

Zhonghao Xu<sup>1</sup> , Stephen M. Croucher<sup>2\*</sup> 

<sup>1</sup>Massey University, Auckland, New Zealand

<sup>2</sup>Clemson University, Clemson, United States

\*e-mail: smcrouc@clemson.edu

## A BERTOPIC EXTRACTION ANALYSIS OF HALL'S LOW-AND HIGH-CONTEXT COMMUNICATION IN COMMUNICATION JOURNALS

The main purpose of this article is to examine citation data for Edward T. Hall's works in communications journals from 1990 to 2024. The authors use technologies of Natural Language Processing (NLP), specifically BERTopic extraction to explore how communication journals have framed Edward T. Hall's theories of culture. The analysis revealed 38 articles referenced Hall's work 432 times. The Journal of Intercultural Communication Research published the most articles, highlighting its significance in intercultural and cross-cultural communication scholarship. Articles focused primarily on the following frames: 1) Culture and the Impact on Work and Research, 2) Time and the Impact on Work and Research, 3) Smell and Sensory Hierarchies, 4) Proxemics and Cultural Expressions, 5) Cross-cultural communication between American and German students, and 6) Cultural differences in Communication between Japanese and other Cultures. The comparative analysis presented in this study provides insight into how academic discourse has shaped Hall's conception of culture over time. The results show that Hall's work has received increased mention in books and monograph chapters, as well as in non-peer-reviewed and non-central publications.

**Key words:** Natural Language Processing, BERT analysis, Hall, high/low-context, journal publishing.

Чжунхао Ху<sup>1</sup>, Стивен М. Краучер<sup>2\*</sup>

<sup>1</sup>Масси университеті, Оскленд, Жаңа Зеландия

<sup>2</sup>Клемсон университеті, Клемсон, Америка Құрама Штаттары

\*e-mail: smcrouc@clemson.edu

## Коммуникация журналдарындағы Холлдың жоғары және төмен контекстік мәдениет теориясы туралы жарияланымдарды BERTopic талдау

Мақаланың негізгі мақсаты – Эдвард Т. Холлдың 1990-2024 жылдар аралығында коммуникациялық журналдарда жарияланған жұмыстарының дәйексөз деректерін зерттеу. Ғылыми зерттеу авторлары коммуникация журналдары Эдвард Т. Холлдың мәдениет теорияларын қалай тұжырымдайтынын зерттеу үшін табиғи тілді өңдеу (NLP) технологияларын, атап айтқанда BERTopic экстракциясын пайдаланады.

Талдау көрсеткендей, Холлдың еңбегі 38 мақалада 432 рет келтірілген. The Journal of Intercultural Communication Research журналы мақалаларының басым көпшілігі мәдениетаралық коммуникация және кросс-мәдени коммуникацияны зерттеуде Эдвард Т. Холл теориясының маңыздылығына назар аударған. Мақалалар негізінен келесі тақырыптарға арналған: 1) Мәдениет және оның еңбек пен зерттеулерге әсері; 2) Уақыт және оның еңбек пен зерттеуге әсері; 3) Иіс сезу және сенсорлық иерархия; 4) Проксемика және мәдени өрнек; 5) Америкалық және Германиялық студенттер арасындағы мәдениетаралық коммуникация; және 6) Жапондар мен басқа мәдениеттер арасындағы қарым-қатынаста байқалатын мәдени ерекшеліктер мен айырмашылықтар.

Осы зерттеуде ұсынылған салыстырмалы талдау уақыт өте келе Холлдың мәдениет концепциясын академиялық дискурс қалай қалыптастырғанын түсінуге мүмкіндік береді. Ғылыми зерттеудің нәтижесі көрсеткендей, Холл жұмысы кітаптар мен монографиялық еңбектердің тарауларында, сондай-ақ рецензияланбайтын журналдар мен жеке басылымдарда көбірек сілтемелерге ие болды.

**Түйін сөздер:** табиғи тілді өңдеу, BERTopic әдісі, Е.Т. Холл, жоғары/төмен контекст, журнал жарияланымдары.

Чжунхао Ху<sup>1</sup>, Стивен М. Краучер<sup>2\*</sup>

<sup>1</sup>Университет Мэсси, Окленд, Новая Зеландия

<sup>2</sup>Университет Клемсона, Клемсон, Соединенные Штаты Америки

\*e-mail: smcrouc@clmson.edu

### **BERTopic анализ публикаций о теории высоко- и низкоконтестуальных культур Э. Холла в журналах по коммуникациям**

Цель статьи – изучение данных цитирования работ Эдварда Т. Холла в журналах по коммуникациям в период с 1990 по 2024 годы. Авторы используют технологии обработки естественного языка (NLP), в частности, «BERTopic extraction», для изучения того, как журналы по коммуникациям формулируют теории культуры Эдварда Т. Холла.

Анализ показал, что в 38-ми статьях работы Холла упоминаются 432 раза. В журнале исследований межкультурной коммуникации «Journal of Intercultural Communication Research» опубликовано больше всего статей, подчеркивающих значимость теории Эдварда Т. Холла в изучении кросс-культурной коммуникации. Статьи были посвящены, главным образом, следующим темам: Культура и ее влияние на работу и исследования; Время и его влияние на работу и исследования; Обоняние и сенсорная иерархия; Взаимосвязь и культурное самовыражение; Межкультурная коммуникация между американскими и немецкими студентами; Культурные особенности и различия в общении между японской и другими культурами.

Представленный сравнительный анализ позволяет понять, как академический дискурс формировал концепцию культуры Холла с течением времени. Результаты показывают, что работы Холла получили более широкое упоминание в книгах и главах монографий, а также в публикациях, не являющихся рецензируемыми и центральными.

**Ключевые слова:** обработка естественного языка, метод BERTopic, Э.Т. Холл, высокий/низкий контекст, публикация в журнале.

## **Introduction**

The significance of journals as forums for academic discourse is increasingly recognized as critical for academia (Peters et al., 2021; Romaine, 2012). Studies show theoretical and methodological understanding are influenced by academic journal articles (Rawat & Meena, 2014; Rose, 2019). Romaine (2012) considers academic journals embodiments of society, with editors, reviewers, and authors fostering disciplinary understanding. With the increase in scientific publications (Bornmann et al., 2021) computational models are increasingly relevant in communication to understand trends (Rains et al., 2018; van Atteveldt et al., 2022). Thus, the examination of published research has become a responsibility for communication researchers (Rains et al., 2018). Considering academic discourse is an “archaeology of knowledge” with “rules of formation” (Foucault, 1969, p. 38), this study explores this discourse within communication journals. Specifically, this study examines the disciplinary discourse around one theorist who has been argued to have shaped cross-cultural communication (Gudykunst & Lee, 2002), Edward T Hall. His work on low-and high-context communication, proxemics, and time (Hall, 1976) has been integral in shaping the discipline (Gudykunst & Lee, 2002; Kim, 1994; Kittler

et al., 2011; Würtz, 2005). Using Natural Language Processing (NLP) and BERTopic for the extraction of topics, the current study examines the extent to which Hall’s work has been cited and framed in published communication journal articles.

## **Literature review**

### ***Context, Proxemics, and Time***

Hall’s (1976) concept of low-and high-context communication differentiates the extent to which communication is embedded in context. In high-context communication, most of the communication (information) is either internalized in the person or physical environment (context). Very little is explicitly communicated as part of the message (Hall, 1976). With low-context communication, most of the communication is explicit or externally communicated. Research has shown that low-context communication is more common in more individualistic cultures, while high-context communication is more common among collectivistic cultures (Gudykunst & Ting-Toomey, 1988). Research in the social sciences has linked context to various communicative actions. For example, Würtz (2005) found web site use strategy preference differed based on the level of context. Kim (1994) found conversational clarity was rated as the most important conversational

constraint among those preferring low-context communication. Ward et al. (2016) found context influences an individual's willingness to speak up at work, with high-context being positively linked with a lower willingness to speak up. Croucher et al. (2012) found high-context cultures prefer the avoiding and obliging conflict styles while more low-context cultures tend to prefer a dominating approach to conflict.

Hall's proxemics theory explores how people use space in different cultures. In this theory, he asserts cultural norms shape how people organize and perceive space (Hall, 1976). Hall described how there are four interpersonal distances or personal spaces that individuals have everywhere they go. Our posture and body spacing are all a reaction to our interactions with others entering our space: intimate, personal, social, and public. The study of proxemics also includes individuals' use of kinesthetics, haptics, eye contact, voice, and olfactory factors. Extensive research has shown differences in each cross-culturally (Atmaca, 2022; Ayabe-Kanamura et al., 1998; Caldwell et al., 2005; Remland et al., 1991; Uono & Hietanen, 2015). Researchers have generally found correlations between low-context cultures and cultures preferring more open space, while more high-context cultures prefer more intimate spaces. However, research has also shown that Asian cultures also prefer more open-space interactions. Kulaksiz (2015) found the perception/use of proxemics differs culturally among language teachers in the United States and Turkey, and that these differences impact language learning. Haslet and Friedman (2012) found Asians interacted at larger distances than Europeans in avatar-mediated communication.

Chronemics is the study of how time is coded, perceived and communicated culturally. While not originally coined by Hall, but by Bruneau (1974, 1977), Hall popularized the concept. Chronemics perceives time as either monochronic or polychronic. Monochronic time cultures perceive time as something that can be scheduled, managed, arranged, and segmented into precise units. This approach to time is more common in Northern European, and Asian cultures. Polychronic time cultures perceive time as more fluid, and see several things being done at once as acceptable. This approach to time is more common in South Asian, Mediterranean, Latin American, African, and Arab cultures. Researchers have consistently shown differences in how cultures approach time (Ahmed & Bates, 2017; Holtbrügge et al., 2012; Inoue, 2007; Lacmanovic,

2023; Merriam, 1983).

While researchers have deemed Hall's work instrumental in shaping the cross-cultural communication discipline, the full extent of its influence is unclear. Thus, we pose two research questions to further understand the extent to which Hall's theories have influenced the cross-cultural communication discipline. This study builds on framing theory (Entman, 2007) to understand how journals have framed Hall's theories. Framing is "the process of culling a few elements of perceived reality and assembling a narrative that highlights connections among them to promote a particular interpretation" (p. 164). Journals play a significant role in framing perception. Gamson and Modigliani (1989) argued framing emphasizes some aspects of reality while ignoring others. Thus, to understand how journals have framed Hall's theories and in turn, influence the academic discourse, we pose the following:

*RQ1:* What is the frequency of communication journals referencing Hall's theories of context, proxemics, and chronemics between 1993 and 2024?

*RQ2:* What frames have emerged linked with Hall's theories of context, proxemics, and chronemics in communication journals?

## Methodology

### *Data-Collection and Pre-Processing*

The keywords "Edward T Hall," and "Hall" were used to search for relevant articles in 25 communication journals. Twenty-three of these journals were selected from journals used in Griffin et al.'s (2018) analysis of scholarly productivity, and two intercultural/cross-cultural communication journals were added: *Argumentation and Advocacy*, *Communication Education*, *Communication Monographs*, *Communication Quarterly*, *Communication Reports*, *Communication Research*, *Communication Research Reports*, *Communication Studies*, *Communication Theory*, *Critical Studies in Mass Communication*, *Howard Journal of Communication*, *Journal of Applied Communication Research*, *Journal of Broadcasting & Electronic Media*, *Journal of Communication*, *Journal of Communication and Religion*, *Journal of Intercultural Communication Research*, *Journal of International and Intercultural Communication*, *Journalism and Mass Communication Quarterly*, *Qualitative Research Reports in Communication*, *Quarterly Journal of Speech*, *Southern Communication Journal*, *Text and Performance Quarterly*, *Western Journal of Communica-*

tion, and *Women's Studies in Communication*. The search period was 1990-2024, to include the past 34 years. The final data set contains 38 articles related to Hall.

### **Data and Topic Extraction**

The title, main content, and raw text of each article are the text analyzed. Journal name and keyword are used for visualizations with NLP. The second extraction is locating the relevant keywords related to "Hall". Regex is used to find the keyword patterns. BERTopic is using different NLP libraries to conduct topic modeling. It categorizes text into topics that can be categorized while retaining keywords. First, the matched content is converted into embeddings using a sentence transformer model. This model captures the semantic meaning between sentences. The second step stabilizes the output of the model by fixing a random state. The third step is that the programmer predefines the number of top-

ics. This is done by tuning the cluster size within the HDBSCAN model. The vectorizer model optimizes the representation of results: it removes stopwords, and focuses on words like nouns or adjectives.

### **Results and Discussion**

#### **Frequency of Referencing Hall**

From 1990 to 2024, the total amount of articles mentioning Edward T. Hall is 38, with an average of 1.15 articles mentioning Hall's theories per year. The journal with the most references to Hall's theories was the *Journal of Intercultural Communication Research* ( $n = 10$ , 26.3%), followed by *Communication Theory* ( $n = 4$ , 10.5%), and *Human Communication Research* ( $n = 29$ , 10.5%). Table 1 shows each journal's total number of references to Hall's theories between 1990 and 2024. In total, there were 38 articles and 432 mentions of his theories in these articles.

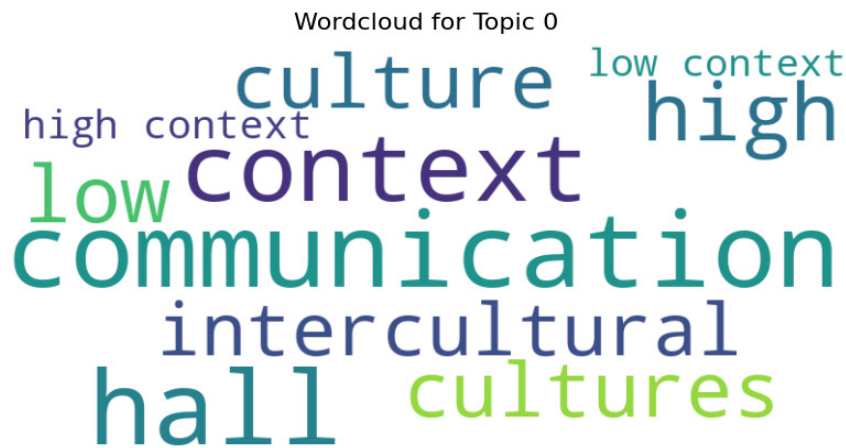
**Table 1** – Total Number of Journal Articles Containing Hall by Journal

Journal	Hofstede References	Journal	Hofstede References
<i>Argumentation and Advocacy</i>	1	<i>Communication Education</i>	2
<i>Communication Monographs</i>	1	<i>Communication Quarterly</i>	2
<i>Communication Reports</i>	0	<i>Communication Research</i>	0
<i>Communication Research Reports</i>	1	<i>Communication Studies</i>	1
<i>Communication Theory</i>	4	<i>Critical Studies in Media Communication</i>	0
<i>Howard Journal of Communication</i>	2	<i>Human Communication Research</i>	4
<i>Journal of Applied Communication Research</i>	0	<i>Journal of Broadcasting &amp; Electronic Media</i>	0
<i>Journal of Communication</i>	3	<i>Journal of Communication and Religion</i>	1
<i>Journal of Intercultural Communication Research</i>	10	<i>Journal of International and Intercultural Communication</i>	1
<i>Journalism and Mass Communication Quarterly</i>	2	<i>Qualitative Research Reports in Communication</i>	0
<i>Quarterly Journal of Speech</i>	0	<i>Southern Communication Journal</i>	0
<i>Text and Performance Quarterly</i>	0	<i>Western Journal of Communication</i>	2
<i>Women's Studies in Communication</i>	1		

### **Framing of Hall**

BERTopic extracted six frames from 38 articles and 432 mentions. These frames are: 1) Culture and the Impact on Work and Research, 2) Time and the Impact on Work and Research, 3) Smell and Sensory Hierarchies, 4) Proxemics and Cultural Expressions, 5) Cross-cultural communication between American and German students, and 6) Cultural differences in Communi-

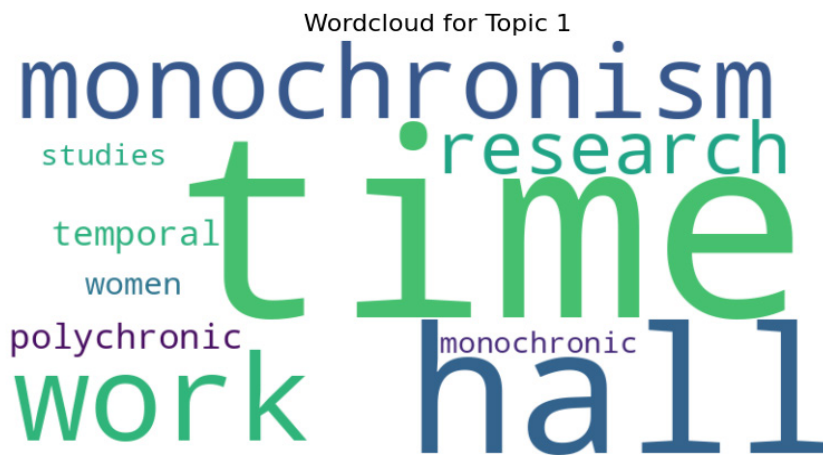
cation between Japanese and other Cultures. The first frame (Topic 0) that emerged via BERTopic analysis was Culture and the Impact on Work and Research. Keywords in this frame include: context, communication, intercultural, Hall, cultures, and high and low-context. A sample article for this frame is Watson's (2014) piece, "Apartheid in their hearts"? How the South African critique of individualism is probably right.



**Figure 1** – Wordcloud of Culture and the Impact on Work and Research

The second frame (Topic 1) was Time and the Impact on Work and Research. Keywords in this frame include: monochronism, time, polychronic, and work. A sample article for this frame is Bal-

lard and Seibold's (2000), "Time orientation and temporal variation across work groups: Implications for group and organizational communication."

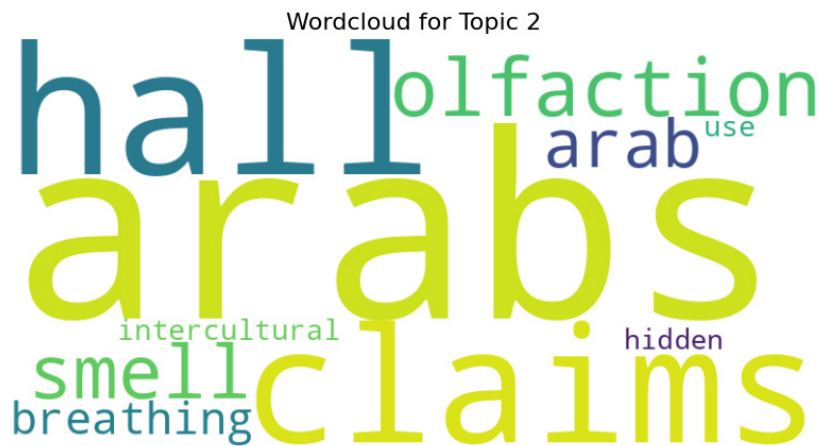


**Figure 2** – Wordcloud of Time and the Impact on Work and Research

The third frame (Topic 2) was Smell and Sensory Hierarchies. Keywords in this frame include: hall, olfaction, arabs, claims, and smell. A sample article for this

frame is Hasting et al.'s (2011), "Revisiting Edward T. Hall's work on Arabs and olfaction: An update with implications for intercultural communication scholarship."

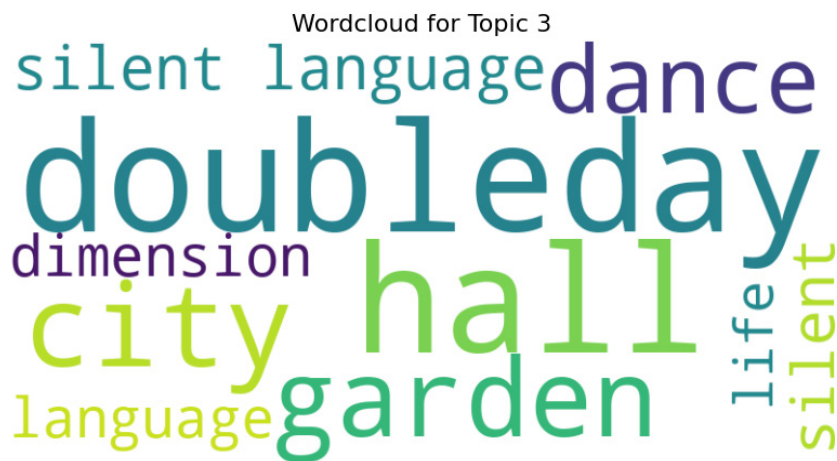




**Figure 3** – Wordcloud of Smell and Sensory Hierarchies

The fourth frame (Topic 3) was Proxemics and Cultural Expressions. Keywords in this frame include: silent language, language, life, silent, dance,

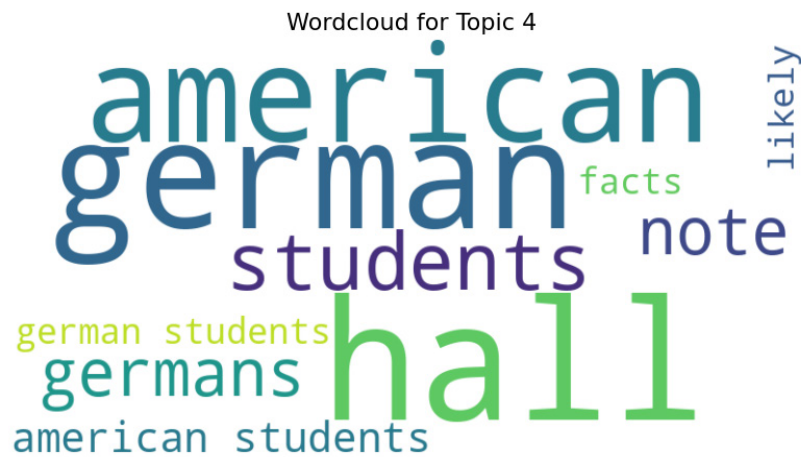
and hall. A sample article for this frame is Wolburg's (1999), "Time: The "silent" cultural value in American television advertising."



**Figure 4** – Wordcloud of Proxemics and Cultural Expressions

The fifth frame (Topic 4) was Cross-cultural communication between American and German students. Keywords in this frame include: American, German, students, and Hall.

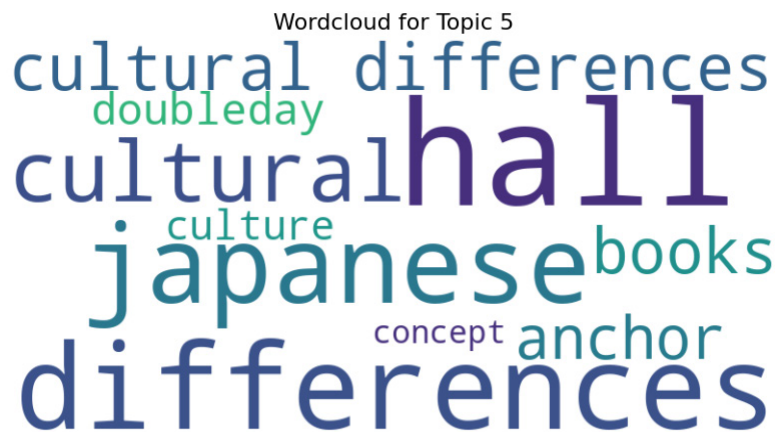
A sample article for this frame is Roach and Byrne's (2001), "A cross-cultural comparison of instructor communication in American and German classrooms."



**Figure 5** – Wordcloud of Cross-cultural communication between American and German students

The sixth frame (Topic 5) was Cultural differences in Communication between Japanese and other Cultures. Keywords in this frame include: dif-

ferences, Japanese, culture, and books. A sample article for this frame is Suzuki's (2008), "Japanese argumentation: Vocabulary and culture."



**Figure 6** – Wordcloud of Cultural differences in Communication between Japanese and other Cultures

There are some trends in the frames over time. The first (Culture and the Impact on Work and Research) and fourth (Proxemics and Cultural Expressions) frames are small in frequency, but appear regularly over time. The third frame,

Smell and Sensory Hierarchies, is the most frequent, but only appeared in 2012. Between 2008-2012, the second frame, Time and the Impact on Work and Research, is the most frequently appearing.

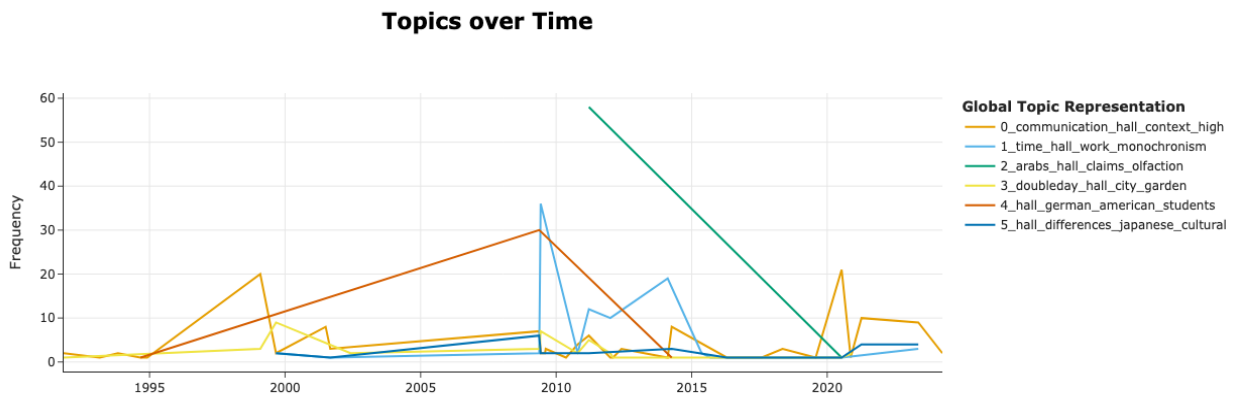


Figure 7 – Topics/Frames over time

## Conclusion

The NLP and BERTopic analysis results demonstrated insights into how Hall's theories were framed in communication journals from 1990 to 2024. In the dataset, there was a total of 38 articles and 432 mentions of Hall's theories. The *Journal of Intercultural Communication Research* published by far the most articles referencing Hall's theories, highlighting the importance of this work in intercultural and cross-cultural communication scholarship. This study indicated researchers regularly discuss "culture's" broad impact on work and research, and proxemics. These frames serve as crucial elements in comprehending the influence of culture on communication. Additional frames appeared in the journals over time, with varying frequency: Time and the impact on work and research, smell and sensory hierarchies, cross-cultural communication between American and German students, and cultural differences in communication between Japanese and other cultures.

Researchers have asserted Hall's work is seminal to cross-cultural communication, and that it has shaped the discipline (Gudykunst & Lee, 2002). However, the limited inclusion or referencing of Hall's work since 1990 in these 25 central journals raises questions as to how communication researchers apply his work within cross-cultural, intercultural, and communication more broadly. A Google Scholar search of "Edward T Hall and Communication" between 1990 and 2024 showed 15,500 citations. These citations were largely from books/chapters (more than 70%). Thus, it would appear as though Hall's work is more prominently used in

books and chapters exploring communication.

While Hall's theories are considered seminal to cross-cultural communication, a comparison can be drawn to the work of Geert Hofstede (1980, 1991, 2001) and his cultural dimension work. In a similar study exploring the frequency and framing of Hofstede's dimensions in communication journals (Author et al., in press) found Hofstede's dimensions have been referenced in 438 articles, versus 38 articles for Hall, and 4779 mentions versus 432 for Hall over the same time period. We propose the difference in citations between these two frameworks is due to Hofstede's dimensions providing a more social scientific approach to comparing cultures, while Hall's theories are a more interpretivist approach. This difference provides many researchers with an "easier" point of cross-cultural comparison.

This study is not without limitations. First, the temporal span of data (1990-2024) highlights trends but does not include all articles since the publication of Hall's concepts. Future research could conduct an analysis from 1977, the year after the publication of Hall's *Beyond culture*. Second, this analysis covers 25 communication journals. While this analysis provides clarity on how these journals frame Hall's work, there are many other journals that make up "communication." Depending on the Terms and Conditions/Use, and the website design of each journal, researchers could incorporate data web scraping software like Octoparse, etc. to pull articles from a larger journal data set.

This study used BERTopic analysis to explore how Hall's theories have been framed in communication journals from 1990 to 2024. The results



highlight how Hall's work has been framed in communication research. The rather limited citations/mentions of Hall in this time period, but broader appeal in books and chapters suggests Hall's theories

are more visible in non-peer reviewed and non-central publications. This BERTopic extraction analysis offers insights into how academic discourse has framed Hall's concept of culture over time.

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**Information about authors:**

Xu Zhonghao – Master of Analytics, Massey Business School, Massey University (Auckland, New Zealand, e-mail: [xuwenbai@gmail.com](mailto:xuwenbai@gmail.com));

Croucher Stephen M. (corresponding author) – Professor of Communication, Department of Communication, Clemson University (Clemson, United States, e-mail: [smcrouc@clemson.edu](mailto:smcrouc@clemson.edu)).

**Авторлар туралы мәлімет:**

Сю Чжунхао – Масси бизнес мектебінің аналитика магистрі. Масси университеті (Окленд, Жаңа Зеландия, e-mail: [xuwenbai@gmail.com](mailto:xuwenbai@gmail.com));

Краучер Стивен М. (корреспондентті автор) – Клемсон университеті Коммуникация департаментінің коммуникация профессоры (Клемсон, Америка Құрама Штаттары, e-mail: [smcrouc@clemson.edu](mailto:smcrouc@clemson.edu)).

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