factors. The second item, EX-MFU, was removed because it was a complex item, factoring highly on two factors. With the two items removed the revised four-factor solution can be seen in Table 2.

The main factor accounting for 25.88% of the variance contained three items and is comprised entirely of Intrinsic Motivation items, so it will retain this name. The second factor claimed 16.33% of the variance and was composed of all five Identified Regulation and one of the Intrinsic Motivation items (I can experience new things). This last item may have been viewed as instrumental in nature. These items together retain the name, Identified Regulation. The third factor accounted for 11.47% of the variance, but contained only two items, both of which were Extrinsic Motivation items. Thus, the factor maintains this name. Last, the smallest factor claimed 9.19% of the variance and had all five items from the Introjected Regulation and one item from the Extrinsic Motivation factor (I feel pressured to do it). It will keep the factor name, Introjected Regulation. Taking the criteria of .8 for reliability (Field, 2005; Kline, 1999), all factors reached this satisfactorily except the Extrinsic Motivation factor, mainly due to only having two items.

Table 2. Factor pattern matrix with factor variance, eigenvalues, and reliability for factors in this study

Items	IM	IR	ER	IN	h^2
IM-EXC	.954				.919
IM-HAP	.763				.812
IM-FUN	.703				.657
IR-DEV		.859			.879
IM-EXP		.758			.737
IR-TRY		.737			.756
IR-CHO		.698			.749
IR-NEC		.678			.575
IR-FUT		.535			.594

EX-CRE			.917	.859
EX-ANG			.595	.859
IN-OTH				.680	.666
IN-COO				.679	.644
IN-EMB				.648	.588
IN-ANX				.647	.641
IN-REG				.620	.719
EX-PRE				.605	.565
Eigenvalue	4.14	2.46	1.97	1.66
Variance (%)	25.88	16.33	11.47	9.19
Reliability	.89	.87	.68	.82

Note. Extraction Method: Generalized Least Squared. Rotation Method: Direct Oblimin. IM = Intrinsic Motivation; IR = Identified Regulation; IN = Introjected Regulation; ERC = External Regulation. Total variance explained = 62.87%. Values less than .4 were removed.

Note. Extraction Method: Generalized Least Squared. Rotation Method: Direct Oblimin. IM = Intrinsic Motivation; IR = Identified Regulation; IN = Introjected Regulation; ERC = External Regulation. Total variance explained = 62.87%. Values less than .4 were removed.

Finally, the relationship between the factors can be seen in Table three, which shows the factor score coefficient matrix, a record of correlation coefficients between the factors. The table shows a strong correlation between Intrinsic Motivation and Identified Regulation, but a weak non-significant relationship between Intrinsic Motivation and Introjected Regulation, and a significant negative correlation between Intrinsic Motivation and External Regulation. Furthermore, there is a slightly stronger negative correlation between Intrinsic Motivation and External Regulation than that seen with Identified Motivation. Identified and Introjected Regulation shares a weak non-significant correlation. Last, between External and Introjected Regulation is a weak non-significant positive correlation. This result mirrors the continuum of the Self-Determination Model in that higher self-determined factors are inversely correlated with the lower self-determined factors, namely External Regulations.

Table 3. Factor score coefficient matrix for self-determination factors

Factor	1	2	3
1. Intrinsic Motivation			
2. Identified Regulation	.452*		
3. External Regulation	-.312*	-.245*	
4. Introjected Regulation	.142	.201	.195

Note. * = p < .05

5. Discussion

This section will address the two research questions in turn.

1) What is the underlying structure of the four factors hypothesized to measure the context?

Many studies have found underlying SDT factors in their data in settings both outside and inside Japan. The factor analysis in the main study revealed four clear hypothesized factors explaining 62.87% of the total variance, which could be viewed as acceptable for multivariate statistics (Hair, Black, Babin, & Anderson, 2014). These results are certainly comparable with other studies of SDT, showing reasonable evidence of construct validity. Looking at some of the factors in turn; first the primacy of Intrinsic Motivation has been established. This factor took the most variance and showed high reliability, even with only three items. It is clear that as with participants in other studies, students in the current study realize the benefit of visiting the SAC because it fulfills positive affective goals. Although the SDT theory originally posited three types of Intrinsic Motivation for Knowledge, Accomplishment and Stimulation (Noels et al., 2003), the three items that factored for Intrinsic Motivation may be closer to the Stimulation factor. The items that did not factor, such as that relating to experiencing new things (IM-EXP) formed part of Identified Regulation. Perhaps, for the SAC, students do not have goals that result in visiting there for its own sake, but relate more to external goals that can be easily internalized. The other non-factoring item, (IM-FRE), may be part of other as yet new factors, which have not been identified.

Next, Identified Regulation, was a strong factor with high reliability. Few studies have reported finding Identified Regulation as a separate factor. Indeed, in second language study, research carried out by Noels in immersion settings in Canada and one general education study by Hayamizu (1997) were those which identified a clear Identified Regulation factor. Other researchers have found it does not appear at all (Honda & Sakyu, 2004; Peng & Woodrow, 2010; Otoshi & Hefferman, 2010) and in other studies, items from Identified Regulation have combined with other items to produce a different SDT-hypothesized factor (Carriera, 2012, Kimura, Nakata, & Okumura, 2001). The difference between Identified and Introjected Regulations is the perceived level of autonomy of the action which affects the degree to which that goal for visiting the SAC has been internationalized. These goals are not carried out for their own reward, and thus, are not intrinsic, but students have endorsed these goals on some personal level. The utility of learning English is often imparted to students, and this develops a clear belief in students to explain endorsement of items such as English being a necessary for one's life or useful for the future. Although these goals may have not derived directly from the learners, they have been taken on board and adopted, to some degree, as part of their self.

The third largest factor was External Regulation. In the current study, the factor only drew two items, both rising from consequences related to the class, namely the teacher's reaction (EX-ANG), and credit for visiting the SAC (EX-CRE). Although the variance could be seen as acceptable, two items mean a large drop in reliability. If one more item had factored, the reliability index would have been much higher. Of the other two items, EX-PRE, formed part of the Introjected Regulation. This result could be attested to the pressure for visiting being derived by the self and not an external agent, thus explaining a partial degree of internalization, as implied by its non-appearance in the External Regulation factor. The other item, EX-MFU, may be similar in nature to the Identified Regulation item, (IR-FUT), but students more strongly endorse the latter because the instrumental value of visiting the SAC may be less clear to some students.

The last factor in size was Introjected Regulation with fairly small, but acceptable variance and reasonable reliability. It included all the items hypothesized for this factor, and one from the external Regulation factor. Setting a threshold at one Eigenvalue (Field, 2005), this factor could be seen as acceptable, but low variance accounted for typically implies that the hypothesized items show little association with the underlying factor. Some of these items may need to be rewritten, modified or tested with another data set to confirm their suitability in the SDT model.

As well as confirming the individual factors of SDT, this study also lends further validation to the existence of a situational level for measuring SDT in a particular situation, namely student use of SAC. Although confirmed in studies in education, leisure and interpersonal relationship (Vallerand & Ratelle, 2002), and once within communication in a Japanese classroom (Robson, 2016), studies involving application of items at the situational level have not yet been applied in second or foreign language settings. This study is the first to confirm self-determined goals for use of a SAC. Therefore, by using a specific situational (contextual) measurement, this study seeks to add validation of the SDT research and its application to various second and foreign language settings.

2) What is the correlational relationship between these four subscales?

Confirmation already exists of such a continuum in second language studies (Noels, Pelletier, Clément, & Vallerand, 2003), as well as a classroom study in Japan (Hayamizu, 1997; Robson, 2016) and in China (Peng & Woodrow, 2010). This study, however, is the first to confirm evidence of the SDT continuum for contextual items related to use of an SAC in both second and foreign language. As seen in table three, the existence of a continuum of self-determination is apparent, owing to the simplex correlational relationships. Higher self-determined factors are negatively correlated with low-self determined factors, mostly at significant levels. There seems to be a slightly unexpected result for Introjected Regulation that is positively correlated, albeit non-significantly with both Intrinsic Motivation and Identified Regulation and External Regulation. For this factor with this set of students, Introjected Regulation is acting in a way not conforming to the hypothesized relationship from SDT. Introjected Regulation shares both features of internalization with higher-self determined factors and perceived lack of locus of control with External Regulation.

Accompanying the factors in this study, the SDT theory also proposes three universal innate psychological needs of Competence, Autonomy, and Relatedness that, the existence and strength of which, can either promote or thwart self-determination (Deci & Ryan, 2000). SDT theory holds that these three basic needs are present in any culture, but relationships between specific behaviors and satisfaction of underlying needs could differ between cultures because such behaviors correspond to specifically endorsed cultural values and practices. In other words, although the theory is considered universal with respect to all cultures, individual cultures may have different interpretations

of the aforementioned needs. In Japan, for example, where the notion of autonomy is different from that in western cultures (Littlewood, 1999), self-determination may exist in a different form, but Intrinsic Motivation is clearly the most determined form of Self-determination, followed by Identified Regulation, with External Regulation being the least. The relationship of Introjected Regulation to the other factors remains somewhat unclear.

6. Conclusion

The present study has two limitations. First, the sample used in this study is small and, therefore, may affect the reliability of the results. Second, although acceptable, the variance explained from the SDT factors was just over half. It is important to realize that other more pertinent factors, perhaps other SDT factors, could have been added to create a truer representation of the hypothesized SDT constructs.

After initial validation of the SDT subscales, further research should consider theoretical and practical implications. Firstly, attempts should be made to replicate the results of this study in other educational settings and with different larger groups of learners. Further, as hypothesized in SDT theory, but not part of the current study, future research could incorporate the three psychological needs (autonomy, competence and relatedness) and their relationship on intrinsic and extrinsic motivation. Very few studies have looked at this relationship (Otoshi & Heffernan, 2011), but results have been inconclusive. Lastly, these SDT subscales could go towards a structural equation model that seeks to account for underlying constructs that go into motivation for using an SAC, including anxiety, and other affective constructs, as well as more contextual variables related to learning such as individual learning goals. In general, structural models help to reduce measurement error compared to factor analysis (Byrne, 2006), so results may be more concise.

As a practical application, SDT could be used as a diagnostic tool to help students understand the individual nature of their motivation for learning a foreign language. Since motivation is an individually specific psychological phenomena, any method to direct students to further understand and develop their own motivation should permit them to develop learning strategies that reinforce key motivating factors. Perhaps a diagnostic test could be designed to determine student ranking on the diametric scale of intrinsic and extrinsic motivation. With a greater understanding of their personal reasons for learning the foreign language, students will be able to access SACs and choose activities which appeal to their needs, providing the SAC has a wide variety of language learning materials and activities. For instance, students who are intrinsically motivated will be drawn towards literature in the form of graded readers and other reading material, games and discussion groups. Extrinsically motivated students will be attracted to occupational information and other content based materials. In short, SDT could be very useful for students to understand how they are individually motivated and help guide them to choose the best resources available at the SAC.

SACs are important to promote autonomy and what students do in the classroom. As espoused in SDT theory, it is important to use contextually-sensitive instruments that actually reflect goals students hold when learning the language such as visiting an SAC. This part of SDT has started to gain some traction; however, more research is needed to identify different parts of SDT at all levels of specificity.

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Appendix A

English version of instrument measuring situational SDT for users of a Self-Access Centre

Reasons for attending the SCA

After attending the SCA, give your level of agreement with each of these statements

(1) strongly disagree (2) disagree (3) slightly agree (4) strongly agree

I attend(ed) the SCA because….

Intrinsic motivation

IM-FUN. It is fun

IM-EXP. I can experience new things

IM-EXC. I feel excited when I visit there

IM-FRE. I can make new friends

IM-HAP. I am happy when I am there

Identified regulation

IR-DEV. I can develop myself there

IR-TRY. I think I have to try and speak English

IR-CHO. I choose to be the kind of person who can communicate well

IR-NEC. English is a necessary part of my life

IR-FUT. It could help me in my future

Introjected regulation

IN-EMB. I don't want to feel embarrassed

IN-ANX. I'd feel anxious, if I don't study

IN. REG. I may regret not doing it

IN-OTH. I want other students to think I am interested in English

IN-COO. If I go there and communicate, people might think I am cool

External regulation

EX-CRE. I need to get the credit

EX-ANG. if I do not, the teacher will be angry

EX-PRE. I feel pressured to do it

EX-MFU. I feel I must go there for the sake of my future

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