Research article

Girls show better quality motivation to learn languages than boys: latent profiles and their gender differences

W.L.Quint Oga-Baldwin [a,*], LukeK. Fryer [b]

[a] *Waseda University, Japan*
[b] *The University of Hong Kong, Hong Kong*

ABSTRACT

Students' gender can have subtle long-term effects on students' motivation, engagement, and ultimate achievement in learning a new language. Given the current focus on motivation in primary and secondary schools in many Asian countries, understanding both boys' and girls' orientations toward learning English may offer insight into students' future trajectories. In this study, we sought to demonstrate the differences in students' motivational profiles originating from their gender. Using a sample of 398 elementary school students in western Japan, we administered motivation surveys at the beginning of the 2013 school year. We analyzed these surveys using latent profile analyses to determine differences in three sub-groups: good quality (high intrinsic regulation, low external regulation), high quantity (high intrinsic and external regulations), and poor quality (high external regulation, low intrinsic regulations). Post-hoc tests showed gender differences within these subgroups. Results indicate that male students were more likely to demonstrate low quality, externally controlled motives, while girls were more likely to show higher quality internally regulated motives. These findings indicate the need to improve support for boys' internally regulated motivation in Asian foreign language settings.

1. Introduction

Boys and girls often interact with their foreign language studies in different ways. In general, when learning a foreign language in school students may engage with their studies for a variety of reasons. They may feel motivated to study by external factors, such as the desire to follow rules or please teachers, primarily controlled by the people and events in their environment. They may also experience internal motives for their actions, choosing to learn because it is interesting or personally beneficial. Many will feel some combination of these two.

According to self-determination theory (Ryan and Deci, 2017), actions originating from a sense of purpose, personal interest, and enjoyment are labeled autonomous motives. These motives are considered high quality due to the likelihood that they will drive students to persist. The opposite, controlled motives, come from more negative stimuli, such as fear of punishment or avoidance of shame. These stimuli have the power to motivate for shorter periods, and thus require constant attention to maintain them. Within this dialectic between the external and internal loci of causality, motivational quality is defined by the degree to which students perceive their actions are autonomous relative to the degree to which they are controlled (Ryan and Deci, 2017). The

combination of these motives (e.g., highly autonomous and low in control, etc.) can be used to derive motivational profiles.

Motivational profiles offer a way to understand individual students' proclivities and can indicate effective models based on students' individual differences. Using a variety of person-centered analyses, it is possible to derive students' motivational profiles (Corpus and Wormington, 2014; Oga-Baldwin and Fryer, 2017; Vansteenkiste et al., 2009). Students' autonomous motivation to learn in schools may differ by subject, connected to both achievement and feelings of self-concept (Chanal and Guay, 2015).

Students' gender also has important effects on their learning (Meece et al., 2006; Voyer and Voyer, 2014). In language learning settings, girls generally show a higher motivation for the language and interest in foreign countries (Carreira, 2011). Boys likewise show less persistence Recognizing the importance of both gender and domain specific motivation for language learning, we investigated Japanese elementary school students' motivation to learn English, looking for person-centered patterns based on quality of motive. Given the explicit focus on autonomous motivation in Japanese schools (MEXT, 2008; Oga-Baldwin and Nakata, 2014) and the upcoming changes to the course of study (MEXT,

---

2016), this investigation may offer insight into students' baseline motivation based on gender.

1.1. Background

Self-determined motivation. According to self-determination theory (SDT; Deci and Ryan, 1985; Ryan and Deci, 2017), human motivation is regulated by the degree to which motives are autonomous or controlled. Autonomous motives are represented by a variety of reasons, each with an internal locus of causality. These reasons include a sense of enjoyment for, a belief in the value of, and feelings of interest in the learning materials. Students who endorse these reasons for learning show increased self-regulation (Brophy, 2010), develop mastery goals, deep approaches to learning (Fryer et al., 2014), and achieve higher grades (Soenens and Vansteenkiste, 2005). Similar effects have been found for studying a foreign language. Autonomously motivated students have a higher desire to continue learning (Noels et al., 2000), visibly engage with their classwork (Oga-Baldwin et al., 2017), and become more interested in learning the language (Fryer, 2015). Accordingly, autonomous motives offer students numerous benefits.

According to SDT (Ryan and Deci, 2017), two types of motivational regulation are said to represent more autonomous motivation: intrinsic regulation and identified regulation. Intrinsic regulation in language education is characterized by feelings of enjoyment, stimulation, or achievement when studying the new language. Identified regulation is represented when students feel that language learning is valuable or personally beneficial.

At the opposite side of the spectrum of self-determined motives, controlled motives generally lead to long term negative effects (Ryan and Deci, 2017). Students with controlled motives are more likely to procrastinate (Vansteenkiste et al., 2005). These students also show lower achievement (Soenens and Vansteenkiste, 2005), perhaps due to using more surface-level approaches to learning (Fryer et al., 2016). These effects stem from the fact that the motives come from outside of the person, and engagement is thus likely to taper or disappear when the external pressure is released (Deci and Ryan, 1985).

Similar to autonomous motivation, controlled motivation is comprised of two related factors: introjected regulation and external regulation (Ryan and Deci, 2017). Introjected regulation is represented by feelings of obligation, guilt, or shame, often in relation to teachers, peers, parents, or other significant others. External regulation is represented by the desire to perform to receive rewards or avoid punishments.

Given that autonomous and controlled motives simultaneously define the reasons that students may study, autonomous and controlled motives may combine in at least four different ways (Vansteenkiste et al., 2009). According to Vansteenkiste and colleagues' (2009) definitions, students may show *low quantity* motivation; they may not be strongly motivated by external or internal factors. They may show *poor quality* motivation, where they act for primarily external reasons, but do not internally endorse their actions. They may show a *high quantity* of motivation, where they act for simultaneously internal and external reasons. Finally, they may show *good quality* motivation, where their actions are prompted by strongly internally regulated reasons. These combined patterns of motivation represent recognized terms within self-determination theory (Ryan and Deci, 2017).

Empirical research in different settings has demonstrated a number of patterns of profiles. In Western high schools and universities, all four profiles were evident (Hayenga and Corpus, 2010; Ratelle et al., 2007; Vansteenkiste et al., 2009; Wormington et al., 2012). In a similar elementary school setting, three profiles were found (Corpus and Wormington, 2014); students in this sample did not show a low quantity of motivation.

One study of motivational profiles in a Japanese setting (Fryer et al., 2016) found three profiles, roughly contiguous with the poor quality, high quantity, and good quality groups. Later work confirmed this in an elementary foreign language learning setting (Oga-Baldwin and Fryer,

2018). In this longitudinal study, elementary students consistently evinced poor quality, high quantity, and good quality profiles. Over the course of two years in a game-based, low stakes learning environment, these students gradually moved toward higher quality motivation. Importantly, an increasing pattern of engagement was associated with this improving motivational quality.

Gender and language motivation. Worldwide, female students tend to outperform males in the realm of languages, especially in English as a foreign language (Education First, 2019). More generally, students' gender is related to their achievement and beliefs in different domains of study (Eccles et al., 1993). Girls show a greater tendency towards engagement in language oriented pursuits, including foreign language, while boys tend to engage less in these domains (Oga-Baldwin and Nakata, 2017).

Research in the domain of foreign language learning has consistently shown an advantage for female students (Henry, 2009; Oga-Baldwin and Nakata, 2017). Even as early as elementary school, boys show lower interest in learning foreign languages (Carreira, 2011), a trend which appears to continue into secondary school and beyond (Baker and MacIntyre, 2000; Fryer and Oga-Baldwin, 2019; Henry and Cliffordson, 2013). As a result, male students around the world perform somewhat worse on language proficiency measures (Education First, 2019). Recognizing this trend, it is crucial to find its nature and origin; understanding students' individual proclivities for language based on gender early on in their language studies can help define this point of origin.

Given the importance of improving the quality of English education through promoting student motivation (MEXT, 2008, 2016; Oga-Baldwin and Nakata, 2014), understanding potential reasons for students' engagement with English will offer diagnostic opportunities. Our previous research (Oga-Baldwin et al., 2017; Oga-Baldwin and Fryer, 2018, 2020; etc.) in this context with this sample has revealed that schools can indeed have positive effects on elementary students' motivation and engagement. Using a large sample of elementary school students, an auto-lagged structural equation model indicated that teachers' use of autonomy supportive instruction predicted better student engagement, which in turn predicted more autonomous motivation and less external regulation over the course of a school year (Oga-Baldwin et al., 2017). In a follow-up latent profile transition analysis covering two years of instruction, we further demonstrated that students dynamically moved toward a good quality motivational profile (Oga-Baldwin and Fryer, 2018). Importantly, this prior research did not consider gender as a variable in the models, an error we now seek to correct. With better understanding of how students, both boys and girls, are individually motivated to learn languages, teachers and researchers may help to craft interventions to improve the quality of learning outcomes.

Motivational profiles, the ways that students transition between these profiles (Oga-Baldwin and Fryer, 2018), and the complimenting variable-centered analyses (Oga-Baldwin et al., 2017) offer understanding of how children develop motivation over time within a school system. Given the importance of good quality motivation for learning both in and out of language education settings (Soenens and Vansteenkiste, 2005; Oga-Baldwin et al., 2017), a diagnostic measure of language motivation can help achieve the goals of promoting student motivation (MEXT, 2008, 2016).

Using the self-determination theory (Deci and Ryan, 1985; Ryan and Deci, 2017) framework to investigate students' motivation, we sought patterns of how gender may also influence these profiles. Based on the established connections between motivation and achievement (Chanal and Guay, 2015), and the dynamic relationship between engagement and future motivation (Oga-Baldwin et al., 2017), we may hypothesize that boys are also likely to display higher patterns of controlled motivation.

2. Aims

Research Questions. Based on previous profile literature, we sought to answer the following research questions.

RQ1) Does a random subsample of a previously sampled group replicate the profiling findings of the larger original sample?

RQ2) What differences in profile membership in this sample do male and female students display?

Hypothesis. Based on the previous pattern of findings in Japanese schools (Oga-Baldwin and Fryer, 2017, 2018), we hypothesized that the three previously observed profiles (poor quality, high quantity, and good quality motivation) would replicate. Within these profiles, male students would present comparatively higher degree of controlled motivation for learning foreign languages. Specifically, boys would more often show patterns of poor quality or high quantity motivation, while female students would show a tendency toward good quality motivation.

This data is part of a larger data set, previously analyzed using variable-centered (Oga-Baldwin et al., 2017) and person-centered longitudinal transition methods (Oga-Baldwin and Fryer, 2018). We undertook this re-analysis to assess issues involving students' gender and to confirm the findings of the larger sample with a random subsample. Given that gender has previously shown important effects in a similar sample (Oga-Baldwin and Nakata, 2017), it is important to clarify and replicate these effects to demonstrate their reliability. Further, other research has indicated greater diversity of profiles (e.g., Vansteenkiste et al., 2009). These profile solutions may have been obscured in the larger sample, but may still be found within a subsample. This subsample was selected using random assignment of roughly 75% of the main target population, as this sample size would be large enough to test the complex modeling (Nylund et al., 2007).

3. Methods

3.1. Participants

Public elementary students in western Japan (total $n = 513$, female $n = 254$, age 10–11) agreed to participate in the research between 2013 and 2015. Research participation was coordinated through meetings with the board of education, school principals, and teachers. Six suburban schools agreed to participate in the study. The municipality was representative of Japan as a whole in terms of socio-economic status, with a mean monthly income for the year in question of ¥463,000 (*cf.* national average ¥461, 000) (Japan Statistics Bureau, 2016). Surveys were administered in the first semester of the 2013 school year. Ethical permission to conduct this research was granted by the Fukuoka University of Education Ethics Review Board. The local board of education, school leaders, and cooperating teachers all volunteered for the research project. Parents and guardians were notified of the research and its scope through communication from the schools, and could withdraw at any time. No children or parents refused or requested withdrawal from the study.

Following the national curriculum (MEXT, 2008), students had no prior English learning experience in their elementary schools. English classes were primarily listening and speaking classes, in line with the Ministry of Education guidelines (MEXT, 2008). Classes followed the Ministry-approved curriculum using only Ministry approved texts (MEXT, 2012). As in most elementary English classes in Japan, two teachers led each weekly class: a native English-speaking teacher and the students' homeroom teacher, a native speaker of Japanese. Classroom activities included games, songs, and chants.

For the current study, a random resample (total $n = 398$, female $n = 201$, age 10–11) of the full sample (see Oga-Baldwin and Fryer, 2018; Oga-Baldwin et al., 2017) was taken from the first time point of the study. This subsample was chosen based on the fact that it most closely represents the starting point of the students' language studies to test for gender differences. Furthermore, this tests the prior three-profile solution (Oga-Baldwin and Fryer, 2018) on a sub-sample to ensure replicability of the prior results.

3.2. Instrument

Motivation surveys. We used a Japanese translation (Fryer and Oga-Baldwin, 2018) of the Self-Regulation Questionnaire—Academic (SRQ—A; Ryan and Connell, 1989) to measure students' intrinsic, identified, introjected and external regulations. Internal reliabilities were acceptable (>.70; Devellis, 2012). Students completed surveys in April of 2013. Instrument descriptive statistics and correlations are presented in Table 1. Survey items are presented in Appendix 1.

Vocabulary pre-test. Students identified English vocabulary words based on the curriculum (MEXT, 2010). Test items included no English loan words used in Japanese daily life. Students demonstrated productive word knowledge by writing either the Japanese phonetic reading (katakana) or English spelling of the items. Usage of Japanese phonetic writing and incorrect spelling were not penalized when they indicated the correct word. Scores ranged from 0 to 20, with a mean of 6 correct items. The test was administered approximately one week prior to the surveys. Vocabulary items are presented in Appendix 2.

3.3. Analysis

Prior to analyses, the reliability of all scales was assessed (Cronbach's Alpha). Following scale evaluation, Latent Profile Analysis was undertaken. A Two, Three and Four subgroup model was examined. To determine the most appropriate subgroup model for the data, three Information Criterion and two Log Likelihood Ratio Tests were used. For each model, Akaikes's Information (AIC; Akaike, 1987), the Bayesian Information Criterion (BIC; Schwarz, 1978) and the sample size-adjusted BIC model, lower values indicate the preferred model. Nylund et al. (2007) have indicated that for this type of analysis that BIC is often the most useful information criterion guide for. Furthermore, Nylund-Gibson et al. (2014) have suggested that where no lowest BIC results from reasonable subgroup arrangements, the last relatively large BIC decrease (or an elbow when graphed) can be interpreted as indicating best fit. The two likelihood ratio tests (LRTs) –Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (Vuong, 1989) and Lo-Mendell-Rubin Likelihood Ratio Test Criterion (Lo et al., 2001)—test whether one set of latent subgroups (e.g., three subgroups) are was less statistically significant than a solution with one group less (e.g., two subgroups). This provides information about whether one subgroup less (than the current number tested) is a better fit for the data. In addition to these fit statistics, relevant theory and subgroup n-size were considered in determining the most appropriate subgroup solution.

Following Latent Profile Analysis, MANOVA was conducted to test the variance explained by the final number of subgroup for the variables measured. The overall model test was followed by ANOVAs testing the difference between subgroups for each variable with the subgroups acting as the independent variable, followed by Tukey's pairwise testing (Bonferonni adjusted). Finally, we explored the gender composition of each subgroup.

4. Results

4.1. Descriptive results

The means and standard deviations for profiled and covariate variables are presented in Table 1. Cronbach's Alpha presented acceptable reliability for all scales (>.70; Devellis, 2012) supporting their use in person-centred and subsequent difference testing analyses.

4.2. Latent profiling

LPAs examining two, three and four subgroup solutions supported three subgroups as fitting the data best (Table 2). According to the standard heuristics (Nylund et al., 2007), both LRTs indicated that four subgroups were not significant ($p < .05$) suggesting three subgroups.

Table 1. Descriptive statistics and Cronbach's Alpha.

	pre-test	Intrinsic	Identified	Introjected	External
Mean	6.31	3.54	3.93	1.93	2.49
Std. Dev.	3.76	.96	.96	.91	1.09
Cronbach's Alpha		.82	.81	.70	.73

Table 2. LPA fit statistics.

	c2	c3	c4
AIC	2198.85	2184.00	2173.17
BIC	2226.79	2223.92	2225.06
Sample size adjusted BIC	2204.58	2192.19	2183.81
Vuong-Lo-Mendell-Rubin LRT	0	0.008	0.10
Lo-Mendell-Rubin LRT	0	0.01	0.11
Entropy	.67	.78	.76

Furthermore, BIC presented a small rise between three and four groups, indicating the three subgroup solution as preferable. Finally, the subgroups were of a reasonable n-size and, after examining the covariates (Table 3), were in alignment with prior self-determination theory results (see Vansteenkiste et al., 2009; Oga-Baldwin and Fryer, 2018). Consistent with previous studies (Oga-Baldwin and Fryer, 2017, 2018), the three finalized subgroups were labelled Poor Quality (high amounts of externally-regulated motivations and low amounts of internally-regulated motivations), High Quantity (large amounts of all motivations measured), Good Quality (low amounts of externally-regulated motivations and high amounts of internally-regulated motivations). We have retained the label terminology from Vansteenkiste et al. (2009), also previously used in studies of the larger sample (Oga-Baldwin and Fryer, 2018).

4.3. Difference testing

To assess the explanatory power of the 3 subgroup model a MANOVA was conducted. The three subgroups were the independent variable and the four types of regulated motivation were the dependent variable (intrinsic/identified/introjected/external). The MANOVA resulted in a Wilks Lambda = .32, $F = 100.25$, $p < .001$ ($R^2 = .68$). ANOVAs were conducted for all constructs measured (Table 4). Difference testing presented large variance explained for intrinsic regulation ($R^2 = .82$), moderate variance for ($R^2 = .22$) external regulation, and identified regulation ($R^2 = .44$), and a small amount of variance for introjected regulation ($R^2 = .04$) and the pre-test ($R^2 = .01$). Effects are consistent with those found in the previous study (intrinsic $R^2 = .68$–78, identified $R^2 = .23$–.50, introjected $R^2 = .01$–.04, external $R^2 = .20$–.30;

Oga-Baldwin and Fryer, 2018). Finally, pairwise testing presented significant differences for latent variables across the subgroups, but no significant pairwise difference for the pre-test. Differences in profile composition across gender are visually presented in Figure 1.

An examination of gender differences across profiles was the final test. In this test, both gender and profile were treated as factorial predictor variables. Small differences were observed simultaneously between groups and genders for intrinsic ($p < .01$, $F = 4.31$, $R^2 = .01$) and external ($p < .05$, $F = 3.75$, $R^2 = .01$) regulations, but not the covariates (introjected, identified, and pre-test scores: $p > .05$) for the sample means. The gender composition for each group is presented in Table 4, with a visualization shown in Figure 2. Male students were over represented in the Poor Quality (male $n = 31$, female $n = 21$), and High Quantity (male $n = 89$, female $n = 71$) motivation subgroups and female students dominated the Good Quality subgroup (male $n = 77$, female $n = 109$). A chi-square test of independence confirmed the differences in group membership, $\chi^2 (6, 398) = 9.41$, $p < .001$.

5. Discussion

In the current person-centered examination of elementary school students' motivation for learning English as a foreign language, three subgroups were observed. Consistent with prior studies (Corpus and Wormington, 2014; Oga-Baldwin and Fryer, 2017; Vansteenkiste et al., 2009) and based on the profiled and covariate variables, the subgroups were labelled Poor Quality, Good Quality, and High Quantity. Multivariate testing indicated that the three subgroup solution explained a substantial amount of variance for the entire data set, the profiled variables and most of the covariates. Initial difference testing with sample mean highlighted gender differences for both intrinsic (higher for female students) and external (higher for male students) regulations. The subgroups presented gender differences which supported the sample mean tests, indicating that male students in the current elementary foreign language context more often experience Poor Quality motivation for learning.

Pilot investigations showed no overall significant differences in motivation by gender (Oga-Baldwin and Fryer, 2017), though the current results showed how the different groups may present different membership patterns based on gender. Findings corroborate prior results showing that Japanese male students are likely to display comparative

Table 3. Mean scores across gender and subgroup.

	Female			Male		
	Poor Quality	Good Quality	High Quantity	Poor Quality	Good Quality	High Quantity
	$n = 21$	$n = 109$	$n = 71$	$n = 31$	$n = 77$	$n = 89$
Intrinsic	1.88	4.34	3.25	1.73	4.31	3.31
[95% CI]	[1.70, 2.06]	[4.26, 4.42]	[3.16, 3.35]	[1.59, 1.87]	[4.22, 4.40]	[3.22, 3.39]
Identified	2.70	4.52	3.62	2.65	4.43	3.83
[95% CI]	[2.38, 3.03]	[4.38, 4.67]	[3.44, 3.80]	[2.25, 2.73]	[4.28, 4.58]	[3.69, 3.98]
Introjected	1.59	2.03	1.89	1.43	2.08	1.98
[95% CI]	[1.18, 1.99]	[1.85, 2.20]	[1.67, 2.11]	[1.12, 1.74]	[1.89, 2.28]	[1.80, 2.16]
External	3.46	1.87	2.90	3.01	2.13	2.90
[95% CI]	[3.08, 3.84]	[1.71, 2.04]	[2.70, 3.11]	[2.66, 3.36]	[1.91, 2.36]	[2.69, 3.10]
Pretest	5.14	6.90	5.88	5.97	6.60	6.06
[95% CI]	[3.50, 6.78]	[6.17, 7.63]	[4.98, 6.79]	[4.66, 7.27]	[5.76, 7.44]	[5.29, 6.83]

Table 4. Difference testing across subgroups.

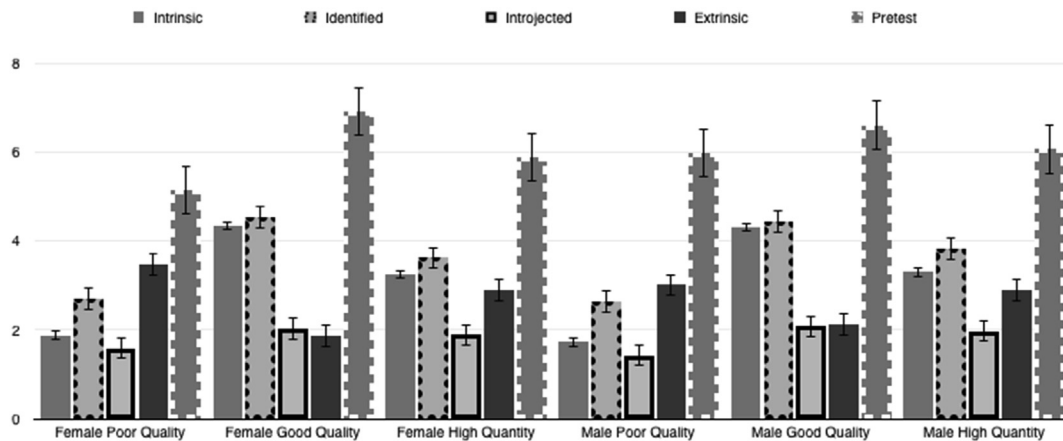|	Poor Quality	Good Quality	High Quantity	F	p	R^2
Intrinsic	1.79	4.33	3.28	881.41	.001	.82
Identified	2.47	4.65	3.90	158.25	.001	.44
Introjected	1.48	2.05	1.94	8.28	.001	.04
External	3.20	1.98	2.89	57.53	.001	.22
Pretest	5.63	6.77	6.01	2.76	.06	.01
N	52	186	160			

Figure 1. Profile composition by gender and subgroup.

deficits in quality of motivation and engagement (Oga-Baldwin and Nakata, 2017). Recognizing that young Japanese male students are more likely to show a greater need for external guidance raises the question of how to move boys in elementary foreign language classes away from this tendency and toward more adaptive motives (Vansteenkiste et al., 2009).

5.1. Future directions and limitations

Given trends demonstrating that male students work at a disadvantage in language related studies (e.g., Carreira, 2011; Oga-Baldwin and Nakata, 2017), future research should address how to best engage boys in foreign language learning. Interventions utilizing progressive research

designs and analyses (see Fryer et al., 2018) are necessary to develop teaching and learning systems capable of supporting male students in engaging in and enjoying foreign language classes as much as their female classmates. With a better understanding of why young Japanese male students show a tendency toward more external control, future research may help to overcome these gaps and assist these male students to both value and achieve proficiency in a foreign language.

While the findings show a clear pattern consistent with previous research, the current study is limited by cross-sectional research design employed and the fact that only elementary students at the beginning of their English studies participated. We therefore call for studies using designs which each include students across a range of learning stages and
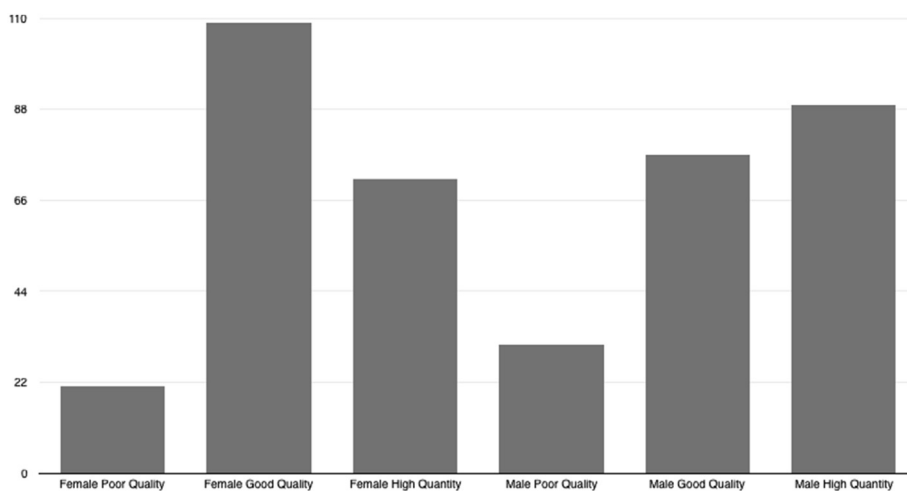

Figure 2. Subgroup gender populations.

follow students across possible transitions between more and less adaptive learner subgroups (for recent examples in higher education see Fryer, 2017; Fryer and Vermunt, 2018).

6. Conclusions

The current study gives credence to previous work showing the importance of gender as a factor in elementary school language learning (Carreira, 2011; Oga-Baldwin and Nakata, 2017). Further, these results indicate that motivational profiles may offer insight into differences based on student gender, corroborating findings from Western contexts (Eccles et al., 1993) in Asia. Accordingly, male students appear to operate at a motivational disadvantage in elementary foreign language classes in Japanese contexts, with potential long-term effects (Education First, 2019). In order to improve the quality of students' foreign language achievement in Japan and East Asia more generally, greater support is necessary in order to improve the quality of boys' motivation.

Declarations

Author contribution statement

W. L. Q Oga-Baldwin: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

L. K Fryer: Analyzed and interpreted the data; Wrote the paper.

Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

Appendix 1. Autonomous and Controlled Language Motivation Scales (Oga-Baldwin and Nakata, 2017).

Autonomous	Intrinsic Regulation	English is fun
		I'm interested in English
		English has value
	Identified Regulation	English will help me in other parts of my life
		I want to be able to use English in the future
		English will help me grow
Controlled	Introjected Regulation	I want my teacher to like me
		I want other people to praise me
		I want my friends to think I'm good at English
	Extrinsic Regulation	If I don't my teacher will get angry
		Participating is one of the rules
		I have no other choice

Appendix 2. Pictures were taken from approved school textbooks, and are subject to copyright. Instructions: Look at the pictures and answer whether you know the word, and reading in English.

Word	I don't know this word	I know this word	Meaning:
(pig)	1	2	_____
(globe)	1	2	_____
(bat – animal)	1	2	_____
(eggplant)	1	2	_____
(microscope)	1	2	_____
(grandfather)	1	2	_____
(baseball player)	1	2	_____
(pudding)	1	2	_____
(eraser)	1	2	_____
(ruler)	1	2	_____
(blackboard)	1	2	_____
(watch)	1	2	_____
(square)	1	2	_____
(calligraphy)	1	2	_____
(brown)	1	2	_____
(pen case)	1	2	_____
(social studies)	1	2	_____
(South Korea)	1	2	_____

References

Akaike, H., 1987. Factor analysis and AIC. Psychometrika 52, 317–333.

Baker, S.C., MacIntyre, P.D., 2000. The role of gender and immersion in communication and second language orientations. Lang. Learn. 50 (2), 311–341.

Brophy, J., 2010. Motivating Students to Learn, third ed. Routledge, New York, NY.

Carreira, J.M., 2011. Relationship between motivation for learning EFL and intrinsic motivation for learning in general among Japanese elementary school students. System 39 (1), 90–102.

Chanal, J., Guay, F., 2015. Are autonomous and controlled motivations school-subjects-specific? PloS One 10 (8), e0134660.

Corpus, J.H., Wormington, S.V., 2014. Profiles of intrinsic and extrinsic motivations in elementary school: a longitudinal analysis. J. Exp. Educ. 82 (4), 480–501.

Deci, E.L., Ryan, R.M., 1985. Intrinsic Motivation and Self-Determination in Human Behavior. Plenum, New York.

Devellis, R.F., 2012. Scale Development: Theory and Application, third ed. Sage, Thousand Oaks, CA.

Eccles, J., Wigfield, A., Harold, R.D., Blumenfeld, P., 1993. Age and gender differences in children's self- and task perceptions during elementary school. Child Dev. 64, 830–847.

Education First, 2019. EF English Proficiency index 2019. Japan. Available from: http ://www.ef.co.uk/epi/regions/asia/japan/.

Fryer, L.K., 2015. Predicting self-concept, interest and achievement for first-year students: the seeds of lifelong learning. Learn. Indiv Differ 1–9.

Fryer, L.K., 2017. (Latent) transitions to learning at university: a latent profile transition analysis of first-year Japanese students. Higher Education.

Fryer, L.K., Oga-Baldwin, W.L.Q., 2018. Assessing motivation and instruction for languages at Japanese junior high schools. In: Clements, P., Krause, A., Bennett, P. (Eds.), Language Teaching in a Global Age: Shaping the Classroom, Shaping the World. JALT, Tokyo. Permanent online location: http://jalt-publications.org/articl es/24348-assessing-motivation-and-instruction-languages-japanese-jhss.

Fryer, L.K., Oga-Baldwin, W.L.Q., 2019. Succeeding at junior high school: students' reasons, their reach, and the teaching that h(inders)elps their grasp. Contemp. Educ. Psychol. 59, 101778.

Fryer, L.K., Vermunt, J.D., 2018. Regulating approaches to learning: testing learning strategy convergences across a year at university. Br. J. Educ. Psychol.

Fryer, L.K., Ginns, P., Walker, R., 2014. Between students' instrumental goals and how they learn: goal content is the gap to mind. Br. J. Educ. Psychol. 84 (4), 612–630.

Fryer, L.K., Ginns, P., Walker, R., 2016. Reciprocal modelling of Japanese university students' regulation strategies and motivational deficits for studying. Learn. Indiv Differ 51, 220–228.

Fryer, L.K., Larson-Hall, J., Stewart, J., 2018. Experimental and longitudinal advances in language learning research. In: Phakiti, A., Costa, P.D., Plonsky, L., Starfield, S. (Eds.),

Palgrave Handbook of Applied Linguistics Research Methodology. Palgrave, New York.

Hayenga, A.O., Corpus, J.H., 2010. Profiles of intrinsic and extrinsic motivations: a person-centered approach to motivation and achievement in middle school. Motiv. Emot. 34 (4), 371–383.

Henry, A., 2009. Gender differences in compulsory school pupils' L2 self-concepts: a longitudinal study. System 37 (2), 177–193.

Henry, A., Cliffordson, C., 2013. Motivation, gender, and possible selves. Lang. Learn.

Japan Statistics Bureau, 2016. Japan Statistical Yearbook 2016. Available from. http://www.stat.go.jp/english/data/nenkan/index.htm.

Lo, Y., Mendell, N., Rubin, D., 2001. Testing the number of components in a normal mixture. Biometrika 88, 767–778.

MEXT, 2008. Shogakkou Gakushuu Shidou Youryou Kaisetu: Gaikokugo Katsudouhen [Explanatory Commentary for the Elementary School Curriculum Guidelines: Foreign Language Activities]. Retrieved 8/26/10 from. http://www.mext.go.jp/component/a_menu/education/micro_detail/_icsFiles/afieldfile/2009/06/16/1234931_012.pdf.

MEXT, 2010. Hi, Friends! 1. Kyoiku Shuppan, Tokyo.

MEXT, 2012. Hi, Friends! 1. Kyouiku Shuppan, Tokyo.

MEXT, 2016. Gaikokugo Waakingu Guruupu-Niokeru Torimatome an Betten Shiryo [Supplementary Document from the Collected Plan of the Foreign Language Working Group]. Retrieved from. http://www.mext.go.jp/b_menu/shingi/chukyo/chukyo3/058/siryo/_icsFiles/afieldfile/2016/09/14/1373448_1.pdf.

Meece, J., Glienke, B., Burg, S., 2006. Gender and motivation. J. Sch. Psychol. 44 (5), 351–373.

Noels, K.A., Pelletier, L.G., Clément, R., Vallerand, R.J., 2000. Why are you learning a second language? Motivational orientations and self-determination theory. Lang. Learn. 50 (1), 57–85.

Nylund, K.L., Asparouhov, T., Muthén, B.O., 2007. Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. Struct. Equ. Model. 14 (4), 535–569.

Nylund-Gibson, K., Grimm, R., Quirk, M., Furlong, M., 2014. A latent transition mixture model using the three-step specification. Struct. Equ. Model. Multidiscip. J. 21, 439–454.

Oga-Baldwin, W.L.Q., Fryer, L.K., 2017. Exploring motivational profiles in public elementary school English classes. In: Clements, P., Krause, A., Brown, H. (Eds.), Transformation in Language Education. JALT, Tokyo.

Oga-Baldwin, W.L.Q., Fryer, L.K., 2018. Schools can improve motivational quality: profile transitions across early foreign language learning experiences. Motiv. Emot. 42 (4), 527–545.

Oga-Baldwin, W.L.Q., Fryer, L.K., 2020. Engagement growth in language learning classrooms: a latent growth analysis of engagement in Japanese elementary schools. In: Hiver, P., Al-Houri, A. (Eds.), Student Engagement in the Language Classroom. Multilingual Matters.

Oga-Baldwin, W.L.Q., Nakata, Y., 2014. Supplementing the elementary foreign language course of study with a self-determination framework. Int. J. Curric. Dev. Pract. 16 (1), 13–26.

Oga-Baldwin, W.L.Q., Nakata, Y., 2017. Engagement, gender, and motivation: a predictive model for Japanese young language learners. System 65, 151–163.

Oga-Baldwin, W.L.Q., Nakata, Y., Parker, P., Ryan, R., 2017. Motivating young language learners: a longitudinal model of self-determined motivation in elementary school foreign language classes. Contemp. Educ. Psychol.

Ratelle, C.F., Guay, F., Vallerand, R.J., Larose, S., Senécal, C., 2007. Autonomous, controlled, and amotivated types of academic motivation: a person-oriented analysis. J. Educ. Psychol. 99, 734–746.

Ryan, R.M., Connell, J.P., 1989. Perceived locus of causality and internalization: examining reasons for acting in two domains. J. Pers. Soc. Psychol. 57, 749–761.

Ryan, R.M., Deci, E.L., 2017. Self-determination Theory: Basic Psychological Needs in Motivation, Development, & Wellness. Guilford, New York.

Schwarz, G.E., 1978. Estimating the dimension of a model. Ann. Stat. 6 (2), 461–464.

Soenens, B., Vansteenkiste, M., 2005. Antecedents and outcomes of self-determination in three life domains: the role of parents' and teachers' autonomy support. J. Youth Adolesc. 34, 589–604.

Vansteenkiste, M., Zhou, M., Lens, W., Soenens, B., 2005. Experiences of autonomy and control among Chinese learners: vitalizing or immobilizing? J. Educ. Psychol. 97, 468–483.

Vansteenkiste, M., Sierens, E., Soenens, B., Luyckx, K., Lens, W., 2009. Motivational profiles from a self-determination perspective: the quality of motivation matters. J. Educ. Psychol. 101, 671–688.

Voyer, D., Voyer, S., 2014. Gender differences in scholastic achievement: a meta-analysis. Psychol. Bull. 140, 1174–1204.

Vuong, Q., 1989. Likelihood ratio tests for model selection and non-nested hypotheses. Econometrica 57, 307–333. http://www.jstor.org/stable/1912557.

Wormington, S.V., Corpus, J.H., Anderson, K.G., 2012. A person-centered investigation of academic motivation and its correlates in high school. Learn. Indiv Differ 22 (4), 429–438.