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REGULAR ARTICLE

Classroom Interactions in the Target Language: Learners' Perceptions, Willingness to Communicate, and Communication Behavior

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Abstract Research has provided evidence in support of the importance of the predictive effect of the willingness to communicate (WTC) on interactions in the classroom and shed light on the predictive sources of WTC. However, few studies have investigated learners' perceptions of classroom interaction in the target language (L2 PCI), and few have considered how these perceptions relate to L2 WTC and actual classroom interaction. Hence, the present study aims at examining the causal relationships between L2 PCI, L2 WTC, and interaction behavior. Based on a critical review of literature, a structural equation model theorizing the causal links among the three factors was proposed for empirical testing. Three hundred and twenty-nine university students participated in the study. The results suggested that learners' perceptions of group interaction and interaction with the teacher significantly predicted L2 WTC and classroom communication in the target language. It was further argued that the research findings had pronounced implications for both language pedagogy and research.

Keywords Classroom interaction · L2 willingness to communicate · L2 communication behavior · Learners' perceptions · SEM

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In terms of preparing learners to use the target language for interpersonal and intergroup communication, interaction has been recognized as a necessary aspect of the language-acquisition process—a process in which the language classroom plays a major role (e.g., Hymes 1971; Long 1996; Mackey 1999, 2006; Swain 1985). A considerable body of research has linked interaction to language learning and suggested the importance of creating opportunities for authentic communication and students' actual use of the target language (e.g., Ellis et al. 1994; Kuhl et al. 2003; Lu 2010; Mackey 1999). Further, in the past two decades, Willingness to Communicate (WTC)—i.e., the intention of a person to communicate with others given the opportunity and the likelihood that a person will do so—has received wide critical attention in second language acquisition (SLA). It is generally argued that the fundamental goal of any language education is to endow learners with both competence and WTC both inside and outside their language classrooms (Dörnyei 2005; MacIntyre et al. 1998, 2001). Past studies have found that classroom environment measured by teacher support, student cohesiveness, and task orientation has a predictive power of students' WTC in the classroom (Khajavy et al. 2016; Peng and Woodrow 2010). Also, Fushino (2010) found that learners' beliefs about the usefulness and potential value of group work may influence their WTC in the class. That is,

the extent to which a student perceives interaction opportunities created by the teacher and/or peers to be valuable is likely to determine his/her WTC level and interaction behaviors in class.

Given that interaction is vital in the language-acquisition process and the language classroom is likely to be among the most important learning contexts providing opportunities for learners to interact in the L2, it is important to examine the role learners' perceptions and evaluative judgments of classroom interaction play in their communication intention and behavior in the L2 classroom.

Nevertheless, perceptions of classroom interaction in L2 and their relationships with communication orientations have not been investigated sufficiently. Therefore, the purpose of the present study is to investigate the relationships between perceptions of classroom interaction in the target language (L2 PCI), L2 WTC, and classroom interaction behavior.

Interaction in Language Acquisition and Learners' Perceptions

The importance of interaction to the acquisition of a language is indisputable. Several theoretical perspectives have been used as a basis for promoting interaction on the part of language learners.

Long's interaction hypothesis (Long 1996; Mackey 2006) points to the importance of interactional processes, which entail opportunities to negotiate meaning, to provide and receive corrective feedback, and to enable modified input and noticing moments. Swain (1985) also proposed a hypothesis related to the interaction hypothesis, i.e., the output hypothesis, whereby learners in interaction are pushed to modify their outputs in response to either self-initiated or interlocutor-initiated repair. It is collaborative dialogues that provide contexts for both language use and language learning, with the former mediating the latter (Swain 2000). A third perspective according to which social interaction with mediated assistance for learners (Lantolf and Thorn 2006) is central to language acquisition is sociocultural theory (SCT), which further heightens the importance of interaction. These perspectives all point to the importance of interaction and to its cognitive and social nature.

Further, research studies focused on teaching a target language also report findings that support the importance of interaction on language learning (e.g., Kuhl et al. 2003; Lu 2010; Mackey 1999; Polio and Gass 1997, 1998). For example, Kuhl et al. (2003) reported two experiments on the impact of exposure to native Mandarin Chinese speakers on American infants' Mandarin speech perception. The infant participants exposed to native Mandarin Chinese speakers were found to have higher scores on a Mandarin speech perception test than did infants without such exposure. This finding suggests that social interaction plays an important role in the language-learning process. Another study by Lu (2010) examined the impact of classroom interaction on language learning by comparing the interactions of two 8th-grade classes measured by the extent to which the students took turns in classroom interaction. The results show that the students in Class A, who had more interaction than did the students in Class B, outperformed the latter on a mock General English Proficiency Test (GEPT). On this basis, the importance of interaction is theoretically and empirically supported in the acquisition of a language.

As a teacher's efforts to create quality interactions do not necessarily guarantee learners' participation, learners' perceptions, defined as evaluative judgments of and attitudes toward interaction in the classroom, can affect learners' intentions to negotiate meaning, their interaction behaviors, and even the level of competence they ultimately achieve in the target language. Much research is related to learners' perceptions of classroom learning. Many studies show that learners and teachers may differ in terms of their perceptions of classroom emphasis (e.g., Brown 2009; Hawkey 2006; Kuo 2011; Peacock 1998). However, other studies have focused on learners' views of classroom interaction (e.g., Kuo 2011; Zhou 2015; Wang 2017; Kuo (2011) reported that learners in a British EFL setting were not satisfied with the student–student interactions they had experienced due to multiple factors, with the teacher as the major factor influencing their perceptions. Similarly, students in Zhou's (2015) qualitative study conducted in a Chinese EFL setting supported speaking practices within and beyond the classroom and were dissatisfied with the way English was taught at their university. In Wang (2017), learners' perceptions of classroom interaction were shown to be very positive and correlated with learners' communication apprehension and communication motivation, of which only the latter was a predictive factor of learners' perceptions.

In summary, interaction has been recognized as a necessary aspect of the language-acquisition process. As MacIntyre et al. (1998) indicated, a lack of communication opportunities in the classroom potentially reveals language-teaching failure. However, some factors are likely to inhibit learners' participation in the classroom; that is, a learner may be cognitively unready, affectively demotivated, and/or socioculturally discouraged. Overall, learners' perceptions are a matter of some importance for both teaching and learning.

Willingness to Communicate (WTC) and Learner Interaction

WTC can be defined as "a readiness to enter into discourse at a particular time with a specific person or persons, using a[n] L2" (MacIntyre et al. 1998, p. 547). In MacIntyre et al.'s (1998) L2 WTC model, WTC is "a situation-based variable representing an intention to communicate at a specific time to a specific person" (p. 559). The relationship between L2 WTC and communication behavior and theoretically predictive factors is exemplified in this model (1998, p. 547), in which L2 WTC is positioned as directly affecting L2 use with ten major sources hypothesized.[1] With self-confidence and the social context empirically found to play a key role in L2 WTC, the authors called for further research in order to test the hypothesized relations of the variables to WTC. Following MacIntyre et al.'s model, many research studies have explored relationships between other variables and L2 WTC. Identified factors of WTC are L2 anxiety, motivation, perceived competence (Hashimoto 2002), proficiency level, length of study, time spent abroad, communicating with foreigners (Alemi and Pahmforoosh 2013), the teacher, group work in the classroom (Sun 2008), and others. In particular, Khajavy et al. (2016) ascertained two direct predictors of L2 WTC, i.e., classroom environment and communication confidence, as well as two indirect predictors, i.e., motivation and English language proficiency, which indirectly affected L2 WTC through communication confidence. Further, both Fushino (2010) and Peng (2014) found that learners' beliefs indirectly affect L2 WTC. Fushino's study (2010) indicated that students who are in favor of working in a group tend to participate more than those who were less in favor of group work. Peng's (2014) study showed that learner beliefs about both language learning and classroom communication have a predictive power for English learning motivation and L2 communicative competence, which sequentially lead to WTC.

There are also research studies examining the relationship between L2 WTC and reported communication frequency. In Dörnyei and Kormos (2000), WTC was found to correlate with communication behaviors measured in reference to learners' utterances and turns taken in communicative tasks, although only for learners who had a positive attitude toward the task. In Hashimoto (2002), in addition to findings pertaining to the three variables that impacted L2 WTC, it was found that L2 WTC affected reported communication frequency in the classroom. However, how learners' perceptions of L2 interaction in the classroom are related to L2 WTC and communication behavior is insufficiently examined. In Dörnyei and Kormos (2000), L2 WTC correlated with communication behaviors only for those who were positive about the communicative tasks they were guided to do, which suggests that attitude toward interaction may play a role in influencing WTC and communication behavior.

Given that the literature review points to insufficient research on learners' perceptions of classroom interactions and on their relationships with L2 WTC and communication behaviors, the present study proposes a hypothetical model (Fig. 1) to account for the interrelationship of perceptions of classroom interaction in the target language (i.e., English in this study), willingness to communicate in English (WTCE), and reported communication behavior with reference to using English (RCBE) and addresses three research questions:

> Research Question 1: Is perception of classroom interaction with reference to using the English language (PCIE) a predictive factor of WTCE?
> Research Question 2: Is perception of classroom interaction with reference to using the English language (PCIE) a predictive factor of students' reported communication behavior in English (RCBE)?

The concept of learner perceptions in this study is defined as evaluative judgments of and attitudes toward interaction in the classroom. As a learner's perceptions of classroom interactions may affect his/her communication intention in the classroom and as research has shown the

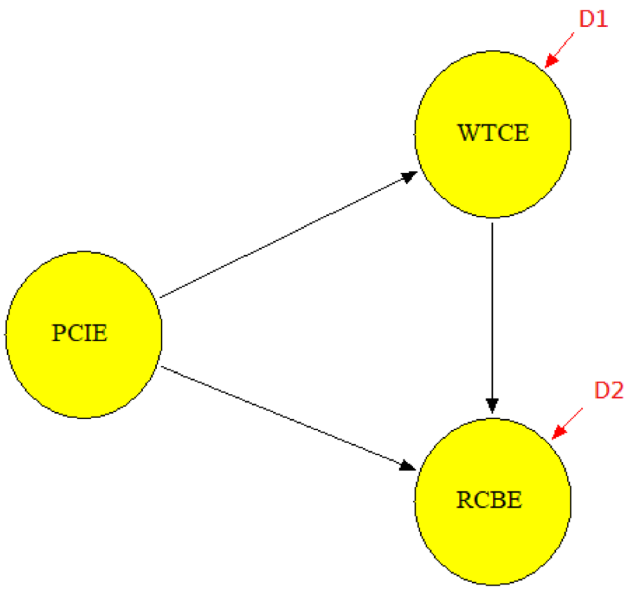

Fig. 1 Hypothesized model

[1] The ten major sources are desire to communicate with a specific person, state communicative self-confidence, interpersonal motivation, intergroup motivation, L2 self-confidence, intergroup attitudes, social situation, communicative competence, intergroup climate, and personality (MacIntyre et al. 1998, p. 547).

relationship of attitude and belief with L2 WTC and communication behavior (Dörnyei and Kormos 2000; Fushino 2010; Peng 2014), the researchers hypothesized in this study that learner perceptions of classroom interactions have explanatory power for WTCE and for reported communication behavior (RCBE).

> Research Question 3: Is WTCE a predictor of learners' reported communication behavior (RCBE)?

Both theory and research (Dörnyei and Kormos 2000; Fushino 2010; Hashimoto 2002; MacIntyre et al. 1998; Peng 2014) point to WTC as a major source of communication behavior. Accordingly, in this study, WTCE is hypothesized as a predictive factor of RCBE.

Methods

This study relies on a quantitative design using questionnaire scales to establish relationships between perceived classroom interaction in English (PCIE), willingness to communicate in English (WTCE), and reported communication behavior (RCBE).

Instrumentation

The questionnaire (Appendix 1) used to collect data consisted of three scales: WTCE, RCBE and PCIE. The scales were adopted from the existing literature.

The Scale of Willingness to Communicate in English (WTCE) consists of five items adapted from McCroskey (1992). Although McCroskey developed his WTC items in the context of L1, the items used for the present study were modified to fit the context of the L2 (i.e., English in this study) classroom. The participants were asked to indicate the percentage of time (from 0 to 100%) they would choose to communicate in English in the classroom. The item examples are "Talk with an acquaintance in English in the classroom" and "Talk in a small group of strangers in English in the classroom." The overall reliability coefficient estimated using Cronbach's alpha is 0.94.

The Scale of Reported Communication Behavior (RCBE) items measuring the frequency of communication in English were adapted from Hashimoto's (2002) scale. This 8-point semantic differential scale has four items with 1 for 'Never' and 8 for 'Many Many Times'. The participants were asked to indicate how frequently they believed they would communicate in an English language classroom. As an example, one of the items used reads as follows: "Talk in a small group of acquaintances in English." The reliability coefficient is 0.84.

Perception of Classroom Interaction with English (PCIE) adopted from Wang (2017) has four dimensions. Perceptions of Interaction with the Teacher (PCIEtea) consists of two items (Items 1 and 2; $\alpha = 0.87$) that examine the participants' views of their interactions with their English teachers in the classroom (e.g., "The opportunity to interact with my English teacher is important for my English language learning"). Perceptions of Interaction with Group Members (PCIEgp) has three items (Items 3, 4, and 5; $\alpha = 0.87$) that measure perceptions of classroom interaction with group members (e.g., "Group discussions are an effective way to enhance my English communication skills"). Perceptions of interaction in pairs (PCIEpr) has three items (Items 6, 7, and 8; $\alpha = 0.88$) that measure perceptions of classroom interaction in pairs (e.g., "Dyadic interaction/communication in English is important for my English language learning"). Perceptions of classroom interaction between others (PCIEob) consists of two items (Items 9 and 10; $\alpha = 0.92$) that assess views of observing interaction between other people in the classroom (e.g., "Listening to others using English in classroom interactions is important for my English language learning"). The overall reliability coefficient is 0.89 derived from a 5-point Likert Scale, with 1 indicating Strongly Disagree, 2 for Disagree, 3 for Neutral, 4 for Agree, and 5 for Strongly Agree.

Participants and Procedures

The study participants comprised 329 English-major students studying at a university in the northern part of Taiwan. There were 152 freshmen, 162 sophomores, and 15 juniors. Their ages ranged from 18 to 21. Sixty-six of the participants were male, 261 were female, and 2 participants did not specify their gender.

All the questionnaire items were translated into Chinese, and then the English and Chinese versions were examined by two experts in applied linguistics to ensure the accuracy of the translation. All the participants responded to the Chinese version of the questionnaire a month before the end of the spring semester. After data collection, missing data were detected and replaced by mean values. The questionnaire data were then analyzed using descriptive statistics and SEM.

Results

The study results pertain to the analysis of normality at both univariate and multivariate levels as well as the testing of the measurement models and the full structural model using EQS 6.2 (Bentler and Wu 2006).

Analysis of Normality at the Univariate and Multivariate Levels

To test whether the questionnaire scores are normally distributed, the researchers used descriptive statistics to obtain skewness values and kurtosis values. Table 1 shows that skewness values of the six scales ranged between − 0.85 and 0.16, and kurtosis values ranged between − 0.43 and 1.63, with most values of each scale in the range of − 1 to + 1. According to George and Mallery (2001) and Kline (2011), skewness values and kurtosis values between -3 and + 3 indicate that the scores are probably normally distributed at the univariate level.

As shown in Appendix 2, the normal probability plots with 95% limits for the six scales were further graphically illustrated. It could be seen that nearly all the empirical data points fell within the range of predicted 95% confidence range except for a few outliers at the two extremes of the central trace lines. In particular, because the scale PCIEtea was the most negatively-skewed among the six scales (skewness = − 0.85), it had the longest left tail locating above the central trace line. On the other hand, RCBE was more positively-skewed, and, hence, it had a long right tail locating below the central trace line. However, subsequent examination of the normality at the multivariate level showed the normalized estimate (40.42) of the Mardia's coefficient (125.89) for the data underlying the proposed model was above the cut-off value set at 5 (Bentler and Wu 2006) and, thus, suggestive of the violation of assumption of multivariate normality in the sample. This was graphically illustrated for the two latent variables examined in the SEM study: WTCE and RCBE (Fig. 2).

As Fig. 2 indicated, due to the inconsistency of scale metrics between WTCE with a 0–100 rating scale and RCBE with a 1–8 rating scale, the bivariate density function integrating the two scales was negatively-skewed and behaved against the assumption of multivariate normality. To amend this, EQS 6.2 rescaled the rating metric of

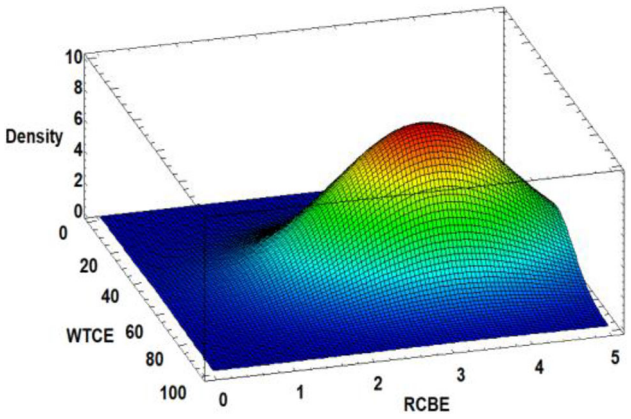

Fig. 2 The bivariate distribution of WTCE and RCBE

WTCE to be identical with the one of RCBE, and based on the rescaled metrics of the two scales, we were able to confirm the fulfillment of multivariate assumption of the two latent dependent variables in the SEM study. The bivariate normality density function was redrawn based on the rescaled data and appeared to behave bivariately normal (Fig. 3). Nevertheless, to comprehensively address the issue regarding the assumption of multivariate normality, Byrne (2010) suggested checking the Satorra–Bentler scaled chi-square (the S–Bχ^2) together with the Robust Comparative Fit Index (CFI) and the Root Mean-Square Error of Approximation (RMSEA).

Measurement Models

Before the study's structural model was tested with SEM, confirmatory factor analysis (CFA) was used to evaluate the hypotheses about the relationships between scale items and latent variables. The CFA results obtained with EQS generate goodness-of-fit indices, which indicate the adequacy of the measurement models. The essential goodness-of-fit measures include the Satorra-Bentler scaled chi-square (the S–Bχ^2), the Robust Comparative Fit Index

Table 1 Descriptive statistics of PCIE, WTCE, and RCBE

	No. of items	M	SD	Skewness		Kurtosis	
				Statistics	Std. error	Statistics	Std. error
PCIEtea	2	4.20	.65	− .85	.13	1.63	.27
PCIEgp	3	3.75	.78	− .37	.13	.14	.27
PCIEpr	3	4.10	.69	− .52	.13	.25	.27
PCIEob	2	3.97	.80	− .74	.13	.76	.27
WTCE	5	52.49	22.13	− .26	.13	− .43	.27
RCBE	5	3.40	1.15	.16	.13	.02	.27

PCIE perception of classroom interaction with reference to using the English language, *PCIEtea* perception of classroom interaction with the teacher, *PCIEgp* perception of classroom interaction with group members, *PCIEpr* perception of classroom interaction in pairs, *PCIEob* perception of classroom interaction of others, *WTCE* willingness to communicate in English, *RCBE* reported communication behavior in English

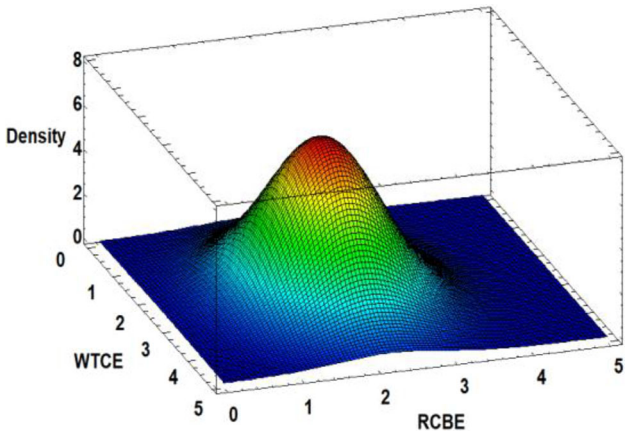

Fig. 3 The rescaled bivariate normality density function of WTCE and RCBE

(CFI), and the root mean-square error of approximation (RMSEA), as suggested by Bentler and Wu (2006) and Byrne (2010) with non-normality at the multivariate level in the sample. Table 2 shows the S–Bχ^2 was 200.64 ($p < 0.05$), CFI was 0.98 (> 0.90) and RMSEA, 0.038 (< 0.05). In addition, the Bentler–Bonett normed fit index (NFI) was 0.94, and Bollen's incremental fit index (IFI), 0.98 (> 0.90). Although the results yielded a significant S–Bχ^2 with p-value smaller than 0.05, all the goodness-of-fit indices reported in Table 2 are larger than 0.90 and, thus, suggested the appropriateness of the measurement models (Hair et al. 2010). The correlation coefficients are presented in Table 3.

Composite Reliability and Convergent Validity

For the structural equation modeling (SEM) analysis, composite reliability (CR) or construct reliability as well as the average variance extracted (AVE) are generally used. According to Fornell and Larcker (1981), a construct should achieve a reliability score higher than 0.7 and a convergent validity score higher than 0.5

Table 4 shows the results for the construct reliability and convergent validity coefficients of the three variables: Perception of classroom interaction with English (PCIE), willingness to communicate in English (WTCE), reported communication behavior (RCBE). The three variables all obtained satisfactory construct reliability ranging from 0.84 to 0.97 and satisfactory convergence validity ranging from 0.57 to 0.76.

Full Structural Model

To examine the relationship of perception of classroom interaction with English (PCIE) with willingness to communicate in English (WTCE), reported communication behavior (RCBE), SEM results were obtained. These are presented in Fig. 4; Table 5, which shows that the model in principle meets the requirements for a good model fit. Although the p-value for the scaled S–Bχ^2 is smaller than 0.05, other model fit indexes help account for the extent to which a model fits to the data. CFI, NFI, and IFI are all higher than 0.9, and RMSER lower than 0.05.

The standard regression weights for the paths of the PCIEtea → WTCE (0.20), the PCIEgp → L2WTC (0.17), the PCIEgp → RCBE (0.17), and the WTCE → RCBE (0.47) are statistically significant at the 0.05 level or below (Table 6).

The effect size was measured using Cohen's f^2 (Cohen 1992).[2] The results show that the effect size for WTCE is $f^2 = R^2/1 - R^2$ (i.e., 0.14/0.86) = 0.16 (a median effect) and that the effect size for RCBE is $f^2 = R^2/1 - R^2$ (i.e., 0.29/0.71) = 0.41 (a large effect).

To further examine the relationships of the latent variables, the direct, indirect, and total effects were calculated. A direct effect represents the direct influence of a predictor variable on a predicted variable. An indirect effect refers to the influence of one variable on another transmitted through a mediator variable in the model (Bollen 1987). Adding up the direct and indirect effects of one variable on another results in the total effect. Table 7 shows the relationships between the latent variables in terms of the direct, indirect, and total effects. Significance at 0.05 or 0.001 for a direct effect was automatically calculated by EQS, whereas the significance of an indirect effect was calculated with the Sobel test. The direct, indirect, and total effects are presented in Table 7. WTCE was predicted by perceptions of interaction with the teacher (PCIEtea, 0.20) and perceptions of interaction with group members (PCIEgp, 0.17). Reported communication behavior (RCBE) was predicted by WTCE (0.47) and by PCIEgp with a direct effect of 0.17, an indirect effect of 0.08, and a total effect of 0.25. Notice that although PCIEtea did not have a significant direct effect on RCBE, it did have a significant indirect effect on RCBE (0.09).

The results show that both PCIEtea and PCIEgp had an explanatory power for WTCE, suggesting that WTCE in the English language classroom could be influenced by the learners' perceptions of their own interactions with the teacher (PCIEtea) and with their group members (PCIEgp) in English rather than with a pair work partner or by observing others' interactions in English. The results also show that PCIEgp had a predictive power for RCBE with a significant direct effect on RCBE and a significant indirect effect via its direct effect on WTCE and WTCE's direct effect on RCBE, suggesting the important role of group activities in strengthening learners' intention to

[2] $f^2 = R^2/1 - R^2$ ($f^2 = 0.02$ indicates small effect, $f^2 = 0.15$, medium effect, and $f^2 = 0.35$, large effect.).

Table 2 CFA for the measurement model

	S–Bχ^2	*df*	Robust CFI	NFI	IFI	RMSEA
	200.64	137	.98	.94	.98	.038
Suggested index			> .90	> .90	> .90	< .05

Table 3 Correlation coefficients between the latent variables

	1	2	3	4	5	6
1. WTCE	.1.00					
2. RCBE	.46**	1.00				
3. PCIEob	.23**	.17*	1.00			
4. PCIEpr	.21**	.19**	.38**	1.00		
5. PCIEgp	.32**	.27**	.47**	.47**	1.00	
6. PCIEtea	.29**	.17*	.45**	.50**	.52**	1.00

PCIE perception of classroom interaction with reference to using the English language, *PCIEtea* perception of classroom interaction with the teacher, *PCIEgp* perception of classroom interaction with group members, *PCIEpr* perception of classroom interaction in pairs, *PCIEob* perception of classroom interaction of others, *WTCE* willingness to communicate in English, *RCBE* reported communication behavior in English

*$p < 0.05$; **$p < 0.001$

Table 4 Composite reliability and convergent validity of the scales

	PCIE	WTCE	RCBE
CR	.97	.94	.84
AVE	.76	.76	.57

communicate in L2 and potentially their L2 classroom interactions. Further, PCIEtea had a significant indirect effect on RCBE via the mediation of WTCE. Therefore, learners' perceptions of their interaction with the teacher may influence their actual L2 communication in the classroom under the condition that they are willing to communicate in the L2. Equally important to note is that WTCE had an explanatory power for RCBE, in accord with results reported in the literature (e.g., Dörnyei and Kormos 2000; Hashimoto 2002).

In summary, the structural model analyzed with SEM supports most of the hypothesized relationships between the latent variables. Perceptions of Interaction with the Teacher (PCIEtea) and perceptions of Interaction with group members (PCIEgp) each had a predictive power for explaining both WTCE and RCBE although to a different extent.

Discussion

The results of this study support the relationships between willingness to communicate in English (WTCE), reported communication behavior (RCBE), and two subscales of perceptions of classroom interaction with English (PCIE). On this basis, the results have important practical and theoretical implications.

Addressing the Research Questions

Results of the study show types of perceptions about classroom interaction in English (i.e., perceptions of interaction with the teacher and perceptions of interaction with group members) can be used to satisfactorily predict WTCE and RCBE. To some extent, the results corroborate findings reported in Sun (2008) whereby the teacher and group work tended to affect Taiwanese students' communication intention. The results also partially support findings reported in Fushino (2010) and Peng (2014). In both of these studies, L2 WTC was found to be indirectly affected by learners' beliefs, whereas perceptions of classroom interaction with the teacher and with group members (i.e., PCIEtea and PCIEgp) in the present study had a significant direct effect on WTCE. In addition, both PCIEtea and PCIEgp were found to have an explanatory power on RCBE, with the latter having the stronger effect. PCIEgp had a significant direct effect and a significant indirect effect on reported communication behavior (RCBE). Further, Although PCIEtea did not have a direct effect on RCBE, through WTCE, PCIEtea had a significant indirect effect on RCBE.

Further, the study results show WTCE's strong explanatory power for reported communication behaviors in English; thus, the WTCE variable is important in

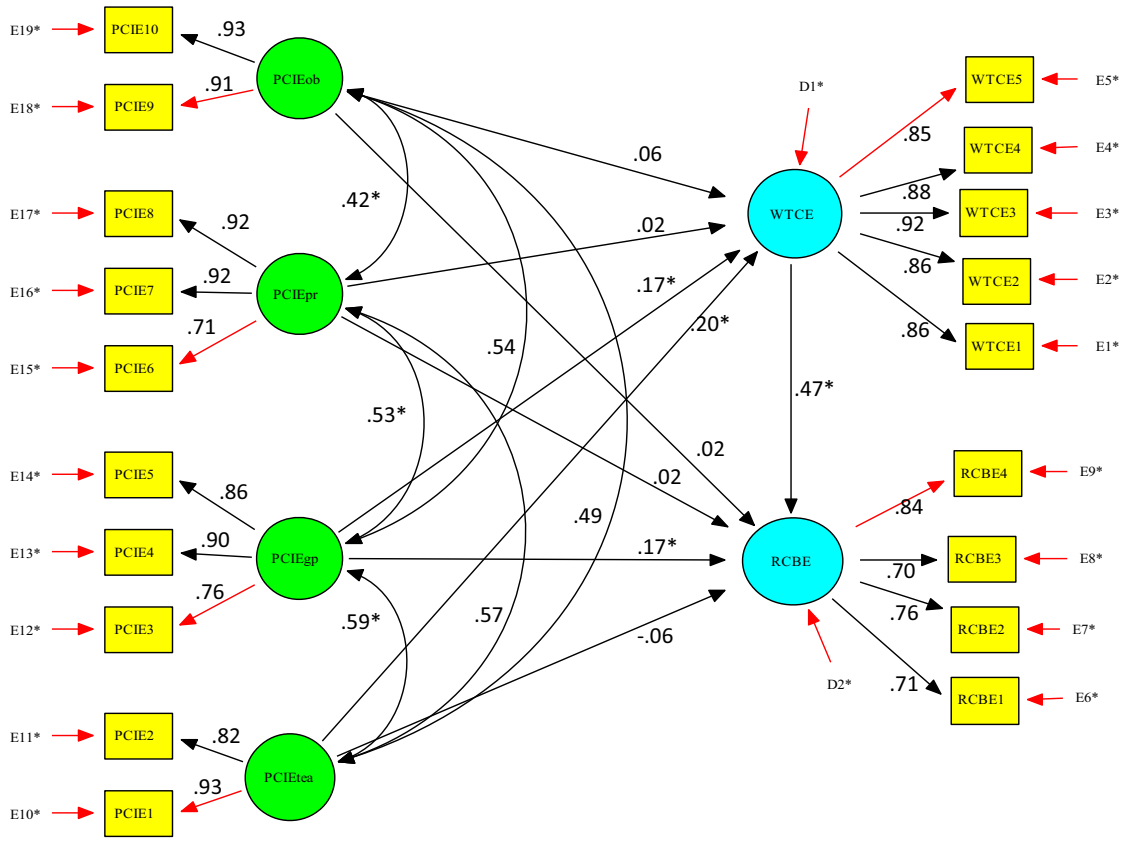

Fig. 4 SEM based on the proposed model. *PCIE* perception of classroom interaction with reference to using the English language, *WTCE* willingness to communicate in English, *RCBE* reported communication behavior in English. PCIE 1–10, WTCE 1–5, RCBE 1–4 are observable variables

Table 5 Summary table of model fit

	S–Bχ^2	*df*	CFI	NFI	IFI	RMSEA
	200.65	137	.98	.94	.98	.038
Suggested index			> .90	> .90	> .90	< .05

Table 6 Standardized parameter estimates for the model

Paths			Estimates	R^2	*P*
L2WTC	←	PCIEtea	.20	.04	.01*
L2WTC	←	PCIEgp	.17	.03	.04*
L2WTC	←	PCIEpr	.02	.0004	.82
L2WTC	←	PCIEob	.06	.0036	.42
L2RBC	←	PCIEtea	− .06	− .0036	.44
L2RBC	←	PCIEgp	.17	. 03	.04*
L2RBC	←	PCIEpr	.02	.0004	.82
L2RBC	←	PCIEob	.02	.0004	.79
L2RBC	←	L2WTC	.47	.22	***

*p <.05; ***p <.0001

PCIE perception of classroom interaction with reference to using the English language, *PCIEtea* perception of classroom interaction with the teacher, *PCIEgp* perception of classroom interaction with group members, *PCIEpr* perception of classroom interaction in pairs, *PCIEob* perception of classroom interaction of others, *WTCE* willingness to communicate in English, *RCBE* reported communication behavior in English

Table 7 Standardized direct, indirect, and total effects

Predicted variable	Predictor variable	Direct effect	Indirect effect	Total effect
WTCE	PCIEtea	.20*		.20*
	PCIEgp	.17*		.17*
	PCIEpr	.02		.02
	PCIEob	.06		.06
RCBE	PCIEtea	− .06	.09*	.03
	PCIEgp	.17*	.08*	.25*
	PCIEpr	.02	.01	.03
	PCIEob	.02	.03	.05
	WTCE	.47***		.47***

PCIE perception of classroom interaction with reference to using the English language, *PCIEtea* perception of classroom interaction with the teacher, *PCIEgp* perception of classroom interaction with group members, *PCIEpr* perception of classroom interaction in pairs, *PCIEob* perception of classroom interaction of others, *WTCE* willingness to communicate in English, *RCBE* reported communication behavior in English

*$p < .05$; ***$p < .0001$

predicting learners' interactions in English, as indicated in the theoretical model proposed by MacIntyre et al. (1998) and in research (e.g., Dörnyei and Kormos 2000; Hashimoto 2002). In Dörnyei and Kormos (2000), WTC was found to correlate with communication behaviors. Further, in Hashimoto (2002), L2 WTC was reported to directly influence communication frequency.

Implications

The study results have both practical and theoretical implications. Based on the study results, the impact of learners' perceptions of classroom interaction with the teacher and group members cannot be overlooked. How learners feel about and evaluate the two types of interactions (i.e., interactions with the teacher and with other learners) may predict their classroom communication intention and behaviors. Thus, finding ways to strengthen students' beliefs in the value of various interaction opportunities in the classroom can potentially influence their intention to engage in classroom communication and their actual use of the target language. Therefore, it appears to be necessary to teach with a focus on nurturing learners' positive views of classroom interaction with the teacher and group members and strengthening the extent to which they believe in the importance of interaction with others in the target language.

Another important pedagogical implication of the results pertains to increasing learners' WTC in the target language. Given that the results point to WTCE as a relatively strong predictor of reported communication behavior (RCBE), learners' L2 WTC should be greatly encouraged in such ways as communicating to learners the importance of interaction in learning, attending to other sources of L2 WTC (e.g., Dörnyei and Kormos 2000; Fushino 2010; Hashimoto 2002; MacIntyre et al. 1998; Peng 2014) in addition to perceived classroom interaction in the L2 (L2 PCI).

The study results also have theoretical implications. First, this study is important in that it offers empirically rendered data corroborating major SLA theorizing in interaction (Swain 1985), highlighting the importance of student–student and student–teacher interaction in promoting WTC and language development in the classroom. Second, there is little research on L2PCI's role in learners' WTC (Fushino 2010) and in their reported communication behaviors in the classroom. However, the results of the present study show the significance of two types of PCIE (i.e., interaction with the teacher and interaction with group members) in explaining WTCE and RCBE and, hence, further advance this research direction.

Limitation and Future Directions

The results of the present study support PCIE's relationship with WTCE and RCBE. The practical and theoretical implications of the study results were also discussed. Like most of the studies in this vein, the current investigation relied on a self-reported instrument to determine communication behavior based entirely on the learners' own perceptions. Alternative data collection methods such as classroom observation and instructor's evaluation of learners' participation in the classroom discourse combined will serve as a more objective measure so that the actual communication pattern in the classroom can be more comprehensively captured.

Further, in the present study, all the students were majoring in the same subject. Future studies, therefore,

could contribute to this research direction by using samples consisting of a more heterogeneous group of participants. The diversity of student backgrounds may produce more knowledge about learners' perceptions of interaction and confirm or disconfirm the relationships of the variables shown herein. In addition, the study was tested within a relatively mono-cultural society, and thus translation and replication of the present study in multicultural settings is necessary. Finally, since the study only included students at the post-secondary school level and learning experiences in different school levels may influence learners' communication orientations and perceptions of L2 classroom interaction, replication of the present study is highly recommended in the post-elementary education. Last but not the least, due to the concerns for expedited data collection, ready accessibility of sample, and cost effectiveness, this study took the approach of convenience sampling without referencing to the ratio of population. Because of a lack of probability-based sampling procedure, the sample recruited in the study may be under-represented, and, hence, the findings of the study should not be directly generalized to the target population. Future studies should be undertaken to replicate the findings of the current study using a more systematic, probability-based sampling strategy.

Appendix 1

Questionnaire Scales

PCIE

1. The opportunity to interact with my English teacher is important for my English language learning.
2. The opportunity to interact with my English teacher is an effective way to enhance my English communication skills.
3. I like group discussions in English.
4. Group discussions are important for my English language learning.
5. Group discussions are an effective way to enhance my English communication skills.
6. I like dyadic interaction in English.
7. Dyadic interaction/communication in English is important for my English language learning.
8. Dyadic interaction/communication in English is an effective way to enhance my English communication skills.
9. Listening to others using English in classroom interactions is important for my English language learning.
10. Listening to others using English in classroom interactions is an effective way to enhance my English communication skills.

Note: PCIEtea, items 1, 2; PCIEgp, items 3, 4, 5; PCIEpr, items 6, 7, 8; PCIEob, items 9, 10.

WTCE

Presume you have completely free choice. Indicate the percentage of times you would choose to communicate in English in each type of situation in the classroom. Indicate in the space at the left what percent of the time you would choose to communicate. Please use a percentage from 0 to 100%.

_____ 1 Talk with an acquaintance in English.
_____ 2 Talk in a small group of strangers in English.
_____ 3 Talk in a large meeting of acquaintances in English.
_____ 4 Talk in a small group of acquaintances in English.
_____ 5 Talk in a large meeting of strangers in English.

RCBE

Please indicate how frequent you believe you will communicate in an English classroom in each of the situations described below. Indicate by putting a number from 1 to 8 in the blank that best describes the extent of your estimate of your frequency of communication. 1 refers to 'Never' and 8 for 'Many Many Times'

_____ 1 Talk with an acquaintance in English.
_____ 2 Talk in a small group of strangers in English.
_____ 3 Talk in a large meeting of acquaintances in English.
_____ 4 Talk in a small group of acquaintances in English.
_____ 5 Talk in a small group of friends in English.

Appendix 2

See Fig. 5.

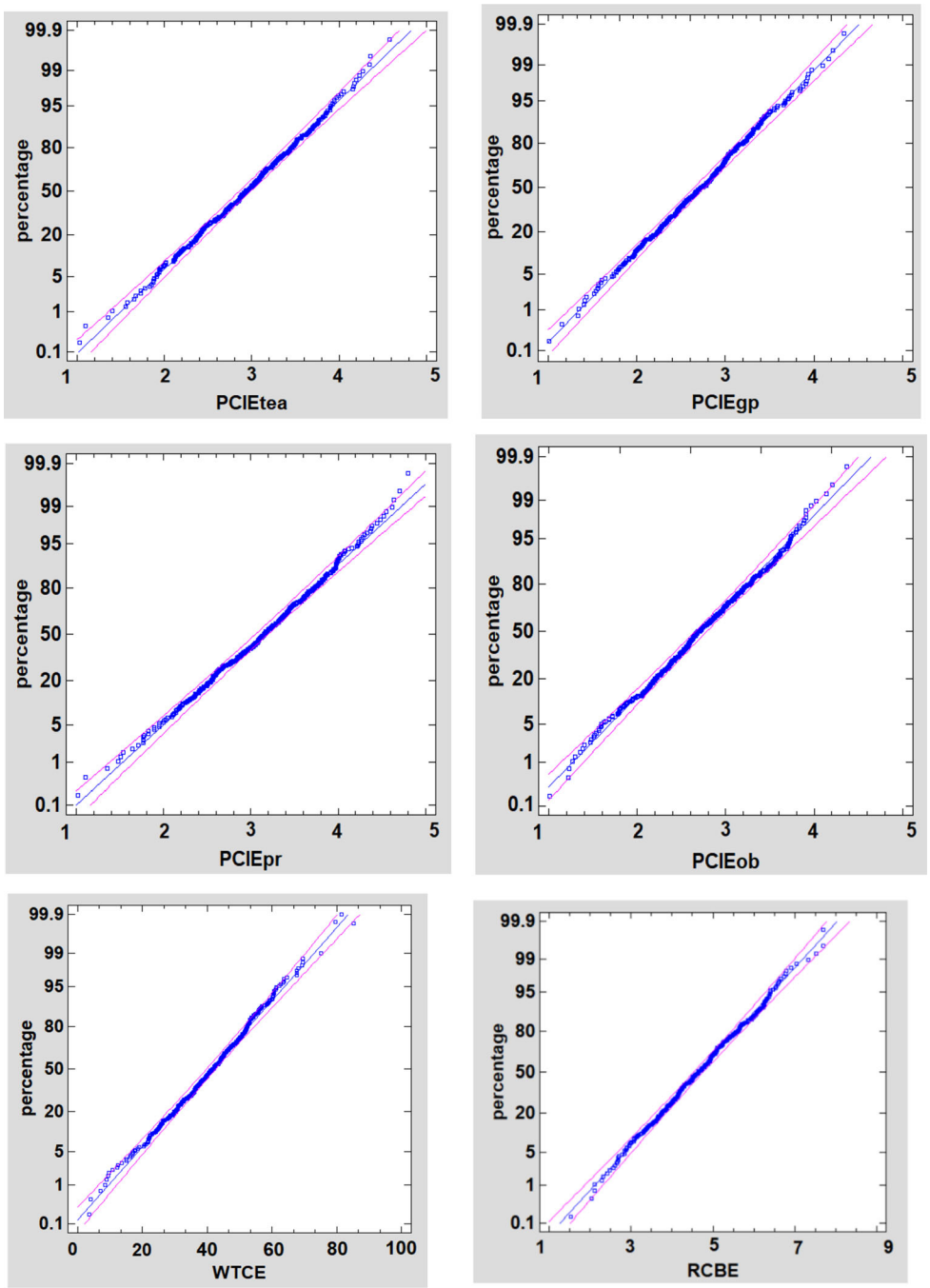

Fig. 5 The normal probability plots with 95% limits of the six scales

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