

Articles

Willingness to Communicate and Japanese High School English Learners

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In this longitudinal study I investigated the extent, if any, to which Japanese high school English learners' willingness to communicate (WTC; McCroskey & Richmond, 1985) changes over the 3 years of high school and then explored the reasons for the changes or stability. A questionnaire was developed drawing on the WTC scale (McCroskey, 1992) and administered to 190 students three times at yearly intervals. The data were analyzed with the Rasch rating scale model and ANOVAs. Two distinct constructs were identified across the three waves of data: willingness to communicate with friends and acquaintances (WTCFA) and willingness to communicate with strangers (WTCS). The results showed that neither WTCFA nor WTCS changed significantly over the high school years, and that WTCS remained low. Follow-up interviews with selected students suggested several possible reasons for the questionnaire results.

本縦断的研究は、日本の高校生英語学習者のwillingness to communicate (WTC; McCroskey & Richmond, 1985)が高校3年間に変化するのかどうかと、その変化または無変化の理由を調査したものである。WTC質問票(McCroskey, 1992)を基に質問票を作成し、高校生190人に、1年間隔で3回、回答してもらった。質問票のデータは、ラッシュモデルと分散分析(ANOVA)を用いて分析した。その結果、何れの回においても、「友人や知人に対するWTC」と「見知らぬ人に対するWTC」の2つの心理概念が見いだされた。そして、「友人や知人に対するWTC」にも「見知らぬ人に対するWTC」にも高校3年間に有意な変化が無かったこと、また、「見知らぬ人に対するWTC」は大変低いレベルに留まっていたことがわかった。質問票での調査に続けて実施した、抽出した生徒へのインタビューでは、それらの結果のいくつかの理由が示唆された。

For the past 20-plus years, the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) has tried to develop high school students' English communication abilities by incorporating oral communication into high school English courses (MEXT, 1989, 1999), designating foreign language as a compulsory subject (MEXT, 1999), and reorganizing high school English courses into communication English, English expression, and English conversation (MEXT, 2009).¹ If or when high school students develop English communication abilities, their willingness to communicate in English will increase because the former can be considered as an antecedent to the latter (MacIntyre, 1994). If their willingness to communicate fails to increase, problems need to be identified. In this study² I investigate the extent, if any, to which Japanese high school students' willingness to communicate in English changes over their high school years and inquire into the reasons for any changes or stability that were observed.

Literature Review

Theoretical Background

Willingness to communicate (WTC) was originally conceptualized with reference to the first language by McCroskey and associates (e.g., McCroskey & Richmond, 1985) as the probability of a person's engaging in communication when free to do so. They treated WTC as a personality trait and suggested that WTC was related to communication apprehension, perceived communicative competence, introversion-extroversion, and self-esteem. MacIntyre (1994) proposed a model describing the interrelations among several individual difference variables as predictors of WTC. In his model, WTC was influenced most directly by a combination of communication apprehension and perceived communicative competence, which in turn were influenced by introversion and self-esteem.

MacIntyre and associates applied WTC to L2 communication in various Canadian contexts and suggested that WTC in the L2 was a predictor of frequency of L2 communication (e.g., MacIntyre & Charos, 1996). MacIntyre, Clément, Dörnyei, and Noels (1998) treated L2 WTC as a situational variable, defined as the individual's "readiness to enter into discourse at a particular time with a specific person or persons, using an L2" (p. 547), and developed a heuristic model of variables influencing it. The model shows the range of potential influences on L2 WTC, including relatively stable influences such as intergroup relations, learner personality, and communicative competence, as well as more transient influences such as desire to speak

to a specific person and communicative self-confidence in a particular setting. MacIntyre et al. (1998) argued that an L2 program that fails to produce learners who are willing to use the language is a failed program.

Empirical Research

Several researchers investigated Japanese English learners' WTC in English using the WTC scale (McCroskey, 1992), which includes items that are designed to measure the individual's likeliness to choose to converse in a particular situation with a specific person or persons. Hashimoto (2002) investigated the WTC in English of Japanese university ESL students in Hawaii. The results indicated that perceived competence and lack of anxiety led to WTC, and that WTC and motivation affected L2 communication frequency in classrooms. Yashima (2002) investigated the relation between L2 learning and L2 communication variables among Japanese university EFL learners and found that motivation enhanced self-confidence in L2 communication, which led to WTC. In addition, greater international posture, which she defined with reference to Japanese EFL learners as "interest in foreign or international affairs, willingness to go overseas to stay or work, readiness to interact with intercultural partners, and . . . openness or a non-ethnocentric attitude toward different cultures" (p. 57), also led to greater WTC. Yashima, Zenuk-Nishide, and Shimizu (2004) investigated the antecedents and results of WTC in English of Japanese high school students in Japan and in the United States on a study-abroad program. The results indicated that perceived L2 communicative competence and international posture led to WTC and L2 communication, and that greater WTC resulted in more frequent L2 communication.

Researchers have reported on Japanese English learners' interest in communicative English, rather than WTC in English, as part of their inquiry into the learners' motivation. Kurahachi (1996), by administering a questionnaire using a retrospective design to university students, investigated how Japanese students' motivation for learning English changed from junior high school through university. The students reported that over time, they lost interest in English as the novelty wore off, experienced a reduced level of self-efficacy, failed to find their learning environment attractive, and finally lost enthusiasm for learning English. However, the results suggested that the university students recognized the need to learn English, and that they wanted to be able to speak the language.

Nakata (2001) investigated the English-learning motivational components of Japanese 1st-year university students and inquired into the

background of the components through a questionnaire. Four motivational components possessed by his students were identified: intrinsic motivation for communication in English, negative attitude toward the instrumentality of English, anxiety, and self-efficacy. The results suggested that despite their negative views of English in the past because of their perceived grammatical difficulties in the language and negative feelings toward “exam English,” university students maintained interest in communicative English.

In summary, the main findings concerning Japanese English learners’ WTC in English and interest in communicative English are as follows. First, the learners’ perceived competence and confidence in L2 communication, international posture, and lack of L2 anxiety lead to WTC, which affects the frequency of their L2 use. Second, despite their negative experiences and views of English in the past, university students retain interest in communicative English.

Purposes and Research Questions

Past studies on WTC focused on identifying and confirming its antecedents and consequences. Studies on its changes over time seem to be almost nonexistent. The purpose of this study was to investigate whether Japanese high school English learners’ WTC in English changes over the high school years and to look into the reasons for changes or stability. The research questions are as follows:

1. Does the WTC in English of Japanese high school English learners change during 3 years in high school?
2. How do the participants perceive changes or stability in their WTC in English in their high school years? What reasons do they give for changes or stability?

Methods

Participants

The participants were 190 first-year high school students aged 15-16 at the start of this study, from a private boys’ school in eastern Japan. This study tracked them over the course of 3 years. Because of absenteeism and natural attrition, 185, 173, and 172 students answered the questionnaire described below in the 1st, 2nd, and 3rd years, respectively. The school is a combined 3-year junior high school and 3-year high school.³ Each week in high school, the participants had six to seven 50-minute English classes, fo-

cused on reading, writing and grammar, and oral communication. They were taught a weekly oral-communication class by a native English speaker from the 1st year in junior high school through the 1st year in high school. As all the participants had passed the school's competitive entrance examination with the intention of proceeding to university after graduation, their English proficiency (determined as early intermediate) as well as their academic ability in general was above the national average.

Instrumentation

A questionnaire that included 19 WTC items was developed. The items are identical to those used by Hashimoto (2002),⁴ who made several changes to McCroskey's (1992) WTC items for her Japanese participants. Of the 19 items, seven items are fillers.⁵ The remaining 12 legitimate items are combinations of four situations (*speaking in dyads*, *speaking in a group of about five people*, *speaking in a meeting of about 10 people*, and *speaking in public to a group of about 30 people*) and three types of receivers (*strangers*, *acquaintances*, and *friends*). Thus, the legitimate items represent 12 contexts (four situations × three types of receivers). For example, one item reads, "Talk in a small group (about five people) of friends." The participants were instructed to imagine that they were living in an English-speaking country and indicate the percentage of times they would choose to communicate in English in each context when free to do so. They completed a Japanese version of the questionnaire (see Appendix A for the English translation) approximately 1 month after the beginning of the 1st, 2nd, and 3rd years of high school (Time 1, Time 2, and Time 3, respectively) during a homeroom hour with their homeroom teacher supervising them.

Preliminary Data Analysis

First, to examine the validity of the construct measured by the questionnaire, the WTC data were analyzed with the Rasch measurement model (Rasch, 1960), using WINSTEPS 3.68.2 (Linacre & Wright, 2009). A Rasch analysis of item fit and a Rasch Principal Components Analysis of item residuals was performed. The criteria for the unidimensionality of the construct were set as follows: (a) item separation is sufficiently high (above 2.00), (b) no items misfit the Rasch model (infit and outfit mean square statistics are between 0.50 and 1.50, Linacre, 2009), (c) the variance explained by the Rasch measures is sufficiently high (above 50%), and (d) the unexplained variance explained by first residual contrast is sufficiently low (below 3.0

eigenvalue units, Linacre, 2009). Across the three waves of data, two fundamentally unidimensional constructs were identified: Willingness to Communicate with Friends and Acquaintances (WTCFA), on which all the friends and acquaintances items loaded, and Willingness to Communicate with Strangers (WTCS), on which all the strangers items loaded (see Appendix B for the Rasch tables). The Cronbach alpha reliability estimates, measured using PASW Statistics 18.0 (2009), were all good across the three waves of data: For WTCFA they were .94, .93, and .93, and for WTCS they were .81, .86, and .80, at Times 1, 2, and 3, respectively. Next, the raw scores from the questionnaire were converted into interval Rasch person measures:⁶ Each participant was given a person measure for WTCFA and a person measure for WTCS at each measurement time. Table 1 shows the descriptive statistics of the person measures for WTCFA and WTCS at each time point. The Pearson correlation coefficients of the person measures for WTCFA and WTCS were low at .45, .54, and .39 ($p < .01$) at Times 1, 2, and 3, respectively.

Table 1. Descriptive Statistics for Willingness to Communicate With Friends and Acquaintances (WTCFA) and Willingness to Communicate With Strangers (WTCS)

	WTCFA			WTCS		
	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
Mean	51.41	51.44	51.89	39.82	40.26	40.13
Standard error	.80	.87	.86	.60	.66	.67
95% confidence interval (LB)	49.83	49.72	50.20	38.64	38.96	38.80
95% confidence interval (UB)	52.99	53.15	53.58	41.00	41.56	41.46
Standard deviation	10.91	11.42	11.18	8.16	8.65	8.84
Skewness	-.31	-.14	-.25	.65	.84	.18
Standard error of skewness	.18	.19	.19	.18	.19	.19
Kurtosis	.29	.09	.43	-.20	.31	2.32
Standard error of kurtosis	.36	.37	.37	.36	.37	.37

Note. The logit scale was transformed into a CHIPS scale (item mean = 50.0).

Interviews

Follow-up interviews were conducted with 13 participants, consisting of three groups of students: typical, motivated, and returnee. Typical students were selected on the condition that their person measures for WTCFA, WTCS, and other constructs⁷ obtained from the three waves of the questionnaire were more or less around 50, which represents the participants' average. Motivated students were selected on the condition that their person measures were mostly over 50. Returnee students, who had lived in a foreign country before, were chosen out of convenience (e.g., from the class I was teaching). About 10 students were listed for each group: They were given an informed consent form, on which a parental signature to indicate permission was requested, and were asked for their voluntary participation in the interviews. Four typical students (i.e., Yu, Shun, Toshi, and Ken), five motivated students (i.e., Dai, Koh, Taka, Teru, and Toku), and four returnee students (i.e., Jun, Kazu, Yuta, and Goh) agreed to be interviewed (all the names are pseudonyms).

The interviews were held approximately 3 months before the students graduated from high school. Each student was interviewed once on a one-on-one basis, and interviews were conducted in Japanese in an amicable atmosphere in a small quiet room at the school. The students were asked predetermined questions based on their answers to the questionnaire and additional questions based on their responses during the interviews. The interviews, which lasted for 22.2 minutes on average, were recorded on an IC recorder.

All the interviews were fully transcribed in standard Japanese orthography without including pauses, prosody, or nonverbal phenomena. Six influential themes, including WTC, were identified, and important utterances were selected for each theme and translated into English. To confirm the reliability of the translations, a Japanese university instructor holding an EdD in TESOL degree translated approximately 20% of all the selected utterances from the original Japanese into English, and my translations were compared with hers. She and I agreed that although our translations did not match word for word, their meanings were the same.

Results

Students' WTC Over Time

Figure 1 represents the mean Rasch person measures for WTCFA and WTCS at each measurement time. It shows that both WTCFA and WTCS

remained stable across the three time points, but that WTCS remained very low. A one-way repeated-measures analysis of variance (ANOVA) was conducted for each construct to assess whether there were significant differences in the means over time. The results showed no significant difference for either WTCFA or WTCS.

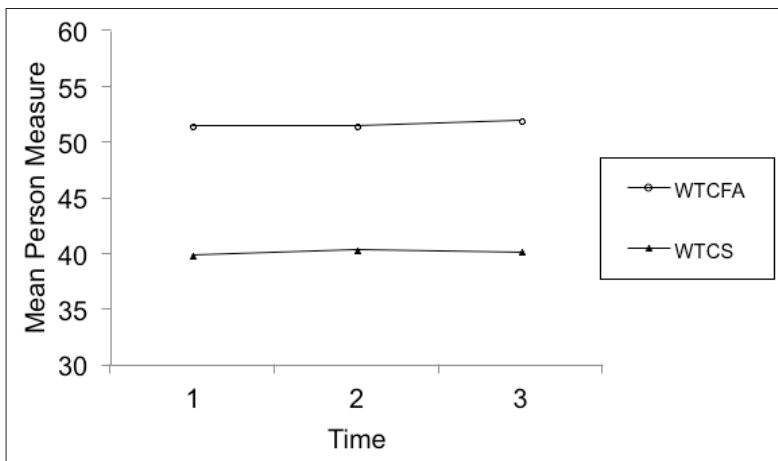


Figure 1. Mean person measures for Willingness to Communicate with Friends and Acquaintances (WTCFA) and Willingness to Communicate with Strangers (WTCS).

Students' Perceptions

Why did neither the students' WTCFA nor their WTCS increase and why did their WTCS stay very low during the high school years? The interviewees suggested several reasons.

First, it might not have been easy for the students to imagine the English-speaking contexts described in the WTC items on the questionnaire. Ken explained why his WTC might have been low:

I can't imagine a situation in which I have to communicate in English very well. I have never thought of living abroad or going abroad. That may be the reason.

The difficulty Ken had imagining the contexts might not be unusual among students who do not have much experience using English communicatively.

In addition, the difficulty might have been increased by the lack of detailed contextual information in the WTC items.

Second, the students might have held uncomfortable feelings toward foreigners, and, as a result, might not have felt like talking with them. Yu explained why his WTC measured by the questionnaire might have been low:

I didn't really want to talk with foreigners. [It's] because I don't have the chance to talk with them in my daily life. I don't know how [inaudible]. I don't really know what they are thinking. I think they have different values from Japanese people. And there have been many incidents in which contact with foreigners caused problems. Probably I was thinking of these when I was filling in the questionnaire.

Considering that the opportunities for most Japanese students to come into contact with foreigners are very limited, it might not be surprising for students to be somewhat uncomfortable with foreigners. However, Yu eventually became interested in learning communicative English seemingly because he shifted his focus from his negative feelings toward foreigners to his dream job, becoming a politician visiting foreign countries, which he discussed elsewhere in the interview.

Third, the students might not have been willing to communicate in English because of their lack of confidence in using it. Goh, who seemed to be motivated to acquire practical English skills for his hoped-for future job as an internationally known chemist, explained why his WTC as measured by the questionnaire might have been low:

I'm not good at speaking English. Besides, I don't have the chance to speak it. So, when I imagined myself in the situations given by the questionnaire, I wasn't sure what I would do . . . I have been learning English since I was in the fourth grade. But I have had few chances to use it; I have been studying it just for exams. So, I can't really apply it to actual situations. I would like to acquire English that I can actually use.

Goh seems to suggest that even if students are motivated to acquire practical English, they cannot build confidence in using English or be willing to communicate in the language without many chances to use it. His words "studying [English] just for exams" seem to indirectly refer to the conventional form and accuracy focused, grammar-translation, and audio-lingual approach these examinations seem to favor.

Fourth, students' WTC can depend on their current environment, as Jun, a returnee student, suggested:

My willingness to communicate in English may have been low probably because there are few foreigners at this school and few chances to talk to them. I think it will change a lot depending on the environment. If I enter the SILS (School of International Liberal Studies) at Waseda [University], I think it will jump up because everything is done in English there. If I enter Keio [University], it will jump up, too, because I'd like to go abroad as an exchange student [from the university].

Jun was able to compare himself in English-speaking and non-English-speaking environments because he had been exposed to both environments as a student abroad and then as a returnee. As Jun suggested, one's WTC in English can be low when in a non-English-speaking environment because of a feeling of psychological distance from the English-speaking environment. In this case, the contexts described in the questionnaire were detached from him. On the other hand, when in an English-speaking environment, those same contexts can seem close and familiar and similar to the contexts encountered in daily life.

Fifth, many students might not have known what communication with native English speakers was like or have realized its importance. This became clear to me when Yuta, another returnee student, explained why he wanted to learn communicative English:

I can get a lot from talking with people from different cultures. Americans are cheerful, and talking to them makes me feel that we can understand each other straightforwardly as two human beings. If I don't talk, they won't open up and, as a result, I won't be able to say what I want to say. So, I think being able to speak [English] well is important, first and foremost.

Yuta keenly felt the importance of communication with native English speakers from his real experiences in the United States. This might explain why his WTCFA and WTCS were both higher than average. However, students without experiences abroad might not have realized its importance so clearly.

Finally, the very low mean for WTCS across time might reflect a Japanese attitudinal tendency about communication with strangers as Klopff (1991)

noted: "The Japanese find it difficult to initiate and maintain communication with strangers" (p. 137). Let me quote Toshi, who was discussing his WTC:

It was neither high nor low. According to the questionnaire, it might have been low, but that was probably because the questions were all like "When you met a person in an elevator . . ." I wouldn't talk to even a Japanese person in an elevator.

Although the item that Toshi referred to was a filler item and was not used for the statistical analyses, the questionnaire included four legitimate items about strangers (the other eight legitimate items were about friends or acquaintances). Because the mean for WTCFA was in the middle range of the scale while the mean for WTCS was extremely low across the three administrations of the questionnaire (Figure 1), the influence of this attitudinal tendency cannot be ruled out.

To summarize, the students' WTCFA/WTCS measured by the questionnaire did not increase over the high school years possibly because (a) it was difficult for the students to imagine themselves in the English-speaking contexts described in the questionnaire, (b) the students might be uncomfortable with foreigners, (c) the students may not have had confidence in using English, (d) the students were not in an English-speaking environment, (e) many students perhaps did not realize the importance of communication with native English speakers sufficiently, and (f) as far as WTCS is concerned, a Japanese attitudinal tendency might have played a role irrespective of growth in proficiency.

Discussion and Conclusion

Past researchers treated WTC, measured by the WTC scale (McCroskey, 1992), as a single construct when they investigated its predictors and results. However, the statistical analysis of this study showed that across the three administrations of the questionnaire, the scale measured two distinct constructs: Willingness to Communicate with Friends and Acquaintances (WTCFA) and Willingness to Communicate with Strangers (WTCS). This differentiation seems to be reasonable because semantically, friends are close to acquaintances, whereas strangers are distant from friends and acquaintances.

Although WTCFA and WTCS should ideally increase in the course of language learning, the questionnaire results of this study showed that there was no significant change in the students' WTCFA or WTCS over their high

school years, and that their WTCS remained very low. The interview results indicated several possible reasons.

Perhaps, as the interview results suggested, the WTC items in the questionnaire might not have been appropriate for the participants. Imagining living in an English-speaking country, a precondition of all the contexts described in the WTC items, might have lacked reality for most students, who had never been or lived abroad. Also, the described contexts might have been too simplified and short for many students to fully imagine. These potential drawbacks of the WTC items are a limitation to this study and need to be taken into consideration in evaluating the questionnaire results.

In addition, the questionnaire results might not necessarily reflect what the participants might actually do in real life. For example, following the last quote in the previous section, Toshi said:

But when I was in the fifth grade at elementary school, I traveled in America with my cousin and his family for about a month during the summer. We traveled from Los Angeles to New York, taking small planes for only 20 people or so and visiting many places on the way. Many people there are friendly, aren't they? So, I was talked to. At that time, I tried to make myself understood by using gestures, eye contact, and what few words I knew. So, I don't think of [my willingness to communicate in English] as low. I think it is important to speak in order to communicate what you feel and think, and in order to do so, English conversation skills are necessary. So, I would like to be able to speak English well enough to make myself understood, if not very well.

Although Toshi seemed to have displayed positive responses to strangers during his trip to the United States and have a strong interest in communicative English, both his WTCS and WTCFA measured by the questionnaire were low across time. This discrepancy suggests that the students' responses to the imaginary contexts in the questionnaire could be different from their actual responses in real life, and that their WTCFA and WTCS as measured by the questionnaire might not mirror their general attitudes toward English communication. These possibilities also need to be taken into account in evaluating the questionnaire results.

That said, the questionnaire results seem to reflect the learning environment of the participants. Although they had a weekly oral communication class taught by a native English speaker until the end of the 1st year in high

school, all the English classes they had in the 2nd and 3rd years were taught by Japanese English teachers in Japanese. In these 2 years, their studies were more and more focused on preparation for university entrance examinations, which usually include an English test that predominantly consists of reading-comprehension, grammar, and vocabulary questions and almost invariably does not include a speaking section. Considering such a milieu, it is unsurprising that the participants' WTCFA and WTCS in English did not increase over the high school years.

On the other hand, I had a strong feeling during the interviews that the students had a growing awareness of the need for practical English skills and a considerable interest in communicative English, which agrees with the findings in Kurahachi's (1996) and Nakata's (2001) studies. This observation and the questionnaire results together suggest that such awareness and interest alone were not enough to raise the students' WTCFA and WTCS.

So, what is needed? Although the participants in this study do not necessarily represent the entire Japanese high school student population, their milieu and awareness concerning English learning are not unusual in Japan. Thus, several implications may be derived from this study for the target population.

First, high school students need more opportunities to communicate in English. This is because the infrequency and limited duration of such opportunities is connected with two possible reasons for the stagnant WTCFA/WTCS of the participants in this study discussed during the interviews: the lack of confidence in using English and the non-English-speaking environment. I hope students will have more such opportunities in and after 2013, when a new course of study for high school (MEXT, 2009) comes into effect. It stipulates that fundamentally, the English classes are to be conducted by means of English, and textbooks compiled in accordance with it contain various aural and oral activities. Students need numerous student-centered, individually focused activities on realistic issues, in which they can be engaged in English communication for an extended period of time while exercising their ingenuity in a friendly atmosphere. Such activities should be implemented in the English class as much as possible.

Second, high school students need to learn more about English-speaking people and their attitudes toward communication. This is because without such knowledge, students might have negative feelings toward them and their English communication might be inhibited by their own attitudinal tendencies and conventions about communication, as the interview results indicated. Although many textbooks include material intended for this pur-

pose, the material does not seem to be enough. Japanese English teachers need to augment it by sharing with the class their own experiences in meeting English speakers and what the students might be able to obtain to this end from language-heavy media such as TV, the Internet, newspapers, magazines, books, songs, dramas, and movies. In addition, as direct contact with English speakers provides students with excellent opportunities to learn about English-speaking people and use the language, schools should expand their student exchange programs, organize more student trips to English-speaking places, domestic and abroad, and invite local English speakers to, or ask them to help with, as many students' events and activities as possible.

Finally, as university entrance examinations have a great influence on English teaching and learning at Japanese high school (Nishino & Watanabe, 2008), I would like to suggest that as part of their entrance examinations, universities give an English speaking test or, alternatively, require candidates to take a commercial standardized English-proficiency examination that includes a speaking test and report their scores.

In short, more communication opportunities and further efforts to overcome the disadvantages of the Japanese EFL environment seem to be needed for the growth of Japanese high school students' WTCFA and WTCS in English.

Notes

1. This reorganization has been implemented since April, 2013.
2. This study is part of a larger study in which I investigated multiple motivational constructs of Japanese high school English learners longitudinally.
3. The Japanese Education Ministry has been promoting the spread of combined junior high school and high school called *chuko ikkan kyoiku ko* since 1999 to diversify secondary education, and has recognized 420 schools (44% public, 56% private) nationwide as such as of 2011 (MEXT, 2011). These schools include many institutions that send many students to prestigious universities in Japan.
4. One of two virtually identical fillers among her 20 items was removed.
5. The fillers are dummy items, with which no analysis was conducted.
6. The logit scale was transformed into a CHIPS scale (item mean = 50.0).
7. The larger study, of which this study is a part, included 12 motivational constructs.

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Appendix A

Willingness-to-Communicate Questionnaire

Imagine that you live in an English-speaking country and face the following 19 situations. You have completely free choice of communicating or not communicating. Please indicate in the underlined space at the left the percentage of times you would choose to communicate in English in each type of situation.

0 % = never, 100 % = always

1. *Talk with an acquaintance in an elevator.
2. *Talk with a stranger on the bus.
3. Speak in public to a group (about 30 people) of strangers.
4. Talk with an acquaintance while standing in line.
5. Talk in a large meeting (about 10 people) of friends.
6. *Talk with a janitor/resident manager.

- __ 7. Talk in a small group (about 5 people) of strangers.
 __ 8. Talk with a friend while standing in line.
 __ 9. *Talk with a waiter/waitress in a restaurant.
 __ 10. Talk in a large meeting (about 10 people) of acquaintances.
 __ 11. Talk with a stranger while standing in line.
 __ 12. *Talk with a shop clerk.
 __ 13. Speak in public to a group (about 30 people) of friends.
 __ 14. Talk in a small group (about 5 people) of acquaintances.
 __ 15. *Talk with a garbage collector.
 __ 16. Talk in a large meeting (about 10 people) of strangers.
 __ 17. *Talk with a librarian.
 __ 18. Talk in a small group (about 5 people) of friends.
 __ 19. Speak in public to a group (about 30 people) of acquaintances.
 *Filler item

Appendix B

Rasch Tables

Table B1. Rasch PCA of Item Residuals for the WTCF and WTCA Items at Time 1

Item	Residual loading	Measure	SE	Infit		Outfit	
				MNSQ	ZSTD	MNSQ	ZSTD
19 WTCA4	.66	57.1	.6	1.03	.3	1.09	.6
14 WTCA3	.59	50.3	.5	.92	-.7	.89	-.9
10 WTCA2	.40	49.7	.5	.99	.0	1.04	.4
13 WTCF3	.19	54.5	.5	1.15	1.3	1.13	1.0
8 WTCF2	-.59	45.4	.5	1.06	.6	.87	-.8
18 WTCF4	-.52	46.5	.5	1.01	.1	.91	-.6
5 WTCF1	-.45	47.1	.5	.77	-2.2	.89	-.7
4 WTCA1	-.26	49.3	.5	1.02	.2	1.16	1.2

Note. The logit scale was transformed into a CHIPS scale (item mean = 50.0). WTCA = Willingness to Communicate with Acquaintances; WTCF = Willingness to Communicate with Friends.

Table B2. Rasch PCA of Item Residuals for the WTCS Items at Time 1

Item	Residual loading	Measure	SE	Infit		Outfit	
				MNSQ	ZSTD	MNSQ	ZSTD
7 WTCS2	.95	44.8	.6	.91	-.7	.91	-.6
3 WTCS1	-.75	51.1	.7	1.27	1.7	1.23	1.4
16 WTCS4	-.21	50.0	.7	.96	-.2	.86	-.9
11 WTCS3	-.12	54.0	.8	1.07	.5	.92	-.4

Note. The logit scale was transformed into a CHIPS scale (item mean = 50.0). WTCS = Willingness to Communicate with Strangers.

Table B3. Rasch PCA of Item Residuals for the WTCA and WTCF Items at Time 2

Item	Residual loading	Measure	SE	Infit		Outfit	
				MNSQ	ZSTD	MNSQ	ZSTD
19 WTCA4	.70	56.8	.6	1.17	1.4	1.00	.1
13 WTCF3	.54	54.6	.6	1.16	1.3	1.03	.3
14 WTCA3	.39	49.4	.6	.69	-2.9	.74	-2.0
10 WTCA2	.15	49.0	.6	.76	-2.2	.73	-2.1
18 WTCF4	.09	48.1	.6	.99	-.1	.91	-.5
8 WTCF2	-.61	44.2	.6	1.03	.3	1.66	2.9
4 WTCA1	-.61	49.5	.6	1.07	.6	1.36	2.4
5 WTCF1	-.40	48.4	.6	1.06	.5	.97	-.2

Note. The logit scale was transformed into a CHIPS scale (item mean = 50.0). WTCA = Willingness to Communicate with Acquaintances; WTCF = Willingness to Communicate with Friends.

Table B4. Rasch PCA of Item Residuals for the WTCS Items at Time 2

Item	Residual loading	Measure	SE	Infit		Outfit	
				MNSQ	ZSTD	MNSQ	ZSTD
7 WTCS2	.83	46.1	.6	.81	-1.4	.83	-1.2
16 WTCS4	.34	50.2	.7	.88	-.8	.75	-1.7
3 WTCS1	-.82	50.5	.7	1.22	1.4	1.26	1.6
11 WTCS3	-.34	53.3	.8	1.26	1.4	1.14	.7

Note. The logit scale was transformed into a CHIPS scale (item mean = 50.0). WTCS = Willingness to Communicate with Strangers.

Table B5. Rasch PCA of Item Residuals for the WTCA and WTCA Items at Time 3

Item	Residual loading	Measure	SE	Infit		Outfit	
				MNSQ	ZSTD	MNSQ	ZSTD
19 WTCA4	.78	57.7	.6	1.45	3.2	1.52	2.9
13 WTCF3	.69	55.7	.6	1.11	.9	1.04	.3
18 WTCF4	.11	47.1	.6	1.03	.3	1.09	.6
8 WTCF2	-.54	43.6	.6	.94	-.4	1.01	.1
10 WTCA2	-.43	50.0	.6	.88	-1.0	.92	-.5
14 WTCA3	-.40	49.8	.6	.68	-3.1	.66	-2.7
4 WTCA1	-.36	48.6	.6	1.01	.1	1.02	.2
5 WTCF1	-.10	47.6	.6	.82	-1.6	1.21	1.3

Note. The logit scale was transformed into a CHIPS scale (item mean = 50.0). WTCA = Willingness to Communicate with Acquaintances; WTCA = Willingness to Communicate with Friends.

Table B6. Rasch PCA of Item Residuals for the WTCS Items at Time 3

Item	Residual loading	Measure	SE	Infit		Outfit	
				MNSQ	ZSTD	MNSQ	ZSTD
7 WTCS2	.94	46.2	.6	.89	-.8	.88	-.8
11 WTCS3	.02	52.5	.8	1.22	1.2	1.10	.6
16 WTCS4	-.58	51.0	.7	1.00	.1	.87	-.7
3 WTCS1	-.56	50.4	.7	1.16	1.0	1.06	.4

Note. The logit scale was transformed into a CHIPS scale (item mean = 50.0).
WTCS = Willingness to Communicate with Strangers.