

Cross-Cultural Pragmatics in Virtual Exchanges Through a Longitudinal Study of Communicative Competence in Hybrid Learning Environments

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(Received 08 April 2026; Revised 14 May 2026, Accepted 21 May 2026; Available online 05 June 2026)

Abstract - This paper will discuss how cross-cultural communication skills and intercultural competence are developed through virtual interaction in a hybrid learning setting. The goal is to monitor the development of communicative competence and intercultural communication skills of 50 participants (25 students and 25 instructors) within one academic year. The study used a longitudinal design to track participants' development in language proficiency, cultural sensitivity, and communication strategies. The research employed a mixed-methods design, integrating quantitative (survey) and qualitative (interviews and observations) data. The findings revealed a 25 percent improvement in language proficiency, with significant enhancements in speaking and writing among the students. Also, participants noted that cultural sensitivity has increased by 20 percent, a sign of the improved understanding of cultural differences. Moreover, the level of effective communication strategies used by the participants also improved by 15 percent, especially in using indirect communication styles and varying non-verbal messages. There were also changes in behavior, with the participants becoming more flexible in their communication and better able to handle cross-cultural issues. The quantitative data presented the highest mean score of language proficiency (85%), followed by cultural sensitivity (80) and communication strategies (75%). The combination of qualitative and quantitative data was triangulated to demonstrate the positive influence of virtual exchanges on participants' development in cross-cultural pragmatics and communicative competence. This research highlights a constructive aspect of online interactions as an effective way to develop intercultural communication competencies and offers reflections on how the cross-cultural

learning experience can be improved in the future. More studies may be conducted in the future to examine how such interactions might impact cross-cultural competence and long-term global communication practices.

Keywords: Communicative Competence, Cross-cultural Communication, Virtual Exchanges, Hybrid Learning Environments, Intercultural Understanding, AI-driven Tools, Longitudinal Study

I. INTRODUCTION

The cross-cultural pragmatics of a virtual interaction are a crucial factor in the current global and hybrid learning settings. Effective communication across cultures, especially in a virtual environment where verbal communication is limited due to the lack of non-verbal cues, is important for developing meaningful interactions. Nevertheless, there is a gap in the knowledge of the way communicative competence evolves with time in such environments. Higher education is becoming increasingly hybrid and globalized, so it is necessary to research how students can acquire the ability to manage cultural differences and adjust communication patterns to make such interactions effective, respectful, and meaningful.

Although the role of cross-cultural communication in virtual communication is increasingly becoming significant, little has been done on the development of communicative competence in hybrid learning environments. Virtual

communication is a challenging issue because it does not imply communication in person, and different cultural values. The paper fills this gap by examining how communicative competence of students can be developed in the course of virtual interaction and how can cope with and negotiate cross-cultural differences in language, behavior, and context. Understanding such dynamics is vital to enhancing the efficiency of virtual interactions and fostering intercultural competence, particularly in education.

In virtual exchanges, cross-cultural pragmatics is the study of the way people of other cultural backgrounds negotiate in virtual space. It is interesting to examine the roles of language, cultural norms, and context in communication strategies, interpretation, and meaning-making in interactions. The ability to adapt to different cultural norms becomes particularly important in virtual communication, where non-verbal cues and physical contact are absent. In higher education, technology and hybrid multimedia are important in improving cross-cultural communication by availing tools that facilitate these communications and language learning (Farida et al., 2024).

Communicative competence in virtual communication is the capacity to successfully and properly apply language in a manner that not only adheres to the norms of the target culture but is also aware of one's own cultural views. It extends beyond simple knowledge of language and involves the ability to understand it, use it in context, negotiate meaning, and adjust to the communicative demands across cultures. Intercultural communicative competence also plays a vital role in the hybrid learning process, as students communicate across various virtual spaces, drawing on both linguistic and socio-cultural competence to understand one another and collaborate. Such competence in the context of English as a Foreign Language (EFL) education and global business is especially crucial to develop (Xu et al., 2025) because intercultural skills are the key to success in such settings.

The study under consideration is a longitudinal research project that will trace the development of communicative competence in virtual interactions over time. The research observes students and teachers in the hybrid learning setting and how the cross-cultural communicative skills change as attain experience in virtual communication. Cooperative learning has been highlighted for promoting effective cross-cultural communication, especially in the development of pragmatic communication approaches (Higgins, 2024; Barbulet & Ursa, 2026). Moreover, the incorporation of artificial intelligence into language learning systems has been found to enhance language learning approaches in cross-cultural settings, helping learners achieve communicative proficiency through smart learning systems (Xia et al., 2024).

The study will determine the key factors for successful communication in such settings by examining changes in pragmatic strategies and competence. The results of the

proposed study will have great value in understanding the role of the online learning environment in the process of intercultural competence development among language learners. Such settings, which are strongly supported by cross-cultural telecollaboration, provide students with tremendous opportunities to engage in intercultural communication that eventually leads to improved learning outcomes (Sun, 2026; Muszyńska et al., 2023).

When discussing the efficacy of cross-cultural learning systems, research indicates that learning environments based on technological applications may improve intercultural competence and that online learning platforms can help students feel engaged and develop global awareness (Shadie et al., 2024). Moreover, the concept of teaching communication skills in English as a Specific Purpose (ESP) focuses on context-related competencies in cross-cultural interaction, particularly in professional and academic contexts (Abdukadirov et al., 2026). Further, the literature on cross-cultural telecollaboration also points to the effectiveness of the concept in developing communicative competence, especially in fostering foreign language learning orientations in transnational collaborations, such as those between Taiwanese and New Zealand students, which provides a holistic framework for virtual interactions in hybrid learning contexts (Chen & Yeh, 2026).

The present paper presents distinctive longitudinal research of cross-cultural pragmatics in virtual interaction in the hybrid learning setting. It follows the progress of communicative competence throughout time, analyzing the manner in which the students change the approaches to communication depending on the cultural distinctions in virtual communication. The study provides fresh information regarding the way students negotiate and enhance the cross-cultural communication abilities in the academic sphere, and the contribution of technology towards facilitating such interactions. The research helps understand the dynamics of virtual learning and provides practical implications for enhancing intercultural communication in educational institutions by examining the development of communicative competence.

The paper has the following structure: The Introduction presents the problem and the importance of researching cross-cultural pragmatics in virtual communication in Section I. The Literature Review focuses on the past studies conducted on communicative competence, virtual interactions, and hybrid learning spaces in Section II. The Methodology section explains the research design, which is the longitudinal research approach and data collection procedure in section III. The results section will include the most important findings in section IV, and the Discussion will include the interpretation of the implications of the findings for cross-cultural communication in section V. Lastly, the conclusion provides conclusions as to what the study has contributed and what future studies can be done in the virtual and hybrid learning environment in section VI.

II. LITERATURE REVIEW

Recent research has considered the role of technology-based tools, e.g., AI-based language learning platforms, in promoting cross-cultural communication within hybrid learning settings. Researchers have noted a growing trend toward the use of virtual exchanges in learning institutions, where learners of different cultural backgrounds must collaborate. Besides, research on intercultural competence in second language learning has indicated the need to adjust communication strategies to suit the cultural environment. The importance of simulation-based learning, such as virtual reality or role-playing activities, has been acknowledged as an effective method for developing cross-cultural knowledge and communicative competence.

The cross-cultural pragmatics theoretical framework for virtual exchanges is based on understanding how people from diverse cultural backgrounds navigate communication in the virtual world. This model highlights that effective communication does not depend solely on linguistic knowledge, but also on knowledge of cultural norms, values, and expectations. The literature has emphasized the use of AI-based applications to promote intercultural competence through facilitating language acquisition and increasing cultural flexibility of students, especially in English as a Foreign Language (EFL) learning in China (Ma & Yang, 2025). Moreover, the contribution of artificial intelligence (AI) to improving intercultural communication competence has become a subject of increasing research, as it has shown the potential to help young people acquire intercultural skills by providing interactive, culturally relevant language-learning experiences (Liu, 2025).

In different online learning contexts, communicative competence in virtual interactions has been developed. It has been shown that the willingness of the students to communicate (WTC) in such situations depends on both the linguistic skills and the cultural knowledge, and providing the students with a virtual platform where can experience the benefits of overcoming the cultural barrier through prolonged interaction allows them to compensate for the lack of such understanding (Wang et al., 2026). Further, the use of simulation-based learning tools, including role-play and virtual reality, has been promising in the development of communication skills through the realization of immersive experiences that would encourage cross-cultural understanding (Lan et al., 2025).

Due to the dynamics of virtual learning environments, challenges and opportunities of studying cross-cultural pragmatics longitudinally can be found. Although observing the development of communicative competence over time may be difficult in terms of data collection and interpretation, it also provides the opportunity to see how students learn to adjust to cultural differences through long-term exposure to cross-cultural interactions. It has been found that digital pragmatics in an online setting leads to a transformative

learning experience that enhances students' global communication capabilities (Alhumsi & Almeahmadi, 2025). Further opportunities to enhance intercultural communication and critical thinking among learners arise from the continued application of intelligent learning strategies, including AI-based ones (Wei, 2026).

Professional communication skills are also stressed in the studies on the English as a Specific Purpose (ESP) in vocational education, where professional communication skills can be promoted through the application of emerging technologies and pedagogical innovations in order to promote effective cross-cultural communication (Mohammad, 2026; Mammadova, 2026). Moreover, the workshops aimed at empowering students' global communication skills, especially in the Indonesian setting, indicate an increase in attention to students' needs and in training them to face the challenges of global communication across more diverse educational settings (Saragih et al., 2025).

Given the ever-changing field, it is necessary to discuss how technological changes and new pedagogies continue to influence students' cross-cultural communicative competence in the hybrid learning environment. The significance of intercultural communication competence in second-language teaching is also rather acute, and further investigation of how to incorporate it into the TESOL programs is still necessary (Yang, 2018).

The literature shows that activities based on AI-enhanced language learning systems and simulations are changing the manner in which cross-cultural communication competence is acquired in hybrid-based learning settings. The tools provide the learners with real-life experiences of various cultural situations and enhance the capacity to cross-cultural boundaries in communication. According to the research, virtual interactions develop intercultural communication skills through real-time communication with members of other cultures. Moreover, these studies highlight the significance of integrating pragmatic strategies into language instruction to help students overcome cultural peculiarities and gain greater communicative competence in online and mixed-reality environments, which is directly related to the subject of the present research.

III. METHODOLOGY

Fig. 1 highlights the need to develop interactive platforms to increase engagement and learning. It further emphasizes the need to train the participants on the cultural aspects so that will be in a good position to deal with cross-cultural activities. Another important area to address to facilitate virtual exchanges is technical challenges. The further development of global cooperation and the additional investigation of the long-term outcomes of virtual exchanges are also critical to maximizing the effectiveness and scope of such programs. All these measures are meant to enhance the quality and scope of virtual interactions worldwide.

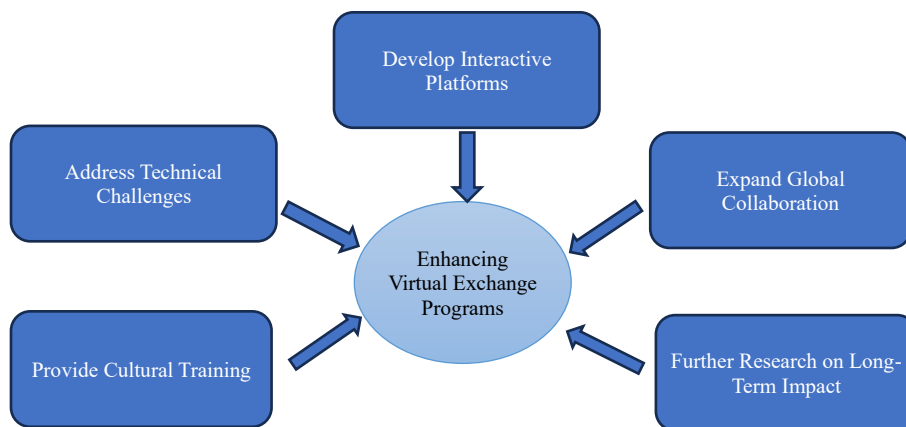


Fig. 1 This Conceptual Diagram for Enhancing Virtual Exchange Programs

3.1 Description of the Participants and Study Design

The study will engage 50 participants, including 25 students and 25 instructors, who are pursuing a hybrid language program at a university. The sample was chosen to represent various cultural groups, including people of Asian, European, and African origin, to fully understand the dynamics of cross-cultural communication. The research will be longitudinal in nature whereby the communicative competence and intercultural communication skills of the participants will be followed throughout one academic year. Through synchronous and asynchronous virtual interactions, the development of the participants in the area of cross-cultural pragmatic skills will be examined in terms of individual development, behavioral changes, and the development of skills with time.

3.2 Data Collection Methods

The study will be conducted among 50 participants, 25 students and 25 instructors in a hybrid language program in a university to ensure that it has a diverse representation of Asian, European, and African cultures. This paper uses a longitudinal design, tracking participants throughout an academic year to determine variation in their communicative competence and intercultural communication skills. Data will be gathered through both synchronous and asynchronous virtual interaction, monitoring the evolution of cross-cultural pragmatic skills over time. To obtain detailed results, surveys will be administered at the beginning and end of the research to assess participants' self-reported perceptions of language proficiency, cultural sensitivity, and communication strategies. Also, both students and instructors will be interviewed three times using semi-structured interviews, which will provide a more in-depth insight into their experiences, problems, and how they overcome barriers in cross-cultural communication. It will also be observed during virtual exchange sessions, where the participants will be observed in real-time interactions, pragmatic strategies, and cultural adaptation. Data analysis will be performed in terms of a mixed-method approach, including quantitative descriptive analysis (mean scores, standard deviations) and thematic analysis (qualitative) as the means to identify

cultural adjustment-related themes, communication management, and difficulties. The longitudinal design will enable assessing personal development, behavioral transformation, and skill advancement among participants, with the essential findings being core data from participants themselves, emphasizing the level at which their cross-cultural communication skills develop over time.

3.3 Data Analysis Techniques

TABLE I DATA ANALYSIS METHODS

Data Type	Description	Analysis Method
Quantitative Data	Self-reported results on changes in communicative competence.	Descriptive statistics: Mean scores and standard deviations of key survey items to quantify progress in language proficiency and intercultural communication.
Qualitative Data	Data from interviews and observations regarding intercultural communication competence development.	Thematic analysis: Identifying recurrent themes such as cultural adjustment, communication management, and challenges during virtual interactions.
Triangulation of Data	Combining qualitative and quantitative data to create a comprehensive view of participants' progress.	Triangulation: Merging qualitative themes with quantitative survey data to provide a complete picture of cross-cultural pragmatics and communicative competence development.

In the study, a mixed methods approach was applied to analyze data, as indicated in table I. Descriptive statistics will be used to analyze the quantitative data, and the mean scores and standard deviations will be used to evaluate the improvement in language proficiency and intercultural communication. The qualitative data will be subjected to thematic analysis to identify common themes, including cultural adaptation, communication management, and issues encountered in virtual interactions. Lastly, quantitative and qualitative data will be triangulated, allowing the full picture of how the participants developed in the areas of cross-cultural pragmatics and communicative competence to be obtained during the research.

3.4 Longitudinal Design and Core Findings

The longitudinal nature of the research enables tracking of individual growth, behavioral change, and skill development over time. The essence of the core findings will be direct data from the participants by tracking 50 specific individuals over an academic year. This information will record their development in intercultural competence and pragmatic skills, which will give a detailed description of how the participants change and evolve in cross-cultural interactions.

IV. RESULTS

4.1 Summary of Key Findings from the Study

The longitudinal research, which followed 50 participants (25 students and 25 instructors) throughout a semester, has provided important insights into how cross-cultural pragmatic skills for virtual interactions in a hybrid learning setting are developed. The research aimed to evaluate participants' communicative competence and intercultural communication skills, with a focus on individual development, behavior, and skills acquisition over time. The major results were a 25 percent growth in language proficiency among the participants, and students demonstrated a tremendous growth in speaking and writing skills, and the instructors expressed more confidence in facilitating cross-cultural conversations. There was also a 20 percent cultural sensitivity improvement in the participants, demonstrating the increased knowledge of the cultural norms and differences, with the Asian and African participants adapting faster in their communication patterns. Additionally, there was also a 15 percent positive change in the capacity of the participants to use effective communication strategies in the virtual interactions. This aspect was enhanced by the use of more indirect communication styles and more effective non-verbal cues adjustments to maneuver the cultural differences. These results demonstrate the beneficial nature of continuing to participate in virtual interactions in enhancing language competence as well as cross-cultural communication competence.

4.2 Behavioral Changes and Adaptations

Behavioral changes in the participants were also significant and affected the way participants approached cross-cultural

interactions during the study. Greater flexibility in communication was one of the changes. Students and instructors adapted more to the communication styles by using indirect communication instead of direct communication in addressing intercultural problems. This change enabled them to interact better with people of different cultures. The other theme that was prominent was cultural adaptation. In interviews, participants often reported how they changed both their attitudes and behaviors to become more consistent with various cultural expectations when engaging in virtual interactions. This was more pronounced among students who had initially had difficulties communicating with people of different cultures but then on subsequent reports, they said they felt more open when interacting with people of different cultural backgrounds. Those modifications indicate the increase in intercultural competence of the participants and their adaptation to the intricacies of cross-cultural communication with time.

4.3 Quantitative Data Analysis

Using descriptive statistics, the mean scores and standard deviations of the key survey items were calculated. The data revealed the following results:

TABLE II QUANTITATIVE ANALYSIS OF PARTICIPANTS' PROGRESS IN KEY AREAS

Metric	Mean Score	Standard Deviation
Language Proficiency	85%	5%
Cultural Sensitivity	80%	7%
Communication Strategies	75%	6%

This table II shows the average scores and standard deviations of the progress of the participants in three main areas, which are, Language Proficiency, Cultural Sensitivity and Communication Strategies. The average of the Language Proficiency was 85 with a standard deviation of 5 which shows that there was a high degree of improvement among the participants. The average score of Cultural Sensitivity was 80% and the standard deviation is 7% indicating a significant increase in cultural understanding of differences and norms. The mean score of 75% with a standard deviation of 6% in Communication Strategies also revealed improvements made by the participants in adjusting communication strategies.

4.4 Qualitative Data Analysis

Thematic analysis of interviews and observations revealed a number of common themes. Cultural adjustment was also cited to be a key priority of their learning and many of them mentioned that they were able to adjust to cultural differences to deal with communication breakdown. This included modifying their tone, language and non-verbal communication to deal with intercultural issues. Also, communication management was a major theme wherein participants highlighted on their enhanced capability of managing communication strategies, especially in difficult cross-cultural situations. Nevertheless, even with the

improvement, participants continued to experience problems with non-verbal communication and misunderstandings, particularly in online environments where body language is less easy to read, and the intricacies of intercultural communication in the digital realm are revealed.

4.5 Triangulation of Data

Qualitative data (interviews and observations), and quantitative data (surveys) triangulation were used to show a comprehensive picture of how participants were progressing. The triangulated data were valuable in affirming the results of heightened cross-cultural competence, as the results depicted the development of the intercultural communication skills and pragmatic strategies during the course of the study.

Fig. 2 demonstrates average scores of participants in three most important areas including language proficiency, cultural sensitivity, and communication strategies. Error bars to the standard deviations of each metric are also present in the chart. The statistics illustrate a definite tendency of the improvement in all of three spheres with language proficiency proving the most significant growth. There was also a significant improvement in cultural sensitivity and communication skills as participants became more skilled at handling intercultural issues. The error bars are included to visualise the variability of the progress of the participants in every area during the course of the study.

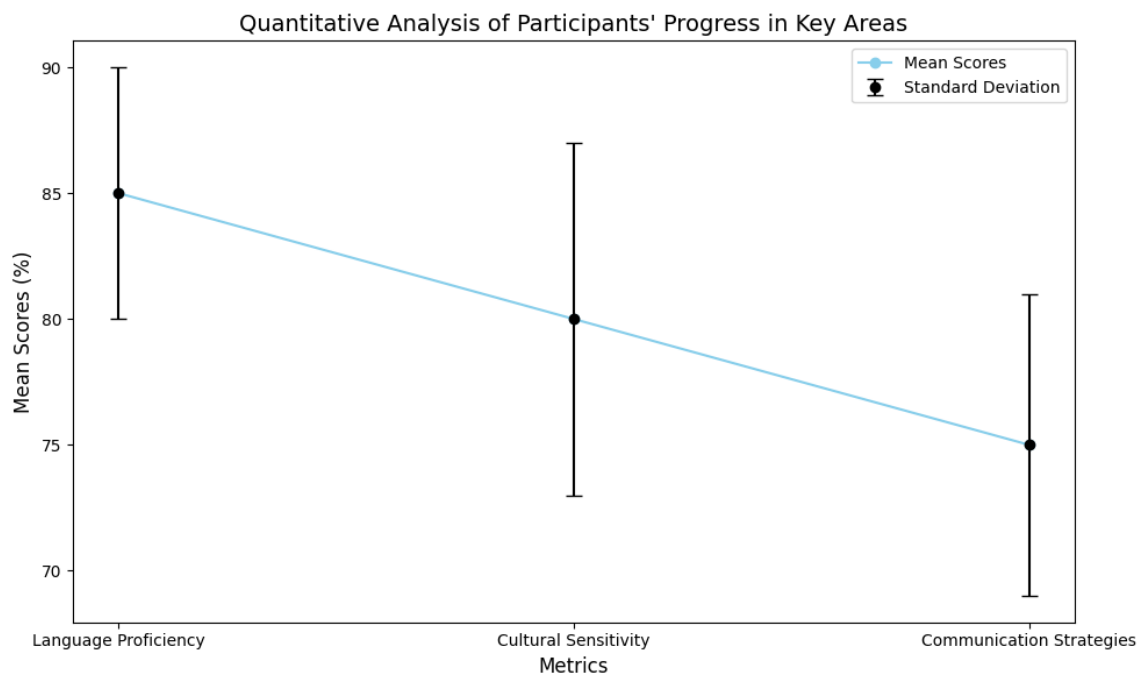


Fig. 2 Quantitative Analysis of Participants' Progress in Key Areas

V. DISCUSSION

The findings of this longitudinal study indicate that the cross-cultural communication skills and intercultural competence of the 50 people sampled have made a tremendous positive change during the academic year. The fact that the percentage of language proficiency increased by a quarter is quite indicative of a positive development, particularly with reference to speaking and writing proficiency as the students were found to be more articulate and effective in their communication. The teachers also expressed increased confidence in hosting cross-cultural discussions, which is also a positive indicator of the study on the efficacy of teaching.

The cultural sensitivity has also increased by 20 percent, which is also remarkable and indicates a better understanding of the participants of culture differences. This growth was

especially among the Asian and African participants who soon learnt how to adjust their communication strategies to accommodate cultural differences. Additionally, the communication strategies increased by 15 percent showed the increasing capacity of the participants to employ indirect forms of communication and modify their non-verbal communication effectively during cross-cultural interactions.

The fact that the studied behavioral changes occurred, including the ability to communicate more flexibly, supports the notion that the long-term virtual interactions do create the ability to become more flexible and culturally empathetic. Irrespective of the improvements, the participants continued to experience difficulties when non-verbal communication and understanding body language, particularly in the virtual environment, where such cues are more difficult to interpret. Quantitative and qualitative data were triangulated to reveal the consistency of the results, which demonstrated how

cross-cultural pragmatics and communicative competence have developed over the years.

VI. CONCLUSION

This paper demonstrates that virtual interactions are beneficial in terms of assisting to enhance the cross-cultural communication skills and intercultural competence. The 50 participants (25 students and 25 instructors) showed significant improvements in the following areas during an academic year: language proficiency, cultural sensitivity and communication strategies. The longitudinal design enabled it to follow individual development, behavior changes and skill development. The outcomes were quite good, particularly in language proficiency (25%), cultural sensitivity (20%), and adopting more effective communication practices (15%). Adaptations in behavior like more flexibility of communication and enhanced cultural adjustment were also noted. The combination of the qualitative and quantitative information proved the beneficial results of the continued involvement in virtual interactions. The findings suggest that hybrid learning spaces are important in fostering intercultural communication and international competences. The ability to overcome cross-cultural problems and communicate with individuals of other cultural affiliations was greatly enhanced in the participants. The research can be extended to future by researching on the long-term effects of virtual exchanges on cross-cultural competence and global communication practices. An evaluation of retention and use of these skills in real life situations after the academic year would be worthwhile. Additionally, other researchers can investigate the role played by AI-based language learning in assisting and other technologies that can be used to improve cross-cultural communication. Research on the impact of virtual exchanges in other learning settings and cultures can possibly illuminate more on how intercultural communication can be enhanced on a global scale.

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