



Why so nervous? Revisiting the sources of speech anxiety in Chinese as a second language

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ARTICLE INFO

Keywords:

Speech anxiety
Speaking strategies
WTC
Self-efficacy
Speaking proficiency
Socio-cultural attitudes

1. Introduction

Anxiety is “a palpable but transitory emotional state or condition characterized by feelings of tension and apprehension and heightened autonomic nervous system activity” (Spielberger, 1972, p. 24). It has been systematically and widely recognized as a major affective factor negatively contributing to students’ second/foreign language (L2) learning and achievement (Cheng, 2017; Huang, 2018; Teimouri et al., 2019). Anxiety in L2 classroom contexts has been suggested to be examined from a language-skill-specific perspective, such as listening, speaking, reading, and writing, given its situation-dependent nature (Cheng, 2017). For example, L2 speaking/speech anxiety often occurs in situations when learners are afraid of using an L2 for communication or speaking up to be evaluated. In contrast, L2 reading anxiety usually happens when learners cannot comprehend L2 reading materials (L. J. Zhang, 2000). A language-skill-specific approach to understanding L2 anxiety, therefore, would be pedagogically more insightful for teachers to tailor their class for students.

A considerable number of studies have examined the impact of general anxiety on L2 learning and achievement through correlation analyses in the context of L2 English based on the Foreign Language Classroom Anxiety Scale (FLCAS; Horwitz & Young, 1991; Yim, 2014). However, limited attention has been given to examining the language-skill-specific L2 anxiety (e.g., speaking) through more robust statistical analyses, such as structural equation modeling (SEM) approaches, in L2 learning contexts other than English (Yim, 2014). One major advantage of using an SEM approach in comparison to correlation analysis is that SEM allows a complex, multilevel,

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and integrated analysis by taking measurement errors into consideration (Kline, 2016). As a result, the factorial relationships revealed through the SEM analysis can be more precise and reliable.

Nevertheless, L2 speech anxiety scales in previous studies were not usually subjected to confirmatory factor analysis, which may result in validity and reliability issues. In other words, the findings of many prior studies may be biased. Further, anxiety type (i.e., reading, listening, and general L2 classroom anxiety) “was found to have a significant moderator effect on the correlation magnitude between [L2] anxiety and performance” (X. Zhang, 2019, p. 7). This suggests that L2 anxiety should be examined from a language-skill-specific perspective. Lastly, previous research has documented a strong correlation between L2 anxiety and various factors, including L2 proficiency (e.g., Liu, 2006; Yim, 2014), self-efficacy (e.g., Phongsa et al., 2018), strategies (e.g., Chou, 2018), willingness-to-communicate (WTC; e.g., Liu & Jackson, 2008), and sociocultural attitudes (e.g., Dewaele, 2005). However, how these linguistic (i.e., L2 proficiency) and extra-linguistic (i.e., self-efficacy, strategies, WTC, and sociocultural attitudes) factors jointly contribute to L2 anxiety still remains open for discussion. To bridge the above gaps, it is necessary to conduct a statistically more robust analysis to understand how these factors contribute to L2 anxiety from a language-skill-specific lens so that better conceptualizations and measurements of such anxiety can be achieved in future empirical endeavours.

This study, therefore, attempts to examine the effects of linguistic and extra-linguistic factors on L2 speech anxiety in an L2 Chinese context through SEM techniques. This study focuses on L2 Chinese speech anxiety for the following reasons. First, speaking is considered as the most anxiety-provoking language skill involving a series of cognitive, affective, and socio-cultural operations (Öztürk & Gürbüz, 2014). It is important to understand how relevant factors contribute to L2 speech anxiety so that possible solutions to mitigate such anxiety may be recommended. Second, L2 Chinese speaking has often been perceived as a huge challenge for atonal language learners (Pelzl, 2019). A more robust statistical understanding of L2 Chinese speech anxiety could provide more reliable pedagogical implications for the improvement of learners’ L2 Chinese speech performance. Last but not least, we believe that the study will draw researchers’ attention to carrying out more language-skill-specific investigations into L2 anxiety to inform and enrich our understanding of L2 learning and teaching in different situations.

2. The Literature review

2.1. Anxiety in L2 learning and speaking contexts

Anxiety can be ambiguous due to its different conceptualizations. For example, Freud (1924) categorized anxiety into objective/reality anxiety, neurotic anxiety, and moral anxiety. In L2 contexts, anxiety has been widely known as “a distinct complex of self-perceptions, beliefs, feelings, and behaviors” pertaining to inside and/or outside classroom L2 learning (Horwitz et al., 1986, p. 128). From a functional perspective, L2 anxiety has been acknowledged to have both facilitative and debilitating impacts on L2 learning (Scovel, 1978). Specifically, facilitative anxiety serves as a drive in the L2 learning process resulting in the improvement of L2 performance, while debilitating anxiety impedes learners’ L2 learning for the fear and insecurity it brings (Teimouri et al., 2019).

From a construct perspective, trait anxiety, state anxiety, and situation-specific anxiety are three broad constructs that have been adopted for the examination of L2 anxiety. Trait anxiety refers to individuals’ relatively stable tendency to react to perceived threatening situations in a consistent manner, while state anxiety refers to a temporary emotional state in response to perceived threats at a particular moment. In other words, trait anxiety can be considered as a fairly stable personality attribute while state anxiety is a temporary condition experienced at certain moments. Situation-specific anxiety, however, falls between trait anxiety and state anxiety, representing individuals’ probability of becoming anxious in a particular situation.

Additionally, Horwitz et al. (1986) proposed a triad construct of L2 anxiety including communication apprehension (or speaking/speech anxiety), test anxiety, and fear of negative evaluation. To be specific, communication apprehension refers to the extent to which people feel anxious in response to real or anticipated communication situations. Previous research has evidenced that communication apprehension was negatively associated with in-class L2 speech performance (Samimy & Tabuse, 1992) and the level of language proficiency (Dewaele & Ip, 2013; Liu, 2006). That is, the more anxious learners are, the worse they may perform in L2 speaking; and the higher L2 speaking proficiency learners have, the less anxiety they may experience.

Test anxiety refers to individuals’ psychological responses, such as stress, worry, discomfort, or fear of failure, to evaluative situations. Research in the L2 learning context suggests that test anxiety is a major cause of learners’ unsatisfactory performance, particularly in L2 speaking (e.g., Salehi & Marefat, 2014; Young, 1991). It is generally agreed that the more test-anxious learners were, the worse their L2 speech performance was, despite a few controversial results showing that test anxiety and L2 speech performance were not related (e.g., Daly et al., 2011).

Fear of negative evaluation can be defined as “apprehension about others’ evaluation, avoidance of evaluative situations, and the expectation that others would evaluate oneself negatively” (Horwitz et al., 1986, p. 128). It has been well-documented that fear of negative evaluation is a prominent factor which negatively contributes to learners’ L2 learning and speaking. For instance, Tzoanopoulou’s (2016) study of 40 L2 English learners found that fear of negative evaluation from peers and teachers significantly contributed to the formation of learners’ speech anxiety.

Although communication apprehension, test anxiety, and fear of negative evaluation have been considered as dominant components of L2 anxiety for investigating the relationships between L2 anxiety and L2 learning in a myriad number of studies, there is a conceptual issue for Horwitz et al.’s (1986) triad L2 anxiety construct. Specifically, there is no clear-cut distinction among communication apprehension, test anxiety, and fear of negative evaluation. Such an issue has been evidenced by the significant correlations among the three types of L2 anxiety, suggesting that the three variables, to a large extent, may measure the same construct (MacIntyre & Gardner, 1989). Additionally, some scholars have argued that test anxiety is not an underlying construct for L2 anxiety because such

anxiety is not specific to L2 learning but rather exists in general learning (Aida, 1994; Tran, 2012). Therefore, this study took L2 speech anxiety as a holistic construct to collectively capture learners' self-perceived beliefs and perceptions toward various L2 speaking situations.

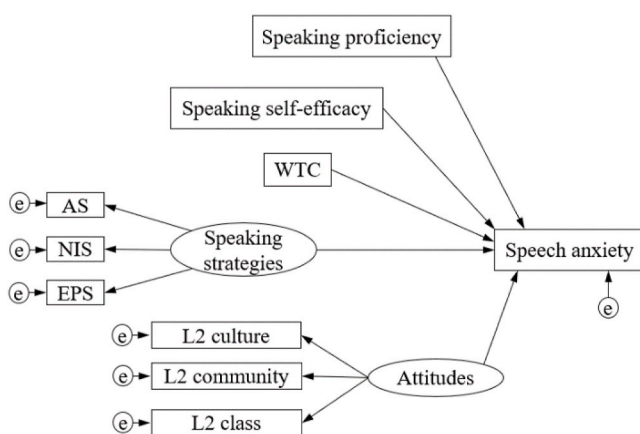
2.2. Linguistic and extra-linguistic sources of L2 anxiety

L2 anxiety can be linguistically and extra-linguistically associated with factors such as gender, L2 experience, language background, L2 proficiency, speaking strategies, self-efficacy, WTC, and socio-cultural attitudes (Teimouri et al., 2019; Toyama & Yamazaki, 2019; X.; Zhang, 2019). For example, it was found that male learners experienced higher L2 anxiety than their female counterparts (e.g., Awan et al., 2010; Cui, 2011; Zhao, 2007). On the contrary, some studies suggested that female learners were more anxious in L2 learning and use (e.g., Abu-Rabia, 2004; Luo, 2014); or there was no gender difference in terms of the impact of anxiety on L2 speech performance (e.g., Huang, 2018). Such inconsistent and conflicting findings were also reported in terms of the effect of studying abroad experience (e.g., Allen & Herron, 2003; Kitano, 2001) and multilingual background (e.g., Phongsa et al., 2018; Santos et al., 2017) on L2 anxiety. Due to these mixed and conflicting results concerning gender, L2 learning experience, and language background, these factors have not been included in the present study.

L2 Chinese speech anxiety, as a type of language-skill-specific anxiety in L2 learning and use, can also be subject to various linguistic and extra-linguistic factors. In terms of linguistic factors, previous research showed that L2 proficiency was closely associated with L2 speech anxiety. For example, it was reported that learners with a higher level of L2 proficiency experienced a lower level of L2 speech anxiety (Liu, 2006; Santos et al., 2017). Such a result echoes Yim's (2014) study of 537 L2 English young learners showing that L2 English proficiency (self-perceived) was the best predictor of anxiety.

In terms of extra-linguistic factors, previous research revealed that age, strategies, self-efficacy, WTC, and socio-cultural attitudes could to different degrees account for L2 speech anxiety. For instance, age was found to be positively or negatively correlated with L2 speech anxiety. Specifically, some studies suggested that younger learners tended to be more anxious in L2 speaking compared with their elder counterparts (e.g., Dewaele et al., 2008), while some found the opposite result (L. J. Zhang, 2001). Additionally, speaking strategy use was found to have a positive influence on reducing learners' L2 speech anxiety. Chou (2018), for example, examined 638 undergraduate students' speaking strategy use in a bilingual instruction context. The results showed that rehearsal strategies were the best predictor of L2 speech anxiety. Learners who had more frequent use of rehearsal and paraphrasing strategies tended to experience lower speech anxiety. These findings were also partially supported by Toyama and Yamazaki's (2019) six-week intervention study, showing that strategies such as cognitive-affective talk, reflective self-talk, and positive self-talk could alleviate learners' L2 anxiety.

Apart from strategies, research has also highlighted the influence of self-efficacy on L2 speech anxiety. Phongsa et al.'s (2018) study of 240 screened L2 English undergraduates of Laos found that learners with stronger self-efficacy were reported to have less anxiety when using English with native speakers. Similar findings have also been documented in studies of Akkason (2016), Dewaele et al. (2008), Ewald (2007), and Thompson and Khawaja (2016), suggesting that there is a negative correlation between higher self-efficacy and L2 speech anxiety. Such a negative correlation has also been found between WTC and anxiety (e.g., Liu, 2006; Liu & Jackson, 2008). For instance, Liu and Jackson's (2008) investigation of 547 L2 English undergraduates revealed that unwillingness to communicate and L2 anxiety (including speech anxiety) were significantly correlated. Specifically, students who were unwilling or less willing to speak and often chose to remain silent were found to be more anxious when participating in speech communication in class.



Note. EPS = expression practice strategy; NIS = native-like and involvement strategy; AS = assistance strategy; WTC = willingness-to-communicate.

Fig. 1. Note. EPS = expression practice strategy; NIS = native-like and involvement strategy; AS = assistance strategy; WTC = willingness-to-communicate.

With the advancement of task-based and incidental L2 learning, research (albeit limited) attempts to uncover the socio-cultural impact on L2 anxiety, particularly from the perspective of learners' socio-cultural attitudes (i.e., attitudes toward L2 class, L2 culture, and L2 society). Dewaele (2005), for instance, examined 100 Flemish high school students' attitudes toward French and English. One of the findings showed that the students' attitudes toward certain L2s were highly connected with their anxiety in using these L2s. For example, students with positive attitudes toward L2 French were found to have a lower level of L2 French speech anxiety.

Although previous research has yielded many insights into L2 speech anxiety from linguistic and extra-linguistic perspectives, there are still limitations observed. Firstly, previous studies predominantly adopted *t*-tests, correlations, or multiple regressions for the analysis of the relationship between proposed variables and L2 anxiety (Yim, 2014). Such methods may be less robust compared with structural equation modeling in estimating relationships and/or causal relationships among variables (Kline, 2016; Schumacker & Lomax, 2016). Secondly, previous research took Horwitz et al.'s (1986) L2 anxiety construct as a dominant perspective for the investigation of the relationships between L2 anxiety and L2 learning. However, L2 anxiety can be situation or language-skill dependent. Research on language-skill-specific anxiety is in urgent need. As a result, more nuanced insights into both L2 learning and teaching could be offered. Lastly, most research on L2 speech anxiety did not report the validity and the reliability of their adopted or compiled L2 speech anxiety construct. This somewhat weakens the credibility of the findings.

Drawing on the contribution of linguistic and extra-linguistic factors to L2 speech anxiety, we hypothesized that speech self-efficacy, speech strategies, socio-cultural attitudes, WTC, and speech proficiency were all direct predictors of speech anxiety (see Fig. 1 for the Hypothesized Model 1). Although age has been found to be either positively or negatively correlated with L2 speech anxiety (e.g., Dewaele & Dewaele et al., 2008; Zhang, 2001), we did not include age in the model because the participants were all university students whose ages were analogous (see Table 1 for details).

2.3. Theoretical foundation of L2 speaking and anxiety

L2 speaking can be cognitively, affectively, and socio-culturally challenging for learners. It has been documented in the literature that L2 speaking can be subject to "the synergistic effects of the cognitive (e.g., age of acquisition, cognitive fluency, learning styles, and speaking strategies), affective (e.g., motivation, anxiety, speaking self-efficacy, and WTC), and socio-cultural (e.g., attitudes toward L2 culture, community, and classes)" factors (Sun & Zhang, 2020, p. 11). These findings echo MacIntyre et al.'s (1998) WTC model, showing that communication behavior or L2 use is the result of various direct and indirect factors. Specifically, WTC, as a behavioral intention, directly determines learners' L2 use, while situational (e.g., communication desire and communicative self-confidence), motivational (e.g., motivation and L2 self-confidence), affective-cognitive (e.g., attitude, situation, and communicative competence), and social-individual (e.g., climate and personality) factors indirectly influence L2 use.

Although the strength of the model lies in its integration of diverse and important factors for explaining individuals' communicative willingness and behavior, the model failed to take anxiety into consideration which has long been recognized as a major factor influencing L2 use, particularly in impromptu L2 speaking situations. Additionally, the hierarchical layers of this pyramid WTC model lacked empirical support, despite the fact that the contribution of the proposed factors have been evidenced in the literature. Thus, further exploration is needed to examine whether WTC is the only direct factor that triggers L2 use or communication behavior while other factors such as self-efficacy and socio-cultural attitudes could only influence L2 use or communication behavior through the mediation of WTC.

Informed by the WTC model, the reviewed literature above, and the fact that anxiety and L2 speaking (communication behavior) often go hand in hand, we hypothesized another model in which linguistic and extra-linguistic factors could either directly or indirectly influence L2 speech anxiety (see Fig. 2, Hypothesized Model 2). Specifically, speech self-efficacy, speech strategies, WTC, and speech proficiency could directly influence speech anxiety, while socio-cultural attitudes, speech self-efficacy, and speech strategies could indirectly influence speech anxiety through WTC.

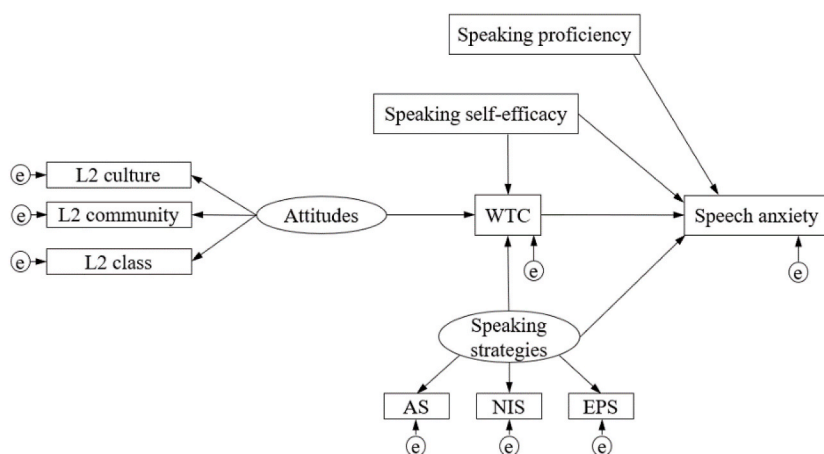
It should be noted that factors in each hypothesized model are correlated. In Model 1, factors such as speaking proficiency, speaking self-efficacy, WTC, speaking strategies, and socio-cultural attitudes are supposed to be correlated. In Model 2, factors such as speaking proficiency, speaking self-efficacy, speaking strategies, and socio-cultural attitudes are correlated. However, the correlation lines are not presented in the two models (i.e., Figs. 1 and 2) for the sake of visual simplicity.

In brief, taking the previous literature and the limitations into consideration, this study revisited factors that could contribute to the causation/formation of L2 Chinese speech anxiety through SEM techniques. Two models were consecutively proposed with the

Table 1
Participants' demographic information.

Background	Description
Sex	102 males, 124 females
Age	Min. = 19, Max. = 22, Average = 20.64, SD = 2.36
Ethnicity	110 Korean, 42 Thai, 18 Burmese, 6 Japanese, 6 Vietnamese, 4 Russian, 4 Kyrgyz, 4 American, 4 Mexican, 4 Mongolian, 2 Irish, 2 Austrian, 2 Brazilian, 2 Panamanian, 2 Belarussian, 2 Tajik, 2 Turkmen, 2 Turkish, 2 Iranian, 2 Malaysian, 2 Singaporean, 2 Indonesian
Proficiency	6 intermediate, 66 intermediate high, 89 advanced, 65 advanced high
Personality	60 introverted, 116 extraverted, 48 uncertain
Time learning L2 Chinese	4.23 years of L2 Chinese learning in China, SD = 3.39

Note. Proficiency and personality are self-perceived.



Note. EPS = expression practice strategy; NIS = native-like and involvement strategy; AS = assistance strategy; WTC = willingness-to-communicate.

Fig. 2. Note. EPS = expression practice strategy; NIS = native-like and involvement strategy; AS = assistance strategy; WTC = willingness-to-communicate.

attempt to find out an optimal model to explain how linguistic and extra-linguistic attributes of L2 Chinese learners jointly influenced their L2 Chinese speech anxiety. The study aimed to answer the following research question:

RQ: To what extent do linguistic (i.e., speech proficiency) and extra-linguistic (i.e., speech self-efficacy, speech strategies, socio-cultural attitudes, and WTC) factors predict L2 Chinese speech anxiety?

3. Methodology

3.1. Participants

Participants were 226 L2 Chinese learners majoring in Chinese-related degrees (e.g., Chinese literature and Chinese language teaching) from two leading universities in Beijing, China. Among the participants, there were 106 males, 128 females, and two unidentified genders, from a variety of countries including Korea, Thailand, Myanmar, Japan, Vietnam, Russia, United States, Mexico, Mongolia, Ireland, Austria, Brazil, Panama, Belarus, Tajikistan, Turkmenistan, Turkey, Iran, Malaysia, Singapore, and Indonesia. The average age of the participants was 20.64 with an age span from 19 to 22 ($SD = 2.36$). Before registration, they had to pass at least the level 5 of *Hànyǔ Shuǐpíng Kǎoshì* (HSK, a national standardized L2 Chinese proficiency test for non-native speakers) according to the two universities' admission requirement. The highest level of HSK was level 6 by the time the study was carried out. The participants reported that they had on average 4.23 years ($SD = 3.39$) of formal L2 Chinese learning in China. Additionally, they all had several years of learning experience of other L2s such as English.

3.2. Instruments

Two instruments were adopted in the study including a questionnaire and a speaking proficiency test. The questionnaire (the L2 Chinese learner questionnaire) was designed to collect participants' demographic information and their self-reported perceptions toward L2 Chinese speech anxiety, while the speaking proficiency test was developed to evaluate participants' actual speaking proficiency (see [Appendix 1](#)).

Questionnaire. The L2 Chinese learner questionnaire contains 50 items, which was developed to capture L2 Chinese learners' beliefs in speaking anxiety (12 items), speaking self-efficacy (3 items), willingness-to-communicate (WTC, 6 items), speaking strategies (14 items), and socio-cultural attitudes toward speaking (15 items). The scale items were adapted and/or modified from the existing relevant questionnaires (e.g., [Dörnyei et al., 2006](#); [Ryan, 2009](#); [Sun, Zhang, & Gray, 2016](#)). A 5-point Likert scale was adopted for the measurement with a range from 1 (*totally disagree*) to 5 (*totally agree*).

Speaking anxiety includes 12 items adapted from [Ryan's \(2009\)](#) motivational factor questionnaire (MFQ) in order to elicit participants' L2 Chinese speaking anxiety with different interlocutors (natives, non-natives, and teachers) in and out of classroom contexts. For instance, we changed "*I would feel uneasy speaking English with a native speaker*" to "*I would feel nervous speaking Chinese with native Chinese speakers*". We also added general anxiety-provoking situations such as "*I will get worried when others do not understand what I am saying in Chinese*".

Speaking self-efficacy includes three items modified from [Ryan's \(2009\)](#) MFQ with the attempt to measure participants' L2 Chinese

speaking self-efficacy. For example, we changed “*I am sure I will be able to learn a foreign language*” to “*If I make more effort, I am sure I will be able to speak Chinese better*”.

WTC includes six modified items from Ryan’s (2009) MFQ aiming to elicit participants’ volitional tendency of actively engaging in L2 Chinese communication in formal (e.g., to present in front of a large audience) and informal (e.g., to talk to a salesperson in a store) situations. For instance, “*I would like to use Chinese to talk with a friend while standing in line*”.

Speaking strategies include 14 items adopted from an L2 Chinese speaking strategy inventory developed by Sun et al. (2016) with acceptable psychometric properties. The 14 items measure general speaking strategies including expression practice (3 items; e.g., *I review words periodically for remembering and using them*), native-like and involvement (6 items; e.g., *I regularly seek out opportunities to talk with native speakers*), and assistance strategies (5 items; e.g., *I encourage others to correct errors in my speaking*). It is worth noting that speaking strategies measured in the study are not limited to strategies that learners use in the process of speaking but also include strategies used for improving speaking ability.

Socio-cultural attitudes toward speaking included 15 items adapted from Ryan’s (2009) MFQ in order to collect participants’ attitudes toward L2 Chinese speaking class (4 items; e.g., *I like taking Chinese speaking class*), L2 Chinese culture (5 items; e.g., *I like watching Chinese movies*), and L2 Chinese community (6 items; e.g., *I like to know more about Chinese people through exploring Chinese communities*).

Speaking Test. A speaking test, based on the Hànyǔ Shuǐpíng Kǒuyǔ Kǎoshì (HSKK, a national standardized L2 Chinese speaking proficiency test for non-native speakers), was developed to evaluate participants’ speaking proficiency from dimensions of fluency, accuracy, and complexity (or coherence in the study). The adoption of the HSKK format was to minimize the influence of test anxiety on participants’ L2 speaking performance or to capture participants’ speaking proficiency to its maximum, since the participants in the study all had experience in sitting HSSK tests.

There were two tasks in the test including an elicited imitation and a picture description (see Appendix 2). The elicited imitation task (EIT), a frequently adopted and empirically supported task for measuring L2 speaking proficiency (Park, Solon, Henderson, & Dehgan-Chaleshtori, 2020), required participants to listen to a passage and retell it in their own words. The chosen topic for this task was related to participants’ daily life so that possible biases against participants of a particular group could be avoided. The picture description task, another common task for measuring L2 speaking proficiency, required participants to talk about their understanding of a given picture with some prompted questions for guidance. To minimize the negative influence of unwillingness to communicate on L2 speech performance, an interesting and thought-provoking picture was designed for this task.

To control the ceiling and the floor effects of the speaking proficiency test, the developed test was piloted with 10 intermediate and 10 advanced L2 Chinese learners. It was suggested that the two developed tasks were appropriate for distinguishing learners’ general L2 speaking proficiency with the observation that the advanced learners ($M = 21.52/24$) outperformed the intermediate counterparts ($M = 18.29/24$). Moreover, the learners reported that they had no problem understanding the content of the EIT task.

3.3. Data collection procedure and analysis

The data collection took place in two leading universities in Beijing, China. Before seeking participants’ consent for participation, we reached out to the deans of the two universities to ask for their permission for data collection. Afterward, invitations were sent out to L2 Chinese language teachers to seek their cooperation. Twelve teachers, in the end, agreed to help our data collection. In order not to interrupt teachers’ classroom teaching, questionnaires (in Chinese) were administered to participants during the 20 min long break after class. All the participants were informed of their full right to decide whether or not to take part in this study.

After questionnaires, the participants were invited individually to take the speaking test according to their schedules. The whole test lasted for approximately 15–20 min depending on the participants’ preparation time and output length. Every test was audio-recorded. To evaluate their speaking proficiency, two raters (Ph.D. candidates in Applied Linguistics) were invited to holistically score their speech performance with reference to an L2 Chinese speech performance scale (see Appendix 3). The scale was developed drawing on the ACTFL speaking proficiency guidelines (ACTFL, 2012), the common European framework of reference for languages (Council of Europe, 2001), the Cambridge English Scale (Cambridge Assessment, 2019), and the HSKK (Chinesetest, n.d.). In line with the HSKK, the developed scale contains three proficiency categories with six detailed levels ranging from level 1 (i.e., the very beginning level) to level 6 (i.e., the most advanced level). Specifically, the three proficiency categories include the elementary (i.e., level 1 and level 2), the intermediate (i.e., level 3 and level 4), and the advanced (i.e., level 5 and level 6).

The data analysis in this study contained two stages: 1) the validity and reliability of instruments, and 2) the SEM analysis and model comparison. The first stage was to ensure that the questionnaire and the speaking test were reliable and valid. The second stage was to construct potential models for explaining the causation/formation of L2 Chinese speech anxiety and to find out a model with the best construct validity through model comparison.

4. Results

4.1. Validity and reliability of the instruments

The validity of the questionnaire (or measurement model) was evaluated by face validity, content validity, and construct validity. The face validity was secured through getting feedback from a group of respondents who were invited to answer the questionnaire and to judge whether the items make sense to them. The content validity was secured by inviting experts to review the questionnaire. The construct validity was examined by confirmatory factor analysis (CFA). According to Kline’s (2016) review, the ratio of chi-square to

its degree of freedom (χ^2/df), the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), the comparative fit index (CFI), and Tucker-Lewis index (TLI), could be employed to measure the goodness of model fit. Specifically, a decent model fit should meet the following indices: $\chi^2/df < 3$, RMSEA $< .08$, SRMR $< .07$; CFI $> .90$, and TLI $> .90$ (Hair et al., 2014; Hu & Bentler, 1999). The reliability of the questionnaire in this study was examined by Cronbach's alpha and composite reliability (CR).

Descriptive analyses of the recruited sample showed that the average scores and standard deviations of the 50 items ranged from 2.48 to 4.34 and from 0.728 to 1.288, respectively. The skewness and kurtosis indices were between the cut-off points of $|3|$ and $|10|$ correspondingly, suggesting the data were normally distributed (Kline, 2016). In addition, multivariate normality was examined by AMOS 24. The results showed that the multivariate kurtosis value and the critical ratio were 307.94 and 32.80 respectively, suggesting non-normality (Field, 2009). Bootstrap maximum likelihood estimates, therefore, were performed to check whether nonnormality inflated the significance of the regression paths. The results showed that all the paths kept the same significance as those of the original, indicating the multivariate non-normality did not affect the proposed paths' significance.

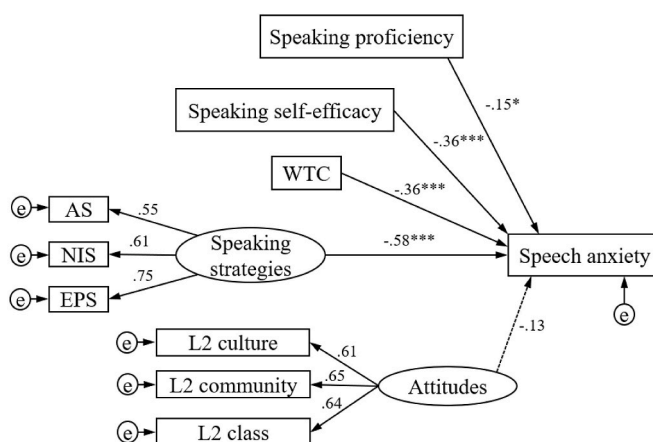
In order to cross-validate the adapted questionnaire, CFA was conducted with AMOS 24 using maximum likelihood estimation. CFA results showed that $\chi^2/df = 1.93$; $p < .001$; CFI = .92; TLI = .91; RMSEA = .06; and SRMR = .07, indicating a good model fit (see Appendix 4). In other words, it suggested that the adapted questionnaire (or measurement model) was a decent instrument with good construct validity. Additionally, the correlations between variables ranged from $|0.1|$ to $|0.55|$ (see Appendix 4), suggesting that there was no multicollinearity between variables. In other words, all variables were distinct from each other.

The overall Cronbach's alpha coefficient value of the questionnaire was 0.89. The Cronbach's alphas for each separate scale were: speaking anxiety $\alpha = .94$, speaking self-efficacy $\alpha = .82$, WTC $\alpha = .88$, speaking strategies $\alpha = .84$, and socio-cultural attitudes toward speaking $\alpha = .87$. All these Cronbach's alphas were higher than the 0.70 benchmark value, suggesting decent reliability of the questionnaire. The CR values for all the latent factors were 0.94 for speaking anxiety, 0.81 for speaking self-efficacy, 0.88 for WTC, 0.73 for expression practice strategy, 0.73 for native-like and involvement strategy, 0.71 for assistance strategy, 0.90 for L2 Chinese speaking class, 0.81 for L2 Chinese culture, and 0.82 for L2 Chinese community. The Cronbach's alpha and the CR values revealed robust internal reliability of the questionnaire.

The speaking test in this study also went through the face validity and the content validity phases. Afterward, two Ph.D. candidates in Applied Linguistics were recruited as raters to holistically evaluate the speaking proficiency of the participants. To make sure that the raters were consistent in evaluation, an intraclass correlation coefficient analysis was performed to check the inter-rater reliability. The result suggested that the two raters' assessments were highly consistent with $r = .958$ and $p < .001$.

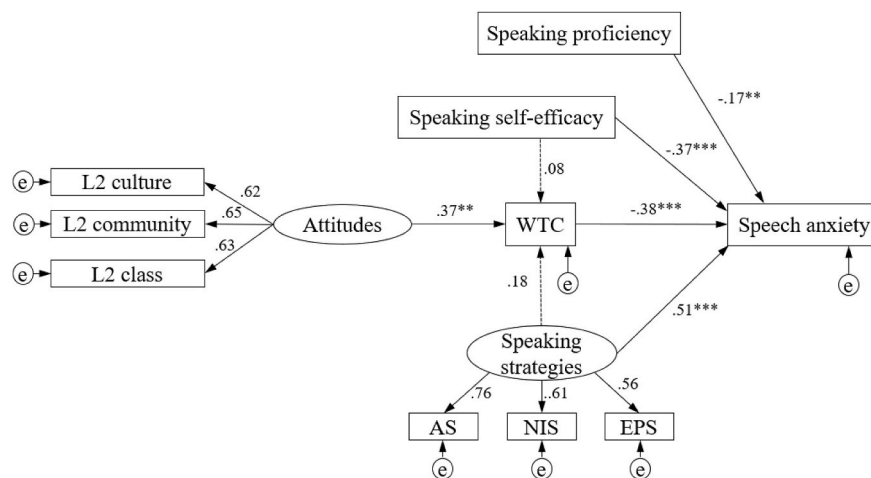
4.2. SEM results and model comparison

The SEM results of Model 1 (see Fig. 3) showed a relatively satisfactory model fit with $\chi^2/df = 2.55$ ($\chi^2 = 61.15$, $df = 24$), CFI = .92, TLI = .85, RMSEA = .081, and SRMR = .049. However, the socio-cultural attitudes \rightarrow speech anxiety path was found to be nonsignificant. The SEM results of Model 2 (see Fig. 4) also showed a relatively satisfactory model fit with $\chi^2/df = 2.39$ ($\chi^2 = 62.15$, $df = 26$), CFI = .92, TLI = .87, RMSEA = .077, and SRMR = .05. However, two nonsignificant paths were found in Model 2. Specifically, the speaking self-efficacy \rightarrow WTC path and the speaking strategies \rightarrow WTC path were found to be not significant. Given that there were nonsignificant paths in both models and Model 2's fit indices were slightly better than Model 1's, we proposed a new model - Model 3



Note. $***p < .001$; $**p < .01$; $*p < .05$; EPS = expression practice strategy; NIS = native-like and involvement strategy; AS = assistance strategy; WTC = willingness-to-communicate.

Fig. 3. Note. $***p < .001$; $**p < .01$; $*p < .05$; EPS = expression practice strategy; NIS = native-like and involvement strategy; AS = assistance strategy; WTC = willingness-to-communicate.



Note. *** $p < .001$; ** $p < .01$; * $p < .05$; EPS = expression practice strategy; NIS = native-like and involvement strategy; AS = assistance strategy; WTC = willingness-to-communicate.

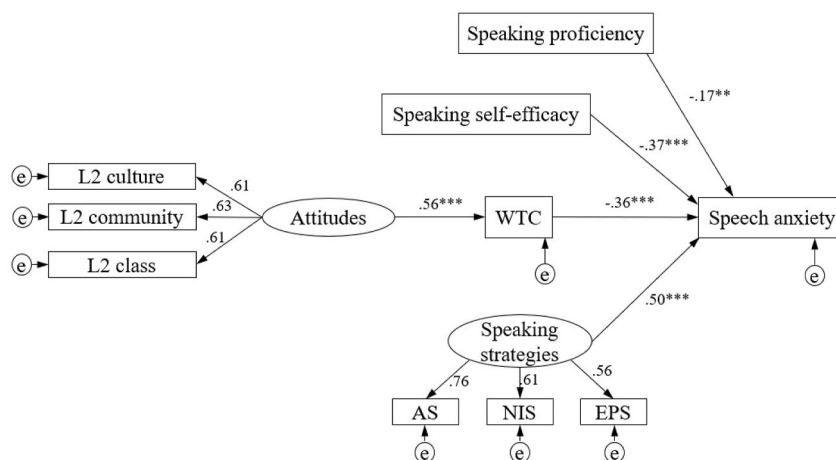
Fig. 4. Note. *** $p < .001$; ** $p < .01$; * $p < .05$; EPS = expression practice strategy; NIS = native-like and involvement strategy; AS = assistance strategy; WTC = willingness-to-communicate.

which removes the nonsignificant paths in Model 2 (see Fig. 5). The SEM results of Model 3 revealed a decent model fit with $\chi^2/df = 2.35$ ($\chi^2 = 63.50$, $df = 27$), CFI = .92, TLI = .87, RMSEA = .076, and RSMR = .05 with all the paths being significant.

To find out which model can best explain how the proposed linguistic and extra-linguistic factors jointly influence learners' L2 Chinese speech anxiety, model comparison was performed through a chi-square difference test: $\chi^2_{diff}/df_{diff} = (\chi^2_a - \chi^2_b)/(df_a - df_b)$. Although there was no statistical difference between the three models, Model 3 was chosen as an optimal model because its model fit indices were slightly better and its paths were all at significant levels.

4.3. Summary

Because L2 anxiety is situation-specific, aroused in the process of L2 learning and use (Cheng, 2004; Horwitz, 2001), it would be better to conceptualize, operationalize, and measure L2 anxiety from a language-skill-specific perspective. Nonetheless, little attention



Note. *** $p < .001$; ** $p < .01$; * $p < .05$; EPS = expression practice strategy; NIS = native-like and involvement strategy; AS = assistance strategy; WTC = willingness-to-communicate.

Fig. 5. Note. *** $p < .001$; ** $p < .01$; * $p < .05$; EPS = expression practice strategy; NIS = native-like and involvement strategy; AS = assistance strategy; WTC = willingness-to-communicate.

has been paid to language-skill-specific L2 anxiety. Among different types of language-skill-specific anxiety, L2 speech anxiety is perhaps the most pervasive form of emotional state in L2 learning (Liu & Jackson, 2008). This study, therefore, examined speech anxiety in an L2 Chinese context by using SEM analyses to understand how linguistic and extra-linguistic factors contribute to L2 Chinese speech anxiety.

Prior to data collection, rigorous procedures were adopted for the development of the instruments for the study, including an L2 Chinese learner questionnaire and an L2 Chinese speech proficiency test. The results of CFA and Cronbach's alpha suggested that the adapted questionnaire had robust reliability and validity. The speaking test was also subjected to the validity and reliability examination.

After data collection, models explaining the potential influence of linguistic and extra-linguistic factors on learners' L2 Chinese speech anxiety were examined. The results of model modification and comparison suggested that Model 3 provided the best explanation for learners' L2 Chinese speech anxiety. Specifically, the speaking strategies factor was found to be the most positive direct predictor of speech anxiety with $\beta = .50$ and $p < .001$. The other significant direct predictors included WTC ($\beta = -0.36$; $p < .001$), speaking self-efficacy ($\beta = -0.37$ and $p < .001$), and speaking proficiency ($\beta = -0.17$ and $p < .01$). Additionally, the socio-cultural attitudes factor ($\beta = .56$ and $p < .001$) was found to have a positive indirect effect on speech anxiety through the mediation of WTC.

5. Discussion and implications

5.1. Significant predictors in Model 3

The findings show that speaking strategy use is the most important factor that positively contributes to learners' L2 Chinese speech anxiety. In other words, the more strategies that learners attempt to use, the more anxious they are. However, the result contradicts Chou's (2018) finding that high speaking strategy use could predict low speech anxiety. Such a conflicting result is probably due to different research contexts. Specifically, the participants of the present study are L2 Chinese learners with other L2 learning experiences such as L2 English. In other words, they are multilingual learners. These learners, therefore, may have more strategies developed for L2 speaking compared with Chou's bilingual participants learning only English as an L2. Given that there is competition in cognitive resources between strategy use and speaking itself, overusing speaking strategies in anxious situations may greatly consume the limited cognitive resources, resulting in their poor speech performance. Consequently, learners' weakened speech performance may make them feel more anxious.

The findings of the study also show that WTC and speaking self-efficacy are major negative predictors of learners' L2 Chinese speech anxiety. In other words, learners tend to be less anxious if they are more willing to communicate and/or more confident about their L2 Chinese speaking. Such results not only corroborate the negative relationship between WTC and anxiety consistently revealed in the literature (e.g., Liu & Jackson, 2008; Mystkowska-Wiertelak & Pawlak, 2014), but also add to the literature that speech anxiety could be subject to speaking self-efficacy (Shih, 2019).

Additionally, speaking proficiency is found to be a negative predictor of learners' L2 Chinese speech anxiety in the study. The finding adds to our understanding of the mutual influence between speaking proficiency and speech anxiety. On the one hand, the literature shows that high anxiety may lead to the poor speech performance of L2 learners (Teimouri et al., 2019). On the other hand, our study suggests that low speaking proficiency (or poor speech performance) can result in high speech anxiety.

Last but not least, socio-cultural attitudes are found to be an indirect factor contributing to L2 Chinese learners' speech anxiety through the mediation of WTC. Learners who are more interested in Chinese class, community, and culture tend to be more willing to communicate in L2 Chinese. Consequently, those learners are likely to be less anxious when they speak in Chinese. The finding not only adds evidence to the literature that individuals' communicative willingness can be subject to contextual factors such as classroom environment and socio-cultural orientation (Bernales, 2016; Peng, 2012), but also enriches the literature that it is WTC rather than socio-cultural attitudes that directly contributes to learners' L2 Chinese speech anxiety.

5.2. Nonsignificant predictors in Models 1 & 2

In terms of the unsupported relationships, the findings of the study show that 1) speaking strategies and speaking self-efficacy are not direct predictors of WTC and 2) socio-cultural attitudes do not directly predict L2 Chinese learners' speech anxiety. However, the nonsignificant speaking strategies \rightarrow WTC path in Model 2 contradicts the direct positive relationship between speaking strategies and WTC revealed in the literature (Kim & Jung, 2019). It has been suggested that speaking strategies could empower learners as the conversational agent and lead to higher WTC (Ayedoun et al., 2019).

Additionally, although the nonsignificant speaking self-efficacy \rightarrow WTC path in Model 2 may provide evidence against the L2 WTC model showing that communicative self-confidence could directly contribute to WTC, the result may add evidence to the volitional nature of WTC. As the majority of the participants in the study are advanced L2 Chinese learners, they can volitionally control whether or not to speak Chinese regardless of the degree of their self-efficacy.

Lastly, the nonsignificant socio-cultural attitudes \rightarrow speech anxiety path in Model 1 not only helps us rule out the direct influence of socio-cultural attitudes on speech anxiety, but also to some extent corroborates our theoretically-informed hypothesis in Model 2 that socio-cultural attitudes could contribute indirectly to anxiety through the mediation of WTC.

5.3. Pedagogical implications

Although “speaking strategies have been viewed as first aid devices used for interaction and communication, to address problems or breakdowns, and to remain active in communication” (Chou, 2018, p. 611), teachers should not merely focus on the development of learners’ speaking strategy repertoire given that too much use of strategies may cause cognitive workload on L2 speaking and thus makes learners feel more anxious.

Instead, teachers should pay close attention to strengthen learners’ WTC, speaking self-efficacy, and speaking proficiency in light of their positive influence on diminishing learners’ speech anxiety. For example, interesting and thought-provoking tasks could be designed to trigger learners’ communicative willingness. Additionally, teachers should offer readily available scaffolding to reinforce learners’ confidence in L2 speaking when they are preparing for speaking tasks. With enhanced WTC and speaking self-efficacy, learners may become more willing to sign a contract to commit to speaking in L2 class. According to Jin et al. (2020, p. 8), “contracting speaking is a feasible approach to [L2] anxiety reduction”.

Teachers should also pay special attention to learners’ socio-cultural attitudes, as such attitudes can directly contribute to WTC and subsequently speech anxiety. For instance, teachers could incorporate some field trips, such as visiting the local museums, theaters, and communities, into their curriculum, given that L2 learning can be more meaningful when situated in sociocultural conditions (Oxford, 2017). As a result, more engaging and interesting experience of L2 learning may enhance learners’ socio-cultural attitudes toward the language they are learning.

6. Limitations and future research

This study has some limitations. Firstly, given the dialogical nature of speaking, some items of the speaking anxiety scale in the study may overlap with listening anxiety. What exactly a speaking anxiety scale should measure can be a question worth further exploration. Future research may consider developing more appropriate and comprehensive scales for measuring L2 speaking anxiety.

Secondly, given that L2 Chinese learners are from different countries in the study, there may be a language distance effect on learners’ L2 Chinese anxiety (X. Zhang, 2019). However, the present study is not able to examine the language distance effect on L2 speech anxiety due to the small sample size. Future research may consider enlarging the sample size to address this gap.

Thirdly, the complexity of learners’ L2 speaking was only holistically assessed from the coherence dimension (see Appendix 3). There is a lack of understanding of learners’ lexical and syntactic complexity. Future research should evaluate learners’ L2 speech performance from a more comprehensive and rigorous approach.

Lastly, the speaking proficiency test adopted in this study mainly focused on participants’ monological speech production without taking the dialogical aspect into consideration. This may lead to a biased assessment of participants’ L2 speech proficiency. Future research is suggested to design dialogical speech production tasks to gain a more comprehensive evaluation of participants’ L2 speech proficiency.

Author contribution

Peijian Paul Sun: Research design, data collection and analysis, writing original draft; review & editing. Lin Sophie Teng: Review & editing.

Declaration of competing interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Acknowledgement

This work was supported by the Ministry of Education of China under Grant 18YJC740086.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.system.2021.102647>.

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