



Intercultural communication competence of Chinese students with limited intercultural experience

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Abstract Numerous studies have assessed the intercultural communication competence (ICC) of experienced interlocutors and have provided a variety of evidence elucidating their characteristics. In contrast, empirical research assessing the ICC of interlocutors with limited intercultural experience is exceedingly scarce. Understanding the characteristics of novices in intercultural communication is particularly important, as they may have unique learning needs during the initial stages of their development. The Global Competence Scale for graduate students (GCSG) was used to collect self-assessments of ICC from 246 students.

Follow-up interviews were conducted with 18 respondents to examine challenges and affordances perceived by students in intercultural communication, as well as their actual reactions to these perceptions. The results indicate that participants rated their ICC as ‘upper-moderate’. More specifically, participants perceived their communication-related skills as weak and attributed to themselves a high degree of openness. We further identified two distinct clusters of participants, one of which exhibited significantly higher self-assessments across all dimensions compared to the other. Finally, we developed an overview of the participants’ engagement in intercultural interactions within process-oriented and result-oriented contexts. Based on these findings, we suggest that the language proficiency of students is correlated with both openness and motivation. Furthermore, building self-confidence and enhancing essential language skills correspond to the distinct core learning needs of the two clusters of students. We challenge the notion that external affordances are a prerequisite for triggering actual actions, instead proposing that the alignment of internal and external affordances is most likely to stimulate actual action.

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Introduction

Globalization is bringing a wider range of cultures into closer contact than ever before. As a result, modern life is characterized by flourishing intercultural contact. Diverse cultures are driving forces for sustainable development (Leeds-Hurwitz, 2013), and the development of intercultural communication competence (ICC) facilitates harmony amongst cultures. This study focuses specifically on the ICC of Chinese students in higher education. Given that Chinese people are world citizens, it is important for them to develop ICC in order to live together with other cultures. One of the best-known definitions of ICC is “the ability to communicate effectively and appropriately in intercultural situations based on one’s intercultural knowledge, skills, and attitudes” (Deardorff, 2006).

As a vital part of the educational system, higher education has the responsibility to address ICC and regard it as an imperative outcome of cultivation. The penetration rate of the concept of ICC amongst Chinese universities is nevertheless very low. On the one hand, Chinese instructors in higher education have neither a clear understanding of ICC nor the practice of improving the ICC of their students (Gu, 2016). On the other hand, Chinese students lack ICC-related educational opportunities, as well as motivation to engage in intercultural communication (Jackson, 2018). Although some Chinese instructors are already putting the improvement of ICC into practice and are assessing the efficacy of teaching and learning, their results have given rise to many polemics (Zhang & Zhou, 2019). For example, many studies have criticized the treatment of ICC as by-product of language learning (Wang & Kulich, 201), as well as for the lack of standard assessment of ICC amongst students (Gu, 2016).

No single instrument or method could be adapted to all situations, as the assessment of ICC is heavily dependent on its pre-determined characteristics in terms of theoretical frameworks and research objectives (Deardorff, 2011). The majority of existing methods (Luo & Chan, 2022) and instruments (Fantini, 2006; Griffith et al., 2016) have been developed in recent decades, and they have been used to assess the ICC of individuals for a variety of purposes. Most ICC assessment instruments are best suited to individuals with prior intercultural communication experience, as they often reflect past interactions. Although such

instruments may perform well with international students, they are less suitable for students with limited experience in intercultural communication. In China, students going abroad for learning purposes account for less than 4% of all students in higher education (Ministry of Education of the People’s Republic of China, 2020). Assessment approaches reflecting the prior experiences of students are thus not suitable for the majority of Chinese students, as they have limited experience on which to reflect and act. Findings from studies assessing the ICC development of Chinese students focus largely on outcomes (Bean & Boffy-Ramirez, 2019; Wang & Kulich, 2015). As a result, understanding of the intercultural interaction process remains limited. In addition, some scholars have questioned the homogeneity of Chinese students, arguing that individual differences within this population should not be overlooked in intercultural research (Lê & Shi, 2006).

In summary, there is currently a lack of understanding regarding the ICC proficiency of Chinese students with limited intercultural experience within a domestic context. Clarity is also lacking with regard to the possibility of individual difference factors that affect the development of ICC in these students.

In addition to the inherent characteristics that students bring with them (e.g. personality, experiences, and cognition), contextual factors play an important role in shaping their perceptions and reactions (Kim et al., 2022; Zou & Yu, 2019). Whereas some studies have explored the perceptions and reactions of Chinese students in intercultural communication (Cai et al., 2022; Meng et al., 2019), there is a dearth of research that is grounded in the indigenous context of mainland China. The current body of knowledge therefore lacks a comprehensive understanding of the perceptions and reactions that students experience during intercultural interactions within such contexts. Addressing this research gap calls for the use of appropriate instruments to assess the ICC of students with limited intercultural experience within a local Chinese context. At the same time, a mixed-methods approach should be employed in order to generate a more comprehensive understanding of the perceptions and actual reactions of these students (Deardorff, 2009).

The investigation of ICC in students with limited intercultural communication experience is a critical research gap that should be addressed for both theoretical and practical reasons. From a theoretical

perspective, existing models of ICC development are based largely on data from individuals who already have some level of intercultural engagement. The exploration of novices could provide an important contrasting perspective with which to test and refine these models. Empirical evidence from this population could yield new insights of componential structures, sequencing patterns or developmental trajectories. In practical terms, research is needed to guide pedagogical practices for the vast numbers of students around the world who have little to no intercultural experience. With appropriate interventions at the novice stage, their ICC could be initiated before any immersive experience through better preparation. In the absence of such research, these students are at risk of missing crucial opportunities for intercultural learning.

The purpose of this empirical study is to develop an ICC profile for Chinese students with limited experience. To this end, the study involves assessing their ICC based on their current knowledge, skills and attitudes, thereby yielding information on their characteristics. The study further endeavours to make the engagement of these students in intercultural communication more concrete by exploring their perceptions and reactions. In addition to revealing the students' self-assessments, the results could uncover potential issues underlying these self-evaluations. The results could also serve as a starting point for educational practitioners aiming to enhance the ICC of novices by informing the design of instructional objectives and intervention strategies. The research questions are as follows:

1. What is the self-perceived ICC level of Chinese students with limited experience in intercultural communication?
2. Can distinct profiles of students be identified based on their self-perceptions of ICC factors within the domestic context?
3. What do Chinese students with limited experience report in terms of their participation in intercultural communication?

Theoretical framework

In the following sections, we provide a comprehensive overview of ICC, which informs our research approach and methodology. We start by describing the origins

and definition of the concept of ICC in order to establish a foundational understanding, after which we explore its components to clarify what constitutes ICC. This is followed by an examination of assessment methods for understanding how ICC is measured in authentic intercultural situations, incorporating ecological perspectives to enhance understanding concerning the complexities of intercultural interactions.

Initiated after the Second World War, the concept of intercultural communication competence (ICC) was a topic of broad interest during 1950s and 1960s, due to the flourishing array of international projects. The concept was originally used to select volunteers who would be suitable for working abroad (Fantini, 2020; Spitzberg & Changnon, 2009). Many impactful constructs and models of ICC were proposed at that time (Byram, 1997; Dearsdorff, 2006). A wide variety of terms have emerged over time, including 'intercultural competence', 'global competence' and 'intercultural awareness', which nevertheless all fundamentally describe one similar competence. Current scholars have reached a basic level of consensus on the definition of ICC as the capability to conduct effective and appropriate communication in intercultural situations. Over the past few decades, scholars have been exploring methods to assess ICC and have found that the evaluation indicators have been evolving with the deepening understanding of the composition of ICC (Spitzberg & Changnon, 2009).

Discussions on the composition of ICC are well documented in existing literature, and a basic consensus has been reached amongst intercultural scholars. One highly influential intercultural work is a Delphi study in which Dearsdorff (2006) synthesizes the perspectives of leading intercultural scholars and international institutions concerning the definition, composition and assessment methods of ICC. One core outcome of this research is the proposition of the Pyramid Model of Intercultural Competence, which identifies three dimensions of ICC: 1) requisite attitudes; 2) knowledge and comprehension; and 3) skills. The Knowledge dimension refers simply to an understanding of self and others, with the Skills dimension referring to abilities relating to communication and interpretation. The Attitudes dimension is regarded as an affect-driven form of positive energy. These three dimensions form the foundation of ICC assessment. Spitzberg and Changnon (2009) further explored the composition of ICC from theoretical and

model perspectives, categorizing existing models into five types: compositional models, co-orientational models, developmental models, adaptation models, and causal path models. Compositional models focus on displaying the components of ICC. Co-orientational models emphasize the exploration of intercultural understanding and shared meanings. Developmental models and adaptation models focus on the acquisition and development process of ICC, as well as the process of mutual adaptation among multiple interactants, respectively. Causal path models focus on displaying the relationships among the components of ICC. The Pyramid Model of Intercultural Competence is a compositional model that effectively explains the components of ICC, including their origins and meanings. This model provides a clear theoretical framework for our study. It also aligns well with the study's focus on understanding students' self-assessment of ICC from different dimensions.

Given that ICC is a constantly evolving ability, thereby the assessment of ICC is a reflection of an individual's level of knowledge, attitudes, and skills at a given moment in time (Deardorff, 2006; Mažeikien & Virgailait-Mečkauskait, 2007). Furthermore, it is better to use a mixed methods approach to assess ICC in order to avoid biases that may arise from relying on a single assessment method (Deardorff, 2009). Regarding quantitative assessment, existing ICC assessment instruments have already covered the evaluation of these three dimensions. They typically assess participants' knowledge by understanding their thoughts and interpretations, their attitudes by understanding their feelings and emotions, and their skills by understanding their actions and social interactions (Matveev & Merz, 2014). Different ICC assessment instruments have been proven to be suitable for different research purposes. For example, the Intercultural Development Inventory (IDI) is regarded as one of the most common instruments used to measure changes in attitudes towards cultural differences (Lombardi, 2010) while the Multicultural Personality Questionnaire (MPQ) focuses on measuring multicultural effectiveness, but places less emphasis on assessing communication skills, and the Intercultural Sensitivity Inventory (ICSI) was designed specifically for international business contexts (Matveev & Merz, 2014). For this study, we should select an assessment instrument that assigns equal evaluation weight to the three dimensions of knowledge, attitudes, and skills, and is also suitable for

the research subjects. It is also necessary to choose an effective qualitative method to further understand the research subjects' self-assessment and personal experiences.

It is necessary to fully understand the research context and the research subjects (i.e., Chinese students within a Chinese context) before beginning the selection of ICC assessment methods. Despite ongoing polemics by Chinese scholars concerning intercultural education (e.g. concerning its theoretical framework, education objectives and teaching methods), studies evaluating the ICC of students have been emerging (Wang & Kulich, 2015). As indicated by the most recent nation-wide survey on the views of English lecturers in Chinese higher education concerning intercultural education, neither theoretical consensus nor practical approaches have been fully recognized (Gu, 2016). Although many respondents called for an ICC assessment instrument, they were less clear on the purpose and objectives of ICC assessment. In response to these calls, however, several quantitative ICC assessment instruments have been developed (e.g. Gu & Zhao, 2021; Huang, 2021), although details on their reliability and validity have yet to be disclosed.

Prior to the nation-wide survey, Peng et al. (2015) designed and tested a 28-item questionnaire for assessing the ICC of Chinese students (i.e. the 'Questionnaire based on the assessment of intercultural competence of Chinese college students', or AIC-CCS), based on the framework developed by Byram (1997). Although the validity and reliability of AIC-CCS was tested in five Chinese institutes of higher education (N=447), some items in that questionnaire are not suitable for students with limited intercultural experience. For example, respondents with only superficial experience of interacting with foreigners may not be able to reflect on a fact when responding to items on "realizing the differences in cultural identity when communicating with foreigners." Another ICC assessment instrument focusing on the local Chinese context is the Global Competence Scale for graduate students (GCSG), which was designed and tested by Liu et al. (2020) across five Chinese universities (N=1618). The validity and reliability of the instrument were good, and the items in this questionnaire are more suitable for students with limited intercultural experience.

This study investigates how students with limited experience in intercultural communication evaluate

their own ICC within a Chinese context, thereby enhancing understanding of the characteristics of these students. The GCSG was selected as the assessment tool for our study, as it integrates several different theoretical frameworks rather than a single perspective. For example, various scales were referenced and integrated for designing the questions to be used in the new scale, including the Assessment of Intercultural Competence (AIC) (Fantini, 2006) and the Global Citizenship Scale (GCS) (Morais & Ogden, 2011). The incorporation of a variety of scales prevents our analysis from being locked into any single perspective.

In aforementioned paragraphs, using a mixed-methods approach can help us gain a more comprehensive understanding of individuals' ICC. Therefore, we employ in-depth interviews to obtain more information on Chinese students' assessments of their own ICC and the details of their engagement of intercultural communication. We concur that discussing intercultural communication should not be divorced from specific contexts (Kimmel & Volet, 2010; Kudo et al., 2017; Volet & Ang, 1998). To this end, we introduce and adapt ecological concepts and models to elucidate the intercultural communication processes. We started by introducing the concepts of affordances (Gibson, 1986) and constraints. Affordances are properties of the environment-human interaction system that provide opportunities for potential action (Stoffregen, 2003), whereas constraints impede potential action. Inspired by Van Lier's (2004) definition, this study defines affordances as opportunities that students perceive and utilize for engaging in intercultural communication. In this study, we employ the term 'challenges' instead of 'constraints' to express the converse notion to affordances, defining them as factors that impede effective and appropriate engagement in intercultural interactions.

As a framework for our qualitative study, we adapted the Basic Research Model of Affordance Theory by Kim et al. (2022) (see Fig. 1). In addition to encompassing all the elements we wish to explore (i.e. perceptions, reactions and context), this model delineates the process from individual perception to response. It thus facilitates a comprehensive understanding of individual interactions from the perspective of both outcomes and process.

We started by adapting the terminology of the original model to fit within the framework of ICC, specifically replacing 'environment' with 'context' and

replacing 'behaviour' with 'reaction'. Context is better suited to capture immediate situational factors (e.g. social and cultural factors) rather than focusing solely on the physical setting. Similarly, reaction is understood as what individuals do, say or think as a result of something that has happened, rather focusing solely on observed behaviours. We then added challenges to the dimension of perception. Finally, we re-conceptualized agency and replaced 'affordance actualization' with 'actual reactions'.

Defined as the ability to influence one's life circumstances through intentional action (Bandura, 2001), agency is an indispensable psychological drive in the transformation of affordances into actions (Bandura, 2001; Stoffregen, 2003). Drawing on the features of agency (Bandura, 2001), the agency of interactors can serve as a mediating mechanism for the transition between intercultural interaction opportunities within a given context and an individual's actual reactions within that context. In essence, human agency provides the inner drive and capacity for individuals to develop and exercise ICC effectively. In turn, ICC can be seen as an application of human agency within the specific domain of intercultural interaction.

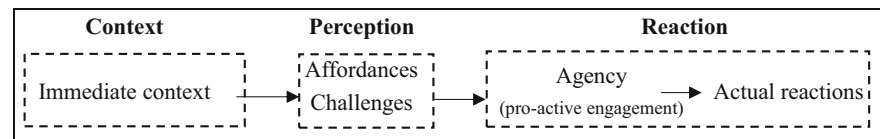
Method

We employed a mixed-method approach for this study, which was conducted in two parts. In the first part, we used the GCSG as an instrument that could yield a clear quantitative measurement of the ICC of students. To avoid single data resource bias and to study the perspectives of participants (Vromans et al., 2023), we conducted follow-up interviews aimed at examining the students' perceptions of challenges, affordances and actual reactions with regard to ICC.

Research setting and participants

This study was conducted within a Chinese scientific institute offering Master's and doctoral degree programmes in the domain of life sciences. The institute has a total student population of more than 5,600. The majority of the students are Master's students (60%), with doctoral students accounting for about 33% and the rest being international students (GSCAAS, 2024). Using convenience sampling, we sent out a link to

Fig. 1 Context-Perception-Reaction model (adapted from Kim et al., 2022)



students in seven Master's classes, inviting them to participate in the survey on a voluntary basis. In all, 246 Master's students who were enrolled in the College English course (in Spring term 2024) responded to the survey. At the same time, interview invitations were sent to all survey participants, ultimately resulting in 18 respondents agreeing to participate in the interviews.

Instruments and data collections

The study was conducted under the supervision of the Social Sciences Ethics Committee at the particular Dutch University and the Chinese scientific institution in the domain of life science, and participant data was collected with their informed consent.

Global competence scale for graduate students (GCSG)

The Global Competence Scale for graduate students (GCSG) is a five-point Likert scale (ranging from strongly disagree to strongly agree) developed for "measuring students' global competence and/or for evaluating any program that aims to improve students' global competence" (Liu et al., 2020). The original authors further adapted it from a 35-item version into a 33-item version. More specifically, they deleted Q7 ("I pay attention to global events and international affairs") and Q11 ("I can easily read and write in one foreign language") after conducting an exploratory factor analysis. The 33-item version contains three core dimensions — 'knowledge and understanding' (9 items), 'skills' (13 items) and 'attitude and values' (11 items) — and its reliability and validity were tested according to Cronbach's alpha value and confirmatory factor analysis (CFA), respectively (Liu et al., 2020). We re-examined the reliability of the scale (see Table 1) and slightly adapted the names of the dimensions and the definitions of factors to fit the framework applied in this study (see Table 2). Based on these results, we used the 33-item version of the GCSG as a measuring instrument.

The GCSG was entered into Wen Juan Xing (问卷星, *wèn juàn xīng*, a professional Chinese online platform for questionnaire surveys, examinations, assessments and voting) in order to create an online survey link. The link was sent by email to 280 Chinese students who were taking the College English course in the participating institution, as well as through relevant groups on student Wechat (微信, *wēixìn*; a micro-messaging platform for messaging, socialization and mobile payment services). The survey was closed after two weeks, as there were no new respondents. In all, 246 responses were collected. A brief demographic overview of the respondents is presented below (Table 3).

Follow-up semi-structured interview

After terminating the online survey, we formulated a semi-structured interview protocol aimed at examining students' perceptions of affordances and challenges, as well as their corresponding reactions during intercultural communication. Seven core questions were designed, and each interview was arranged to last 15–30 min. Initially, participants were asked about their experience with intercultural communication. They were deemed to have limited experience, as none had any overseas exposure exceeding three months, and the majority had only superficial intercultural communication experience (e.g. greetings or casual conversations). Following the initial inquiry, the participants were asked to discuss the challenges they faced during intercultural interactions. The purpose of this question was to gain an in-depth understanding of the specific nature of the challenges and the contexts in which they occurred. Participants were also asked about their reactions to the aforementioned challenges. The insights garnered from their answers were crucial for evaluating the magnitude of influence that these challenges exerted on their intercultural engagement. Following the exploration of challenges, participants were asked about affordances. In addition, they were asked to elucidate how they reacted to these affordances. These two questions were designed to ascertain

Table 1 Reliability of the survey

Scope	Items	Cronbach's alpha value
Full scale	Q1–33	0.964
Knowledge (dimension)	Q1–9	0.945
Knowledge of others (factor)	Q1–3	0.898
Understanding globalization (factor)	Q4–6	0.919
International academic knowledge (factor)	Q7–9	0.916
Skills (dimension)	Q10–22	0.933
Tool usage (factor)	Q10–11	0.788
Compatibility (factor)	Q12–17	0.906
International academic communication (factor)	Q18–22	0.880
Attitudes (dimension)	Q23–33	0.920
Motivation (factor)	Q23–27	0.917
Openness (factor)	Q28–30	0.941
Values (factor)	Q31–33	0.913

which affordances the participants perceived and which of those affordances were translated into action. The sixth question pertained to the contexts that made participants perceive challenges and affordances in intercultural communication. This question was intended to explore the influence of context on the perceptions of participants. Finally, the participants were asked about the benefits they derived from intercultural communication. This question was instrumental in examining their perceptions of intercultural communication, including such aspects as attitudes and motivations. After all questions had been addressed, participants were given the opportunity to freely share any experiences or feelings related to intercultural communication. To allow participants to express themselves freely, the entire process was conducted in Mandarin and audio recorded (with consent). The interviews were conducted either in person or online, according to the preference of the participant.

Data analysis

Quantitative analysis

The survey data were entered into SPSS (version 26) for statistical analysis. Descriptive statistics, including means and standard deviations, were conducted to identify the rating of ICC at different levels (i.e. overview, dimension and factor). Two-step cluster analysis, an exploratory method designed to reveal natural groupings within a dataset, was applied to categorize the participants into an optimal number of

clusters, highlighting potential characteristics between cohorts within the group.

Qualitative analysis

The interviews were studied according to thematic analysis (Braun & Clarke, 2006), which is conducive to the investigation of under-researched areas. The corpus comprised 18 participants (Table 4). In our study, we followed the six phases of thematic analysis. In the initial phase, the first author transcribed the interview recordings into NVivo (version 12) and conducted a thorough reading, noting preliminary ideas. Subsequently, in the second phase, the first author generated initial codes using both inductive and deductive logic. The inductive approach involved direct extraction and refinement from the interview data, whereas the deductive approach targeted the extraction and refinement of content relating to perceptions, reactions and context, based on the interview protocol and the Context-Perception-Reaction model. The third phase involved identifying themes by merging initial codes into potential themes and consolidating all relevant data under each potential theme. In this phase, the first author compared all initial codes from the previous phase across all participants and further aggregated related codes to form potential themes. These potential themes were then assessed (fourth phase) to ensure their relevance to the initial codes and the corpus. The themes were then defined and named (fifth phase). Finally, in the sixth phase, vivid and representative

Table 2 Questionnaire structure

Dimensions	Sub-factors/definitions	Items
<i>Knowledge</i> Q1–9	<i>Knowledge of others:</i> Knowledge of others' culture (e.g. language, history, customs and geography)	Q1: Other than my own country, I know about the history and geography of at least one other country
		Q2: Other than my own country, I know about the political and economic systems of at least one other country
		Q3: Other than my own country, I know about the language, cultural norms, religions, beliefs and customs of at least one other country
	<i>Understanding Globalization:</i> Understanding of the concept, implications and developmental trends of globalization	Q4: I understand the concept of globalization and its development trends
		Q5: I understand the effect of globalization on a country's development, individual lifestyles and scientific research activities
		Q6: I understand the roles of international organizations and institutions in today's world and society
	<i>International Academic Knowledge:</i> Knowledge of international academic developments	Q7: I know the internationally accepted theories and schools of thought in my field of study or profession
		Q8: I know the international cutting-edge research problems, issues and theories in my field of study or profession
		Q9: I know the main internationally accepted research methods in my field of study or profession
<i>Skills</i> Q10–22	<i>Tool usage:</i> Use of tools to facilitate communicate	Q10: I can easily use MS Office, PDF Reader and other common international software
		Q11: I can easily browse foreign-language websites to obtain knowledge and the requisite information
		Q12: I can analyse and evaluate issues from the perspective of a foreign culture
	<i>Compatibility:</i> Ability to communicate, learn and collaborate with people from diverse cultural backgrounds	Q13: I have made efforts to understand foreigners so that we can work or live together
		Q14: I can be aware of cultural differences in my interactions with people from different cultures
		Q15: I am able to quickly communicate in a common language in my interactions with people from different cultures
		Q16: I am able to adjust to language and communication outside of my own culture
		Q17: I can learn, work and live outside of my own culture
		Q18: I can easily comprehend foreign literature in my field of study or profession
		Q19: When faced with problems in understanding professional literature, I can take the initiative to contact and consult the author
		Q20: I have made efforts to publish papers in SCI, SSCI, ISTP, EI and other indexed journals or conferences with my supervisors
		Q21: I can actively seek foreign scholars to discuss research questions and issues at international academic conferences
		Q22: I can easily discuss research questions and issues with foreign scholars at international academic conferences

Table 2 continued

Dimensions	Sub-factors/definitions	Items
<i>Attitudes</i> Q23–33	<i>Motivation</i> : Initiative to seek intercultural experiences	Q23: I would like to spend time and energy interacting with foreigners and establishing contacts
		Q24: I would like to experience life and culture in other countries (e.g. through tourism)
		Q25: I would like to take the risk to experience cross-cultural learning and personal development (e.g. through overseas study and work)
		Q26: I would like to go abroad and experience the academic and research environments of foreign countries
		Q27: I would like to consult foreign scholars in my areas of interest at international academic lectures and report sessions
	<i>Openness</i> : Open attitude to diverse cultures	Q28: When communicating with foreigners, I try to respect their cultures and values
		Q29: When communicating with foreigners, I try to understand their cultures and values
		Q30: When communicating with foreigners, I try to appreciate their cultures and values
	<i>Values</i> : Identification with one’s own values (i.e. self-value and worldview) and recognition that they are not universal	Q31: I identify with my own country’s culture and values
		Q32: I believe that my worldview is one of many equally valid worldviews
		Q33: I consider myself valuable to my country and society

Source: adapted from Liu et al. (2020)

Table 3 Demographic overview of the questionnaire respondents

Variable	Value	Frequency (cases)	Percentage (%)
Gender	Male	82	33.3
	Female	160	65.0
	Not for disclosure	4	1.7
Field of study	Social science	32	13.0
	Natural science	181	73.6
	Undisclosed	33	13.4
Overseas experience	None	221	89.9
	Less than 3 months	22	8.9
	3–6 months	1	0.4
	7–12 months	2	0.8
Attitude towards ICC	Essential	75	30.5
	Very useful	90	36.6
	Useful	66	26.8
	Slightly useful	9	3.7
	Useless	6	2.4
Valid cases: 246/246			

excerpts were selected for the further explanation and analysis of each theme.

To enhance the rigor and transparency of data analysis, we adhered to the consolidated criteria proposed by Tong et al. (2007) for reporting qualitative

Table 4 Demographic overview of the interview participants

Participant	Gender	Major*	Previous overseas experience	Intercultural communication experience**	Form of interview	Length of interview***
1	Female	Food science	X	O	In person	17'14''
2	Female	Resources and conservation	X	O	In person	32'10''
3	Female	Food science	X	O	In person	22'16''
4	Female	Food science	X	O	In person	17'50''
5	Female	Plant science	O	O	In person	19'53''
6	Male	Computer science	O	O	In person	25'35''
7	Female	Food science	X	O	Online	15'05''
8	Female	Agrotechny and storage	X	O	In person	16'41''
9	Female	Resources and conservation	X	O	In person	20'22''
10	Male	Management	X	O	In person	15'22''
11	Female	Resources and conservation	X	O	Online	19'28''
12	Female	Biological medicine	X	O	Online	17'44''
13	Male	Biological information	X	O	Online	15'38''
14	Male	Food science	X	O	Online	15'27''
15	Male	Management	O	O	In person	15'08''
16	Male	Resources and conservation	X	O	Online	14'33''
17	Male	Management	O	O	In person	12'05''
18	Female	Plant science	X	O	Online	12'43''

Valid cases: 18/18

X, no experience; O, experience

*To protect the privacy of the participants, only an umbrella category is displayed

**Intercultural communication experience refers to having spoken conversations with people from other cultures in a non-native language

***xx'xx''=xx (minutes) xx (seconds)

research (COREQ). In compliance with the items on data analysis within the checklist (Domain 3), the first author shared all coding-related information with the co-authors upon completion of the coding process. This included the raw data, the coding trees, the origins of the themes and other details. Following this, the other co-authors checked and reviewed the coding process and outcomes and convened in a full-group meeting to discuss both the coding approaches and the results until consensus was achieved amongst all parties involved.

Results

Self-perceived ICC level of Chinese students with limited intercultural experience (RQ1)

The dispersion degree of quantitative data is presented first, and the self-evaluated ICC of the participants are displayed in a raincloud plot (Fig. 2). Raincloud plots offer maximum utility and flexibility to readers, ensuring that all information needed to assess the data can be shown (Allen et al., 2019). They combine the advantages of violin plots and boxplots, which can

indicate many important statistical results (e.g. dispersion degree, mean, outliers). The area of cloud and boxes depict the main data distribution section. Briefly, the higher cloud peaks indicate more respondents choosing that rating, and higher scores indicate higher self-evaluations of their ICC. The mean (M) reflects an overall score of the respondents' self-evaluations in each dimension.

As shown in the figure, respondents have a much higher mean score (3.785) on the Attitudes dimension (SD=0.688) than they did on the Knowledge dimension (M=3.429, SD=0.816) and the Skills dimension (M=3.195, SD=0.749). Because all the data from the questionnaire are integers, the 'rain' under the box is not scattered, but approximates a line. To provide a more detailed portrait of respondents' perceived ICC, we used means and standard deviation (SD) as statistical descriptions for all dimensions and factors (Table 5).

Analysis

A paired-samples t-test was conducted on the means of all dimensions and selected factors (see Table 6). The rationale for choosing these factors was their significant deviation from the mean of their respective

dimensions, as compared to other factors within the same dimension.

In addition to statistical data, previous studies have revealed the heterogeneity of the personal experiences and social attitudes of Chinese students (Heng, 2019; Lin et al., 2016). This may lead to the emergence of different subgroups.

Distinct groups (RQ2)

To further elucidate the characteristics of the respondents, we conducted a two-step cluster analysis (a clustering algorithm in SPSS) with all nine factors. The results are displayed in Table 7 below.

The cluster analysis revealed two distinct groups amongst the respondents. Cluster 2 (51.6% of respondents) consistently scored approximately one unit higher on all input items, as compared to Cluster 1 (48.4% of respondents). Of these 17 items, 7 were related to the Skills dimension, 7 were related to the Attitudes dimension and 3 were related to the Knowledge dimension.

To further elucidate the results of the measurements, we analysed the participants' engagement in intercultural interaction using the Context-Perception-Reaction model on the interview data.

Fig. 2 Overview of participants' self-assessment of ICC in three dimensions. M=mean; strongly disagree=1.00, disagree=2.00, neutral=3.00, agree=4.00, strongly agree=5.00

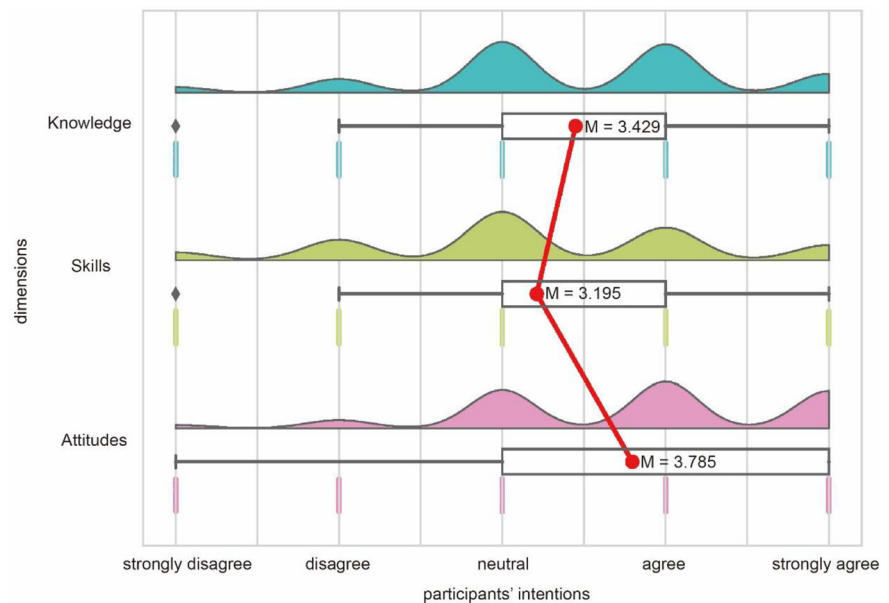


Table 5 Mean and SD for all dimensions and factors

	Scope	M	SD
Overall	Questions 1–33	3.455	0.665
Dimension: Knowledge	Questions 1–9	3.429	0.816
Factor 1: Knowledge of others	Questions 1–3	3.412	0.981
Factor 2: Understanding globalization	Questions 4–6	3.436	0.893
Factor 3: International academic knowledge	Questions 7–9	3.439	0.824
Dimension: Skills	Questions 10–22	3.195	0.749
Factor 1: Tool usage	Questions 10–11	3.831	0.806
Factor 2: Compatibility	Questions 12–17	3.121	0.837
Factor 3: International academic communication	Questions 18–22	3.029	0.855
Dimension: Attitudes	Questions 23–33	3.785	0.688
Factor 1: Motivation	Questions 23–27	3.429	0.870
Factor 2: Openness	Questions 28–30	3.824	0.817
Factor 3: Values	Questions 31–33	4.339	0.771

Table 6 Paired-samples t-test for dimensions and factors of ICC

Pairs	Mean±SD	t	Sig. (2-tailed)
Knowledge—Overall	−0.026±.384	−1.073	0.284
Skills—Overall	−0.260±.279	−14.647	<0.001
Attitudes—Overall	0.329±.377	13.709	<0.001
Skills—Tool usage	−.636±.647	−15.425	<0.001
Attitudes—Motivation	0.355±.407	13.674	<0.001
Attitudes—Values	−0.553±.618	−14.033	<0.001

The Knowledge dimension showed no significant difference from the overall mean, as it was only 0.026 points lower ($t=-1.073$, $p=0.284$). In contrast, both the Skills and Attitudes dimensions demonstrated significant variance from the overall mean. The Skills dimension was 0.260 points lower than the overall mean ($t=-14.647$, $p<0.001$), and the Attitudes dimension was 0.329 points higher ($t=13.709$, $p<0.001$). At the factor level, the Tool-usage factor was 0.636 points higher than the Skills dimension ($t=15.425$, $p<0.001$). The Motivation factor was 0.355 points lower than the Attitudes dimension ($t=-13.674$, $p<0.001$), and the Values factor was 0.553 points higher than that dimension ($t=14.033$, $p<0.001$).

Students' engagement in intercultural interaction (RQ3)

The three themes employed to demonstrate the students' engagement in intercultural communication were as follows: 1) different contexts; 2) challenges and affordances; and 3) expected benefits. The theme 'different contexts' refers to the intercultural events and contexts that participants have previously experienced, as well as the intercultural contexts they anticipate potentially engaging in, based on their own plans and projections. The theme 'challenges and affordance' refers to the impediments and opportunities that students perceived in their engagement of intercultural communication. The theme 'expected benefits' refers

to students' insights into the benefits of having intercultural communication. An overview of the findings of the thematic analysis is presented in Table 8.

The participants' shared experiences of intercultural interaction can be categorized into two types: process-oriented and result-oriented. The former refers to a context that focuses on the communication process, and the latter pertains to a context that emphasizes the outcomes of communication. Participants experienced distinct perceptions within these two contexts. With regard to challenges, a scarcity of shared topics was perceived within the process-oriented context, whereas no such perception was present within the result-oriented context. Moreover, mutual understanding was

Table 7 Two-step cluster analysis results for the nine ICC factors

Cluster	1	2
Size	119 (48.4%)	127 (51.6%)
Characteristic	Lower scores	Higher scores
Input item*	Mean score	Mean score
Q23 (Motivation)	2.55	3.80
Q29 (Openness)	3.25	4.32
Q13 (Compatibility)	2.22	3.53
Q16 (Compatibility)	2.39	3.61
Q9 (International academic knowledge)	2.94	3.97
Q11 (Tool usage)	3.15	4.24
Q30 (Openness)	3.29	4.27
Q6 (Understanding globalization)	2.86	3.96
Q26 (Motivation)	2.99	4.13
Q3 (Knowledge of others)	2.88	4.04
Q21 (International academic communication)	2.45	3.63
Q25 (Motivation)	2.87	4.00
Q15 (Compatibility)	2.40	3.54
Q24 (Motivation)	3.02	4.14
Q28 (Openness)	3.38	4.33
Q14 (Compatibility)	3.08	4.08
Q12 (Compatibility)	2.69	3.75

*Only items with Input (Predictor) Importance > 0.8 are shown

perceived as a challenge solely within the result-oriented context. In terms of affordances, the willingness to communicate was perceived as an affordance within the process-oriented context, but this was not the case within the result-oriented context. The actual reactions of participants within a process-oriented context involved continuous engagement in intercultural communication and interaction, whereas such interactions were discontinued upon the attainment of a specific outcome within the result-oriented context.

Different contexts

We categorized the participants' intercultural communication experiences into two types based on their actual reactions. Within the process-oriented context, participants typically engaged in ongoing interaction. For instance, as a registered tea club member, P1

continuously interacted with international students during a recruitment event, answering their questions and providing detailed introductions to the club's various activities: "I want to introduce as much as possible about tea." The concept of continuity mentioned here does not refer to the duration of interaction or conversation, but rather to the absence of a 'stop button' within such contexts, thereby signifying the lack of a clear endpoint for engagement. In contrast, within the result-oriented context, there was a clear, distinct endpoint for engagement. Participants in these experiences explicitly mentioned the endpoints of their interactive engagement (e.g. giving directions to others (P17) and checking into a hotel (P18)).

Challenges and affordances

For the participants, 'using English for communication' posed a challenge across all contexts. For instance, P6 noted, "I would like to chat with others about astronomy, which is my hobby, but there are many terms I cannot express in English." In their respective narratives, P13 and P17 delineated particular impediments in their engagement with English as a *lingua franca*. In addition, P13 struggled with understanding the English spoken by colleagues in a group meeting, and P17 experienced a communication breakdown during the hotel check-in process. Furthermore, P14 experienced the challenge of having "nothing to say," stating, "Aside from polite greetings, we did not know what to talk about." These challenges nevertheless did not prevent participants from engaging in or initiating intercultural interactions, although they did affect the quality of those interactions.

Both context and curiosity were perceived as affordances within both the process-oriented and result-oriented contexts. With regard to affordances, the distinction between the two types of contexts lay in the participants' expressed willingness to engage in communication within process-oriented contexts. This willingness does not refer to the motivation to initiate or engage in interactions. Instead, it indicates a greater focus on the process of interaction than it does on its outcome. For example, P6 remarked, "the international conference was an opportunity [for intercultural communication] for me. To facilitate conversation, I deliberately sat next to foreign scholars that day." Conversely, some interactions place greater emphasis on outcomes. Once the communicative goal has been

Table 8 Overview of the participants' intercultural interaction engagement

<i>Contexts</i>	<i>Perceptions</i>	<i>Actual reactions</i>
Process-oriented *(P1, 2, 4, 5, 6, 9, 10, 12, 14, 16)	<i>Challenges</i> Using English for communication Lacking shared topics <i>Affordance</i> Context as affordance Curiosity Willingness to communicate	Sustained communication and interaction
Result-oriented *(P3, **4, 7, 8, 11, 13, 15, 17, 18)	<i>Challenges</i> Using English for communication Cannot find a <i>lingua franca</i> for communication Mutual understanding <i>Affordance</i> Context as affordance Curiosity	Concluding the engagement once a particular result is attained

*Participants whose intercultural experiences were divided into the corresponding categories

**Participant 4 shared two distinct intercultural experiences, each corresponding to a different context category

achieved, the interaction is concluded, as seen in such situations as exchanging greetings (P3, P7, P8), giving directions to others (P11, P18) and assisting with locating a package (P4). Although the participants perceived a variety of affordances, not all of these perceptions translated into actual actions (i.e. engaging in intercultural interactions). For instance, P13 mentioned occasionally being aware of cultural differences with international teammates and expressed curiosity about these differences. To satisfy this curiosity, he would search online for relevant information to understand his teammates' behaviours, although this curiosity did not translate into actual communication with them.

Expected benefits

Participants reported three categories of benefits they may acquire from engaging in intercultural communication. The first category of benefits (actual or potential) reported by participants is the improvement of their ability to use English for communication. For instance, P7 noted a significant improvement in her oral expression skills following a few intercultural

communication experiences. In contrast, P9 stated, "If I were to be exposed to an intercultural context, my proficiency in English would be greatly enhanced." The second category of benefits has to do with the potential of intercultural communication to foster mutual understanding amongst cultures, thereby enabling individuals to move beyond their own limitations and mitigate or eliminate stereotypes and prejudices. Participants frequently mentioned the benefit of 'broadening their horizons' through gaining insights into customs, lifestyles and cultural nuances beyond their own. Some participants also viewed this as an opportunity to represent their own cultures, as remarked by P5, "I've found that some people from other cultures are quite uninformed about China, and many of their perceptions are biased and limited." The third category of benefits concern the potential of intercultural communication to assist participants in engaging in multidimensional self-reflection, encompassing such aspects as values, thought processes, behavioural patterns and cultural diversity. For example, P2 stated, "Understanding diverse values and ideas can help me break away from my own narrow-mindedness."

Discussion

This study applied mixed methods to evaluate the ICC of Chinese higher education students with limited intercultural experience. Quantitative analysis was used to assess the students' self-perceived levels of ICC, and qualitative analysis revealed the nuances of their perceptions and reactions across different contexts.

Self-criticism of the language proficiency of Chinese students

In addressing the first research question, the results indicate that participants assessed themselves as possessing a moderately high level of ICC. The greatest disparity in their self-assessment was between skills and attitudes, with participants rating their skills as lower and their attitudes as better. More specifically, they assigned the lowest ratings to skills related to interaction and communication, assigning higher evaluations to their tool usage. Although they rated the dimension of attitudes highly, they assigned lower ratings to the factor of motivation within that dimension. These results are consistent with those of many prior studies involving Chinese students, especially when they are exposed to intercultural contexts. For instance, numerous Chinese international students have encountered a variety of interaction-related challenges while studying abroad (Lin & Zhang, 2021; Meng et al., 2019; Popov et al., 2012). Some scholars have argued that language proficiency is the primary factor contributing to such challenges (Yu & Wright, 2017). In contrast, other scholars have refuted this perspective. For example, Zou and Yu (2019) identify the main barrier that impedes students in mainland China from engaging in intercultural discussion: "lack of confidence to take a position and share their opinion freely (p.12)", rather than low language proficiency. According to our results, the participants did indeed assign the lowest ratings to their communicative skills, which may also be indicative of a phase-specific psychological issue. As demonstrated in the study by Nam et al. (2023), novices in intercultural interactions tend to exhibit timidity during the initial phase, despite possessing language proficiency at upper-intermediate levels. For this reason, the combination of low language proficiency and a lack of confidence could potentially be the primary challenges

for students. In cultivating ICC amongst novices, we advocate initially creating appropriate contexts for students (Straker, 2016; Zou & Yu, 2019) that can help them to assess their learning needs objectively. Subsequently, targeted solutions (e.g. activities, training and curricula) are designed based on an understanding of these learning needs.

The heterogeneity of self-assessment

For the second research question, analysis revealed two distinct participant groups. One group (Cluster 2) perceived their ICC as significantly higher than the other group (Cluster 1). Furthermore, we found that this difference stems primarily from their perceptions of the dimensions of skills and attitudes. Theoretically, the clustering result of this study corroborates the notion that there is a strong correlation between skills and attitudes (Wang & Teo, 2024). This result also demonstrates that, in addition to being associated with openness (Sakamoto & Roger, 2023; Wang & Teo, 2024), language proficiency is linked to motivation. It is evident that the students participating in this study perceived themselves as possessing greater motivation, higher levels of openness and proficiency in language (see Table 6). Recognizing and understanding individual differences within the cohort is crucial. Educational practitioners should take these variables into account in order to provide better support for students in intercultural interactions. As advocated by Heng (2019), Chinese international students should not be viewed as a homogeneous population. Instead, their individual differences in perceived ICC should be valued, as these differences constitute significant factors that affect their participation in activities and social interactions. The needs of the two categories of students identified in our analysis are not in conflict with each other. Both categories require increased opportunities for intercultural interaction and appropriate contexts. For students with higher self-assessments, the priority is to learn how to take a position and express viewpoints freely (Nam et al., 2023; Zou & Yu, 2019). In contrast, students with lower self-assessments should first focus on developing their essential language skills (Sakamoto & Roger, 2023).

Intercultural interaction engagement

The results of the qualitative analysis address the third research question by highlighting the critical junctures in the participants' processes of intercultural interaction: context, perception and actual reaction. The participants initially encountered language-related challenges in intercultural interactions. The perception of these challenges did not immediately lead them to withdraw from engagement, however, as they attempted to employ a variety of coping strategies, including the use of translation tools (e.g. P3, P7, P9) and adjusting their modes of expression (e.g. P3, P6, P10). The results further reveal a relationship between affordances and reactions. Affordances can emanate from essentially any entity (e.g. the concrete physical environment; Gibson, 1986) and from various abstract concepts (e.g. technology and culture; Sun & Suthers, 2023). Aronin and Singleton (2012) categorize affordances according to their source into external (i.e. social) affordances (e.g. family and nation) and internal (i.e. individual) affordances (e.g. personal experience and motivation). External affordances refer to opportunities provided by the context within which an individual is situated, and external affordances pertain to opportunities that an individual inherently possesses. As emphasized by Aronin and Singleton (2012), external affordances are a prerequisite for internal affordances. Based on our findings, however, internal affordances might not necessarily depend on external affordances. Instead, the transformation of affordances into tangible action might depend on the alignment of the two types of affordances. For example, P4 stated, "Students participating in the exchange program all want to improve their English proficiency, so we actively seek opportunities to practice English during our exchange period." This perspective is supported in another research as well. For example, Kim et al. (2022) demonstrate that students aspiring to enhance their language proficiency actively seek opportunities to engage in interactions using English as a *lingua franca* within a multilingual university setting. This represents the actualization of action spurred by the alignment of an individual's internal affordances with the external affordances of the context.

Conclusion

In this study, Chinese students with limited intercultural experience reported their levels of ICC. According to this assessment, they perceived their skills related to interaction and communication as relatively weak, coupled with appropriate attitudes and moderate levels of knowledge. Further analysis revealed that participants could be divided into two clusters, with one cluster reporting overall higher ICC scores than the other. Participants viewed using English for communication as a challenge in both process-oriented and result-oriented contexts, while perceiving context and curiosity as affordances. There were also nuance in their perceptions between the two types of contexts. In process-oriented contexts, participants focused more on the sustainability of communication, whereas in outcome-oriented contexts, they emphasized the functionality of communication.

The results presented above reflect a number of insights. First, all participants perceived using English for communication as a challenge across different contexts. Second, despite commonalities (limited intercultural experiences), individual differences should not be overlooked, which are manifested in some participants' tendency to hold a more optimistic attitude towards their own ICC. Specifically, they tend to give higher ratings to their compatibility, openness, and motivation. Finally, our results indicate that there are certain commonalities in the differences of participants' perceptions and actual reactions across different contexts. Moreover, our results also reveal the potential relationship between affordances and actual reactions. Applying the concepts of internal and external affordances, we negate the notion of dependency or sequential relationship between the two and propose that actual action is most likely to occur when internal and external affordances are in alignment.

Implications and future research agenda

From a theoretical perspective, the results of our cluster analysis indicate that participants with high self-assessments on compatibility also tend to rate themselves highly on openness and motivation. The reverse applies as well. This suggests a strong correlation between the dimensions of attitudes and skills within the ICC framework, and it further indicates that language proficiency is not related solely to openness,

but also to motivation. The nature and mutual effect of this association warrant more comprehensive validation. The results of this study also call into question the notion that external affordances are a prerequisite for the transformation of internal affordances into actual action. We propose that congruence between internal and external affordances is most likely to trigger actual action. Although this perspective could provide insights for the prediction of behaviour and the selection of targets, it requires thorough validation in future research.

From the perspective of educational practice, this study highlights the existence of two distinct core learning needs amongst students with limited intercultural experience: the enhancement of essential language skills and the establishment of confidence in taking positions and expressing opinions freely. This insight should prompt educational practitioners to consider both of these needs when designing curricula or activities for novices and to devise targeted plans accordingly. Future research could focus on two directions: one investigating differences in the intercultural interaction processes of these two clusters of students, and the other exploring ways of assisting students in achieving their respective learning objectives.

Limitations

One limitation to this study is that the sample included only Chinese students at single institution, thus possibly restricting the transferability of the findings. Follow-up studies could assess a broader range of participants across language competence, cultural backgrounds and educational levels. Secondly, this study only provides limited contextual information. Different contexts may impose varying implicit demands on interlocutors' ICC, thereby affecting their engagement. Therefore, future research can provide more contextual information to elaborate on the relationship between the emergence of perceptions and context. The other limitation of this study is the absence of an examination of developmental trajectories over time, which confines the perspective of this paper to a single point in time. At the same time, in an effort to move beyond solely self-reported data, future studies should examine the actual behaviours and expressions of students within immediate contexts. By incorporating their feelings, such studies could

elucidate the progression from internal psychological changes to observable behaviours throughout the communication process, thereby generating a comprehensive view on ICC development.

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Declarations

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