

# Discourse, conversation and argumentation: theoretical perspectives and innovative empirical studies, volume III

**Edited by**

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# Discourse, conversation and argumentation: theoretical perspectives and innovative empirical studies, volume III

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# Editorial: Discourse, conversation and argumentation: theoretical perspectives and innovative empirical studies, volume III

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## KEYWORDS

argumentation, communicative interactions, conversation, discourse, psychology

## Editorial on the Research Topic

Discourse, conversation and argumentation: theoretical perspectives and innovative empirical studies, volume III

Despite the fundamental role that discursive, conversational, and argumentative interactions play in daily life, psychological research has yet to establish a comprehensive framework for understanding these forms of communication. Current investigations into discourse, conversation, and argumentation are fragmented across distinct research communities, often siloed within separate disciplines, resulting in limited interdisciplinary dialogue. This third volume of the Research Topic, “*Discourse, conversation and argumentation: theoretical perspectives and innovative empirical studies*,” seeks to bridge this gap by offering an integrated platform for advancing theoretical and empirical inquiry into communicative processes from a psychological lens. In particular, this volume presents groundbreaking research that delves into the dynamics of these interactions across individual, group, and institutional contexts, while emphasizing recent methodological innovations in their study. By consolidating contributions from diverse international perspectives, this Research Topic fosters a rich exchange of ideas, offering a state-of-the-art synthesis of psychological research on communication.

Contributors to this Research Topic bring fresh insights, grounded in rigorous empirical work, that span the spectrum of discursive, conversational, and argumentative interaction. The range of perspectives presented here not only reflects the field's vibrancy but also signals a promising convergence of approaches that transcend disciplinary boundaries. By assembling such a distinguished group of scholars, this volume arrives at a critical juncture, providing valuable guidance for those navigating the complexities of specialized research in this field. We are confident that the contributions within this volume will inspire and challenge a broad academic audience, driving the integration of psychological research on communicative interactions and promoting future interdisciplinary collaboration.

Convertini and Luciani delve into the intricate social co-construction of psychologist and patient roles across various contextual domains, offering a profound exploration of how these dynamics are shaped. Leveraging the Argumentum Model of Topics, their research underscores the pivotal role of implicit contextual premises in perpetuating mental health stigma. Their findings reveal that in well-defined institutional settings, institutional norms tend to prevail, whereas more informal domains allow individual perspectives to take precedence. This study emphasizes the urgent need to dismantle outdated premises in order to reduce stigma and enhance mental health awareness.

Liu M. et al. contribute a corpus-assisted discourse analysis of China's official diplomatic speeches, highlighting themes of cooperation, development, and peace, with an emphasis on President Xi Jinping's leadership. Their analysis uncovers how China's diplomatic discourse frames its international relations and shapes its global image, shedding light on the ideological underpinnings of China's foreign policy rhetoric.

Wang examines the role of teacher care behaviors in reducing EFL (English as a Foreign Language) learners' anxiety. Through a chain mediation model, Wang identifies student engagement and learning strategies as key factors in mitigating anxiety, offering educators valuable insights into creating supportive and effective teaching environments that enhance learning outcomes in EFL contexts.

Wu et al. provide a comparative analysis of self-praise strategies on English and Chinese social media platforms, revealing distinct cultural patterns. On Twitter, users tend to employ more explicit self-praise strategies, whereas Weibo users favor implicit expressions. The study explores how factors such as appearance and virtues differ across platforms and the psychological and commercial motivations that drive self-praise. This research deepens our understanding of cross-cultural differences in online self-presentation.

Xu and Ge focus on same-turn self-repair in Chinese civil courtroom interactions, illustrating how participants strategically use language to manage credibility and adjust their epistemic stance. Their findings highlight the importance of repair mechanisms in navigating complex legal discourse, offering critical insights into communication strategies within institutional settings.

Ni applies role-theoretic discourse analysis to Germany's parliamentary debates on military operations in Afghanistan. Identifying five key topoi—necessity, obligation, self-interest, capability, and solution—the study provides an in-depth analysis of how these argumentative themes shape Germany's evolving security policy. Through this lens, the research offers a fresh perspective on Germany's shifting role as a global actor in the international arena.

Lee et al. investigate age-related changes in speech production using eye-tracking during picture description tasks. Their results indicate that older adults demonstrate reduced linguistic productivity and cognitive processing efficiency compared to younger individuals. These findings offer important implications for understanding how aging impacts communication and cognitive function.

Hosokawa and Kitagami explore the cognitive processes involved in visuospatial perspective-taking during narrative comprehension. Their research reveals that shifting perspectives between characters significantly increases cognitive load, highlighting how narrative complexity interacts with individual differences in working memory to influence comprehension.

Zhuo introduces a pioneering approach to affective pragmatics through the framework of Darwinian Biolinguistics. Zhuo's study investigates how biological factors, particularly those related to emotional processing in the brain, shape the way language is used and interpreted. This interdisciplinary research opens new pathways for understanding the intersection of biology, emotion, and communication.

Liu L. et al. present a novel high-frequency sense list designed to aid language learners in prioritizing the most common meanings of words. By semantically annotating large corpora, the researchers offer a powerful tool for improving vocabulary acquisition, particularly for beginners, thus providing more efficient strategies for language learning.

These studies collectively offer significant contributions to psychological and linguistic research, enhancing our understanding of communicative interactions across a variety of contexts. From the social stigmas of mental health to the intricacies of narrative comprehension, this body of work expands the boundaries of psychological science and provides fresh insights into the complexities of human communication.

## Author contributions

AB: Writing – review & editing, Writing – original draft. CG: Writing – review & editing, Writing – original draft. FA: Writing – review & editing, Writing – original draft. LH: Writing – review & editing, Writing – original draft.

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# Social construction of the image of the psychologist and of the patient: the role of implicit premises

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Nowadays, there is a growing consideration of people's mental health through awareness programs, policies, and practices promoted by international aid agencies and non-governmental organizations. Psychologists and patients are major actors in mental health, and their images are socially co-constructed. Nevertheless, there is still a lot of confusion about who "psychologists" and "patients" are or what a psychologist does. This muddle may underline stereotypes and broadly speaking stigma related to mental health. Therefore, confronting directly the ideas of "psychologist" and "patient" could be a little step in challenging stereotypes and making order in the panorama of mental health. In our study, we focus on the implicit contextual premises that shape particular framings around which the images of the psychologist and of the patient are socially and culturally co-constructed. In order to reach this goal, we have investigated the discourses and the multiple points of view behind the social image of the psychologist and of the patient from different sources or contextual domains: psychology online forums, university websites, and an online survey. From a methodological perspective and according to the pragma-dialectical approach, we have identified all the different standpoints and arguments related to the various conceptions of the psychologist and the patient. We have made explicit the implicit premises that lay behind each argumentative inference via the Argumentum Model of Topics. Based on these analyses, we have reconstructed the distinct framings at stake in the different contextual domains. The findings show that implicit contextual premises have huge power in constructing stigmatization in the ideas that lay people have toward the image of the psychologist and of the patient. In particular, we have observed that the more the contextual domain is defined, the more institutional premises dominate over individual ones; on the contrary, in informal contextual domains, heterogeneous individual premises are prominent. Our study underlines that it is only by substituting old implicit premises with new unimagined ones that we can change subjacent contextual premises at the very core of stigma and the prototypical world's images.

## KEYWORDS

psychologist, patient, contextual premises, framing, stigma



# 1. Introduction

The role of the psychologist can be defined according to different criteria. Following the European Certificate in Psychology (EuroPsy), “the overall purpose of practicing as a professional psychologist is to develop and apply psychological principles, knowledge, models and methods in an ethical and scientific way in order to promote the development, well-being and effectiveness of individuals, groups, organizations and society” (p. 45, 2021).<sup>1</sup> Furthermore, according to the Italian law (No. 56/89), “the profession of psychologist includes the use of cognitive and intervention tools for prevention, diagnosis, habilitation-rehabilitation and support activities in the field of psychology addressed to the person, group, social bodies and communities. It also includes experimentation, research and teaching activities in this field”.<sup>2</sup> In addition to this, psychologists have to carry out many other ethical, moral, and deontological duties. The APA Dictionary of Psychology defines a psychologist as “an individual who is professionally trained in one or more branches or subfields of psychology (...). Psychologists work in a variety of settings (...). The professional activities of psychologists are also varied but can include psychological counseling, involvement in other mental health care services, educational testing and assessment, research, teaching, and business and organizational consulting”.<sup>3</sup> Several differences in psychologist, psychotherapist, and counseling training practices still remain worldwide. For example, discrepancies concern whether or not attending personal therapy sessions during the training (Edwards, 2018), the quality standards of psychotherapy supervision practices (Watkins, 2013), and the guidance regarding trainees’ evaluation (Fiorillo et al., 2011). Despite some misalignments that can be found in the training, a widely shared agreement concerns the presence of professional criteria regulating the profession of psychology.

Referring to the person who goes to the therapy,<sup>4</sup> several labels such as patient, client, and user can be found according to the reference documents (e.g., DSM-5, psychological associations’ status, and event flyers). However, these terms are not exhaustive of all the characteristics entailed by a person who decides to consult a psychologist. Indeed, lay people develop a diversity of images of the “patient”: who they are and the reasons behind consulting a psychologist. There is still a lot of confusion around the social images of the psychologist and the patient.

Moreover, in the panorama of mental health, both the psychologist and the patient can be the object of stereotypes,

prejudices, and discriminations (e.g., ageism refers to stereotypes toward others or oneself based on age, stereotypical, or inequitable gender attitudes). Social stigma is a widely studied phenomenon. Nevertheless, as WHO recently reported<sup>5</sup> (WHO, 2022), many steps in the context of mental health are still to be pursued. Our study can be situated in line with these studies (e.g., Heijnders and Van Der Meij, 2006; Orchowski et al., 2006) and, by directly confronting the ideas of “psychologist” and “patient”, we aim to offer a little contribution in challenging stereotypes and in making order in the panorama of mental health. In particular, our study deals with the investigation of implicit premises leading to the stereotypes that rotate around the figures of the psychologist and of the person who consults a psychologist.

In Section 2, we present a theoretical framework proposing the notion of “perfect ideas” and a brief literature review on stigmatizing frameworks in psychology. Section 3 is devoted to the methodology adopted to collect and analyze the data. Section 4 presents the findings by illustrating four excerpts in a detailed way. In Section 5, we conclude the study.

# 2. Theoretical framework

We stage our research in the context of the literature on stigma in psychology. Moreover, we adopt the concept of “perfect ideas” (Cecchin and Apolloni, 2003) to present the stigma as the result of rigid ideas perpetrated in cultural premises.

## 2.1. The tyranny of the totalitarian glance of “perfect ideas”

In this study, we follow the path traced by Cecchin and Apolloni (2003), which coin the concept of “perfect ideas”, i.e., “results of pragmatic actions and behaviors, aimed at managing the present time, that as a result of their evident utility and efficacy tend to be structured in terms of absolute, a-temporal and a-historical truth”<sup>6</sup> (Cecchin and Apolloni, 2003, p. 44). This is similar to what is called “musts” in cognitive psychology: irrational and rigid beliefs on the image that people have on themselves, on the others, and on the life conditions (Ellis, 1989), as for example: “If I am not able to find a job, I am an unworthy person”. These beliefs are absolutistic and dogmatic and are acquired by human beings in the form of rules eliciting emotional distress (Ellis and Harper, 1975). Moreover, they are conceived as implicit or explicit premises that guide people in their interactions with the world and with the social environment and that lead to irrational conclusions. Nevertheless, perfect ideas are much more than simple musts: Indeed, they are ideas that include not only logical but also contextual premises.

1 See [https://europsy.eu/\\_webdata/europsy\\_regulations\\_december\\_2021\\_virtual\\_ga.pdf](https://europsy.eu/_webdata/europsy_regulations_december_2021_virtual_ga.pdf) (last accessed 10 July 2023).

2 The original verbatim is: “La professione di Psicologo comprende l’uso degli strumenti conoscitivi e di intervento per la prevenzione, la diagnosi, le attività di abilitazione-riabilitazione e di sostegno in ambito psicologico rivolte alla persona, al gruppo, agli organismi sociali e alle comunità. Comprende altresì le attività di sperimentazione, ricerca e didattica in tale ambito”. For more details, see <https://www.gazzettaufficiale.it/eli/id/1989/02/24/089G0090/sq> (last accessed 5 May 2023).

3 For more details, see <https://dictionary.apa.org/psychologist> (last accessed 4 July 2023).

4 We will adopt the term “patient” in order to avoid semantic ambiguities.

5 “There is an imperative to transform the way mental health care and support are conceived and provided (...) there is growing recognition that mental health and well-being are intimately linked to one’s social, economic, and physical environment” (WHO, 2022, p. 16).

6 Our translation. The original Italian quotation is the following: “derivati di azioni e comportamenti pragmatici, finalizzati a gestire il presente, che in seguito all’evidenza della loro utilità ed efficacia tendono a venire strutturati in termini di verità assoluta, atemporale e astorica”.



It is the normative idea entailed in the logical underpinnings of Cecchin's perfect ideas that lead people to blind labyrinths (Cecchin and Apolloni, 2003). What are perfect ideas according to Cecchin? In short, they are ideas that people have on the way in which the world *should* be and on how people themselves *should* be: In particular, these representations are perceived as obligations with reference to what the familiar, relational, and socio-cultural premises "prescribe". It is like a Totalitarianism and an authoritarian glance that people impose themselves alone. We are dealing with social worlds created in light of practices oriented toward *stasis* and perfection, which create pathological systems and stigmas. This way of living and interacting with the external world and with one's internal world is pervasive and gives rise to what Cecchin has called "stuck systems", i.e., immobile systems (Cecchin and Apolloni, 2003) in which the same immobile relational dynamics are perpetrated. Perfect ideas, which sustain and are at the same time sustained by stuck systems, have one main protagonist: freezing premises in an immutable condition without any possibility of change and without the possibility to imagine a new state of affairs.

As highlighted by Bateson (1976), our way of knowing reality is characterized by an alternation of descriptions of "processes" and classifications of "forms": When we perceive simple actions, gestures, and behaviors, we immediately classify them into categories of actions. For instance, if we see a person taking food from another, we can start to classify it into categories of actions (buying, selling, donating, and stealing). This happens because we have a totalitarian glance toward phenomena and we make inferences on the basis of our premises (Cecchin and Apolloni, 2003). This highly resembles what Ferreira has called "familiar myths", i.e., rigid ideas consisting of shared and well-rooted thoughts that refer to each member of a given family and the reciprocal positions within familiar life. These thoughts are not challenged by anyone in the family, even though they are characterized by big reality's distortions (Ferreira, 1963): Myths constrain subsequent generations to repeat the same schemes, therefore occupying the positions that maintain a balance in a given family.

As psychologists, we are continuously faced with rigid categories that identify the way in which we connect ourselves with the world. This conception fits very well with the study on stigma that we have conducted, since we believe that stigma has to do with rigid ideas perpetrated in cultural premises over time, and which become obvious ahistorical premises.

## 2.2. Stigma in psychology

Stigma is a phenomenon broadly explored in the literature on psychotherapy, and it is associated with having mental illness or mental disorders, seeking psychotherapy (Lannin et al., 2013), maintaining relationships with people having psychological problems (Feldman and Crandall, 2007) or adopting psychiatric treatments, and the psychologist himself. Goffman (1963) defines stigma as "the phenomenon whereby an individual with an attribute which is deeply discredited by his/her society is rejected as a result of the attribute" (p. 21). The stigma is distinguished into public stigma and self-stigma. Both dimensions

can potentially express themselves through three different forms: stereotypes, prejudice, and discrimination. As Larson and Corrigan (2010) point out, stereotypes in public stigma refer to societal notions about groups of people, used to organize knowledge. Prejudice indicates adherence to and consensus on the same knowledge associated with negative emotions such as fear, anger, and repulsion. The two forms of public stigma can coexist but stereotypes can also arise regardless of prejudice. Finally, discrimination implies a transition from thoughts and feelings to action.<sup>7</sup> In the case of the psychologist, an example could be the following: "The psychologist is a fortune teller, I do not address to him". According to Larson and Corrigan (2010), the patient/the psychologist within self-stigma can be aware of what society thinks about the category (stereotypes), adhere to this knowledge, and develop negative emotions (prejudice; e.g., hating oneself) with a practical impact on their own everyday lives (feelings of discrimination; e.g., Würth et al., 2018). Stigma can be moral or physical, as in self-injuries (Long, 2018). Stigma can have a significant impact on different phases of psychotherapy. It may prevent people from acknowledging that they are struggling with their own feelings and may cause the person to ignore messages from the external (e.g., family) and internal (e.g., panic attack) environments. It may prevent people from recognizing that they need the help of a specialist to the point that they delay or do not undertake the search for a psychotherapist; people may experience low self-esteem or shame for themselves. Since the person does not enter into psychotherapy as a *tabula rasa*, stigma also acts in psychotherapy in both group and individual treatments by affecting, for example, working alliances (Kendra et al., 2014). In this regard, the self-stigma of mental illness differs and is independent of the self-stigma of seeking psychological help (Tucker et al., 2013). As described by Tucker et al. (2013), a person might seek outpatient counseling or psychotherapy without recognizing themselves as a person in distress. Conversely, another person might recognize himself as a person with a mental illness (and not judge himself for it), but have stereotypes about the therapy and the psychologist. Stigma, and in particular stereotypes, can also refer to the figure of the psychologist and healthcare professionals.<sup>8</sup> Not all individuals with psychological difficulties decide to consult a psychologist: On the one hand, positive past experiences with psychological services increase the chance of consulting a psychologist (Pfeiffer and In-Albon, 2022); on the other hand, some stereotypes make this event less probable. For example, some adolescents may avoid consulting a school psychologist because they feel that the psychologist might judge them to the point of not being able to help them or because they think that a school psychologist might be useful only to address difficulties closely connected to the school context (Cornoldi and Molinari, 2019). As a result, the individual has to manage dialectical positions concerning the motivations to access the psychological path and the motivations to avoid it (Owen et al., 2013). At the same time, some stereotypes can be explored in therapy by the patient

<sup>7</sup> For an extended overview of discrimination in intellectual disability (ID), see the works of Ebersold (e.g., Ebersold and Armagnague-Roucher, 2017; Ebersold, 2022).

<sup>8</sup> e.g., Buttigieg et al. (2018), Zawawi and Al-Rashed (2020), Kwaghe et al. (2021), and Najjar et al. (2022).

and by the psychologist himself, giving them an active role in this process (Heijnders and Van Der Meij, 2006). Stigma is structurally complex and emanates from different social contexts (e.g., our own ethnic population and institutions). Distinct framings arise from different contextual domains that somehow are connected to the individual. An important distinction needs to be made between these contexts as some of them are related to society (e.g., general population), while others concern the own private social network (e.g., family) with a different impact on the patient and the psychologist (Vogel et al., 2009).

The aim of the present article was to identify the implicit contextual premises that shape particular framings around which the image of the psychologist and the patient are socially and culturally constructed in different contextual domains.

### 3. Methodology

#### 3.1. Data collection

We refer to three main sources of data (Table 1): (1) a psychology online forum; (2) different university websites; and (3) an online survey filled out by a heterogeneous sample of citizens.

We referred to three different contextual domains (our sources of data) since it is only in real-life domains that these types of phenomena can be observed.

We have consulted one Italian informal forum of psychology<sup>9</sup> which has been selected because it is active for over 15 years. It is one of the main forums about psychology in Italy as it presents different sections, one of which is a free space where lay people can propose a topic of discussion and people can support each other by sharing experiences or answering questions. The forum has been consulted in July 2022 and the latest 50 posts pointing at the social images of the psychologist and of the patient have been considered. The posts have been selected by entering the keyword “psychologist” in the search box and checking the presence of any reference to the person who consults a psychologist. We have copied the posts taken from the forum and pasted them on an *ad hoc* document enabling us to analyze them.

As a second investigation domain, we have consulted 10 Italian university websites for Bachelor’s and Master’s degrees in psychology: in particular, we have paid attention to the section called “professional profiles”, choosing the more popular ones in terms of those more attended by the students’ population. Every university website has such a section presenting the profession of a psychologist and its roles. In order to build the most possible representative sample, we have selected a variety of psychology

departments that are different in terms of theoretical framework (e.g., cognitive, psychodynamic, and systemic relational), as well as for their geographical locations (universities from South, Center, and North of Italy). In a similar way, as for the informal forum, we have copied and pasted in an *ad hoc* document the concerned sections, to have the possibility to analyze it. The 10 university websites were consulted in July 2022.

The third context of investigation is represented by informal public opinions of a heterogeneous sample of citizens gained through an anonymous online survey in which we asked people two questions: “What comes to your mind when you think of a psychologist?” and “When is it advisable to contact a psychologist?” The first general question was chosen to set the context and to introduce people to the second – more specific – question, in order to elicit information on possible lay people’s prejudices and stereotypes about the profession and about the patient. Since we were not interested in evaluating the correctness of the answers nor drawing up normative profiles, we have proposed the above-mentioned two open questions rather than referring to a validated questionnaire. The survey has been launched through Google Forms<sup>10</sup> and submitted via social media or e-mail to a group of 72 people representing a variety of social profiles in order to maximize the possibility of having a heterogeneous group of respondents.<sup>11</sup> The invitation to fill out the survey has remained active for 4 months, from April 2022 to July 2022. No data about respondents are reported here, as the survey was anonymous. The answers to the questions did not entail space limits: participants were free to express themselves without any restrictions. We obtained 55 answers to the first question and 57 to the second question (112 in total) which were then copied and pasted in an *ad hoc* document for the analyses.

#### 3.2. Analytical approach

We stage our research in the context of the polylogical argumentation (Lewiński and Aakhus, 2014)<sup>12</sup> which allows us to put into relation different points of view around the same topic (in our case, the representations of the psychologist and the patient). To analyze our data, we have used the pragma-dialectics (van Eemeren and Grootendorst, 1984, 2004) to define the issue and to identify the standpoint and the arguments supporting it. Concerning the missing link represented by implicit premises, we have used the Argumentum Model of Topics (AMT, Rigotti and Greco, 2019) for studying the inference and to reconstruct the implicit premises. After these steps, we have reconstructed the distinct framings at stake in the different contextual domains

TABLE 1 Sources and types of data.

Source of data	Types of data
Psychology online forum	50 posts
University websites	10 sections “professional profiles”
Anonymous online survey	112 answers

9 <https://www.psiconline.it/forum/> (last accessed 5 May 2023).

10 <https://www.google.com/intl/it/forms/about/> (last access, 5 May 2023).

11 Due to the fact that we consider stigma as a socially widespread phenomenon (Sanhori et al., 2019), we have not collected socio-demographical data about the sample.

12 Aakhus and Lewiński (2017) define “argumentative polylogue not simply as a discussion between multiple participants, but rather multiple different argumentative parties defending their distinct positions” (p. 181). For more details on the application of polylogical argumentation to the study of multiple voice actors, see Greco and De Cock (2021) and Greco (2023).

(related to our sources of data: psychology online forums, university websites platforms, and the online survey). We have analyzed the framings at two levels: at a micro level, by looking at words and expressions according to what has been done by Fillmore (1976); and at a macro level, according to what has been done by Goffman (1974). We recognize that we were looking at the data through the lenses of our premises and prejudices<sup>13</sup> (Cecchin et al., 1997) that guided us in understanding others' premises and prejudices, in line with the second cybernetic (Maturana and Varela, 1980).

4. Findings

The performed analyses show as a main result that implicit contextual premises have huge power in constructing stigmatizing framings and, more in detail, in highlighting the stereotypes that rotate around the images of the psychologist and of the patient. We have observed that the more the contextual domain is defined (as in the case of the university website), the more group premises dominate over individual ones; on the contrary, in informal heterogenous contexts (as in the case of the online forums and the survey), individual premises are prominent and consequently more heterogeneous. Indeed, on the basis of the analyses of the university websites, a homogeneous picture of the premises on the patient, on the psychologist, and of whom are consulting a psychologist arises. This can be considered a normative view of the psychologist. On the contrary, these premises are heterogeneous in the answers elicited from the psychology informal forums and the survey.<sup>14</sup> In more detail, university websites support the figure of the psychologist as a professional who promotes psychological wellbeing in various fields. Data from the anonymous online survey present different types of stereotypes and prejudices: The most frequent concerns the idea of psychology centered on a curative approach and wellbeing as the absence of symptoms; less frequent, but still present, is the idea of the psychologist as a psychoanalyst (e.g., the presence of a coach and the idea of psychologist as the one who makes people speaking for a long time); in some excerpts, the psychologist is considered less important and less useful than the psychiatrist. Although the term “psychologist” has been adopted in the survey, most of the participants refer to the psychotherapist. In the online forum, we find similar categories of stereotypes and prejudices as presented in the survey. However, sentences are accompanied by more qualifying adjectives. Disgust emotions could be addressed to the psychologist, the patient (in both other-directed and self-directed forms), and the people surrounding the patient. To

13 Cecchin used the term prejudices in order to refer to premises so that he could distinguish himself from the logicians of the time.

14 In order to give a picture of the examples that are present in our corpora, we might refer to some approximate figures. We analyzed 172 excerpts in our study. Around 40% of these examples (N = 69) are, in our interpretation, cases in which stereotypes and prejudices emerge. Our calculations are dependent on our interpretation as analysts of argumentation and related to the lenses of our premises and prejudices (Cecchin et al., 1997). Although these figures might be subject to debate, in this study, our objective is to emphasize the role of implicit premises in stigma, without pretending any statistical form of generalization.

highlight the role of implicit premises in stigmatizing framings, we will present four examples, grouping the less representative items for each different contextual domain. We present these excerpts as they describe less visible forms of stigma. Our first example is taken from a university website (Section 4.1), the second one (Section 4.2) is related to the psychology online forum, and the last one (Sections 4.3 and 4.4) concerns the anonymous online survey.

4.1. Excerpt 1: psychology beyond psychic distress

The following excerpt is taken from the website of the University of Turin (Italy) on the presentation page of the Bachelor of Arts - BA in “Psychological Sciences and Techniques”.<sup>15</sup> More specifically, our analysis focuses on the section about the occupational profiles of future graduate students. In this section, the main tasks and opportunities for graduate students are presented referring to current Italian legislation (DPR 328/01) and the Order of Psychologists (psychologists can enroll in this order after having passed a formal examination qualifying them to the profession).

In Excerpt 1, we analyze the part in which the main professional opportunities are presented with a focus on what the psychologist will practically do and the contexts in which they will operate.

According to the pragma-dialectics approach, the following elements can be identified (Table 2):

*Issue:* Can bachelor graduate students carry out some professional activities?

*Standpoint:* The graduate students will be able to carry out professional activities in public as well as private structures, in educational institutions as well as in third-sector organizations.

*Argument:* Because the course prepares to carry out professional activities as collaborators of psychologists enrolled in the Order in different organizational and research contexts.

TABLE 2 Excerpt taken from a university website.

Original verbatim	English translation
Il Corso di Laurea prepara a svolgere attività professionali in qualità di collaboratore dello psicologo iscritto all'Albo A, nell'ambito di diversi contesti organizzativi e di ricerca. Di conseguenza, i laureati della classe potranno svolgere attività professionali in strutture pubbliche e private, nelle istituzioni educative, nelle imprese e nelle organizzazioni del terzo settore.	The degree course prepares graduate students to carry out professional activities as collaborators of the A-listed psychologists in various organizational and research contexts. Consequently, graduate students of the concerned class will be able to carry out professional activities in public and private facilities, educational institutions, companies, and third-sector organizations.

15 The original Italian course's name is «Scienze e Tecniche Psicologiche».

In the example, the issue at stake for the argumentation can be identified as follows: “Can bachelor graduate students carry out some activities?” The present issue is implicit in the quotation and can be made explicit starting from the initial focus of the sentence that highlights the professional activities that bachelor graduate students can enact. The issue pertains to the domain of possibilities and is placed out publicly. It is strictly dependent on the type of website and section: this issue is in line with the university context and strongly interacts with the meta-message that advises students to enroll in the Bachelor’s degree in psychology. The adjective “professional” specifies and delimits the borders of activities that the psychologist belonging to a specific community of professionals can enact. In our analytical reconstruction, the standpoint is the following: “The graduate students will be able to carry out professional activities in public as well as private structures, in educational institutions as well as in third-sector organizations”. The university puts forth a standpoint that fosters a positive image of the psychologist as a professional that not only cures psychic distress but rather helps to increase psychological wellbeing and to prevent psychological distress. The argument supporting this standpoint is the following: “Because the course prepares to carry out professional activities as collaborator of the psychologists enrolled to the Order in different organizational and research contexts”. This argument invites the audience to reflect on the fact that being a professional requires attending an academic path, therefore implicitly arguing that a psychologist is a professional.

Figure 1 presents the argumentative structure of the argumentation.

The AMT enables us to make an inferential analysis and to consider the reasoning passages that make it possible to draw a conclusion on the basis of a given premise: in particular, this method enables us to shed light on the implicit premises and to

make them explicit. In our analysis of framings, the endoxon is a crucial element because it coincides with the cultural ingredient of the reasoning that is supposed to be shared and accepted by a given community. This endoxon is fundamental to the image of professionalism that the university wants to convey. The endoxon is not simply an implicit element in the discourse, but is a premise in the reasoning, i.e., without this component, the reasoning does not allow the conclusion to be reached. In our example, the endoxon “The aim of an academic course should be to allow the psychologist to carry out professional activities in public and private structures, in educational institutions, in companies and in third-sector organizations” is not only specifically accepted by the university but it is also an element that the concerned university considers to be universally shared and without which it is not possible to conclude that “The graduate students will be able to carry out professional activities in public as well as private structures, in educational institutions as well as in third-sector organizations”. Through the implicit endoxon, the university supports the figure of the psychologist as a professional who promotes psychological wellbeing in various fields (e.g., Ryff and Keyes, 1995). Finally, this principle is not only adopted by the concerned university but it is also recognized by the university itself as fundamentally accepted by every academic institution.

#### 4.2. Excerpt 2: “you are a psychologist, you should tell me what to do”

The following excerpt is taken from informal public opinions of a heterogeneous sample of citizens. In this section, we analyze an answer to the question “What comes to your mind when you

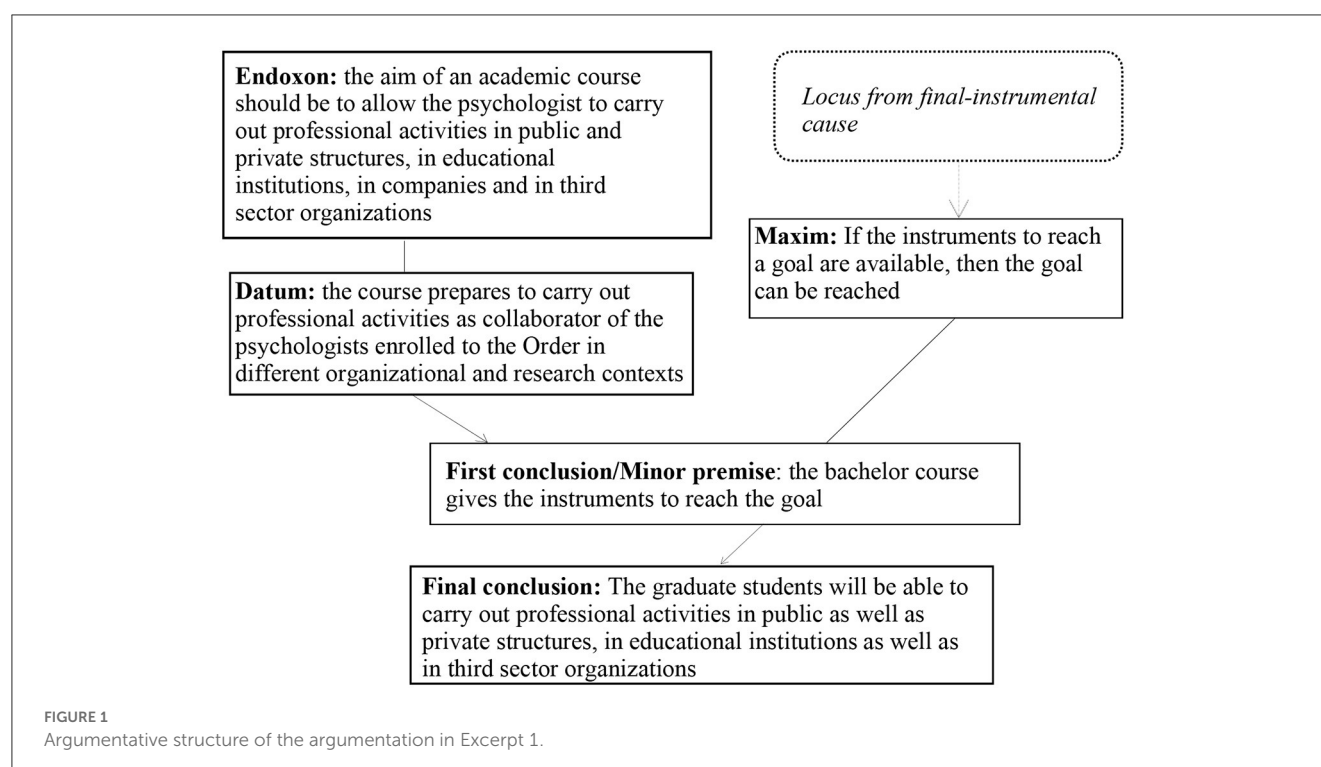




TABLE 3 Excerpt from the online survey.

Original verbatim	English translation
Un professionista che dia una risposta ai tuoi mille interrogativi.	A professional who should give me an answer to my endless questions.

think of a psychologist?” of the proposed anonymous online survey. We decided to focus on this specific example because, in our opinion, it is significant of common people’s premises concerning the psychologist and the psychological intervention.

In Excerpt 2, we analyze a sentence in which a person firmly and concisely offers an opinion on who is a psychologist (Table 3).

According to the pragma-dialectics approach, the following elements can be highlighted:

- Issue:* What comes to your mind when you think of a psychologist?
- Standpoint:* The psychologist is the one who should give me an answer to my endless questions.
- Argument:* Because the psychologist is a professional.

In our example, the issue at stake for the argumentation coincides with the question proposed in the survey: “What comes to your mind when you think of a psychologist?” As a result, the present issue is made explicit and does not need to be reconstructed. In our analytical reconstruction, the standpoint is the following: “The psychologist is the one who should give me an answer to my endless questions”. Starting from the standpoint, we can reconstruct the implicit issue opened by the participant: “Does it exist a right answer to my endless questions?” Indeed, in the standpoint, the participant adopts the Italian formulation “una risposta” that could be interpreted as “one answer” or “an answer”. However, the core of the matter does not change since the patient expects that the psychologist reduces the field of possibilities opened up in the participant’s mind. The paradox consists in the fact that, as psychologists, we have the ethical duty to do the opposite, and to broaden the field of possibilities in line with Von Foerster’s ethical imperative: “act always so as to increase the number of choices” which the father of the second order cybernetics proposed in his essay (von Foerster, 1984).

In what follows, we show the analysis of the inferential configuration of the participant’s argumentation (Figure 2).

The inferential reasoning of the argumentation describes a definitional procedure that derives from the objectives of a professional, i.e., the definition of the psychologist is built on the goal of a professional.<sup>16</sup> The inference connecting the argument and the standpoint is embodied in the locus from definition (ontological implication). As stated by Schär (2017, pp. 179–180), “the locus designates the relationship between the nature of an entity and the implications of this nature, namely the goal this entity has been designed for. An example that highlights the relation between

ontology and deontology would be: if you are a politician, you need to be accountable”. This example highly reminds of our case, in which the locus identifies the relationship between the essence of the ontology of the psychologist and its deontological implications, namely “telling the patient what to do” (i.e., “the psychologist should give me an answer to my endless questions”) in the final conclusion. Such a stereotype has the negative consequence of removing responsibility from the patient, who at the same time loses a high degree of freedom and agency in his life. On the contrary, in psychotherapy, the patient’s disclosure has a real healing power and has a *construens* function: the patient selects given pieces of information that are then deployed by the therapist to reframe the patient’s narration, so that the patient can re-read reality in a more useful way for them in a given moment (Luciani and Convertini, 2023).

4.3. Excerpt 3: “the patient as an abandoned child”

The following example is taken from the informal public opinions of a heterogeneous sample of citizens, as in Section 4.1. In this section, we analyze an answer to the question: “When is it advisable to contact a psychologist?” We present this specific excerpt because it sheds light on a very subtle stereotype that involves both the patient and the people around them. In particular, in Excerpt 3, we analyze a sentence in which a person expresses an opinion on his view of who a patient is (Table 4).

The reconstruction of the argumentation is staged within the framework of pragma-dialectic:

- Issue:* When is it advisable to contact a psychologist?
- Standpoint:* When people close to you cannot help you.
- Argument 1:* Because they are not available.
- Argument 2:* Because they do not have the theoretical tools to do that.

According to our reconstruction, the issue is the following: “When is it advisable to contact a psychologist?” The implicit standpoint proposed by the participant to answer the issue is the following: “When people close to you cannot help you”. The participant explicitly expresses two arguments that support the standpoint, namely: “Because they are not available” and “Because they do not have the theoretical tools to do that”. These arguments can be considered independent from each other since they appeal to distinct characteristics of the person nearby. Indeed, a person could have the theoretical instruments to help you, but they could be unavailable to help you and, vice versa, a person being available to help you might not have the theoretical tools to do that. As we identified the same logical principles for both Argument 1 and Argument 2, in what follows, we only show the analysis of the inferential configuration of the participant’s argumentation Argument 1 (Figure 3):

The first stereotype that emerges from our reconstruction is that the patient is a person who is completely alone in getting help. In turn, this stereotype is bound with the ancestral stereotype of the psychologist conceived as someone who keeps isolated

16 As stated by Greco et al. (2018), “The ontological implication on which this argument is built derives from this kind of functional definition” (p. 452).

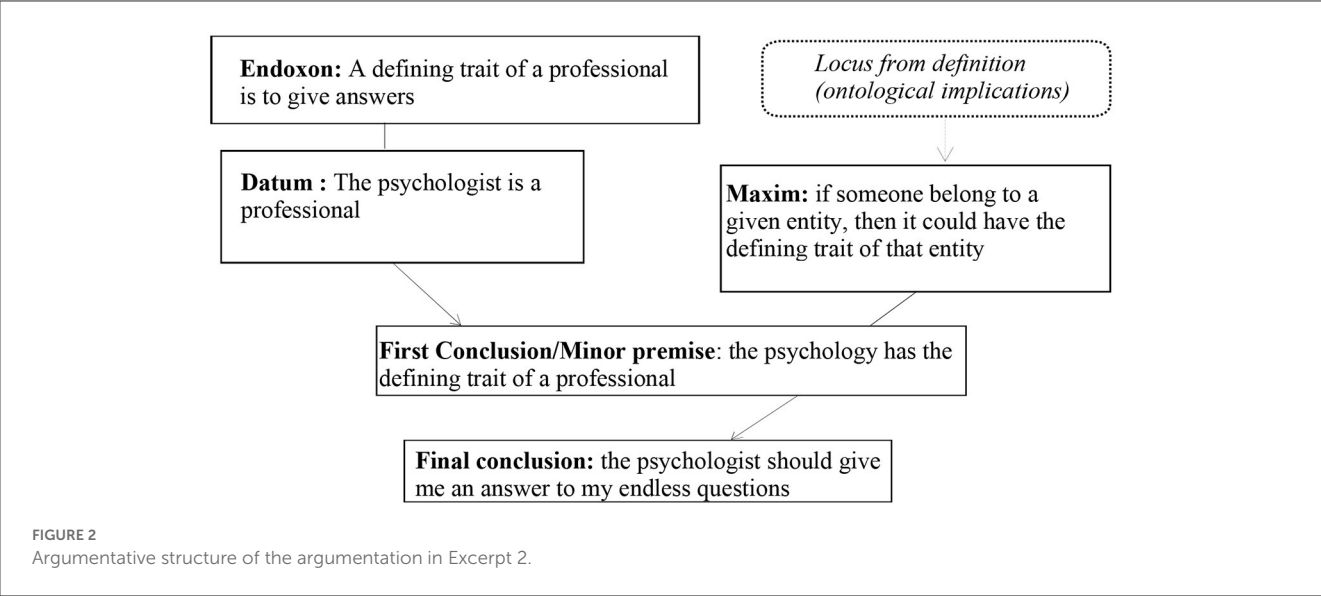


TABLE 4 Excerpt from the online survey.

Original verbatim	English translation
Quando non si ha nessuna figura vicina che sia disponibile ad aiutarti e/o che non abbia gli strumenti teorici per farlo.	When you do not have any person close to you who is available to help you and/or who does not have the theoretical tools to do that.

members company. On the contrary, a person may be isolated (since they may be part of a familiar as well as social system that leaves them at the margins), but not alone since they may be surrounded by destructive relationships. Furthermore, the psychologist is conceived almost as a friend that should answer to the patients’ familiar and social needs. The premises connecting the first argument (“Because they are not available”) with the standpoint (“When people close to you cannot help you”) signal that the person who is close to that patient does not help the patient because they do not want or that they cannot. In short, the pragmatic effect is that the patient does not receive help from the person who is close to them. A prejudice emerges that the familiar and social contexts around the patient are poor in relational resources. The premises connecting the second argument (“Because they do not have the theoretical tools to do that”) with the standpoint (“When people close to you cannot help you”) signal that even in the hypothesis that the person who is close to the patient is available to help them, they are unable to do that. Theoretical instruments are not the unique and most important tools in a psychotherapy path. Moreover, the network of a patient could not have theoretical instruments to help the patient, but rather could have relational as well as human resources able to help them (e.g., Kucharewicz and Wieteska, 2019).

4.4. Excerpt 4: “yours are not problems!”

The following excerpt is taken from a psychology website in which articles written by experts as well as an online forum are

included. In the online forum, private users can publish questions about different topics (such as naïve advice on psychological issues and on the therapeutic path to choose) and they can receive answers from both experts and lay people.

In Excerpt 4, we present a dialogical exchange involving two users. In particular, we analyze a question proposed by a user and the answer advanced by another one. In this excerpt, the participants do not explicitly discuss the figure of the “patient”. However, we present this discussion because they reflect on patient’ feelings and to some extent on the meaning of being a patient (Table 5):

The reconstruction of this argumentation is staged within the framework of pragma-dialectics:

Issue: Should I ask myself these questions?  
Standpoint 1: (no)  
User 2 Arg 1: Because feelings of being confused and failure to find an identity are not a problem but normal things  
User 2 Arg 1.1: Because in the past human beings didn’t see them as a problem  
User 2 Arg 2: Because we find problems everywhere that need to be solved  
User 2 Arg 3: Loneliness is not a problem  
Issue: Should I consult a psychologist?  
Standpoint: (no)  
User 2 Arg 1: Because he will find you a problem  
User 2 Arg 2: Because the normality does not exist.

A question arises from User 1: “Why do I keep doing it then?” However, User 2 shifted the issue. According to our reconstruction, the implicit issue that can be reconstructed starting from the sentence of User 2 is the following: “Should I ask myself these questions?” The implicit standpoint proposed by the participant to answer this issue is “No”. The participant explicitly expresses several arguments in a combination of different argumentative structures (van Eemeren and Grootendorst, 1992). The arguments supporting the standpoint are: “Because feelings of being confused



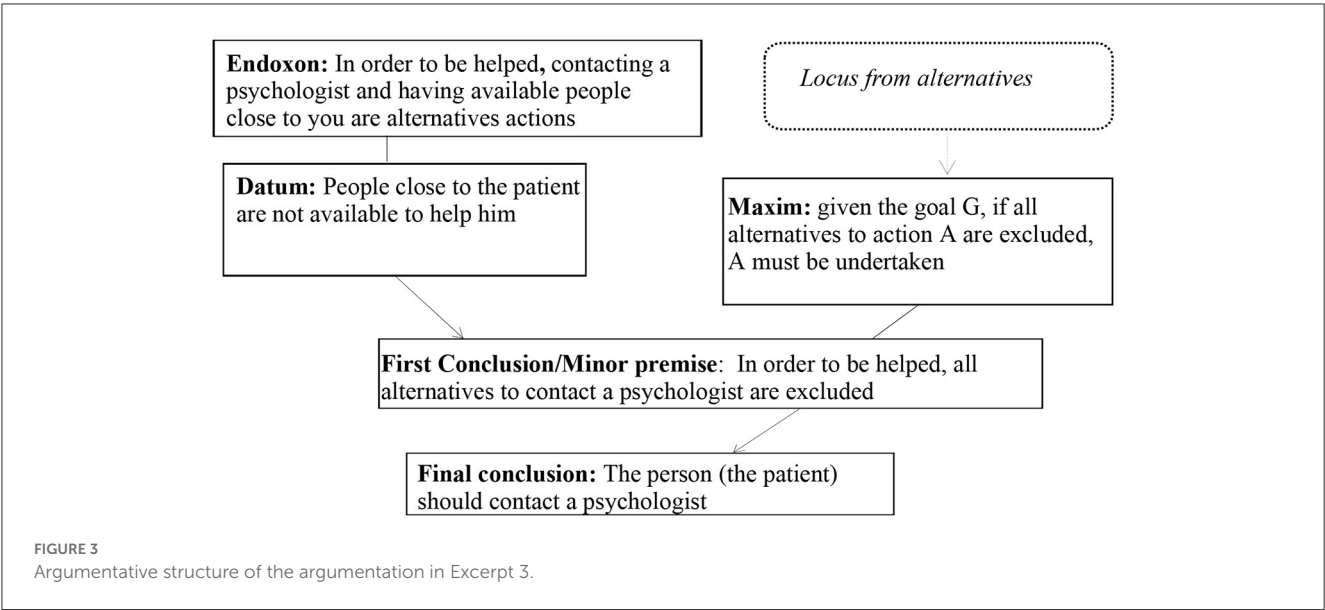


TABLE 5 Extract from informal forums of a psychology website.

User 1	I am a lonely person and I seek solitude. Although I feel an initial relief, it turns into sadness afterward. Why do I keep doing it then?
User 2	The youth of today is confused, we are unable to find an identity. In the past, human beings experienced similar feelings, but they didn't get lost in them and didn't see them as a problem. Today, we find everywhere problems that need to be solved. Loneliness is not a problem. Yours are not problems, they are normal things. If you go to consult a psychologist, they will find you a problem, but I would like to know what normality is.

and failure to find an identity are not a problem but<sup>17</sup> normal things". This argument is, in turn, supported by another argument (Arg 1.1): "Because in the past human beings didn't see them as a problem". In this subordinative structure, argument 1.1 strengthens the standpoint. User 2 presents two additional arguments: "Because we find problems everywhere that need to be solved", and "Loneliness is not a problem".

With reference to the implicit issue "Should I consult a psychologist?", the implicit standpoint of User 2 is "yes". The participant explicitly expresses two arguments that support the standpoint, namely "Because he will find you a problem", and "Because the normality does not exist".

The first stereotype that emerges from our reconstruction is that being a very reflective person coincides with being a problematic person. On the contrary, we argue that being a reflective person is the expression of being a person with very high meta-reflective functions and a person capable of looking into reality with a very critical glance. The process that underways the exchange in Excerpt 4 can be seen as a form of "emotional invalidation" (perceiving

one's own emotions as trivialized or ignored by the other).<sup>18</sup>

Furthermore, a second stereotype that emerges from our reconstruction is that a psychological issue exists only if it is recognized by another person and in particular a person who is an expert in psychological health, such as a psychologist. On the contrary, a person consulting a psychologist is already doing a step forward in the treatment process. Indeed, if the patient has not a first insight toward the recognition of a psychological issue, they would not consult a psychologist.

## 5. Discussion and openings

The state of the arts concerning stigma in psychotherapy has highlighted that stereotypes, prejudices, and discrimination refer to psychologists well as to patients. This mechanism is at the very core of avoiding and delaying psychotherapeutic interventions. Furthermore, it strongly influences the session's flow. It also affects people's private and professional lives, as well as their mental health.

To move a step forward within this frame, we have undertaken a different theoretical and methodological approach. From a theoretical point of view, we consider that the representations of the psychologist and of the patient are socially co-constructed. A confusion around as to whom "psychologists" and "patients" are may underlines (implicit) stereotypes and, broadly speaking, stigmas related to mental health (WHO, 2022). Therefore, we have investigated argumentations proposed in different contextual domains to address the issue of who the patient and the psychologist are. From a methodological point of view, we have focused on implicit discourses by making explicit the missing link explaining the passage from implicit premises to conclusions, and its interweaving with specific framings.

In our view, contextual premises represent the very core of stereotypes' (and stigmas') construction. Through four excerpts,

17 The adversative connective "but" helps to signal the argumentation (Rocci et al., 2020).

18 In clinical psychology, "emotional invalidation" has a key role in disorganized mother-child attachment patterns (e.g., Liotti, 2001, 2004).

we have been able to show the following aspects: (a) university endorses a positive image of the psychologist, as a professional who follows a very specific training in order to be competent to increase personal growth and life purposes; (b) lay people who answered to our survey offer a representation of the psychologist as an expert person who gives advices and takes responsibilities in the place of the patient, thus restoring an image of the patient as a person without agency; (c) lay people advance a representation of the patient as a person who is completely alone and, in some way, isolated from social reality (the familiar and social contexts around the patient are poor of relational resources); (d) lay people's opinions from online forums highlight that being a very reflective person coincides with being a problematic person and that a psychological issue exists only if it is recognized by another person and in particular by a person who is expert of psychological health.

## 6. Conclusion

In conclusion, we believe that contextual implicit premises are fundamental in shedding light on how stereotypes (and stigma) are built according to how people see the world and themselves. It is the perfect idea (Cecchin and Apolloni, 2003) of how the world should be that constructs prisons around people's lives: "As therapists we should open up a space of freedom from tangles of maladaptive habits" (Luciani, 2021, p. 130).

As stated by Bakhtin (1986), "contextual meaning is potentially infinite, but it can only be actualized when accompanied by another (other's) meaning, if only by a question in the inner speech of the one who understands ... There can be no 'contextual meaning in and of itself' – it exists only for another contextual meaning, that is, it exists only in conjunction with it" (p. 145). In psychotherapeutic terms, this means that the heart of therapy (and therefore of change) can be found at the very core of the dialogue between the premises of the patient and those of the therapist (Cecchin et al., 1997): for instance, if a patient strongly uses premises relying on authority judgment ("I have done x because my mum/my boss/my professor has said that..."), the therapist can counter-argue with premises referring to other types of meaning ("I have done x because I felt that it made me relax").

At a more theoretical level, we can conclude that perfect ideas arise when the Self does not dialogue with the other and more particularly when our premises do not dialogue with each other and with the others' premises. Therefore, it is only by putting our premises in connection among each other and with the others' premises (and especially individual premises with institutional premises) that we can fight mental health stigma.

Our study has highlighted the importance of transforming implicit stereotypes into a visible object of study, for disentangling elements around the social images of the psychologist and of the patient in communication. Starting from this path, we can change subjacent contextual premises at the very core of stigmas and prototypical world images only by making explicit the implicit premises. Our aim was to reconstruct the prototypical social images of the psychologist and of the patient, as it could be dangerous when it prevents people from asking for psychological help and taking care of their psychological wellbeing. As people intending to promote taking care of human wellbeing, we should fight this reductionist view that is still dominant in our society.

In this regard, education and school are also crucial because "ensuring rights-based approaches to mental health should be incorporated into human rights education programs in schools as well as feature as compulsory core components of tertiary and vocational education and specialized training for health and legal professionals, the police and judiciary to combat discrimination and negative stereotypes" (WHO, 2022, p. 117). Our study has shown that further research is needed in the field of mental health in order to consider the following open questions: How can we intervene in fighting the mental health stigma? What type of training and methodologies can be useful? We strongly believe that our combination of theoretical and methodological approaches could be beneficial for future investigations in the domain of argumentation and communication in psychology. This will allow us to better consider the role of implicit premises that are vehiculated in the construction of social representations of actors interacting in professional contexts, such as psychologists and patients.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, on request.

## Ethics statement

The participants provided their written informed consent to participate in this study.

## Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# The relationship between teacher care behavior and EFL learning anxiety: the chain mediation effect of learning engagement and learning strategies

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This study aims to discuss the impact of teacher care behavior on EFL learning anxiety, as well as the mediating role of learning engagement and learning strategies. The Process plugin Model6 was used to measure the interaction between teacher care behavior (TCB), EFL learning anxiety (EFLLA), learning engagement (LE), and English learning strategies (ELS), in order to analyze and summarize their impact characteristics on college students' EFL learning anxiety. The results show that teacher care behavior has a direct impact on EFL learning anxiety and a significant negative predictive effect on it. Learning engagement and English learning strategies play a mediating and chain mediating role between teacher care behavior and EFL learning anxiety. Thus, it can be seen that these factors can help reduce EFL learning anxiety, manifested in aspects such as mood, cognition, emotion, and behavior. Given the research findings, this study further provides suggestions for alleviating college students' EFL learning anxiety, optimizing English teaching and learning design, and cultivating English learning strategies for college students.

## KEYWORDS

teacher care behavior, EFL learning anxiety, learning engagement, English learning strategy, mediation effect

## Introduction

In China, English is the most important foreign language with a majority of people learning English as foreign language. Thus, people tend to use foreign language to refer to English (in this study, foreign language classroom means English classroom). In most parts of China, English has always been the core curriculum of primary and secondary schools, and college English is a compulsory course. Even so, most Chinese students still experience anxiety in English learning even during their college years (Wang and Jiang, 2021; Xiao, 2021), mainly due to serious English learning barriers caused by the English learning environment and exam mechanisms (Yang and Chen, 2016). The main concerns in academic area regarding English learning anxiety include: (1) the causes of anxiety. An in-depth exploration was conducted on the sources and influencing factors of English learning anxiety (Huang, 2021; AL-Qadri et al., 2023). These factors include learners' personal characteristics (such as personality, learning foundation, learning motivation, etc.), external environment (such as teachers' teaching methods, learning resources, etc.), and learning tasks (such as task difficulty, time constraints, etc.). (2) The impact of anxiety on English learning. High anxiety is believed to hinder the learning process and



interfere with students' reception and acquisition of language materials (Yu et al., 2015). In contrast, low anxiety is considered beneficial for second language acquisition (Yu, 2022). (3) Identification and assessment of anxiety. Identifying and evaluating English learning anxiety has also received attention from researchers (Zhang, 2008). This involves assessing students' anxiety levels through observing their behavior and asking about their feelings, in order to provide them with timely help and intervention. (4) Strategies to reduce English learning anxiety. Some studies have found that teachers can reduce students' English learning anxiety by using certain teaching strategies (Chen et al., 2022). For example, creating a safe and positive learning environment, providing support and encouragement, designing interesting and challenging learning tasks, and providing timely and positive feedback. In recent years, second language acquisition has shifted toward studying positive psychology (Shao et al., 2020; Mac Intyre, 2021), focusing on emotions, engagement, and teacher-student relationships, and emphasizing the role of emotions in language learning (Li and Xu, 2019; Fang and Tang, 2021). Therefore, it is of great significance to clarify the impact mechanism of teacher care behavior on English learning anxiety.

## Literature

### EFL learning anxiety

Anxiety is a psychological concept that refers to the fear and unease emotions that arise from an individual's inability to evade behavior and cope with expectations or premonitions of setbacks. Anxiety is an important emotional factor that affects students' learning, which can seriously affect academic performance (Tang and He, 2023). English learning anxiety is a specific emotional reflection originating from the English classroom environment, characterized by nervousness, anxiety, worry and fear, including communication anxiety, exam anxiety, and negative evaluation fear (Horwitz et al., 1986). Students are prone to anxiety in EFL learning (Aichhorn and Puck, 2017), and low proficiency foreign language learners are more likely to develop anxiety tendencies (Su, 2022). For a long time, English learning anxiety has been a focus of attention in the academic area (Horwitz et al., 1986; Dewaele and Mac Intyre, 2014; Yu et al., 2015; He, 2022; Gordani and Sadeghzadeh, 2023; Yu et al., 2023). It is believed that the causes of English learning anxiety include language cognitive impairment, insufficient expression and communication skills, weak competitive awareness, low self-efficacy, and dull teaching methods, etc. (Horwitz et al., 1986).

Research has found that English learning anxiety has seriously affected students' English learning (Li and Liu, 2013; Mohammed et al., 2021), with some students developing a form of learning helplessness and frequent communication barriers in English (Ma et al., 2009; Tan and Xie, 2020). Moreover, long-term English learning anxiety can lead to a decrease in self-efficacy (Li and Liu, 2013), learning burnout (Jing, 2021), and affect academic performance (Xu, 2023; Zhang, 2023) and learning engagement (Dong and Zhang, 2023). However, some qualitative studies have also found that moderate EFL learning anxiety can facilitate foreign language learning (Yu, 2022).

### The mediating effect of teacher care behavior

Teacher care behavior originates from the feelings, thoughts, and activities of teachers that motivate or help learners with all their desires (O'Connor, 2008). Teacher care behavior is the behavior taken by teachers to establish a good relationship with students and ensure that expectations will occur (Lei et al., 2015). Essentially, teacher care refers to the emotions and attitudes that teachers hold toward students' learning. During the teaching process, teachers show concern, understanding, respect, support, and encouragement to students through verbal and nonverbal behaviors. Teacher care behavior is conducive to the establishment of good teacher-student relationship. Through active interaction with teachers, students can achieve emotional and attitudinal stability, stimulate effective learning behavior (Pekrun and Schutz, 2007; Trigueros et al., 2020), and promote active student participation (Huang and Meng, 2017). Self-determination theory believes that teacher care behavior is an important driving factor for developing students' intrinsic motivation, which can stimulate students' learning related abilities and self-confidence, and enhance their self-efficacy (Havik and Westergård, 2020).

Studies have found that teacher care behavior has a positive impact on academic performance (Lei et al., 2015), which can promote students' psychological capital to increase learning investment (Huang and Meng, 2017), enhance self-efficacy (Ye et al., 2017), alleviate learning pressure (Fu and Zhang, 2023; Jiang et al., 2023), and promote students' mental health (Zheng et al., 2017; Kelly et al., 2022). Previous studies have shown that in EFL learning, teachers' emotional support plays a moderating role in students' self-efficacy and online English learning burnout (Yang et al., 2022), and teacher care behavior can promote students to increase their engagement in English learning (Sun, 2021).

### The mediating effect of learning engagement

Learning engagement is the degree of participation of students in educational tasks and activities (Heflin et al., 2017). It is an important potential variable for students to form learning motivation and optimize learning outcomes (Reschly and Christenson, 2012), as well as an important observational indicator during the learning process, and a key factor in students' achieving academic success (Liu, 2023). Schaufeli et al. (2002) believes that learning engagement includes three dimensions: vigor, dedication, and absorption. Hart et al. (2011) measured students' learning engagement from three aspects: emotion, cognition, and behavior. Lam et al. (2013) believes that the higher the motivational characteristics, the higher the level of engagement, and the closer the relationship between students, teachers, and peers, the higher the emotional and cognitive engagement. The three are interdependent. Behavioral engagement is the carrier of cognitive and emotional engagement and emotional engagement influences behavioral engagement through cognitive engagement. The degree of learning engagement has a direct impact on learning outcomes (Chi and Wylie, 2014), and learning engagement affects students' self-learning regulation (An et al., 2023).

Previous studies have found that English learning engagement positively predicts learning satisfaction, and both emotional and cognitive engagement have a positive impact on behavioral engagement. Cognitive engagement is the mediator between emotional engagement and behavioral engagement (Ren, 2023). There is a positive correlation between learning engagement and learning strategies (Abubakar, 2017), which jointly predicts learning performance (Alqarni, 2023). Learning behavior engagement directly determines the level of learning engagement and affects the use of learning strategies (Abulela et al., 2023). For example, emotional engagement affects the use of emotional strategies, while cognitive engagement affects the use of memory strategies.

## The mediating effect of learning strategies

Language learning strategies are very important influencing factors in language learning, which are specific learning actions that language learners intentionally take to promote the acquisition, understanding, storage, and retrieval of information (Weinstein and Mayer, 1986). According to Oxford's (1990) classification, language learning strategies include memory strategies, cognitive strategies, compensation strategies, metacognitive strategies, affective strategies, and communicative strategies. Research has found that learners' use of language learning strategies is influenced by various factors, such as emotional factors (anxiety, confidence) (Krashen, 2009), learning motivation (Oxford, 1990), learning habits (Jiang, 2006), and language proficiency (Peng, 2023). Among them, learning anxiety is one of the most important factors affecting the use of language learning strategies (Nishitani and Matsuda, 2011; Xiong, 2011). Experiments have shown that anxiety is accompanied by a decrease in learning and memory abilities (Lu et al., 2022). In contrast, memory capacity has a certain regulatory effect on anxiety (Hu and Zhou, 2022). Learning strategies not only affect academic performance (Abimbade, 2023; Alqarni, 2023), but also predict learning engagement (Abulela et al., 2023), such as cognitive strategies affecting students' learning engagement (Kim and Kim, 2016). Good learning strategies can help students reduce learning anxiety (Geng, 2021; Ji, 2022).

Based on the above literature review, it can be seen that existing research only preliminarily discussed the influence of teacher care on English learning engagement, with little exploration of the mechanism of teacher care's impact on EFL learning anxiety, and little discussion on the relationship between teacher care behavior and learning engagement, learning strategies, and EFL learning anxiety.

Thus, this paper proposes the following assumptions:

*H1:* There is a negative correlation between teacher care behavior and EFL learning anxiety.

*H2:* Learning engagement plays a mediating role in teacher care behavior and EFL learning anxiety.

*H3:* Learning strategies play a mediating role in teacher care behavior and EFL learning anxiety.

*H4:* Teacher care behavior plays a chain mediating role in EFL learning anxiety through learning engagement and learning strategies.

## Research design

### Research sample

This study uses a mediating effect model to explore the impact and mechanism of teacher care behavior on EFL learning anxiety. The mediating variables are learning engagement and English learning strategies. The independent variable is teacher care behavior, and the dependent variable is EFL learning anxiety. Subsequently, a convenient cluster sampling method was used to select 522 college students ( $M = 20.06$  years old,  $SD = 1.21$ ) from three universities in the capital cities of the central and southeastern provinces as survey subjects. They filled out the Teacher Care Behavior Scale, Foreign Language Classroom Anxiety Scale, Utrentwork Engagement Scale-Student, and Strategy Inventory for Language Learning Scale online, respectively. A total of 504 valid samples were obtained in this survey (excluding samples with online answering time less than 180 s), with an effective rate of 96.55%. Among them, there are 263 female students (52.18%) and 241 male students (47.82%); 138 English majors (27.38%) and 366 non-English majors (72.62%).

## Measures

### Teacher care behavior scale

Teacher care behavior was assessed with Lei's (2014) "Teacher Care Behavior Scale" (Chinese version) which consists of 18 items and three dimensions: conscientiousness, support, and inclusiveness. Participants were asked to report their English teacher's behavior in the past year (e.g., the teacher takes time to know me). The scores were rated using Likert 5-point scale, from "1" strongly disagree to "5" strongly agree, the higher the score, the higher the teacher's caring behavior. The Cronbach's alpha of this scale is 0.965, and the Cronbach's alpha coefficients for each dimension are 0.912, 0.944, and 0.941, respectively. This study conducted exploratory and confirmatory factor analysis on the scale, and the results were as follows: KMO was 0.957, the spherical degree of Bartlett test for sig value.000, at 0.05 significant level;  $\chi^2/df = 2.746$ , GFI = 0.912, CFI = 0.931, SRMR = 0.024, RMSEA = 0.057.

### Foreign language classroom anxiety scale

Students' EFL learning anxiety was assessed with Horwitz et al.'s (1986) "Foreign Language Classroom Anxiety Scale-FLCAS" [Chinese Version by Wang (2003)], which consists of 33 items and four dimensions: worry, nervousness, fear of speaking English, and fear of classroom questioning. Students were asked to report their EFL learning anxiety in the past year (e.g., I have no confidence when speaking English in foreign language classroom). The scores were rated using Likert 5-point scoring system, from "1" being very inconsistent to "5" being very consistent. The higher the score, the more anxious foreign language learning anxiety is. The Cronbach's alpha of this scale is 0.963, and the Cronbach's alpha coefficients for each dimension are 0.903, 0.908, 0.902, and 0.905, respectively. This study conducted exploratory and confirmatory factor analysis on the scale, and the results were as follows: KMO was 0.971, the spherical



degree of Bartlett test for sig value.000, at 0.05 significant level;  $\chi^2/df = 2.027$ , GFI = 0.918, CFI = 0.945, SRMR = 0.028, RMSEA = 0.036.

## Utrechtwork engagement scale-student

Students' learning engagement was assessed with Schaufeli's "Utrechtwork Engagement Scale-Student-UWES-S" [Chinese Version by Li and Huang (2010)], which consists of 17 items and three dimensions: vigor, dedication, and absorption. Students were asked to report their learning engagement in the past year (e.g., I feel full of energy when learning English). The scores were rated using Likert 7-point scoring, from "1" the situation never occurs to "7" the situation always occurs, with higher scores indicating greater learning engagement. The Cronbach's alpha of this scale is 0.961, and the Cronbach's alpha coefficients for each dimension are 0.938, 0.922, and 0.901, respectively. This study conducted exploratory and confirmatory factor analysis on the scale, and the results were as follows: KMO was 0.953, the spherical degree of Bartlett test for sig value.000, at 0.05 significant level;  $\chi^2/df = 2.892$ , GFI = 0.912, CFI = 0.937, SRMR = 0.039, RMSEA = 0.063.

## Strategy inventory for language learning (SILL) scale

Students English learning strategy was assessed with Oxford's (1990) "Strategy Inventory for Language Learning Scale" (Chinese Version), which consists of 50 items and six dimensions: memory, cognition, compensation, metacognition, emotion, and communication. Students were asked to report their English learning strategy in the past year (e.g., In order to better memorize the words, I write down the new words on the card). The scores were rated using Likert's 5-point scoring system, from "1" very inconsistent to "5" very consistent. The higher the score, the more learning strategies there are. The Cronbach's alpha of this scale is 0.974, and the Cronbach's alpha coefficients for each dimension are 0.929, 0.917, 0.898, 0.920, 0.907, and 0.908, respectively. This study conducted exploratory and confirmatory factor analysis on the scale, and the results were as follows: KMO was 0.966, the spherical degree of Bartlett test for sig value.000, at 0.05 significant level;  $\chi^2/df = 2.137$ , GFI = 0.925, CFI = 0.953, SRMR = 0.025, RMSEA = 0.049.

## Research procedures and statistical analysis

Informed consent was obtained from each participant before completing the online questionnaires, which required approximately 15 min. The valid data was obtained for common method bias testing. Factor analysis was conducted using Harman's single factor analysis on the Teacher Care Behavior Scale, FLCAS, UWES-S, and SILL Scale. The results showed that a total of 16 common factors with eigenvalues greater than 1 were generated, of which the variance explained by the first common factor after rotation was 18.11%, much less than the 40% critical standard (Tang and Wen, 2020). Therefore, it can be inferred that there is no significant common method bias in this study. First, the inter subject effects were examined through demographic and

professional variable differences statistics. Second, descriptive statistics were conducted on each variable to test their correlation. Finally, chain mediated effect analysis and testing were conducted using the SPSS 23.0 software Process plugin, and Model 6 was selected and the 95% confidence interval of parameter estimation was obtained using the 5,000 bootstrap method of repeated sampling.

## Results

### Intersubjective effect test

By conducting statistical analysis of the differences between demographic and professional variables (see Table 1), the author examined whether the main effects of gender and major variables were significant, that is, conducting inter subject effects tests on four variables: gender, major and teacher care behavior, foreign language learning anxiety, learning engagement, and English learning strategies. (1) Compared with boys, the gender main effects of female students in EFL learning anxiety were significant ( $F = 4.548$ ,  $p < 0.05$ ). The main effects of the other three variables were not significant; (2) Compared with English majors, non-English majors had a significant main effect on EFL learning anxiety ( $F = 4.823$ ,  $p < 0.05$ ), while the other three variables had no significant main effect.

### Correlation analysis between variables

Control variables such as gender and major, and analyze the correlation between the main variables using partial correlation analysis. From Table 2, it can be seen that teacher care behavior, learning engagement, and English learning strategies are significantly positively correlated with each other ( $r = 0.332 \sim 0.588$ ,  $p < 0.01$ ), and negatively correlated with EFL learning anxiety ( $r = -0.328 \sim -0.256$ ,  $p < 0.01$ ). Among them, there is a significant negative correlation between teacher care behavior and EFL learning anxiety ( $r = -0.309$ ,  $p < 0.01$ ), indicating that theoretical hypothesis H1 has been validated.

From Table 3, it can be seen that teacher care behavior which includes three dimensions: conscientiousness, support, and inclusiveness, learning engagement which includes three dimensions: vigor, dedication, and absorption, and English learning strategies which include six dimensions: memory, cognition, compensation, metacognition, emotion, and communication, are significantly positively correlated with each other ( $r = 0.195 \sim 0.893$ ,  $p < 0.01$ ), while English learning anxiety which includes worry, nervousness, fear of speaking English and fear of classroom questioning are significantly negatively correlated with each other ( $r = -0.359 \sim -0.126$ ,  $p < 0.01$ ), further confirming the theoretical hypothesis H1.

### Analysis of chain mediation model

From Table 4, it can be seen that in Equation 1, teacher care significantly positively predicts learning engagement ( $\beta = 0.109$ ,  $t = 3.296$ ,  $p < 0.001$ ). Equation 2 shows that teacher care behavior is significantly positively predictive of English learning strategies ( $\beta = 0.073$ ,  $t = 3.810$ ,  $p < 0.001$ ), while learning engagement significantly positively predicts English learning strategies ( $\beta = 0.943$ ,  $t = 14.769$ ,

TABLE 1 Intersubjective effect test of gender and major ( $M \pm SD$ ).

		Care	Anxiety	Engagement	Strategy
gender	F ( $n = 263$ )	75.825 $\pm$ 13.191	65.076 $\pm$ 21.499	75.521 $\pm$ 17.645	165.825 $\pm$ 32.697
	M ( $n = 241$ )	75.905 $\pm$ 11.672	62.639 $\pm$ 19.031	77.253 $\pm$ 20.156	168.709 $\pm$ 33.734
major	EM ( $n = 138$ )	75.703 $\pm$ 12.572	61.304 $\pm$ 23.319	76.319 $\pm$ 20.035	167.326 $\pm$ 42.905
	NE ( $n = 366$ )	75.924 $\pm$ 12.456	64.893 $\pm$ 19.087	76.361 $\pm$ 18.466	167.159 $\pm$ 28.768
$F_{(g)}$		0.153	4.548*	0.635	0.552
$F_{(m)}$		0.002	4.823*	0.004	0.016

\* $p < 0.05$ . Care, teacher care behavior; Anxiety, EFL learning anxiety; Engagement, learning Engagement; Strategy, English learning strategy; g, gender; m, major; F, female; M, male; EM, English major; NE, Non-English; Gender and major were dummy coded such that 1 = Female, 2 = Male, 3 = English major, 4 = non-English major.

TABLE 2 Correlation analysis of TCB, EFLLA, LE, and ELS.

		M	SD	1	2	3	4
1	Care	75.863	12.476	1			
2	Anxiety	63.911	20.373	−0.309**	1		
3	engagement	76.349	18.888	0.332**	−0.256**	1	
4	Strategy	167.204	33.195	0.359**	−0.328**	0.588**	1

\*\* $p < 0.01$ . TBC, teacher care behavior; EFLLA, EFL learning anxiety; LE, learning engagement; ELS, English learning strategy.

$p < 0.001$ ). In Equation 3, when teacher care behavior, learning engagement, and English learning strategies are all included in the regression equation, teacher care behavior ( $\beta = -0.124$ ,  $t = -4.735$ ,  $p < 0.001$ ), learning engagement ( $\beta = -0.237$ ,  $t = -5.918$ ,  $p < 0.001$ ), English learning strategies ( $\beta = -0.307$ ,  $t = -5.200$ ,  $p < 0.001$ ), all three significantly negatively predict EFL learning anxiety.

According to Table 5 and Figure 1, it can be seen that learning engagement and English learning strategies play a mediating role between teacher care behavior and EFL learning anxiety, with a total indirect mediating effect value of  $-0.065$ , accounting for 34.39% of the total effect  $-0.189$ . At this point, the mediating effect consists of three pathways: (1) learning engagement serves as a mediator, and the indirect effect generated by teacher care behavior  $\rightarrow$  learning engagement  $\rightarrow$  EFL learning anxiety is  $-0.026$  ( $-0.047$ ,  $-0.009$ ) and the effect amount is 13.76%, indicating that the theoretical hypothesis H2 has been verified; (2) The indirect effects of teacher care behavior, English learning strategy, and EFL learning anxiety as mediators are  $-0.023$  ( $-0.041$ ,  $-0.008$ ) and the effect amount is 12.17%, indicating that the theoretical hypothesis H3 has been validated; (3) The indirect effects of teacher care behavior, learning engagement, English learning strategies, and EFL learning anxiety are  $-0.016$  ( $-0.028$ ,  $-0.006$ ) and the effect amount is 8.46%, respectively, and the theoretical hypothesis H4 is verified. Meanwhile, the Bootstrap 95% CI of the mediating effect did not include 0 and reached a significant level.

## Discussion

### The relationship between teacher care behavior and EFL learning anxiety

The inter subject effect test of this study shows that there is a significant gender and major effect between female students and non-English majors in EFL learning anxiety. This result indicates that female students and non-English major students are more likely to

experience learning anxiety in the EFL classroom, which also confirms the correlation between anxiety and gender (Bensalem, 2018). The relevant analysis of this study shows that teacher care behavior, learning engagement, and English learning strategies are significantly positively correlated with each other, while they are significantly negatively correlated with EFL learning anxiety. Among them, there is a significant negative correlation between conscientiousness, support, inclusiveness, vigor, dedication, absorption, memory, cognition, compensation, metacognition, emotion, communication and worry, nervousness, fear of speaking English, fear of classroom questioning. This deeply indicates that the first three have a close positive correlation and a negative correlation with EFL learning anxiety, which also provides data support for testing the chain mediated effect. Previous studies have shown that the positive event context in which an individual is exposed can affect their state of mind, leading to changes in their behavior (Rosenhan et al., 1980). Foreign language learning anxiety is a negative state of mind generated by subtle cognitive processing efforts of learners in the process of processing input and output information (Sparks and Ganschow, 1991). It is worry and fear caused by individuals' negative premonition of results (Tao and He, 2021), and a specific emotion generated during foreign language classroom learning (Dong, 2021). In fact, the caring behavior of teachers in the context of foreign language learning is a concrete manifestation of a positive state of mind which can influence the learners to a large extent. The results of this study confirm the negative correlation between teacher care behavior and EFL learning anxiety, which proved the positive effect of teacher care behavior in EFL learning context.

### The mediating effect of learning engagement and English learning strategies

The results of this study indicate that learning engagement and English learning strategies partially mediate the relationship between

TABLE 3 Correlation analysis of CS, SU, IN, WO, ON, VI, DE, and AB.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	CS	1															
2	SU	0.771**	1														
3	IN	0.813**	0.743**	1													
4	WO	−0.321**	−0.271**	−0.359**	1												
5	ON	−0.276**	−0.240**	−0.287**	0.822**	1											
6	AS	−0.177**	−0.175**	−0.210**	0.621**	0.720**	1										
7	AA	−0.204**	−0.203**	−0.239**	0.721**	0.781**	0.826**	1									
8	VI	0.357**	0.310**	0.340**	−0.254**	−0.256**	−0.195**	−0.224**	1								
9	DE	0.244**	0.236**	0.250**	−0.186**	−0.178**	−0.126**	−0.172**	0.794**	1							
10	AB	0.272**	0.257**	0.270**	−0.236**	−0.229**	−0.180**	−0.233**	0.720**	0.798**	1						
11	ME	0.323**	0.289**	0.325**	−0.325**	−0.340**	−0.273**	−0.328**	0.565**	0.461**	0.508**	1					
12	CG	0.286**	0.269**	0.282**	−0.268**	−0.267**	−0.185**	−0.235**	0.530**	0.404**	0.440**	0.809**	1				
13	CM	0.217**	0.195**	0.201**	−0.205**	−0.199**	−0.166**	−0.212**	0.336**	0.226**	0.215**	0.494**	0.543**	1			
14	MT	0.290**	0.299**	0.294**	−0.246**	−0.258**	−0.209**	−0.248**	0.558**	0.440**	0.466**	0.746**	0.715**	0.576**	1		
15	EM	0.323**	0.318**	0.313**	−0.294**	−0.284**	−0.225**	−0.276**	0.577**	0.461**	0.529**	0.825**	0.766**	0.508**	0.804**	1	
16	CO	0.289**	0.282**	0.296**	−0.299**	−0.279**	−0.225**	−0.270**	0.573**	0.450**	0.502**	0.816**	0.757**	0.472**	0.789**	0.893**	1
	Ske	−0.848	−0.688	−0.816	0.205	0.134	0.066	0.056	0.040	−0.121	0.045	0.149	0.131	0.266	0.192	0.207	0.057
	Kur	0.696	−0.021	0.241	−1.010	−1.243	−1.456	−1.265	0.330	0.612	0.343	0.678	0.852	0.468	0.914	0.651	0.566
	M	29.706	24.964	21.193	22.403	17.653	11.833	12.022	27.316	22.228	26.806	29.960	46.784	21.069	30.232	19.544	19.615
	SD	4.882	4.819	3.821	7.595	6.197	4.569	4.220	7.131	6.275	7.132	7.168	9.852	4.121	6.693	4.968	4.984

CS, Conscientiousness; SU, Support; IN, inclusiveness; WO, worry; ON, on edge; AS, Afraid of speaking English; AA, Afraid of asking questions; VI, vigor; DE, dedication; AB, absorption; ME, memory; CG, cognition; CM, compensation; MT, metacognition; EM, emotion; CO, communication; Ske, Skewness; Kur, Kurtosis.

TABLE 4 A chain mediated model of TCB and EFLLA.

	Equation 1: LE			Equation 2: ELS			Equation 3:EFLLA		
	$\beta$	SE	<i>t</i>	$\beta$	SE	<i>t</i>	$\beta$	SE	<i>t</i>
Constant	−9.061	7.135	−1.263	30.276	10.213	2.964	−6.406	4.448	−1.440
TCB	0.109	0.033	3.296***	0.073	0.019	3.810***	−0.124	0.026	−4.735***
LE				0.943	0.063	14.769***	−0.237	0.040	−5.918***
ELS							−0.307	0.059	−5.200***
Gender	−0.492	2.017	−0.244***	5.718	2.882	1.984	−0.755	1.249	−0.604
Major	2.629	2.259	1.163	−10.395	3.233	−3.214	2.099	1.410	1.488
<i>R</i> <sup>2</sup>	0.068			0.385			0.189		
<i>F</i>	12.123***			78.043***			23.314***		

\*\*\**p* < 0.001. TBC, teacher care behavior; EFLLA, EFL learning anxiety; LE, learning engagement; ELS, English learning strategy.

TABLE 5 The chain mediation effect test of TCB and EFLLA.

Effect	Path	EV	ES	95%CI	
				Lower	Upper
Direct	TCB → EFLLA	−0.124	65.61%	−0.176	−0.073
Indirect	TCB → LE → EFLLA	−0.026	13.76%	−0.047	−0.009
	TCB → ELS → EFLLA	−0.023	12.17%	−0.041	−0.008
	TCB → LE → ELS → EFLLA	−0.016	8.46%	−0.028	−0.006
Total indirect		−0.065	34.39%	−0.092	−0.041
Total		−0.189		−0.240	−0.138

TCB, teacher care behavior; EFLLA, EFL learning anxiety; EV, estimated value; ES, effect size; LE, learning engagement; ELS, English learning strategy.

teacher care behavior and EFL learning anxiety, respectively. That is to say, teacher care behavior can directly affect EFL learning anxiety, or indirectly affect EFL learning anxiety through influencing learning engagement and English learning strategies. On the one hand, the stronger a learner's vigor, absorption, and internal mobilization, the more sustainable, explicit, positive, and stable their language learning tendencies are, thereby offsetting some negative emotions such as anxiety and burnout (Bailey et al., 1998). On the other hand, learners who possess good cognitive information processing strategies and sufficient memory carrying capacity in the process of foreign language reading and oral communication (Dewaele and Mac Intyre, 2014) can effectively reduce the probability of foreign language learner's learning anxiety (Dewaele et al., 2019). In foreign language classroom teaching, it is possible to reduce concerns, nervousness, and fear of questioning in foreign language learning by enhancing learners' enthusiasm and focus, as well as improving their cognitive and memory methods. The research conclusion shows that the characteristics of teacher care behavior in foreign language classroom teaching, such as encouragement, tolerance, and responsibility, essentially belong to the category of positive mood, and can also affect learning engagement and learning strategies, thereby reducing the level of foreign language learner's learning anxiety.

### The chain mediating effect of learning engagement and English learning strategies

This study found that teacher care behavior can affect EFL learning anxiety through the chain mediating effect of learning

engagement and English learning strategies. Specifically, as the teacher's sense of responsibility, inclusivity, and support become apparent in classroom teaching, this positive emotion will encourage learners to overcome anxiety, encourage themselves, enhance their confidence, arrange learning in a planned manner, establish learning priorities, and strive to overcome their own shortcomings, etc. That is to say, teacher care behavior is not only a resource for foreign language classroom teaching environment, but also a situational variable that has a significant positive effect on the cognitive to behavioral process. Here, a general learning model can be used to explain (Buckley and Anderson, 2006), that teachers adjust their internal psychological activities and act on learners' psychological processes, which is conducive to the generation of positive psychology (PP) for learners. It is why PP has become more and more popular in second and foreign language teaching and acquisition recent years, because PP can generate positive language learning activities (Mac Intyre and Mercer, 2014; Dewaele et al., 2019). That is, language learners invest a large amount of time to promote the improvement of English learning strategies and improve their self-confidence, thereby reducing anxiety such as worry or fear of questioning in the classroom with the changing of their mood to positive psychology. This is not only a cognitive processing course, but also a process of mind improvement. Although EFL learners often experience negative emotions due to questioning in foreign language classrooms, under the influence of PP, learners actively enhance their level of focus or vigor in learning, actively participate in learning activities, form initiative from different levels of cognition, emotion, and behavior, promote language learning, and enhance cognitive processing and memory abilities in foreign language learning (Philp and Duchesne, 2016; Ellis, 2019). In

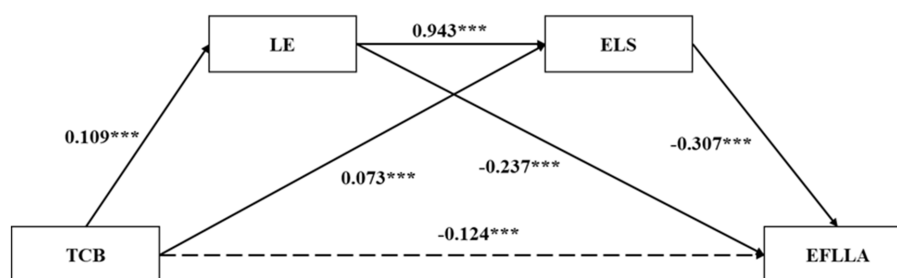


FIGURE 1  
A chain mediated model of TCB and EFLA.

summary, teachers are the key factors affecting the effectiveness of classroom teaching (Huang and Xin, 2007). Through their own behavior support and encouragement, teachers encourage learners to invest as much energy and strategies as possible, thereby reducing the level of EFL learning anxiety.

This study examined the chain mediating effect of learning engagement and English learning strategies on teacher care behavior and EFL learning anxiety, and found that there are the following pathways to the impact of teacher care behavior on EFL learning anxiety: encouraging, accommodating, and other behaviors can enable learners to invest more energy, focus, and other psychological capital, continuously improving individual cognitive processing and memory abilities, thereby reducing concerns in foreign language classrooms anxious emotions such as fear of asking questions. This pathway highlights the co-mediating effect of learning engagement and learning strategies, not only revealing the interrelationship between teacher care behavior and foreign language learner's learning anxiety, but also providing a basis for foreign language classroom learning theory.

## Conclusion

Firstly, this study explores the chain mediating role of learning engagement and English learning strategies in teacher care behavior and EFL learning anxiety, which not only enriches previous research but also reveals the impact mechanism of teacher care behavior on EFL learning anxiety. Previous studies have focused on the relationship between teacher care behavior and learning engagement, as well as English learning strategies, with less emphasis on incorporating EFL learning anxiety into the research scope. In essence, in foreign language classroom teaching, learners are always in a passive state to participate in classroom interaction, leading to frequent burnout and anxiety in foreign language learning. Therefore, this study aims to discuss the phenomenon of EFL learning anxiety and supplement previous studies.

Secondly, this study conducted inter subject effects testing, variable correlation analysis, and mediation effects testing, and the results all supported the proposed theoretical hypothesis. From this, the following conclusion can be drawn: teacher care behavior is considered as a category of psychological capital in EFL classrooms, and is a key element in reducing EFL learning anxiety levels. Teacher care behavior enhances learners' learning engagement and improves their English learning strategies, thereby reducing EFL learning anxiety levels. Although classroom psychological capital, individual

energy, and cognitive processing ability have independent mechanisms in reducing EFL learning anxiety levels, this study verified through chain mediation that their combined effects are more significant.

This study further indicates that teacher classroom teaching design should fully consider intervention measures for EFL learning anxiety, facilitate the application of corresponding incentive measures to learners, enhance their confidence and self-efficacy, and thereby improve individual cognitive processing and memory strategies.

## Implications

The empirical data of this study indicates that teacher care behavior has a significant negative predictive effect on English learning anxiety. Teacher care behavior can reduce students' EFL learning anxiety through joint mediating effect of learning engagement and English learning strategies. This indicates that teacher caring behavior can enhance students' positive emotional experience and their learning motivation, increase their learning engagement, improve individual cognitive processing and memory abilities, change learning methods and strategies, and alleviate negative emotions such as worry and fear of questioning in foreign language classrooms. Therefore, this study provides a basis for foreign language classroom teaching and learning theory. Given all of this, this study proposes two suggestions for optimizing foreign language teaching and learning.

First, students' English learning anxiety can be reduced due to the caring behavior of teachers. Therefore, teachers should increase emotional support, give more attention and understanding of students' learning situation, learning status and level of anxiety, and provide learning suggestions and guidance to help them alleviate their EFL learning anxiety. In class, teachers try to create a relaxed and pleasant learning atmosphere for students. For those who are prone to nervousness and fear of asking questions, teachers can encourage them to express themselves bravely, such as speaking in groups, reciting texts, giving rewards for their participation, etc., to improve students' confidence and sense of achievement in English learning and improve their English learning ability.

Due to the joint mediation of learning engagement and English learning strategies in reducing students' EFL learning anxiety, teachers can help students improve their learning engagement, encourage them to invest more energy and focus in English learning, such as formulating detailed English learning plans, preparing the study in advance, identifying learning difficulties, etc., and encourage them to think more in English and increase their output rate. Teachers can also give them English learning strategies training, help students change



their English learning methods, improve their English learning efficiency, and become a successful language learner.

## Limitations

This study used a scale scoring test to examine the chain mediating effect of learning engagement and English learning strategies on teacher care behavior and EFL learning anxiety. EEG indicators were not included in the scope of the test. Therefore, it is necessary to use more physiological indicators as mediating variables in future research.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

Ethical review and approval were not required for the study on human participants in accordance with the local legislation and institutional requirements. The participants provided their online informed consent to participate in this study.

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# Themes and ideologies in China's diplomatic discourse – a corpus-assisted discourse analysis in China's official speeches

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Diplomatic discourse is a formalized form of political communication that significantly influences a country's international perception. However, there is a research gap in the analysis of China's diplomatic discourse, particularly in relation to the speeches available on the official Chinese Foreign Ministry website. This study aims to address this gap by conducting a quantitative and qualitative analysis of China's diplomatic speeches. This study utilizes a quantitative corpus-assisted discourse analysis to explore the prevalent themes in China's official speeches. Additionally, qualitative discourse analysis is employed to examine the ideologies manifested in specific examples from the official speeches. The research combines a corpus-based approach with critical discourse analysis to investigate language use, discourse practices, and social practices. The analysis of China's diplomatic discourse reveals several key themes related to President Xi Jinping's leadership, international relations, and future community and economy. The findings provide valuable insights into China's diplomatic strategies and its international image, emphasizing its commitment to cooperation, development, and peace. This research contributes to a better understanding of China's diplomatic discourse and its role in shaping international perceptions of the country. By highlighting the prevalent themes and ideologies in China's official speeches, the study emphasizes China's commitment to fostering positive international relations. The findings offer valuable insights into China's diplomatic strategies and its efforts to shape its international image.

## KEYWORDS

diplomatic discourse, corpus-assisted discourse analysis, China's official speeches, critical discourse analysis, China

## 1 Introduction

In recent years, there has been a notable increase in scholarly interest regarding China's official discourse, particularly during the tenure of President Xi Jinping. Researchers have dedicated their efforts to analyzing the evolution of strategic narratives under his leadership, with a specific focus on how these narratives are strategically tailored to appeal to diverse audiences, both within China and on the international stage (Lams, 2018; Yang, 2020; Brown, 2021). Moreover, scholars have explored the intricate interplay between domestic and international contexts, acknowledging the significant impact of global events and dynamics on China's diplomatic discourse (Edney, 2014; Chang, 2021; Yang and Chen, 2021).

Previous research has primarily focused on analyzing speeches by President Xi, official conference speeches, and news articles from official outlets (Sun, 2017; Lu, 2018; Lutgard, 2018;

Shi and Qu, 2019; Li and Zhu, 2020; Wang, 2021; Zhang et al., 2023). However, there is a significant research gap in the analysis of speeches published on the official Chinese Foreign Ministry website, which encompasses not only the speeches delivered by the Chinese leader but also those delivered by key officials. These speeches, published in English, are considered highly authoritative positions of the Chinese state and are carefully crafted to convey the desired messages to the global community. The study of China's official discourse, particularly the texts available on the Chinese Foreign Ministry website, provides valuable insights into China's strategic narratives and diplomatic tools employed to achieve foreign policy objectives. They serve as valuable sources for understanding China's strategic narratives and the diplomatic tools employed to engage with foreign actors and achieve foreign policy objectives. The study aims to fill the gap in existing research by examining speeches available on the official Chinese Foreign Ministry website and gain insights into China's official positions, priorities, and strategies. This study could provide a deeper understanding of China's diplomatic efforts and shed light on its engagement with the international community. It can also contribute to the broader field of diplomatic studies, offering valuable perspectives on the role of discourse in shaping international relations and influencing global perceptions. This research aims to fill this gap by investigating the corpus of speeches found on the aforementioned website.

The following questions will be addressed:

- 1 What themes are represented in China's speeches available on the official Chinese Foreign Ministry website?
- 2 What are the linguistic patterns employed to voice the ideologies in these themes?

## 2 Research design

### 2.1 Corpus

The data utilized in this study was exclusively sourced from the official English website of the Ministry of Foreign Affairs of the People's Republic of China.<sup>1</sup> A total of 500 items from the website, spanning from October 29, 2014, to July 4, 2023, were downloaded and saved as text files for further analysis. The title list of all the items can be found in the accompanying document provided in the dataset. The corpus employed for this research is specifically identified as the Corpus of Diplomatic Speeches from the Ministry of Foreign Affairs of the People's Republic of China (CODS).

### 2.2 Theoretical foundations and analytical framework

The corpus-based approach, as defined by Sinclair (1991), involves the purposeful construction of a collection of natural language texts for specific research purposes. By analyzing authentic text, researchers

can uncover previously unknown linguistic characteristics, providing a new perspective on language. This approach allows for the objective observation of regularities in language usage, as researchers can use software to process and analyze data, revealing language use patterns, word lists, concordance lines, collocates, and lexical bundles in the corpus. Thematic analysis can be performed by employing a corpus-based method, which has demonstrated its effectiveness as an analytical technique since the early days of content analysis (Osgood, 1959). Furthermore, contemporary studies have made use of network analysis indicators, as suggested by Danowski (1993). Thematic analysis not only uncovers connections among words but also offers valuable insights into the relationships between words and variables/headings.

One of the advantages of the corpus-based approach is that it offers a comprehensive and reliable qualitative analysis. By analyzing search items, lexical bundles, and collocations in the corpus, researchers can gain insights into the linguistic context and patterns of high-frequency words. This approach minimizes researcher bias, as it relies on natural language data and allows for comparatively objective judgment based on a large amount of data (Baker, 2006). Therefore, corpus-based analysis is often combined with discourse analysis to investigate language use in describing social events.

Critical Discourse Analysis (CDA), on the other hand, takes a critical stance toward language use by examining the underlying ideology and values present in various types of discourse. Fairclough (1992) put forward the theory and method of critical discourse analysis. Compared with traditional discourse analysis, the distinctive feature of critical discourse analysis is that it closely links discourse with social power, reveals social problems through discourse analysis and proposes corresponding strategies to improve the problems on the basis of discourse analysis. Critical discourse analysis is closely linked to Systemic Functional Linguistics (Halliday et al., 2014). As Young and Harrison (2004, 4) suggest, the link between Systemic Functional Linguistics (SFL) and Critical Discourse Analysis (CDA) has a strong tradition. On the one hand, Systemic Functional Linguistics (SFL) has been an important theoretical foundation and linguistic tool for critical discourse analysis (Fowler et al., 1979; Fairclough and Wodak, 1997; Martin and Rose, 2007). On the other hand, Systemic Functional Linguistics (SFL) has been continuously developed in the practice of critical discourse analysis, perfecting the path of SFL in critical discourse analysis. Discourse engages in ideological work (Fairclough and Wodak, 1997; Fairclough, 2010), but ideology is often implicitly embedded in discourse through linguistic means, becoming naturalized common sense, and the operation of ideology is thus difficult to detect. One of the tasks of critical discourse analysis is to reveal the implicit ideological meaning of a discourse through specific linguistic analysis. CDA, as presented by Fairclough (1992), employs a three-dimensional framework that analyzes discourse as text, discourse practice, and social practice. This framework emphasizes that text analysis should not be done in isolation, but rather should consider the broader context in which the discourse is produced and consumed.

The "text" dimension of CDA focuses on the analysis of language in the texts themselves. This involves examining the linguistic qualities and structures present in the discourse. The "discourse practice" dimension addresses the production and consumption of diplomatic speeches, analyzing the strategies employed by news media in shaping and disseminating information. This dimension considers the role of

<sup>1</sup> [https://www.fmprc.gov.cn/eng/wjdt\\_665385/zyjh\\_665391/](https://www.fmprc.gov.cn/eng/wjdt_665385/zyjh_665391/)



power and ideology in the production and dissemination of discourse. Finally, the “social practice” dimension explores the relationship between discourse practices and the broader social context. It examines the social and cultural practices surrounding the events being reported and how they shape the discourse.

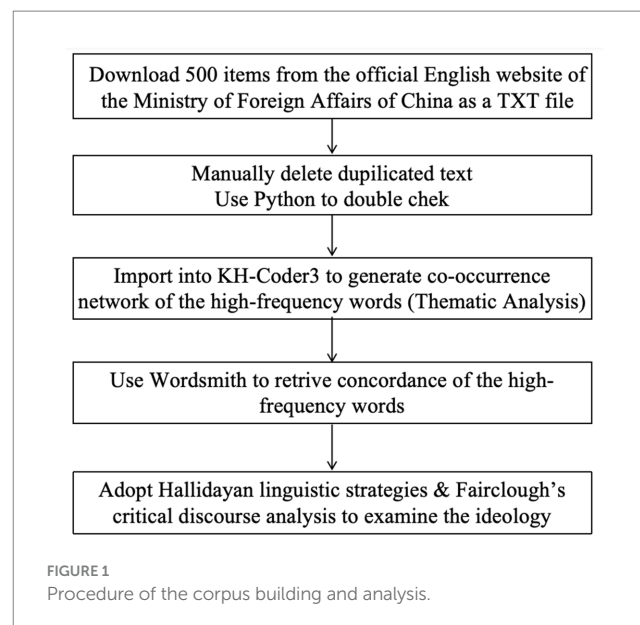
In order to conduct a thorough analysis of the discourse, focusing on the underlying attitude and ideology conveyed in the text, this study adopts [Martin and White \(2005\)](#) framework for appraisal analysis. According to their framework, each segment of text, such as a noun phrase, verb phrase, or clause, that implies an instance of appraisal is referred to as an appraisal group. Within each instance of appraisal, there are typically two primary actors involved: the appraiser and the object of appraisal. The appraisal theory outlined by Martin and White recognizes three key aspects of appraisal between these two actors: Attitude: Attitude represents the emotional essence conveyed by the appraiser toward the object. Various emotions or attitudes such as love, anger, fear, jealousy, excitement, hostility, or satisfaction can be expressed within appraisal groups. Graduation: Graduation pertains to the strength or intensity of the emotion and attitude within each appraisal group. Additionally, the choice of words used to express attitude may also imply a certain level of graduation. Engagement: Sentiments can be expressed directly, indirectly, or attributed to another source. Engagement refers to how speakers or writers express their appraisal or engage in the argument.

## 2.3 Methodology and procedures

By combining corpus linguistics and critical discourse analysis (CDA), this study aims to gain a deeper understanding of language patterns within a specific socio-political context. Corpus linguistics provides the study with efficient methods and tools to analyze a large sample of data, which would be impractical to do manually ([Biber et al., 1999](#); [Partington, 2004](#); [Baker et al., 2008](#)). The use of computer-assisted tools allows for the identification of distinct language patterns that may not be easily discernible through qualitative analysis of a small text sample ([Morley and Bayley, 2009](#)). On the other hand, critical discourse analysis (CDA) contributes to the study by providing the necessary theories and methods to interpret the data. CDA examines discourse within its socio-historical context and analyzes texts at multiple levels, including topics/themes, discourse strategies, and linguistic means and realizations ([Morley and Bayley, 2009](#); [Richards and Schmidt, 2010](#); [Mautner, 2016](#)). This approach allows for a comprehensive analysis of the language patterns and their underlying socio-political factors ([Baker, 2006](#)).

To analyze the themes, the study employs the text-mining software KH-Coder, which has been demonstrated to be effective in quantitative content analysis ([Higuchi, 2016, 2017](#)). This software performs a co-occurrence network analysis, which identifies high-frequency words in the corpus. The analysis generates a network diagram that visually displays words with similar appearance patterns, connected by lines. This helps to identify the prominent language patterns and their relationships within the corpus.

In addition to KH-Coder, the study also utilizes Wordsmith Tools 7.0, a software that aids in the identification of discursive strategies employed to construct each theme. Through a close analysis of the concordance lines, the study can examine how specific language



choices and patterns contribute to the construction of meaning within each theme ([Figure 1](#)).

Overall, the combination of corpus linguistics and critical discourse analysis provides a robust framework for analyzing language patterns within a socio-political context. The use of computer-assisted tools enhances the efficiency and accuracy of the analysis, while the theoretical insights from CDA help to interpret and explain the findings. This interdisciplinary approach allows for a comprehensive understanding of the language patterns and their socio-political implications.

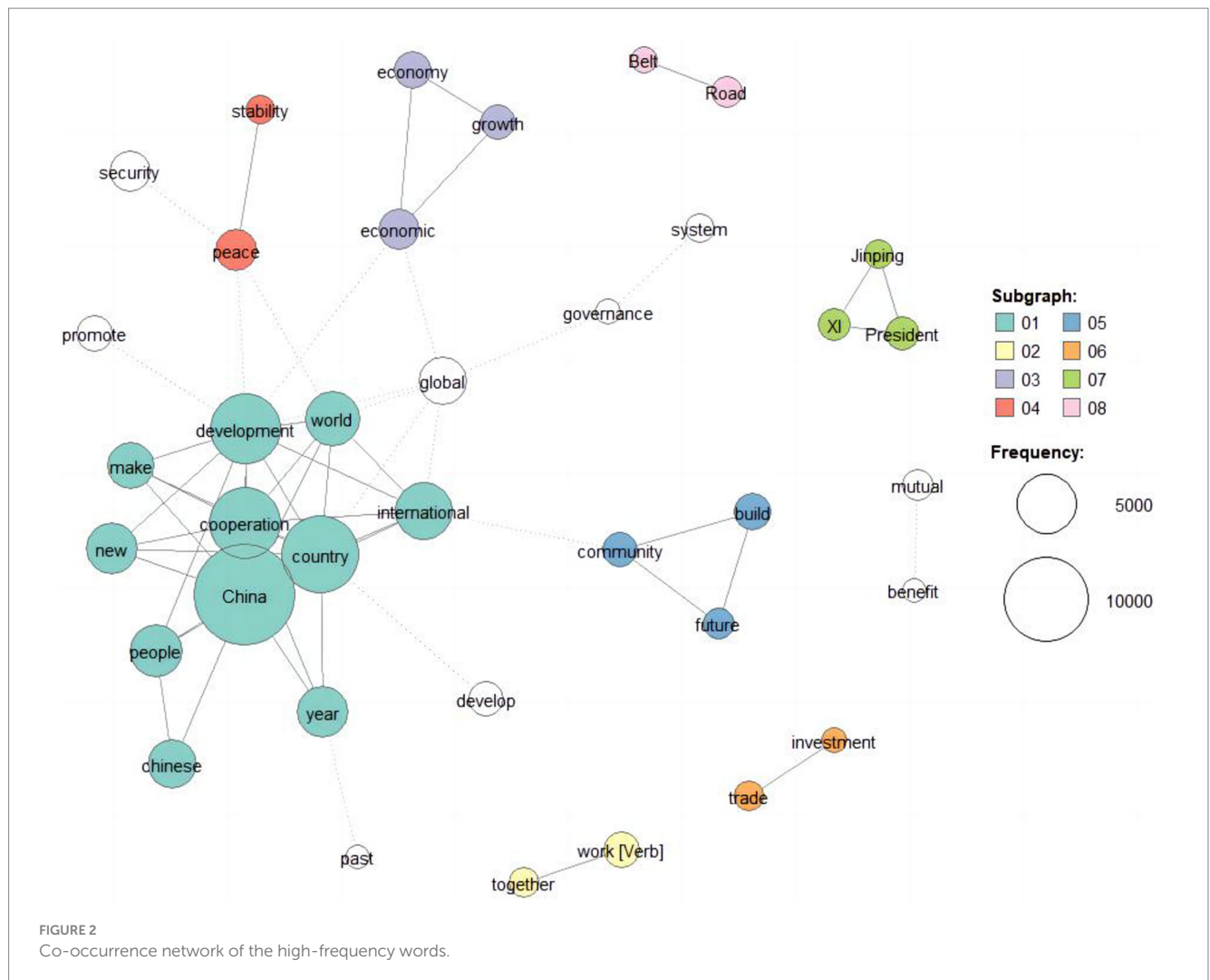
## 3 Themes

[Figure 2](#) presents an intriguing visualization of the co-occurrence network formed by high-frequency words in the context of CODS. This network analysis reveals that these co-occurring tokens can be categorized into eight distinct clusters, each representing a different thematic focus, which could answer RQ1.

Category 1, as depicted in [Figure 2](#), explores China's active engagement with the international community and its tireless efforts to foster cooperation and promote global development. This category signifies China's commitment to playing a constructive role on the world stage and highlights its diplomatic endeavors aimed at forging stronger ties with other nations. Moving on, Category 2 places significant emphasis on the collaborative aspect, emphasizing the importance of working together toward common goals. It underscores the notion that collective efforts and partnerships are crucial for addressing global challenges and achieving shared prosperity. Conversely, Category 3 revolves around the promotion and facilitation of economic growth. The words clustered in this category likely pertain to China's economic policies, trade relations, and initiatives to enhance economic cooperation, both regionally and globally.

Category 4, as evident from the network, underscores the paramount importance of peace, stability, and security. It suggests that discussions involve themes related to conflict resolution,





international security, and the maintenance of peaceful relations among nations. Shifting focus, Category 5 draws attention toward the establishment of a future community. The words clustered in this category may indicate China's vision of a harmonious and prosperous global community, encompassing diverse nations and cultures, and working toward a shared future. Category 6 delves into the realm of investment and trade, indicating the relevance of economic activities, investment strategies, and trade cooperation within the context under examination. This category likely captures discussions related to China's role as a major player in the global economy. Category 7, as highlighted by Figure 2, specifically focuses on the role and actions of Chinese President Xi Jinping. This category suggests that President Xi's leadership and policies are central to the discussions, highlighting his influence and the significance of his decision-making. Lastly, Category 8 delves into the intricacies of the Belt and Road Initiative (BRI). The words clustered in this category likely pertain to China's ambitious infrastructure and development project, which aims to foster connectivity, trade, and economic cooperation across regions spanning Asia, Europe, Africa, and beyond.

Overall, the co-occurrence network presented in Figure 2 provides valuable insights into the thematic landscape and key areas of focus within CODS. It reveals the multidimensionality of the discussions,

ranging from China's international engagement to economic growth, peace and security, future visions, and the role of President Xi Jinping, as well as the significance of the Belt and Road Initiative.

## 4 Discussion and analysis

The subsequent sections will delve into the seven themes revealed in CODS and conduct an analysis of the language patterns employed, as well as the socio-political factors that underlie them. These themes encompass China's Engagement with the International Community, Promotion and Facilitation of Economic Growth, Peace, Stability, and Security, Establishment of a Future Community, Investment and Trade, President Xi Jinping, and The Belt and Road Initiative.

### 4.1 China's engagement with the international community

China has recently become a key provider of development cooperation in the world (Kolmas, 2016; Han, 2017; Chao, 2021). The manifestation of this phenomenon within the discourse can be effectively demonstrated through the explicit acknowledgment of

collaborative endeavors involving multiple stakeholders, as well as the comprehensive elucidation of collocations.

#### 4.1.1 Extract 1

This injected strong positive energy of China into the international cooperation on development. It wrote a splendid chapter in the world history of development (*Implement the New Development Agenda and Open Up New Horizons*, 2016).

Extract 1 exhibits a positive attitude toward China's contribution to international cooperation on development. The phrase "strong positive energy" implies a favorable evaluation of the impact. The sentence shows a high level of engagement with the topic of international cooperation on development. The discourse contends that China's contribution as a notable event in the history of development, emphasizing its importance and relevance. In fact, China believes it has the capacity to maintain its position as a prominent force in promoting a diverse global economic structure that benefits both developing and high-income nations in multiple ways (Lin, 2011). This involvement has yielded a multitude of benefits and advancements, fostering collaboration and progress among nations.

#### 4.1.2 Extract 2

We have developed greater synergy between our development strategies and embarked on a path of win-win cooperation with distinctive features (*Two Decades of A Shared Journey toward New Heights in the New Era – Commemorating the 20th Anniversary of The Forum on China-Africa Cooperation*, 2020).

Extract 2 conveys a positive attitude toward the development strategies and win-win cooperation. The use of phrases like "greater synergy" and "win-win cooperation" implies a favorable evaluation of the outcomes. It demonstrates a high level of engagement with the topic of development strategies and cooperation. It emphasizes the active involvement and effort put into developing the synergy and embarking on the path of win-win cooperation. The sentence generates a sense of optimism and positivity. The mention of "win-win cooperation" indicates mutual benefits and positive outcomes for all parties involved. It conveys the idea of collaboration and shared success. In fact, China's success can largely be attributed to its effective implementation of "good neighbor diplomacy" strategies, such as the "win-win" approach and policies promoting reform and openness (Womack, 2013).

#### 4.1.3 Extract 3

We need to act with a sense of responsibility and unity, and work together to foster a community of life for man and Nature (*For Man and Nature: Building a Community of Life Together*, 2021).

#### 4.1.4 Extract 4

China chose not to stand idly by but to work together with other countries to tide over rough times.

Extract 3 conveys a sense of responsibility and urgency. It implies that it is important and necessary for "We" to act and work together. The phrase "with a sense of responsibility and unity" intensifies the evaluation of the desired actions. It emphasizes the need for individuals to take responsibility and unite in their efforts. The sentence evokes a sense of importance and concern. The mention of "fostering a community of life for man and Nature" suggests a caring

and nurturing attitude toward the environment and the well-being of both humans and nature. In fact, China's policies on environmental protection and sustainable development hold significant importance for both China and the global community (Zhang and Wen, 2008). Extract 4 conveys a positive attitude toward China's proactive approach. The use of phrases like "not to stand idly by" and "work together with other countries" implies a favorable evaluation of the chosen action. The sentence demonstrates a high level of engagement with the topic of cooperation and resilience. It highlights the active involvement of China and its willingness to work alongside other countries. The sentence generates a sense of determination and solidarity. The mention of "tide over rough times" suggests a challenging period or crisis that requires collective action. It conveys a positive emotional impact, emphasizing the resolve to overcome difficulties. In fact, China has established strategic partnerships with nearly a quarter of the countries worldwide (Feng and Huang, 2014).

## 4.2 Promotion and facilitation of economic growth

In the discourse, there is a clear emphasis on the growth of both China's economy and the global economy. China, as an aspiring economy (Zhao, 2018; Bruton et al., 2021), has been diligently focusing on its economic growth. Also, depending on China's continued economic growth in the coming decades, China will affect the rest of the world economy (Jin et al., 2016).

#### 4.2.1 Extract 5

It is essential that we keep China's economic growth on a steady course (*Premier Li Keqiang Meets the Press*, 2020).

#### 4.2.2 Extract 6

We will do our utmost to keep China's economic growth stable and make steady progress (*Premier Li Keqiang Meets the Press*, 2020).

Extract 5 expresses a positive attitude toward the importance of keeping China's economic growth on a steady course. The word "essential" indicates the speaker's evaluation that it is crucial for this action to happen. The use of "essential" implies a strong degree of importance or necessity, indicating a high graduation in the evaluation. The speaker positions themselves as being responsible for the action by using the pronoun "we." This suggests a personal involvement and commitment to the task.

Extract 6 expresses a positive attitude toward the actions of keeping China's economic growth stable and making steady progress. The phrase "do our utmost" indicates a strong commitment and determination, reflecting a positive evaluation of the speaker's efforts. The use of "utmost" implies a high degree of effort and commitment, indicating a strong graduation in the evaluation. The speaker positions themselves and others (we) as actively involved in the actions. The phrase "our utmost" shows personal engagement and a sense of responsibility.

Overall, the emphasis on sustaining stable economic growth in China, as highlighted in both Extract 5 and Extract 6, underscores the significance of this objective for the country's overall development and prosperity. The stability of China's economic growth is of utmost importance for the country's overall development and prosperity and also for the whole world (Ding and Tay, 2016). A steady course ensures

that the economy remains on track, avoiding sudden fluctuations or downturns that could have adverse effects on various sectors and the livelihoods of the people.

### 4.3 Peace, stability, and security

China collaborates with multiple nations to promote peace and stability in various regions, including Russia, Africa, and others (Moller-Loswick et al., 2015; Adhikari, 2021; Ling, 2021). This commitment is further evident in China's diplomatic discourse.

#### 4.3.1 Extract 7

At the ninth Beijing Xiangshan Forum held on 22 October 2019, Vice Foreign Minister Le Yucheng pointed out that providing peace, security and a happy life for all the Chinese people, or one fifth of the world's population, is in itself a major contribution by China to world peace and development (*Le Yucheng: China Is the Safest Country in the World*, 2019).

Extract 7 expresses a positive attitude toward China's contribution to world peace and development. It portrays China's actions as significant and beneficial. The adjective "major" is used to intensify the contribution, indicating the high degree of significance attributed to China's role in providing peace, security, and a happy life for its people. The statement engages the reader or listener by highlighting the scale of the Chinese population ("one-fifth of the world's population"), emphasizing the magnitude of the impact and the significance of China's efforts. The discourse showcases China's belief that providing peace, security, and a happy life for its people is a significant contribution to world peace and development. It reflects China's commitment to its citizens' well-being and its desire to play a constructive role in global affairs. This corresponds to Xi Jinping's vision of the "Chinese Dream" in relation to Chinese Foreign Policy, wherein the focus has shifted from maintaining a low-key approach to actively displaying and utilizing capabilities while striving for leadership, particularly within the region (Sørensen, 2015).

#### 4.3.2 Extract 8

All in all, China will always be a contributor to world peace, facilitator of global development and proponent of a just and reasonable international order (*Join Hands to Create a Bright Future of Peace and Prosperity*, 2016).

Extract 8 expresses a positive attitude toward China, portraying it as a consistent contributor to world peace, a facilitator of global development, and a proponent of a just and reasonable international order. It suggests that China plays a significant and positive role in these areas. The adjectives "always" and "just and reasonable" are used to intensify China's role and the nature of the international order it supports. They convey a strong and unwavering commitment on the part of China. The statement engages the reader or listener by presenting China's role as an ongoing and continuous contribution to world peace, global development, and a just international order. It implies that China's actions align with widely shared values and aspirations. It highlights China's commitment to contributing to world peace, facilitating global development, and advocating for a just and reasonable international order. This statement reflects China seeks to play a more responsible and cooperative role in international affairs (Gill and Huang, 2023).

#### 4.3.3 Extract 9

We will stick to the principle of seeking progress while maintaining stability, ensure the continuity and stability of macro-control policies and adopt pre-adjustment and fine tuning at a proper time within a proper range (*Enhance ASEAN Plus Three cooperation*, 2014).

Extract 9 expresses a positive attitude toward the principle of seeking progress while maintaining stability. It positions it as a guiding principle and implies that it is valued and considered essential for effective governance. The adjectives "proper" and "fine" are used to qualify the timing and range of the pre-adjustment and fine-tuning of macro-control policies. This suggests a careful and precise approach, indicating an intention to make adjustments within appropriate boundaries. The statement engages the reader or listener by highlighting the commitment to continuity and stability in macro-control policies. It implies a proactive stance toward policy adjustments while ensuring stability and minimizing disruptions (Qin, 2014).

#### 4.3.4 Extract 10

Countries must work together for their national and regional security through dialog and cooperation, and put equal emphasis on development and security, so as to eventually achieve enduring peace and security for all (*China: A Source of Certainty and Stability in a Changing World*, 2019).

Extract 10 expresses a positive attitude toward collaboration, dialog, cooperation, and the equal emphasis on development and security. It suggests that these actions and approaches are valued and necessary for achieving peace and security. The adjectives "national and regional," "equal," and "enduring" are used to intensify the importance and scope of security, development, and peace. They indicate a strong commitment to comprehensive security and long-lasting outcomes. The statement engages the reader or listener by emphasizing the need for countries to work together through dialog and cooperation. It implies that active participation and collaboration are fundamental for achieving the desired peace and security.

Overall, Extract 7 highlights Vice Foreign Minister Le Yucheng's statement at the Beijing Xiangshan Forum, emphasizing China's contribution to world peace and development through providing peace, security, and a happy life for its citizens. This reflects China's belief in the interconnectedness of domestic and global peace and its aspiration to be a positive force in the world (Buzan, 2010). Extract 8 asserts that China will consistently contribute to world peace, facilitate global development, and advocate for a just and reasonable international order. It positions China as a proactive and responsible global actor, committed to maintaining stability, supporting development, and promoting fairness in global governance. Extracts 9 and 10 further emphasize the importance of stability, collaboration, and balancing development and security for achieving enduring peace and security. The discourse portrays China as a committed partner in global affairs, working toward a harmonious and prosperous world (Jisi, 2011).

### 4.4 Establishment of a future community

The People's Republic of China (PRC) is currently undertaking a global initiative known as the "community of shared future for humankind," which has the potential to significantly influence the

future global order. This concept encompasses multilateral cooperation in various domains, including the economic, political, humanitarian, and security spheres (Ma and Ma, 2018; Semenov and Tsvyk, 2019). This concept is prominently reflected in diplomatic discourse.

#### 4.4.1 Extract 11

China is firmly committed to pursuing the peaceful development path, maintaining the international order with the purposes and principles of the UN Charter at its core, fostering a new type of international relations of win-win cooperation, and building a community of shared future for all mankind (*Jointly Create a Better Future of Peace and Prosperity for Asia Through Dialogue and Consensus*, 2016).

Extract 11 expresses a positive attitude toward China's commitment to the mentioned principles and objectives. It positions them as essential and desirable for promoting peace, cooperation, and shared well-being. The adverbs "firmly" and "new" are used to intensify China's commitment and the nature of the international relations being fostered. They convey a strong and unwavering dedication to these ideals. The statement engages the reader or listener by highlighting China's active role in pursuing the peaceful development path, maintaining the international order, fostering cooperation, and building a community of shared future. The concept of a community of shared future for all mankind, as advocated by China, emphasizes the importance of global cooperation and mutual benefits for all nations. It promotes the idea that countries should work together to address common challenges and achieve common development (Xiaochun, 2018).

#### 4.4.2 Extract 12

In building a community of shared future for mankind, China encourages all countries to coexist peacefully, engage in sound interaction and seek win-win cooperation (*Work Together to Create a Community of Shared Future for Mankind*, 2016).

Extract 12 expresses a positive attitude toward the principles of peaceful coexistence, sound interaction, and win-win cooperation. It positions them as desirable and beneficial for fostering a community of shared future for mankind. The adjectives "peacefully," "sound," and "win-win" are used to intensify the nature of coexistence, interaction, and cooperation. They suggest a preference for harmonious relationships and mutually beneficial outcomes. The statement engages the reader or listener by emphasizing China's encouragement for all countries to adopt these principles. It implies an active role in promoting cooperation and a sense of shared responsibility for building a community of shared future.

The discourse constructs China's image in peaceful coexistence, sound interaction and win-win cooperation. China encourages countries to peacefully coexist, respecting each other's sovereignty and territorial integrity (Li and Worm, 2011). This principle emphasizes the importance of resolving conflicts through dialog and negotiation rather than resorting to force. Besides, China emphasizes the need for countries to engage in constructive and meaningful interactions (Mazarr et al., 2018). This involves promoting exchanges and cooperation in various fields, such as politics, economy, culture, and science, to foster mutual understanding and trust. Also, China advocates for win-win cooperation, where all parties involved benefit from collaboration (Danzhi, 2019). This principle rejects zero-sum

thinking and encourages countries to work together to achieve common development and prosperity.

### 4.5 Investment and trade

China has made substantial investments both in its domestic market and on the international stage. The growth in investments in goods has been remarkable across various countries, particularly in investment-intensive economies like China, since the 1980s (Guo et al., 2021). As a result, China has emerged as a significant source country for outward foreign direct investment flows (Sauvant, 2016).

Since the implementation of its reform and opening-up policies, China has consistently witnessed remarkable growth in its foreign trade (Jin et al., 2016). In recent years, the nation has attained the position of the world's largest exporter and the second largest importer of goods and commodities. The investment and trade of China have become prominent themes in diplomatic discourse.

#### 4.5.1 Extract 13

China's door of opening-up will never close. Our policy toward foreign investment will not change. Our protection of legitimate rights and interests of foreign-invested enterprises will not change (*Remarks by H.E. Xi Jinping President of the People's Republic of China At the Opening Ceremony of the Second World Internet Conference*, 2015).

Extract 13 expresses a positive attitude toward maintaining an open-door policy and a consistent approach toward foreign investment. It positions these policies as essential and valuable for promoting cooperation and protecting the interests of foreign-invested enterprises. The phrases "never close" and "will not change" intensify the commitment and assurance expressed in the statement. They convey a strong sense of permanence and stability in these policies. The statement engages the reader or listener by emphasizing China's firm position and assurance regarding the mentioned policies. It implies a sense of reliability in China's approach to foreign investment (Shan et al., 2012).

#### 4.5.2 Extract 14

President Xi has made clear repeatedly that the door of reform and opening up will not close, but will only open wider and wider. We welcome foreign investment to China. At the same time, we also encourage Chinese companies to explore the global market (*Transcript of Vice Foreign Minister Le Yucheng's Exclusive Interview with the Financial Times*, 2018).

Extract 14 expresses a positive attitude toward the door of reform and opening up, foreign investment, and Chinese companies exploring the global market. It positions them as essential and beneficial for promoting economic growth, international cooperation, and global engagement. The phrases "not close," "open wider and wider," and "welcome" intensify the commitment, expansion, and openness expressed in the statement. They convey a sense of continuous progress and inclusivity. The statement engages the reader or listener by referencing President Xi's repeated emphasis and the welcoming attitude toward foreign investment and the encouragement for Chinese companies (Shan et al., 2012). It implies an active role in promoting collaboration, economic development, and global integration.



### 4.5.3 Extract 15

We have pursued the free trade strategy at a faster pace to build a free trade network with focus on China's neighbors and covering the whole world (2015, *A Year of Flying Colors for Pursuing Major-Country Diplomacy with Distinctive Chinese Features – Speech by Foreign Minister Wang Yi*, 2015).

For the trade, Extract 15 expresses a positive attitude toward the pursuit of a free trade strategy and the goal of building a free trade network. It positions them as important and beneficial for promoting economic integration, regional cooperation, and global trade. The mention of pursuing the free trade strategy at a “faster pace” indicates an intensification in China's efforts. It suggests an increased commitment and urgency in achieving the desired goals. The statement engages the reader or listener by emphasizing China's active pursuit of the free trade strategy and the goal of building a comprehensive network. It implies a proactive role in promoting economic cooperation and connectivity (Wolff, 2016).

### 4.5.4 Extract 16

We need to promote global trade and investment to generate growth and build an open world economy (*Remarks by H.E. Xi Jinping President of the People's Republic of China On the 2016 G20 Summit in China At the Working Lunch of the G20 Summit*, 2015).

Extract 16 expresses a positive attitude toward the promotion of global trade and investment. It positions them as essential and beneficial for generating economic growth and establishing an open world economy. It suggests that these actions are seen as important drivers of prosperity and global economic integration. The use of the word “need” implies a sense of urgency and importance in promoting global trade and investment. The statement engages the reader or listener by presenting a call to action to promote global trade and investment. It implies an active role for individuals, organizations, or governments in facilitating these processes. It encourages participation and involvement in building a more interconnected and open economy.

## 4.6 President Xi Jinping

Since assuming the position of General Secretary of the Communist Party of China (CPC) in 2012, Xi Jinping has overseen a significant series of political transformations within the country. Under his leadership, the status of Xi Jinping as the Core Leader of the Party has been instrumental in reinforcing the principles of centralized and unified governance within the Central Committee of the CPC (CPCCC). This has led to a notable enhancement of the Party's leadership structure and its cohesiveness (Guo, 2020). The leadership of President Xi Jinping can be seen in the discourse.

### 4.6.1 Extract 17

Under the strong leadership of the CPC Central Committee with Comrade Xi Jinping at its core, the “acceleration button” was pressed in China's modernization drive (*Chinese Modernization: New Opportunities for the World*, 2023).

Extract 17 expresses a positive attitude toward the leadership of the CPC Central Committee with Comrade Xi Jinping at its core. It positions them as strong and effective in driving China's modernization efforts. The use of the term “acceleration button” suggests a proactive

and decisive approach. The phrase “acceleration button” indicates an intensification or escalation in China's modernization drive. It implies a deliberate and focused effort to expedite progress. The statement engages the reader or listener by highlighting the central role of the CPC Central Committee, with Comrade Xi Jinping at its core, in pressing the acceleration button. It implies a proactive and hands-on approach to drive China's modernization.

### 4.6.2 Extract 18

It was a choice by history and by the people. With the conviction and responsibility of “serving the people selflessly,” President Xi Jinping is steering Chinese modernization forward and leading us in marching on the right path toward a better future (*Chinese Modernization: New Opportunities for the World*, 2023).

Extract 18 expresses a positive attitude toward President Xi Jinping's leadership and his role in steering Chinese modernization. It positions him as a dedicated and responsible leader who serves the people selflessly. It suggests that his leadership is seen as crucial for achieving a better future for China. The use of phrases like “choice by history and by the people” and “marching on the right path toward a better future” implies a sense of importance, progress, and positive evaluation of President Xi Jinping's leadership. The statement engages the reader or listener by emphasizing the significance of President Xi Jinping's leadership and the sense of responsibility he carries. It suggests that his leadership is actively guiding Chinese modernization and leading the nation toward a better future.

The discourse strategies used in these extracts highlight the central and influential role of President Xi Jinping in driving China's modernization efforts. The language emphasizes his strong leadership and the collective support of the Communist Party of China (CPC) Central Committee. The use of metaphors and positive language portrays President Xi as a selfless leader dedicated to serving the Chinese people and leading the country on the right path toward a better future. Overall, the discourse aims to reinforce President Xi's authority and the legitimacy of his leadership in guiding China's modernization journey (Li, 2016).

## 4.7 The belt and road initiative

The Belt and Road Initiative (BRI) represents China's most significant international economic endeavor, with the goal of promoting economic development across a vast region. This initiative is designed to reshape China's external sector and sustain its robust growth. In addition to its focus on infrastructure development, the BRI encompasses a comprehensive range of activities, such as policy dialog, unimpeded trade, financial support, and people-to-people exchange (Huang, 2016; Liu and Dunford, 2016). The term “Belt and Road Initiative” has consistently featured in the discourse.

### 4.7.1 Extract 19

The Belt and Road initiative is proposed by China, but it is not a “patent” exclusively owned by China. On the contrary, we see it as a symphony and team performance instead of a solo or one-man show. And I am very pleased to see that “One Belt, One Road” has grown to become the shared efforts and aspiration of all populace along its path (*Building the Maritime Silk Road of the 21st Century with Open Mind and Bold Courage*, 2015).



Extract 19 expresses a positive attitude toward the Belt and Road Initiative and its collective nature. It suggests that the BRI is not exclusively owned by China but is seen as a collaborative effort. The use of terms like “symphony” and “team performance” implies a sense of harmony and collaboration among participating countries. The statement includes graduation markers such as “not exclusively owned” and “shared efforts and aspiration.” It suggests that the perspective presented is a departure from the notion of exclusive ownership and emphasizes the collective nature of the BRI. The statement engages the reader or listener by inviting them to perceive the Belt and Road Initiative as a collaborative endeavor rather than a solo effort. It emphasizes the participation and contributions of multiple countries along the BRI path. It seeks to foster a sense of inclusivity and shared aspirations.

#### 4.7.2 Extract 20

We believe that all partners along the routes of the Belt and Road, whether coastal countries or landlocked ones, could make unique contributions to promoting connectivity and international trade, and as equal contributors to and beneficiaries of this initiative, we should all enjoy the rights to participate in the international maritime cooperation (*Building the Maritime Silk Road of the 21st Century with Open Mind and Bold Courage*, 2015).

Extract 20 expresses a positive attitude toward the partners along the Belt and Road routes and their potential contributions to connectivity and international trade. It positions them as equal contributors and beneficiaries of the initiative. It also emphasizes the belief in the rights of all partners to participate in international maritime cooperation. The statement includes graduation markers such as “unique contributions,” “equal contributors and beneficiaries,” and “rights to participate.” It suggests that the perspectives presented are seen as important, significant, and deserving of recognition. The statement engages the reader or listener by inviting them to consider the potential of all partners along the Belt and Road routes and their entitlement to participate in international maritime cooperation. It emphasizes the importance of inclusivity and equal opportunities for all partners.

The discourse strategies used in these extracts highlight the collaborative and inclusive nature of the Belt and Road Initiative (BRI). The Belt & Road Initiative represents China’s most significant international economic endeavor, with the goal of promoting economic growth across a vast region that spans sub-regions in Asia, Europe, and Africa (Huang, 2016). The language emphasizes that the initiative is not solely owned by China but is a collective effort involving multiple countries. The use of metaphors, such as “symphony” and “team performance,” portrays the BRI as a collaborative endeavor rather than a one-man show. The discourse also emphasizes the belief that all countries along the BRI routes, regardless of their geographical location, have the potential to contribute to connectivity and international trade. It suggests that all partners should be considered equal contributors and beneficiaries of the initiative, with the right to participate in international maritime cooperation. Overall, the discourse aims to promote a sense of shared ownership and equal participation in the BRI, highlighting its potential benefits for all involved countries.

## 5 Conclusion

Diplomacy is a fundamental aspect of international relations, involving the management of relations between sovereign states (Berridge and Lloyd, 2012). It is through diplomacy that countries engage with one another, negotiate agreements, resolve conflicts, and promote their national interests on the global stage. China, as a major global power, recognizes the importance of diplomacy in shaping its international image and influencing global perceptions. The country’s diplomatic efforts are aimed at projecting a positive image, promoting its interests, and enhancing its standing in the international community. China’s diplomacy is not limited to bilateral relations with other countries, but also extends to multilateral forums such as the United Nations, where it actively participates in global governance and decision-making processes (Li and Hu, 2017).

Diplomatic discourse is a crucial component of China’s diplomatic efforts. It refers to the language and practices employed by the Chinese government to articulate its international strategies and foreign policies (Li and Hu, 2017). This discourse encompasses a wide range of communication channels, including official diplomatic documents, speeches by national leaders, treaties, agreements, communiques, declarations, statements, and press conferences (Afzaal et al., 2019, 2022). Diplomatic discourse is characterized by its formality and authority. It is the most official and authoritative means of international communication, reflecting the government’s diplomatic priorities and objectives (Wu and Cao, 2011). Through diplomatic discourse, China aims to effectively communicate its policies, intentions, and actions to the international community. It seeks to shape international perceptions, garner support, and influence public opinion in its favor (Jin, 2007).

By engaging in diplomatic discourse, China seeks to build alliances, strengthen partnerships, and promote cooperation with other countries. It also aims to address conflicts and disputes through peaceful means, emphasizing the importance of dialog and negotiation (Du and Mei, 2019). Furthermore, diplomatic discourse serves as a platform for China to assert its role as a responsible global actor. It allows the country to showcase its commitment to international norms, principles, and rules, while also advocating for its own interests (Liu and Yang, 2019; Niu and Relly, 2021). Through diplomatic discourse, China seeks to contribute to global governance, promote regional stability, and address global challenges such as climate change, poverty, and terrorism.

Chinese diplomatic discourse plays a crucial role in shaping China’s international image and promoting its interests on the global stage. It serves as a means for China to convey its positions and attitudes on various issues, allowing the country to engage with other nations and influence international perceptions. China has actively utilized its diplomatic discourse to project itself as a peace-loving nation, a victim of foreign aggression, a socialist country, a stronghold of revolution, an anti-hegemonic force, a developing country, a major power, an international collaborator, and an autonomous actor (Wang, 2003). These narratives have been carefully crafted to align with China’s strategic objectives and to garner support from the international community. By enhancing its diplomatic discourse, China can effectively communicate its ideas, policies, and actions to the international community, thereby shaping international perceptions and gaining support for its initiatives.

This study on Chinese diplomatic speeches is in line with previous scholarly works that underscore the significance of enhancing China's diplomatic capability and refining its discursive framework (Sun, 2020; Sun and Kong, 2020). However, this study uncovers several crucial themes. China's engagement with the international community is characterized by its active participation in global development cooperation, its efforts to foster cooperation and promote development, and its commitment to maintaining stable economic growth. China's role as a key provider of development cooperation has been widely recognized, and its injection of positive energy into international cooperation on development has made a significant impact. The collaborative nature of China's endeavors is emphasized, highlighting the importance of working together to facilitate economic growth and achieve mutual benefits. China's commitment to peace, stability, and security is evident in its active collaboration with other nations to promote global peace and stability. The concept of a community of shared future for all mankind reflects China's belief in the importance of global cooperation and mutual benefits. China's investments and trade initiatives, along with its commitment to an open-door policy, contribute to economic growth and international collaboration. President Xi Jinping's leadership plays a crucial role in driving China's modernization efforts and guiding the nation toward a better future. The Belt and Road Initiative, as a collaborative endeavor, aims to promote connectivity, international trade, and cooperation among participating countries. It represents China's commitment to fostering economic development across a vast region and reshaping its external sector. The initiative encompasses various activities, including policy dialog, unimpeded trade, financial support, and people-to-people exchange.

The analysis of Chinese diplomatic discourse provides valuable insights into China's diplomatic strategies and its international image. It highlights China's commitment to cooperation, development, and peace, as well as its efforts to create a better future for all. These findings have implications for China's diplomatic policies and its interactions with the international community.

Future research could further analyze specific speeches or documents within the corpus to gain a deeper understanding of China's diplomatic discourse. Comparative studies with other countries' diplomatic discourses could also be conducted to explore similarities and differences in their approaches and strategies. Additionally, examining the reception and impact of China's diplomatic discourse on the international stage could provide further insights into its effectiveness and influence.

In conclusion, the analysis of Chinese diplomatic discourse sheds light on China's engagement with the international community, its commitment to cooperation and development, its emphasis on peace and stability, and its efforts to shape a better future. These findings contribute to our understanding of China's diplomatic strategies and its role in the global arena.

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## Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

## Author contributions

ML: Funding acquisition, Writing – review & editing. JY: Funding acquisition, Writing – review & editing. GY: Writing – original draft.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1278240/abstract#supplementary-material>

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# A comparative study of self-praise on English and Chinese social media: strategies, themes, and motivations

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The act of self-praise, a novel and prevalent discourse pattern on social media across different cultures, is still understudied. As such, this study delves into self-praise from linguistic and psychological perspectives by examining and comparing the strategies, themes, and motivations of self-praise on English and Chinese social media. A discourse-based analysis of the data comprising 200 posts from Twitter (English) users and 200 posts from Weibo (Chinese) users revealed that Twitter users favored more unmodified explicit self-praise strategies, while Weibo users opted for more implicit self-praise strategies. Both groups employed explicit self-praise equally, but with different sub-strategies. The most prevalent themes were appearance, competence/performance, skills, virtues, and self-encouragement. Appearance was more dominant among Twitter users, whereas skills and self-encouragement were more popular among Weibo users. Both groups valued competence/performance and virtues, but with different virtues. Twitter users valued cherishing friendship, bravery, and maturity, whereas Weibo users stressed kindness, cherishing kinship, and thoughtfulness. Two semi-structured interviews conducted with six Twitter participants and six Weibo participants indicated that the motivations for online self-praise in both groups were psychological needs such as self-flattery, self-presentation, and self-encouragement, while commercial profit was a motivation only for Weibo participants. This study also discusses the social and cultural factors that may account for these differences and provides implications for future research on online self-praise.

## KEYWORDS

self-praise, social media, discourse analysis, cross-cultural comparison, psychological motivations

## 1 Introduction

English and Chinese are two languages that have been widely studied in pragmatics, mainly because of the large population of their users and the fascinating and different cultures that underlie their politeness (Leech, 2007). Numerous studies have explored and compared various speech acts, especially those related to Brown and Levinson's (1987) face theory such as gratitude, refusal, and requests, in English and Chinese (Zhu, 2017; Chang and Ren, 2020; House and Kádár, 2021; Li, 2022). However, the speech act of self-praise remains relatively understudied (Li and Wu, 2022; Xia and Jiang, 2022; Zhang and Aliya, 2022).



Self-praise is a type of self-presentation that involves disclosing positive information about oneself with the purpose of constructing a favorable self-image, which usually poses a threat to the hearer's face to some extent (Ren and Guo, 2020). In the era of social media, self-praising content has become prevalent, which challenges the existing politeness theories. Therefore, investigating self-praise in online contexts may have pragmatic significance. Driven by this motivation, many studies have examined online self-praise in different contexts and languages and provided valuable insights into this politeness-deviant phenomenon (Dayter, 2014; Matley, 2018; Guo and Ren, 2020; Ren and Guo, 2020; Xia and Jiang, 2022).

However, except for several comparative studies (Ma et al., 2017; Chen and Lunt, 2021; Wan, and Yeung, 2022), few studies have directly compared online self-praise performed by English and Chinese speakers. Moreover, most of the existing literature has focused on the analysis of pragmatic strategies of self-praise employed by netizens and overlooked the themes of and motivations for performing self-praise online, which prevents from a more comprehensive understanding of this phenomenon (Dayter, 2014; Matley, 2018; Guo and Ren, 2020; Ren and Guo, 2020; Xia and Jiang, 2022). Therefore, to fill in these research gaps and provide references for online intercultural communication, this study aims to investigate and compare self-praise in terms of strategies, themes, and motivations in English and Chinese on social media.

## 2 Literature review

### 2.1 Theories in relation to self-praise

The existing literature on self-praise is scarce and scattered across different disciplines. This section reviews some of the relevant theories from sociopsychology and sociolinguistics that can shed light on the phenomenon of self-praise.

One of the sociopsychological perspectives that can be applied to online self-praise is Goffman's (1959) self-presentation theory, which posits that people present themselves in different ways to construct an ideal identity for various purposes, such as obtaining job opportunities or influencing others' impression (Speer, 2012). Self-presentation encompasses several psychological concepts, such as impression management (Pandey, 2022), self-concept (Strimbu and O'Connell, 2019), and self-esteem (Jang et al., 2018). Self-praise is a specific form of self-presentation that involves highlighting one's positive attributes or achievements. Ellis et al. (2002) distinguish self-praise from other types of self-presentation, such as self-enhancement and ingratiation.

Another perspective that can provide more in-depth insights into online self-praise is politeness theory, which originates from sociolinguistics. Politeness theory deals with how people manage their face needs and avoid face-threatening acts in communication. Brown and Levinson (1987) propose one of the most influential models of politeness theory, which consists of three basic notions: face, face-threatening acts, and politeness strategies. Face refers to "the public self-image that every member wants to claim for himself," which can be divided into positive face (the desire for one's wants to be recognized, admitted, praised) and negative face (the hope for one's unwillingness to be refuted, denied, criticized). Self-praise can be seen as a face-threatening act to hearers' positive face, since it implies speakers' superiority over others.

Leech's (1983) politeness principle is another relevant theory from sociolinguistics, which is a continuation and revision of Grice's (1975) cooperative principle. Leech (1983) argues that politeness plays a pivotal role in the establishment and maintenance of harmonious interpersonal relationships, which can be achieved by following six maxims: tact, generosity, approbation, modesty, agreement, and sympathy. The modesty maxim is most related to self-praise, as it states "minimize the expression of praise of self; maximize the expression of dispraise of self." In other words, the modesty maxim encourages speakers to depreciate themselves and evaluate hearers positively. Self-praise clearly violates the modesty maxim in its nature.

The two sociolinguistic theories that focus on the maintenance of hearers' face, but largely neglect the relational and interactional aspects of face, such as the maintenance of speakers' face. To address this gap, Spencer-Oatey (2002) proposes rapport management theory, which accounts for the reciprocal politeness observed in daily communication. According to Spencer-Oatey (2002), communication should achieve a balance between the face needs of speakers and hearers. This implies that speakers should avoid being excessively modest or self-evaluating in a conversation. Self-praise, which involves a high degree of positive self-enhancement, seems to deviate from the essence of rapport management theory as well.

In conclusion, self-praise, as a new and prevalent discourse pattern in social media across the world, seems to contradict some core components of the existing politeness theories to some extent. Therefore, it is significant to explore self-praise in communication, especially in social media contexts.

### 2.2 Studies in relation to online self-praise

This study adopts the definition of self-praise proposed by Ren and Guo (2020), who regard it as a speech act that speakers use to display their valued possessions, such as their appearance, wealth, skills, and virtue. The existing research on self-praise can be divided into two main areas: self-praise in face-to-face communication and self-praise in online communication. The latter area, which is more pertinent to this study and has received growing interest in recent years, will be the main focus of this section. In particular, this section reviews the scarce literature on online self-praise, which is mostly conducted within pragmatics, and which either investigated the pragmatic strategies of a specific group in a single social media platform (Dayter, 2014; Guo and Ren, 2020; Rüdiger and Dayter, 2020) or explored those of the general users in one specific social media platform (Matley, 2018; Tobback, 2019; Ren and Guo, 2020; Xia and Jiang, 2022; Zhang and Aliya, 2022).

Concerning the self-praise strategies used by certain groups, Dayter (2014) conducted a pioneering study by examining how ballet students showcased their valued possessions on Twitter. She collected 1,000 posts and identified five self-praise strategies that the students employed to mitigate the potential negative effects of self-praise: providing a disclaimer, diverting the attention, making self-deprecating remarks, acknowledging hard work, and presenting it as a third-party complaint. She claimed that self-praise was a discursive practice to construct a 'hero' identity of a professional dancer. Rüdiger and Dayter (2020) later investigated another group: pick-up artists. By analyzing 38 texts, they identified three main types of self-praise strategies used by pick-up artists on forums: brag statements, proxy

brags, and evidential brags. They also analyzed the reactions to self-praise and found that it was not challenged as it was part of pick-up artists' interactional norms. Self-praise was also a way to construct the image of a successful seducer. Guo and Ren (2020) identified celebrities as another specific group that employed self-praise strategies on Weibo, a popular microblogging platform in China. They found three main categories of self-praise strategies after analyzing 300 posts: modified explicit self-praise, implicit self-praise, and explicit self-praise without modification. These studies showed that although they all tried to balance between self-promotion and politeness, different groups have different preferences for self-praise strategies. Ballet students and Chinese celebrities preferred indirect strategies (e.g., adding disclaimer, modified explicit self-praise), while pick-up artists liked direct strategies (e.g., brag statements).

For self-praise strategies employed by general users, Matley (2018) investigated how Instagram users performed self-praise and face work in their self-presentation when they posted photos that highlighted their achievements or qualities. He analyzed 200 posts and discovered that the hashtag #humblebrag was employed as an indirect and implicit self-praise strategy, which could be interpreted as a face-saving act that respected the audience's negative face. Tobback (2019) examined self-praise on another online platform, LinkedIn, by comparing 90 LinkedIn summaries from French and US users. He revealed that both direct and indirect self-praise strategies were used on LinkedIn, but there were cultural differences in the degree of modification. Specifically, French users tended to use more indirect and softening strategies, while US users preferred more direct and strengthening strategies. In the Chinese context, Ren and Guo (2020) developed a detailed taxonomy of self-praise strategies used by Chinese netizens on Weibo, based on 300 posts. Their taxonomy consisted of three main categories: explicit self-praise without modification, modified explicit self-praise, and implicit self-praise, each with several sub-strategies. Applying this taxonomy, Zhang and Aliya (2022) explored the self-praise strategies on Xiaohongshu, a newly-emerged social media platform in China, using 300 posts. Xia and Jiang (2022) extended the research on online self-praise in China by examining another aspect besides strategies, namely, themes. They analyzed 623 posts on Weibo and found that there was a correlation between strategies and themes. This was a breakthrough compared with previous studies that only focused on self-praise strategies.

## 2.3 Research gaps and this study

The existing studies have made valuable contributions to the understanding of self-praise in social media, which is a face-enhancing but hearer-unfriendly discourse pattern that deviates from the conventional politeness theory. However, there are still some gaps in the literature that need to be addressed.

First, the classification of pragmatic strategies of self-praise in the existing literature is somewhat unclear and overlapping in dimension. For example, Ren and Guo (2020) included both "reference to hard work" and "praise from a third party" as subcategories of "modified explicit self-praise." However, the former is related to "strategies," while the latter seems more related to "themes" or "topics" rather than "strategies." Therefore, this classification needs to be revised to be more dimensionally consistent. Second, previous studies have mainly focused on pragmatic strategies in social media, and few studies have

systematically explored the topics or themes of self-praise. Moreover, there is a lack of empirical research on the motivations that drive users to perform self-praise or what users want to achieve by performing self-praise. Third, few studies have compared self-praise used by different users with different languages, which could enhance the understanding of different languages from a pragmatic perspective, and provide useful references for people who want to better assimilate into the cultures that different languages originate from. English and Chinese are the two languages with the most speakers in the world. Therefore, it is pragmatically significant to compare self-praise between English and Chinese.

To fill in the above-mentioned gaps in the literature, this study aims to achieve the following objectives: first, to investigate self-praise collected from Twitter and Weibo, two popular social network microblog platforms among English and Chinese speakers, respectively; second, to compare the strategies, themes, and motivations of self-praise performed by Twitter and Weibo users; and third, to explain the possible reasons for the differences. More specifically, this study is guided by the following research questions:

RQ1: What are the differences in strategies of self-praise between Twitter users and Weibo users?

RQ2: What are the differences in themes of self-praise between Twitter users and Weibo users?

RQ3: What are the differences in motivations for self-praise between Twitter users and Weibo users?

## 3 Materials and methods

### 3.1 Data collection and participants

This study employed data from Twitter and Weibo to investigate the strategies and themes of online self-praise. The search function and the hashtag feature of both platforms enabled the researchers to access public posts related to specific topics (Page, 2012; Sullivan, 2014). These features also helped the researchers to adopt an emic perspective and reduce their subjectivity in identifying self-praise posts. The keywords "self-praise," "self-compliment" (without "-"), and "humblebrag" were used to search for posts on Twitter, and their Chinese equivalents "自夸," "自我表扬," and "自我赞赏" were used on Weibo. Following Matley (2018), 200 relevant posts from each platform were manually collected as the dataset. The 200 posts from Twitter came from 187 different users, while the 200 posts from Weibo came from 177 different users. To focus on ordinary users rather than celebrities, we selected the posts from users who had less than 200 followers, which was a stricter criterion than Ren and Guo (2020) who used 300 followers as the threshold.

To explore the motivations for online self-praise, we conducted online semi-structured interviews with 12 participants whose posts were in our dataset. The participants included 6 Twitter users (A-F; 3 males, 3 females; age: Mean = 25.3, SD = 4.72) and 6 Weibo users (1-6; 3 males, 3 females; age: Mean = 25.8, SD = 5.42). Specifically, we first contacted more than 30 users on each platform and received positive responses from 13 Twitter users and 8 Weibo users. Then we randomly selected 6 positive responders from each platform and interviewed

them via video call on Instagram for Twitter users and on Wechat for Weibo users. The interview questions were: “why do you perform self-praise on Twitter? Can you give some reasons” for Twitter users, and “您为什么要在微博自夸呢? 能给出一些原因吗?” for Weibo users. With their consent, we recorded and transcribed the interviews that lasted about 30 min each. All participants signed the informed consent form. The Ethics Committee of Hunan Normal University approved this study.

### 3.2 Data coding and analysis

As the above description shows, the taxonomy in previous work is likely less clear. Therefore, we slightly modified the coding scheme developed by Ren and Guo (2020) to make it dimensionally clearer and suitable for our data (see Table 1). In the following explanation, we first provide English examples, followed by Chinese examples.

Unmodified explicit self-praise refers to praise of oneself without modified words to reduce the intended self-aggrandization. [e.g., I’m so beautiful! (我太漂亮了!)]. Modified explicit self-praise refers to praise of oneself with modified words to attenuate the intended self-aggrandization, consisting of five sub-strategies. (1) Praise from a third party is defined as praise of oneself by quoting other people’s evaluation [e.g., My colleague said I was trustworthy. (我同事说我值得信赖。)]; (2) disclaimer is used to deny some responsibility for praise of oneself, often marked by a negation [e.g., I am not bragging, but my skin is quite good! (不是我自夸, 我皮肤太好了!)]; (3) change of praise focus is operationalized as praising other people or things associated with digital users to imply a positive self-image [e.g., My dad is handsome, and I look just like him! (我爸好帅, 我俩长得很像!)]; (4) comparison between aspects of oneself is achieved by comparing two aspects of digital users themselves, usually with self-deprecation to show humility [e.g., I’m careless, but I’m kind. (虽然我很马虎, 但挺善良。)]; and (5) comparison between oneself and others is realized by comparing digital users themselves with others [e.g., I’m better than most people. (我比多数人强。)].

Implicit self-praise is defined as the post in which the semantic meaning of the text and the hashtag self-praise are mismatched at a surface level, consisting of three sub-strategies. (1) Self-praise as question refers to the post in which questions are raised to highlight commendable qualities to hearers [e.g., Tell me if I am the most humorous person? (告诉我, 我是不是最幽默的?)]; (2) self-praise

as narration refers to the post in which digital users seemingly narrate the events or feelings, but their intention of self-praise is hidden in their narration [e.g., People can hate me but I would move on. (人们可以讨厌我, 但我会继续前行。)]; and (3) self-praise as sharing refers to irrelevant words combined with photos or hyperlinks in which the praiseworthiness of digital users is implied [e.g., The sun is so shining today (a photo of blue sky is added). (今日阳光明媚。)]. As many posts referred to multiple strategies, we coded each strategy separately, and did the same for coding themes.

We followed the six steps of thematic analysis (Braun and Clarke, 2006) to analyze the self-praise posts using NVivo 11.0. The steps were: familiarization, initial coding, searching for themes, reviewing themes, defining themes, and reporting themes. The first and second authors coded the data for strategies, themes, and motivations independently. They used their own interpretations to code themes and motivations, as there was no prior literature to guide them. For instance, they coded the post “I just want to show my followers that I’m a good person” as “self-presentation” motivation. They initially generated different numbers of codes for each category on Twitter and Weibo (Twitter: 212 and 206 codes for strategies, 215 and 208 codes for themes, and 18 and 21 codes for motivations; Weibo: 231 and 224 codes for strategies, 210 and 213 codes for themes, and 28 and 25 codes for motivations). They discussed and resolved their discrepancies and reached an agreement on 209 codes for strategies, 213 codes for themes, and 19 codes for motivations on Twitter, and 227 codes for strategies, 211 codes for themes, and 27 codes for motivations on Weibo. They also agreed on most of the names for the codes. The main disagreement was on how to label a group of codes related to the themes of self-praise. These codes could be labeled as either “performance” or “competence,” depending on the perspective. They sought the opinion of the third author, who suggested using the combined term “performance/competence” for this group of codes.

We need to point out several issues. First, we did not modify grammatical errors or improper expressions in the posts and interviews to ensure the authenticity of the data. Second, to protect their privacy, we removed all identifiable information such as users’ nicknames and IDs (Georgakopoulou, 2017). Third, we used English tweets for our data, but not all tweeters are from English-speaking countries. Also, online self-praise may vary among native English speakers due to different cultural norms (e.g., America versus Britain). This may limit the validity of our findings somewhat. Fourth, we used SPSS 26.0 to perform quantitative analyses to determine the differences and similarities between the two groups with the alpha level at 0.05.

## 4 Results

### 4.1 Strategies of self-praise

To answer RQ1, we compared self-praise strategies using 200 posts from Twitter and Weibo. We coded the posts for three types of self-praise strategies: unmodified explicit, modified explicit, and implicit. We found that Weibo users employed more diverse strategies than Twitter users, as shown in Table 2.

A Chi-square test revealed a significant difference between the two platforms in terms of self-praise strategies (Chi-square = 10.5,  $df=2$ ,  $p<0.05$ ). Further analysis showed that Twitter users used more

TABLE 1 Taxonomy of self-praise strategies.

Strategies	Sub-strategies
Unmodified Explicit self-praise	/
	Praise from a third party
	Disclaimer
Modified explicit self-praise	Change of praise focus
	Comparison between aspects of oneself
	Comparison between oneself and others
	Self-praise as question
Implicit self-praise	Self-praise as narration
	Self-praise as sharing

TABLE 2 Frequency and percentage of self-praise strategies.

Strategies	Twitter users		Weibo users	
	Frequency	Percentage	Frequency	Percentage
Unmodified explicit self-praise	129	61.72%	110	48.46%
Modified explicit self-praise	54	25.84%	65	28.63%
Praise from a third party	6	2.87%	16	7.05%
Disclaimer	9	4.39%	21	9.25%
Change of praise focus	25	11.96%	26	11.45%
Comparison between aspects of oneself	3	1.44%	4	1.76%
Comparison between oneself and others	11	5.26%	0	0%
Implicit self-praise	26	12.44%	52	22.91%
Self-praise as question	4	1.91%	3	1.32%
Self-praise as narration	19	9.09%	47	20.70%
Self-praise as sharing	3	1.44%	2	0.88%
Total	209	100%	227	100%

unmodified explicit self-praise, while Weibo users used more modified explicit and implicit self-praise.

As some cells had an expected value that was 5 or less, we performed a Fisher's exact test to examine the sub-strategies within each category and found significant differences in some of them. For modified explicit self-praise, Twitter users used less 'praise from a third party' ( $p < 0.05$ ) and 'disclaimer' strategies than Weibo users ( $p < 0.05$ ), but more 'comparison between oneself and others' strategies ( $p < 0.05$ ). For implicit self-praise, Weibo users used more 'self-praise as narration' strategies than Twitter users ( $p < 0.05$ ). The following examples illustrate these sub-strategies. The context of the posts is explained in square brackets.

4.1.1 Unmodified explicit self-praise

Example 1 (Twitter users).  
I have great skin. Screw makeup and screw a filter [Followed by the user's selfie.]  
Example 2 (Weibo users).  
组装小能手上线!我不管!我最棒![附鞋柜组装前后的两张图片] [Translation: an excellent assembler goes online! Whatever! I'm the best! (Followed by two photos of the shoe cabinet before and after assembly)].

4.2 Modified explicit self-praise

4.2.1 Praise from a third party

Example 3 (Twitter).  
Everyone: Johnny, why are you so popular? Me: Because I love everyone!  
Example 4 (Weibo).  
同学都说我跟一个代课老师长得像，话说她确实挺好看的。(Translation: My classmates say I look like a substitute teacher, and she is really pretty).

4.2.2 Disclaimer

Example 5 (Twitter).  
I never say this, but I'm so proud of myself. Just reviewed my morning presentation and am so proud of how far I have come.

Example 6 (Weibo).  
不是自夸，但是我觉得我看男人的眼光真挺不错的。(Translation: I'm not bragging, but I think I have a pretty good eye for men).

4.2.3 Comparison between oneself and others

Example 7 (Twitter).  
I'm honestly dying to show you the painting. I once said Doc Culber was the best one yet, I dare to say we have a new one.

4.3 Implicit self-praise

4.3.1 Self-praise As narration

Example 8 (Twitter).  
I have completed the task I've been avoiding.  
Example 9 (Weibo).  
今天一大爷的车，卡在柱子中间动不了了。我赶快去帮忙最后安全倒回来了。(Translation: Today an old man's car got stuck in the middle of two pillars and could not move. I quickly went to help and finally backed it up safely).

4.4 Themes of self-praise

To address RQ2, we analyzed the themes of self-praise on Twitter and Weibo, using 200 posts from each platform, respectively. We coded the posts for five themes: appearance, performance/competence, skills, virtues, and self-encouragement. We found that the two platforms had similar numbers of themes, but different distributions, as shown in Table 3.

A Chi-square test revealed a significant difference between the two platforms in terms of self-praise themes (Chi-square = 14.5,  $df = 4$ ,  $p < 0.05$ ). Further analysis indicated that Twitter users used more appearance-related self-praise, while Weibo users used more skills-related and self-encouragement-related self-praise.

Using a Fisher's exact test, we also examined the sub-themes within each theme and found significant differences in some of them. For skills, Weibo users used more food-making-related self-praise



TABLE 3 Frequency and percentage of themes about self-praise.

Themes	Twitter users			Weibo users	
	Frequency	Percentage		Frequency	Percentage
Appearance	62	29.11%	Appearance	35	16.59%
Performance/ Competence	41	19.25%	Performance/ Competence	40	18.96%
Skills	50	23.47%	Skills	64	30.33%
Food making	29	13.62%	Food making	51	24.17%
Photographing	13	6.10%	Photographing	8	3.79%
Painting	8	3.76%	Painting	5	2.37%
Virtues	48	22.54%	Virtues	38	18.01%
Cherishing friendship	16	7.51%	Kindness	18	8.53%
Bravery	12	5.63%	Cherishing kinship	11	5.21%
Maturity	10	4.70%	Thoughtfulness	9	4.27%
Self-encouragement	6	2.82%	Self-encouragement	16	7.58%
Others	6	2.82%	Others	18	8.53%
Total	213	100%	Total	211	100%

than Twitter users ( $p<0.05$ ). For virtues, the two platforms had different sub-themes, such as cherishing friendship, bravery, and maturity on Twitter, and kindness, cherishing kinship, and thoughtfulness on Weibo. The following examples illustrate these sub-themes. The context of the posts is explained in square brackets.

4.5 Appearance

Appearance in our study refers to the way people look like. In our corpus, self-praise for good appearance was largely involved with various expressions and generally with selfies.

Example 10 (Twitter).  
I'm obsessed with myself and how far I've come as a person! I'm the fucking shit!!! [Followed by the user's selfie.]  
Example 11 (Weibo).  
这张不记得及时拍的，但是觉得满漂亮。[附用户自拍]  
(Translation: I do not remember when I took this photo, but I think it's very beautiful. [Followed by the user's selfie.]

4.6 Performance/competence

In this study, performance refers to how successful people are or how well they do something, which indicates their competence. In our corpus, performance/competence can be roughly divided into three categories: performance/competence in dealing with issues in daily life, study, and work. Due to the ambiguity of many posts about performance/competence, we did not offer any subthemes.

Example 12 (Twitter).  
Cannot believe tomorrow is my last ever day on clinical placement as a student physiotherapist so proud of everything I've achieved so far.  
Example 13 (Weibo).  
今日自夸:PhD期间应当有的重要训练:快速理解他人想法的能力。(Translation: Today's self-praise: An important training that

should be done during doctoral studies: the ability to quickly understand other people's ideas).

4.7 Skills

In this study, skills refer to a type of work or activity that requires specialized knowledge or expertise. In our corpus, the three most common skills were culinary arts, photography, and painting among both Twitter and Weibo users.

4.7.1 Food making  
Example 14 (Twitter).  
After successfully preparing sambhar, dosa & coconut chutney that too from scratch which includes preparing sambhar masala & dosa batter, I now declare myself a great chef.  
Example 15 (Weibo).  
自己做的，虽然不如外面的卖相好，但是自己做的干净，味道也不错的说!嘿嘿，让我自夸一下自己哈。(Translation: It's homemade. It may not look as nice as the ones sold outside, but it's clean and delicious. Hehe, let me brag a little about myself).

4.8 Virtues

In this study, virtues refer to moral or ethical qualities. Twitter and Weibo users showed significant differences in their emphasis on specific virtues. For Twitter users, the three most prevalent virtues were loyalty to friends, courage, and maturity. For Weibo users, they were kindness, respect for family, and thoughtfulness.

4.8.1 Cherishing friendship  
Example 16 (Twitter).  
I'm sweet and treat my partner well if I really like you. I'm the sweetest guy you'll ever meet.



### 4.8.2 Kindness

Example 17 (Weibo).

13号线上，隔壁小情侣起身下车时，余光撇到座位上有黑色物体，调经反射边叫他们边捡起了手机~啊~我真是个好宝宝，一个爱疯都不能动摇我。(Translation: On the subway Line 13, I caught a glimpse of a black thing on the seat when the young couple beside me stood up to leave. I instinctively shouted to them and picked up the phone. Ah, I'm such a good kid, even an iPhone cannot tempt me).

## 4.9 Self-encouragement

In this study, self-encouragement refers to how people motivate, encourage, uplift, and comfort themselves to overcome difficulties in their life. In our corpus, we found that people, especially Weibo users, often achieved self-motivation by performing self-praise.

Example 18 (Twitter).

Little encouragement and support for all who might need it today. Keep on surfing, you are doing great!

Example 19 (Weibo).

学会适可而止，看不完的电影可以暂停，咽不下去的食物可以不吃，人活一世，不要过于苛责自己。(Translation: Learn to stop when appropriate, pause the movie you cannot finish, do not eat the food you cannot swallow, live your life, do not be too hard on yourself).

## 4.10 Motivations for self-praise

To address RQ3, we conducted semi-structured interviews with 6 Twitter and 6 Weibo users. From the analysis of the qualitative data, we identified two themes related to implicit self-praise, namely, psychological needs and commercial profit (see Table 4).

## 4.11 Psychological needs

Psychological needs comprised three subthemes: self-flattery, self-presentation, and self-encouragement. Self-flattery involves excessive pride in oneself. In our study, self-flattery, found in both groups, is one's desire to receive praise from others to increase their sense of superiority. Superiority can derive from appearance, competence, skills, and so on. For instance, participant D and participant 3 stated:

You know, Twitter is where I show off all the amazing things I've done in different areas. I have a lot to be proud of, because I've

achieved things that most people can't even dream of. I think people need to see how awesome I am and learn from me. (Participant D—Interview for Twitter users)

I don't want to show off on WeChat. You know, ironically, the ones who don't want you to do well are always your acquaintances. But on Weibo, I don't have any acquaintances. Flaunting my achievements can make netizens think I'm a smart guy. Honestly, praising myself on Weibo can satisfy my vanity. (Participant 3—Interview for Weibo users)

In this study, self-presentation refers to how people portray themselves, including their physical appearance and their impressions of personality, competence, and so on. The difference between self-presentation and self-flattery is that the latter implies superiority over others. Both Twitter and Weibo users mentioned their hope to establish a positive image through performing self-praise. For instance, participant B and Participant 6 said:

I enjoy boasting on Twitter. I just want to show my followers that I'm a good person, even if I don't have many followers. (Participant B—Interview for Twitter users)

I want to present myself as a confident and successful person on Weibo, so I often post about my achievements and accomplishments. I think this way, I can impress others and gain their admiration and respect. I also hope that by sharing my positive experiences, I can inspire and motivate others to pursue their goals. (Participant 6—Interview for Weibo users)

Self-encouragement refers to how users employed self-praise to encourage, console, or uplift themselves, so that they could overcome difficulties, mitigate negative emotions, or forgive themselves for their regrets, mediocrity, and so on. Self-encouragement was found in both groups, as indicated in the following excerpt:

When I feel low, I try to boost my confidence by telling myself that I've done a great job. Twitter gives me a space where I can express my weaknesses and recharge myself because nobody knows me. (Participant E—Interview for Twitter users)

I often face setbacks in my life that make me feel frustrated, so I use self-praise to raise myself up. I share my strengths and achievements on Weibo, and tell myself how much progress I have made. I believe this way, I can increase my confidence, and deal with the difficulties more optimistically. (Participant 2—Interview for Weibo users)

TABLE 4 Motivations for self-praise in online contexts.

Themes	Subthemes
	Self-flattery
Psychological needs (T, W)	Self-presentation
	Self-encouragement
Commercial profit (W)	

T, the subthemes found in Twitter users; W, the subthemes found in Weibo users.

## 4.12 Commercial profit

Self-praise for commercial profit was only reported by Weibo participants. Traditionally, commercial profit derives from the sale of commodities at prices above those paid by merchants. However, Weibo users can gain commercial profit by posting advertisements. For instance, participant 6 mentioned:

Many online users get rich overnight. I don't expect to be like them. But it would be nice if I could earn some extra money. Obviously, if you want to attract advertisers, you need a lot of followers. Showing off your skills and good looks is probably the best way to get more followers. (Participant 6—Interview for Weibo users)

I often praise myself for being a good cook and a food lover on Weibo. I post pictures and videos of the dishes I make or the restaurants I visit. I also write some reviews and tips for cooking or eating. I hope to attract more followers and then get paid by some food brands or restaurants to endorse their products or services. This way, I can make some extra income and also showcase my skills and taste. (Participant 1—Interview for Weibo users)

## Discussion

In this study, we investigated and compared self-praise strategies, themes, and motivations in English and Chinese online contexts. It is noteworthy that we only incorporated posts containing “self-praise” and its synonyms in hashtags. Therefore, the proportion and category of self-praise strategies and themes may differ in self-praise posts without these hashtags. This problem is almost inherent in empirical dataset-based research in a computer-mediated communication environment.

In relation to RQ1, our first finding was that Twitter users used unmodified explicit self-praise more frequently than Weibo users, which is in line with previous literature on self-positivity in the field of culture and psychology (Xie and Teo, 2020; Lou and Li, 2022; Salvador et al., 2022). For instance, Salvador et al. (2022) compared self-enhancement and self-criticism in Western (American) and Eastern (Chinese) samples. They confirmed that the Western sample exhibited self-enhancement bias, while the Eastern sample showed self-criticism bias. Therefore, cultural differences may also explain why Twitter users preferred unmodified explicit self-praise more. Moreover, Western people, who usually come from low-context or individualistic cultures, tend to communicate directly, while Eastern people, who usually come from high-context or collectivistic cultures, tend to communicate indirectly (Velez-Calle et al., 2021; Yang et al., 2021; Tabata and Vrij, 2023). We assume that this difference also affects the way Twitter and Weibo users employ self-praise.

Secondly, we found that both groups utilized modified explicit self-praise with a similar frequency, but they exhibited different preferences for the sub-strategies they employed. Specifically, Weibo users favored the use of praise from a third party and disclaimer as modes of expressing self-praise, whereas Twitter users resorted to more comparisons between oneself and others. Praise from a third party entail quoting or mentioning positive evaluations from others. This sub-strategy can render self-praise more objective and less face-threatening, as it enlarges the context and elicits more responses from the interlocutors (Guo and Ren, 2020; Itakura, 2022). Disclaimer is another sub-strategy that entails displaying modesty or disavowing self-praise. This sub-strategy can also diminish the threat to face by distancing oneself from self-praise and avoiding arrogance (Ren and Guo, 2020; Xia and Jiang, 2022). Hence, Weibo users' proclivity for

these sub-strategies reflects their adherence to politeness theories and Chinese traditional culture that value modesty and humility (Ren and Guo, 2021; Shi et al., 2021; Lin and Chen, 2022). In contrast, Twitter users' frequent use of comparison between oneself and others is a sub-strategy that entails accentuating one's achievements or qualities in relation to others. This sub-strategy implies a sense of superiority and competitiveness, which may be influenced by western culture's great value on competition. Typically, Western beliefs, influenced by Protestantism, emphasize competition over cooperation (Dagnino and Minà, 2021), while Eastern beliefs, influenced by Confucianism, emphasize cooperation over competition (Minà and Dagnino, 2021).

Our third finding was that Weibo users and Twitter users differed in their frequency of using implicit self-praise. Weibo users employed this strategy more frequently than Twitter users. This finding is in line with the empirical study of Cai et al. (2016), which suggests that Eastern samples (China) tend to downplay the positivity of the self more directly than Western samples (America) due to prohibitive cultural pressures. However, Eastern samples also tend to indirectly highlight the positivity of the self through their humility or situationally triggered behavior. Thus, we attribute Weibo users' higher frequency of using implicit self-praise to these cultural differences. Among the individual strategies of implicit self-praise, Weibo users favored self-praise as a narration more than Twitter users. This is consistent with the findings of Xia and Jiang (2022) that Weibo users often provided evidence through narration when they performed self-praise. It implies that the modesty maxim still operates and exerts a greater influence on the social interaction of Chinese speakers than English speakers.

With respect to RQ2, our first finding was that both Twitter and Weibo users employed appearance as a most repeated theme when they performed self-praise, but Twitter users emphasized appearance more. Previous studies observed that self-praise of appearance accompanied by selfies was prevalent among both groups, but they did not compare the frequency of these two groups (Ma et al., 2017; Ren and Guo, 2020). The preference for appearance-related self-praise among both groups may be attributed to the fact that people from different cultures share the same strong desire to construct and display their positive social image and ideal selves, particularly in online contexts, although the extent of their desire may be nuanced (Burnell et al., 2021; van Oosten et al., 2023). Furthermore, as indicated earlier, the modesty maxim exerts more constraints on Eastern people. Self-praise on appearance may entail higher risks of threatening the face of hearers than other forms of self-praise, since self-praise on genetically determined appearance could be interpreted as discrimination against hearers who are not good-looking (Spiegel, 2023). Thus, Weibo users may be less inclined to perform appearance-related self-praise.

Another of our findings was that both groups gave equal importance to performance/competence as a theme when they performed self-praise. This theme was related to various aspects of their lives, such as academic performance, mundane life, and career. For example, they praised themselves for getting good grades, completing tasks, or achieving goals. This finding is not surprising, as performance/competence has been long recognized as one of the most valuable attributes in both cultures. Western culture's emphasis on competence/performance can be traced back to Greek philosophy, in which competence and performance were defined as the ability and the action of achieving excellence and their relationship was explained in Aristotelian tradition (Trültzsch-Wijnen, 2020). Eastern people's

value on competence/performance is greatly influenced by Confucianism. Confucius stressed the salience of competence/performance many times in his lifetime. In his philosophy, competence/performance is a comprehensive concept that involves erudition and versatility, or the knowledge and the skill of applying it in different situations (Brown, 2021). The significance of competence/performance in both philosophical origins has a lasting impact on contemporary West and East. Competence/performance's close associations with career success, perceived by ordinary people and demonstrated by researchers, may also make it one of the archetypal constructs of positive self-presentation (Elsey et al., 2022; Zhang et al., 2022; Peltokorpi, 2023).

We further discovered that Weibo and Twitter users utilized three skills as themes for their self-praise on social media. These skills were food making, photographing, and painting. Food making was the most preferred skill by Weibo users compared to Twitter users. The common use of these skills in both groups could be explained by their accessibility to ordinary people who can readily practice them in their daily lives, but the additional emphasis on food making by Weibo users might have underlying reasons associated with cultural and social factors. Food making or cooking, as a crucial component of domestic labor, could be viewed as the manifestation of housework (Guan and Zuo, 2021). The traditional gender norm that stipulates males as the breadwinner and females as the homemaker has been altered in China's labor market due to the rising participation of women in the workforce, but it has remained intact in the domestic sphere where women still shoulder most of the domestic duties (Xu, 2021; Zhang and Xu, 2022). Consequently, females who exhibit their cooking skills online may aim to construct a positive image of a (potential) good wife who can balance work and family. Food making is also valued by Chinese males. Previous research indicated that Chinese urban husbands performed more domestic labor than their rural counterparts, implying a regional decrease of gender disparities in housework due to a socio-economic transition (de Bruin and Liu, 2020). Therefore, we hypothesize that many Chinese males also have a strong motivation to present their cooking skills on social media to portray themselves as a (potential) good husband who can share the domestic burden with their partners.

Additionally, we discovered that Twitter and Weibo users placed the same emphasis on virtues, but they differed in their focus on specific virtues that they employed to praise themselves on social media. Twitter users valued cherishing friendship, bravery, and maturity, whereas Weibo users stressed kindness, cherishing kinship, and thoughtfulness. Previous studies have indicated that westerners have a larger friendship network and derive more well-being from it than easterners, suggesting that westerners' value of friendship is probably culturally rooted (Li and Cheng, 2015; Hongladarom and Joaquin, 2021). Expressing bravery and maturity are consistent with Western culture that is imbued with individualism, which emphasizes personal achievement and autonomy. Virtues in the contemporary East are profoundly influenced by their culture, history, and philosophy (Fatehi et al., 2020). The three virtues highlighted by Weibo users are all within the scope of Ren (benevolence), one of the basic notions of Confucian virtue ethics that guides moral conduct and interpersonal relationships. Confucius's Ren has its ethical sequence: to love relatives first, which corresponds to cherishing kinship, and to love others afterward, which matches kindness (Hu et al., 2021; Lee, 2022). Thoughtfulness is also reflected by Ren, as the

Confucian maxim states: "treat others as you hope they will treat you" (Jia, 2022), which implies reciprocity and empathy.

Interestingly, we also discovered that Weibo users showed a significantly higher frequency of posting content related to self-encouragement than Twitter users, which may have its social basis. Recently, the word "involution" has become extremely popular in Chinese-language social media as a complaint of hard life experienced by individuals in the contemporary era (Forges, 2022). Involution in the Chinese context refers to the situation where people make extra efforts to compete for limited resources, resulting in a decline in the "return on investment" of individuals. It could be seen as the "inflation of effort" that does not lead to proportional rewards or benefits. Involution has been demonstrated in many fields in China such as education and employment, widely affecting Chinese citizens (Dou et al., 2022; Yu et al., 2022). We assume that Weibo, due to its anonymity, is ideal for Chinese netizens facing involution to rejuvenate themselves through self-encouragement. In other words, self-encouragement becomes a form of self-praise that enhances Chinese netizens' confidence and motivation so that they are empowered to cope with the societal pressures.

With respect to RQ3, we found that both Twitter and Weibo participants performed self-praise out of three psychological needs: self-flattery, self-presentation, and self-encouragement. These needs reflect different purposes and motivations for engaging in self-praise online. Previous literature has corroborated that netizens' online self-praise was mainly for presenting the best possible self to others (Strimbu and O'Connell, 2019; Zheng et al., 2020; Kawamoto, 2021), which was also confirmed by our study. This type of self-praise, which we term self-presentation, aims to create a positive impression and gain social approval. However, our study, to our best knowledge, is the first one to empirically find that performing self-praise online is also possible for expressing superiority over others and for consoling and uplifting oneself. The former type of self-praise, which we term self-flattery, contradicts the modesty maxim in nature, since it threatens the hearers' face by boasting one's own achievements or qualities. The anonymity of these two platforms may facilitate self-flattery to occur as self-flatterers do not need to maintain hearers' face when the intention of social interaction is lacking. The latter type of self-praise, which we term self-encouragement, is more prevalent among Weibo users than Twitter users. As discussed above, self-encouragement is the result of catharsis, which means releasing negative emotions and coping with stress by affirming one's abilities and achievements.

Another noteworthy finding of our study is that performing self-praise for commercial profit was only observed in Weibo participants, which may be closely related to the prosperity of fan economy in China (Xu, 2023; Yang, 2023). Fan economy refers to the phenomenon where fans support their idols by purchasing their products or services. In recent years, many celebrities who used to be ordinary people with a huge number of fans have become millionaires through e-commerce livestreaming (Si, 2021), a form of online marketing that involves live video and interaction with potential customers. As a result, to benefit from this flourishing industry, an increasing number of ordinary people may be motivated to perform online self-praise for constructing a positive image to attract more fans. For instance, they may post content that showcases their talents, skills, or achievements. Naturally, these "would-be" celebrities share the same motivation for self-praise, namely, commercial profit, with those real celebrities (Guo and Ren, 2020), who also use self-praise as a means of promoting

themselves and their products or services. Hence, self-praise for commercial profit is a type of self-praise that aims to generate income and gain popularity.

## 5 Conclusion

This study examined and contrasted how Twitter (English) and Weibo (Chinese) users perform self-praise and explored the potential factors behind the cultural differences from a linguistic and psychological perspectives. Regarding strategies, Twitter users favored more unmodified explicit self-praise, while Weibo users opted for more implicit self-praise. Both groups used explicit self-praise equally, but with different sub-strategies. Concerning themes, appearance, competence/performance, skills, virtues, and self-encouragement were most common. Appearance was more prevalent among Twitter users, and skills and self-encouragement were more popular among Weibo users. Both groups valued competence/performance and virtues, albeit with different virtues. In terms of motivations, psychological needs and commercial profit were identified. Psychological needs that included self-flattery, self-presentation, and self-encouragement were reported in both groups. Commercial profit was only observed in Weibo participants.

This study makes several contributions to the existing literature. Theoretically, this study is the first one, to the best of our knowledge, that adopts both linguistic and psychological perspectives to compare and contrast online self-praise behavior of English and Chinese speakers in terms of strategies, themes, and motivations. Practically, this study provides a deeper insight into the cross-cultural differences and psychological factors that influence online self-praise of the two groups across the three aspects, which has implications for intercultural communication.

However, this study also has some limitations. First, the sample sizes of posts and participants in this study were relatively small, which may affect the generalizability of the findings to a larger population. Therefore, future research should use larger and more representative samples to validate the results. Second, the findings may be subject to some bias, as different social media platforms may attract different types of posts and users. For example, in North America, people who want to showcase their culinary skills may prefer Instagram or TikTok over Twitter. Thus, future research should include more social media platforms (e.g., TikTok) to conduct comparative studies. Third, the language background of the Twitter users in this study may have an impact on their online self-praise behavior, as they may not all be native English speakers. This may affect the validity of our conclusions. In fact, even among native English speakers, there may be variations in online self-praise due to different cultural norms (e.g., America versus Britain). Therefore, future research should control for the language background by focusing on one specific English-speaking country. Fourth, we relied on interviews to explore the motivations for online self-praise, which were based on the participants' self-reported psychological needs. However, these needs may not reflect their actual motivations, as they may be influenced by social desirability or other factors. Future research should use more objective and reliable methods to measure the motivations for online self-praise, such as experiments or observations (Derakhshan et al., 2023). Fifth, we did not investigate the possible relationships between self-praise strategies, themes, and motivations, as they were coded independently. Hence, a more

comprehensive study that explores the links between these three aspects is recommended for future research to gain a deeper understanding of online self-praise behavior of the two groups.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving humans were approved by the Ethics Committee of Hunan Normal University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

HW: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. LZ: Funding acquisition, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. SR: Data curation, Investigation, Supervision, Validation, Visualization, Writing – original draft.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# Displaying epistemic stance through same-turn self-repair in Chinese civil courtroom interaction

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Repair, or conversational repair, frequently appears in court proceedings as a vital mechanism sustaining effective communication. Our study presents a conversational analysis of the choices of different operations in the same-turn self-repair and shows how judges, plaintiffs, defendants, and their lawyers deploy those operations based on a model of epistemic stance. The data were drawn from the top five most-viewed videos of Changsha civil courtrooms from March to May, 2019, totaling more than 50,000 words. In the courtroom interaction, replacing and inserting are the most frequently used operations for all participants. In the courtroom cross-examinations, interlocutors use discrepant same-turn self-repair operations to achieve single or multiple communicative goals, such as improving precision, increasing credibility, highlighting their points, skirting questions, and confirming information. Additionally, when the epistemic stance of the trouble source is [K+], speakers employ most same-turn self-repair operations to keep their [K+] epistemic stance by improving precision and increasing credibility of their utterances or use reformatting or inserting to downgrade epistemic stance to [K−] by decreasing the certainty of their utterances. These findings shed light on the understanding of same-turn self-repairs in the institutional interaction, particularly in Chinese civil courtroom interaction.

## KEYWORDS

same-turn self-repair, repair operations, epistemic stance, conversation analysis, courtroom interaction

## 1 Introduction

The civil courtroom interaction mirrors the features of distinct identities in the court proceedings. The Chinese civil courtroom usually consists of six regular stages: pretrial preparation, court opening, court investigation, court debate, court mediation, and court adjudication (Ge and Wang, 2019). In China, the public has access to civil trials,<sup>1</sup> both live streams and recordings, since 2016. Such service also provides abundant data for us to explore the forms and functions of the same-turn self-repair operations in the Chinese civil courtrooms.

Previous studies on the courtroom discourse have mostly focused on the interactions of judges (e.g., Balcha, 2014). For instance, Heffer (2008) reveals that judges in the United States display distinct types of discourses such as jury instruction and judgment for different legal

<sup>1</sup> <http://tingshen.court.gov.cn/live>

purposes. However, drawing on the data from Mandarin Chinese civil trials, Han (2011) analyzes a range of Chinese judges in the civil judgments during a judicial reform, while Ge and Wang (2019) examine the discourses of judges in Chinese civil trials through the critical genre analysis and show that the Chinese traditional values of “harmonious society” and “modesty” are combined with Anglo-Saxon judiciary concepts like “human rights” and “the rule of law” in the current trial system. The previous research reveals that the correlation between the self-repair operations and epistemic stance is not sufficiently investigated. For this reason, this article attempts to further explore the same-turn self-repair operations in Chinese civil courtroom discourse in terms of the epistemics model.

In this article, stance is the attitude, judgments, or commitment of speakers toward propositions (e.g., Wang et al., 2022), and “epistemic stance refers to knowledge or belief vis-à-vis some focus of concern, including degrees of Certainty or knowledge, degrees of commitment to truth of propositions, and sources of knowledge, among other epistemic qualities” (Ochs, 1996, p. 410). Also, according to Heritage (2012b), the epistemic stance of [K–] means that a less knowledgeable interlocutor who lacks a piece of information while [K+] suggests that a more knowledgeable co-participant who has that information.

Overall, this article conducts a moment-by-moment sequential analysis of Chinese civil courtroom interaction with the aim of exploring the correlation between the choice of same-turn self-repair operations and the convergence and divergence of the epistemic stance among Chinese judges, plaintiffs, defendants, and their lawyers.

The rest of the article is divided into six parts. Part II presents the literature review on repair and epistemics. Part III depicts the data and research methods of this article. The results are explained in detail in Part IV. To conclude, Part V discusses the implications of this article’s findings, the limitations, and the future research orientations.

## 2 Literature review

Research on the same-turn self-repairs spans a considerable variety of institutional contexts and languages. A comprehensive overview of same-turn self-repair operations (Schegloff, 2013), repair sequences in the courtroom, and epistemics is presented below.

### 2.1 Same-turn self-repair

Repair, the process individuals use to detect and resolve problems of speaking, hearing, and understanding (Albert and de Ruiter, 2018), is ubiquitous in talk-in-interaction. For instance, Chen and Ye (2022) display how L2 learners orient to public repair sequences by drawing on 10 h of videotaped data from an interactive English course through a conversation analytic study. The same-turn self-repair is the most common repair type (Németh, 2012). In same-turn self-repair, the

repairable and repairing sequences occur in the same turn, and the repair is performed by the initiator of the repairable (Rieger, 2003). According to Fox et al. (2009), same-turn self-repair is defined as the process by which speakers stop an utterance in progress and then abort, recast, or redo that utterance. Extract (1) shows an example from Hellermann (2009) of a same-turn self-repair.

Extract (1) from Hellermann (2009, Excerpt 5, p. 116).

01 I: a:nd Julian, my first son,

02 J: ah.

03 → I: and **I am** uh **he**: is eight.

In this extract, the speaker self-initiates a repair in line 03 (see the arrow; trouble source and same-turn self-repair indicated in bold) and repairs within the same-turn during which the trouble source occurred. In other words, the speaker first produces “I am” when referring to her son. Subsequently, she utters “he is” as a replacement in the same turn, correcting her error in speaking.

One of the central findings of earlier works on repairs concerns the predominance of self-repairs in talk-in-interaction. Schegloff et al. (1977) notice that the occurrence of self-repairs is more common than other-repairs when they analyze the conversational data of the native English speakers. On the other hand, the analysis of interaction of repair sequences suggests that the turns are designed to facilitate self-repairs, or display the speaker’s sensitivity to the appropriateness of self-repairs and the (possible) impropriety of other-repairs (Dingemans and Enfield, 2015). Additionally, repair tends to occur in the first position in close proximity to the trouble source. Levinson (1983) summarizes a ranking of preference from high to low: self-initiated self-repairs (in the same turn), self-initiated self-repairs (in the transitional space between turns), other-initiated self-repairs, self-initiated other-repairs, and other-initiated other-repairs. In actuality, Schegloff (1992) argues that trouble sources that are not addressed close to their occurrences can lead to serious problems in an exchange. McHoul (1990) claims that the general preference for repair organization, marked by the predominance of self-repairs over other-repairs, does not operate in the classroom discourse.

In terms of the typology of repair operations, by looking into Japanese other-initiated repairs, Hayashi and Hayano (2013) conclude that replacement, deletion, and repetition are the normal conversation repair strategies through conversation analysis. In another conversational analytic study, Jordanian speakers deploy ten self-initiated repair structures: expansion, hesitation, replacement, repetition, abort and restart, abort and abandon, insertion, deletion, meta-repair, and modify order (Mohammad and Al-Harash, 2015). Additionally, drawing on the data of English conversations, Schegloff (2013) identifies ten operations: replacing, inserting, deleting, searching, parenthesizing, aborting, sequence jumping, reformatting, and reordering, based on the English data, which has also been found in Chinese corpus (Ma and Gao, 2018). These studies show that replacement, deletion, and repetition are the three most important repair operations across languages, whereas there are different terms for the same repair strategy, such as “modifying order” and “reordering” in different studies. This study also considers the ten operations proposed by Schegloff (2013) in self-initiated self-repairs as the basic framework, since the ten operations in his categorization can be conducive to identifying the same-turn self-repairs in the Chinese civil court interactions. In this study, six

Abbreviations: ASP, aspect marker (le); CLF, classifier; COP, copula; MM, modifier marker (de); MV, modal verb; NEG, negative; PRT, utterance final particle; QP, question particle; 1PP, first person plural pronoun; 2PP, second person plural pronoun; 3PP, third person plural pronoun; 1SG, first person singular pronoun; 2SG, second person singular pronoun; 3SG, third person singular pronoun.



operation types have been found to be commonly used in the collected data: replacing, inserting, searching, recycling, deleting, and reformatting.

## 2.2 Repair sequences in courtroom interaction

Particular characteristics of the courtroom interaction as opposed to everyday conversation and other kinds of institutional and professional talk have been studied and documented since the late 1970s (e.g., Pomerantz, 1978). Previous research reveals that questions and answers are pervasive in the courtroom examination (e.g., Heritage and Clayman, 2010). However, more recently, Matoesian (2018) investigates an affective stance in objections through a multimodal analysis of the trial interactions.

For example, Drew (1991) observes the strategies by witnesses in cross-examinations, finding that witnesses rarely use self-repairs because they could decrease the credibility and accuracy of the testimony. Matoesian (1993) discusses the sequence of conversation repairs, claiming that the role of questioners and answerers reverse between an attorney and a witness when the witness initiates a repair. Romaniuk and Ehrlich (2013) note that the same-turn self-repair from the courtroom interaction in which the repair sequence allows participants to address some of the interactional contingencies related to the norms of the courtroom. In other words, the same-turn self-repairs that we focus on “do not seem to be necessary in terms of correcting something that was problematic or mistaken” (Sidnell, 2010, p. 117), but rather serve other interactional purposes. Understanding the management of same-turn self-repairs in the courtroom interaction, therefore, is fundamental in the courtroom research with implications for co-participants to select the proper type of self-repair to achieve convergence or divergence of their epistemic stance in mundane talk-in-interaction.

However, how epistemic stance influences the choice of repair operations is still under-researched, and particularly in Mandarin Chinese courtroom interaction. In this article, an investigation of the function of epistemic stance in courtroom repair operations may shed light on the mechanism of participants’ choices of repair operations.

## 2.3 Epistemics in courtroom interaction

Epistemics has been studied in many contexts (e.g., Grzech, 2021). For example, Stivers et al. (2011) show that the deployment of and reliance on epistemic resources are organized in a way that impacts on social relations through moment-by-moment conversation analysis. Marin-Arrese (2015) compares epistemic stance strategies in journalistic discourse in English and Spanish and finds some similarities and differences in the use of epistemic expressions in both languages. Recently, Bristol and Rossano (2020) reveal that there is gradient texture to ‘epistemic territory’ and that knowledge domains contribute to the acceptability of disagreement in social interactions. Additionally, Heller (2021) investigates epistemic stances in the display of “doing thinking” in children’s collaborative reasoning through a multimodal discourse analysis. Drawing on the data of parliamentary debates in Catalan, Cuenca (2023) looks into the correlation among disagreement, epistemic stance and contrasts

through a qualitative analysis. Overall, epistemics plays a critical role in talk-in-interactions.

On top of that, epistemics has also captivated some attention in the study of the courtroom interaction, though not necessarily under that particular label (e.g., Dong, 2013). Despite grammatical changes, previous studies mainly focus on the epistemic expressions in courtrooms, especially witnesses’ testimonies (e.g., powerless language features were perceived as less credible, less truthful, and less trustworthy than speakers who did not use such features). Table 1 shows some studies on epistemic stance in the legal settings.

For instance, Szczyrbak (2021) focuses on epistemic lexical verbs, especially “I think,” on the basis of the data from an actual court case in the United Kingdom. It is nevertheless striking to note that she finds that epistemic lexical verbs are used to communicate moderate certainty rather than uncertainty and doubt, and on that basis argues, with reference to Simon-Vandenberg and Aijmer (2007), that the expressions are deployed to perform various rhetorical functions including persuasion, manipulation, challenging, confrontation, and acceptance. Additionally, in the studies on epistemics in the context of the courtroom interaction, particularly in court proceedings and court debate, interlocutors interact and understand one another on the basis of two aspects: the judgment of epistemic stance of their own and of their interlocutors and the adjustment of action and understanding (Heritage, 2012b). In the courtroom discourse, epistemics stance is a necessary resource for speakers to initiate repairs (Robinson, 2013). Speakers claim their [K+] or [K−] stance in their expertise or real-world experience based on the judgment of their epistemic stance. As an illustration, Table 2 shows the use of distinct types of questions (Sadock, 2012) and the display of epistemic stance.

This article aims to show how participants express their epistemic stance by employing different same-turn self-repair operations based on their understandings of their own epistemic stance and of their interlocutors by looking into the use of repair operations in the

TABLE 1 Studies on epistemics in courtroom interactions.

Authors	Context	Data analysis	Results
Gibbons (2008)	Common Law courts in Hong Kong	Conversation analysis	The answerer is pressured to answer in the way the questioner wishes by means of a wide range of linguistic resources related to epistemic stance.
Dong (2013)	Trial Techniques Thomas A. Maucet CITI Publishing House No.6 Edition	Systemic Functional Linguistics	The study shows the techniques for the lawyer and the witness to examine or reply in terms of epistemic stance.
Szczyrbak (2021)	A British libel trial	Discourse analysis	Epistemic lexical verbs are used to communicate moderate certainty rather than uncertainty and doubt.

**TABLE 2** The use of distinct types of questions and the display of epistemic stance.

Types of questions	epistemic stance	Examples
Wh-Questions	Unknowing [K-]	What do you think this is?
Polar and alternative questions	Unknowing [K-]	Is poo-poo one word, or two?
Tag questions	Unknowing [K-]	You are not going to start any fires, are you?
Rhetorical Questions	Knowing [K+]	Is the government very successful? No.

Chinese civil courtroom. As such, we address the following specific questions.

- (1) What are the most commonly used forms and functions of same-turn self-repair operations in Chinese civil courtroom interaction?
- (2) How does the same-turn self-repair operate in terms of the model of epistemic stance within the conversation analysis framework?

### 3 Data and research methods

We conducted our data analysis in four successive steps: transcription, coding, quantitative analyses of the entire data set, and turn-by-turn analysis of the repair sequences in the light of epistemics.

#### 3.1 Data collection

The data in this article were drawn on the natural interaction in the typical civil cases from the intermediate court of Changsha, including two contract dispute cases, two labor dispute cases and one loan dispute case, attracting the top five hits from March to May, 2019, with a total of more than 50,000 words. Five cases were selected to examine repair sequences in the civil courtroom interaction. The reason that the top 5 most-viewed cases were chosen is that they might be representative of the local civil court interaction, and participants in the civil courtroom can also be typical of the local people in the data chosen. Case 1 was a commercial apartment pre-sale contract dispute case, in which the real estate company was accused of cheating customers in the contract. Case 2 was a labor contract dispute case, in which the defendant was accused of requesting unreasonable compensation from the previous employed company. Case 3 was a commercial apartment pre-sale contract dispute case, in which the real estate company was accused of delaying the completion date and violating the regulation of renovation in the contract by the four homeowners. Case 4 was a labor contract dispute case, in which the company is accused of dismissing employee without compensation. Case 5 was a loan dispute case, in which the plaintiff asked for the money back. All personal names in the corpus and other references that could allow the disclosure of sensitive information have been replaced with

pseudonyms. Table 2 shows the distribution of different repair operations deployed by all participants in the civil trials.

Overall, 324 same-turn self-repairs were produced by judges, plaintiffs, defendants, and their lawyers in the civil courtroom interaction. Table 2 shows that replacing and inserting are the most frequently used operations in the same-turn self-repair, altogether accounting for more than 50%. Searching and recycling make up 19.6 and 18.63% respectively, followed by deleting (8.50%) and reformatting (2.94%).

Also, Table 3 shows the frequency of the six different same-turn self-repair deployed by judges, plaintiffs, and defendants in the data.

Different from Tables 3, 4 compares the frequency of six self-repair operations deployed by the major participants, including judges, plaintiffs, and defendants, in the data, with a total of 203 (excluding 121 self-repairs produced by the lawyers of plaintiffs and defendants). Similarly, it is manifest that replacing and inserting are the most frequently used operations for all participants in courtroom interactions. The only difference is that inserting is the most used operation by judges (30.77%), while plaintiffs (25%) and defendants (27.59%) choose replacing as the most frequently used repair operation in same-turn self-repairs. Additionally, recycling and searching are employed more by defendants and plaintiffs than by judges. A final striking point is that there is a difference among participants in the least frequently used operations. Specifically, reformatting is the least deployed by plaintiffs (0.74%) and defendants (1.72%), while deletion is the least used by judges (5.77%). One possible reason that reformatting is least common among plaintiffs and defendants is that they are average citizens with accents when they speak Mandarin Chinese. In other words, they are not well-educated in contrast to judges so that they do not alter the syntactic constructions to upgrade or downgrade their epistemic stance. Another reason is related to the property of the Chinese language, which is considered as a paratactic language (Li and Yu, 2021), a language in which logical and semantic relationships between elements within sentences are usually implied and understood from context rather than expressed lexically.

#### 3.2 Data analysis

At the outset, all instances of same-turn self-repair configuration types were collected for detailed analyses. By and large, 324 same-turn self-repairs were produced by the judges, plaintiffs, defendants, and their lawyers in the five cases.

Secondly, those selected instances were transcribed in greater details. In addition to talk, inhales, exhales, pauses, and sound stretches were transcribed as well for interactional meanings and are not extraneous elements of talk-in-interaction (Wong and Waring, 2010). In conversations, verbal and nonverbal means (e.g., eye gaze and gestures) of communication are deployed conjointly to convey speakers' intentions.

Finally, all examples were grouped into different types of repair operations in light of the categorization given by Schegloff (2013). The results are rechecked, and the time interval between the categorizations is one week and the results are nearly the same. It is found that there are six most common types of same-turn self-repair operations deployed in the Chinese civil courtroom interaction, namely replacing, inserting, searching, recycling, deleting, and reformatting.

TABLE 3 Frequency of same-turn self-repair operations.

Participants	Replacing	Inserting	Searching	Recycling	Deleting	Reformatting
Judges	23.08%	30.77%	15.38%	13.46%	5.77%	11.54%
Plaintiffs	25%	23.53%	19.85%	22.79%	8.09%	0.74%
Defendants	27.59%	22.41%	21.55%	16.38%	10.34%	1.72%
Total	75.67%	76.71%	56.78%	52.63%	24.2%	14%

TABLE 4 Distribution of repair operations in Chinese civil courtroom.

Repair operations	Numbers	Percentages
Replacing	83	25.49%
Inserting	81	24.84%
Searching	64	19.6%
Recycling	61	18.63%
Deleting	28	8.5%
Reformatting	7	2.94%
Total	324	100%

There are several benefits in investigating repair sequences from a CA perspective. Firstly, researchers from the CA perspective regard repair sequences as a means to achieve mutual understanding. Their focus of investigation is naturally occurring interactions that involve the negotiation of meaning. In other words, the CA perspective offers more of a holistic understanding of communication by examining sequentially organized actions. CA investigation into courtroom self-repairs considers the same turn organization of interaction moment-by-moment, thus providing a more progressive view of same-turn self-repairs.

Secondly, a CA approach to the study of repair sequences can be fruitful to the courtroom research because it explores naturally occurring conversations and can, therefore, shed light on participants' spontaneous ways to correct, clarify, or confirm each other's utterances. In the courtroom interaction, language is a vehicle for the interaction but not its focus. Researchers from a CA perspective contend that courtrooms create an environment conducive to exploring repair sequences because these operations provide speakers with ample opportunities to modify their utterances (Mininni et al., 2014). The CA approach to repair sequences investigates how repair is relevant to the participants by identifying the object of repair, or trouble-source (Wong and Waring, 2010, p. 213), and by investigating repairs in terms of repair initiations and repair operations. This article attempts to advance our understanding of a relatively unexamined domain: the various types of self-initiated same-turn self-repair operations that participants employ as they engage in a conversation in the Chinese civil courtroom from a conversation analytic perspective.

Finally, there are three major steps in using conversation analysis in the study of repair sequences. One fundamental step is that 324 same-turn self-repairs sequences were collected, followed by an examination of variation among coders. In terms of inter-rater reliability of two independent coders, only a small number of 324 same-turn self-repairs are identified in five civil cases. There is little incongruency between raters, and the percentage agreement is almost

100%. If there is a minor incongruency, both raters would discuss it until they reached agreements. The last step is to provide a moment-by-moment analysis of the repair sequence to address the research questions. It should be noted that both authors have received intensive training in coding and transcribing the data in this study, and they have also published monographs and journal papers within the conversation analytic framework.

However, CA research does not generally report precise numbers, but instead relies on informal quantification (Schegloff, 1993) or numeric descriptors (Stivers, 2015). CA investigations of self-repair operation types have reported their data in terms of their relative frequencies in their data set, such as over-represented, extremely common (Fox et al., 2010), significantly more (Bada, 2010), a higher proportion (Quan and Weisser, 2015, p. 46), a considerable number (Németh, 2012, p. 2,032) and far less common (Schegloff, 2013, p. 47). Also, Schegloff (1993) argues that single case analysis can demonstrate the orderly operations in conversation and talk-in-interaction and quantification can be seen as the multiples or aggregates of single cases. In other words, the qualitative analysis of single episodes of talk in interaction can display the way in which the self-repair operation unfolds turn by turn and the sequential environment in which self-repairs occur within the conversational analytic framework.

## 4 Results

The data clearly show that judges, plaintiffs, defendants, and their lawyers have deployed same-turn self-repair operations in the Chinese civil courtroom to display epistemic stance. Also, speakers can choose different operations to express their epistemic stance and achieve a specific interactive goal in various contexts. More importantly, epistemic stance is dynamic in the same-turn self-repairs, which can be roughly divided into two categories: the convergence and divergence in the correlation between the epistemic stance in trouble source and the epistemic stance after employing same-turn self-repair operations. Consequently, a model of epistemic stance in same-turn self-repairs is constructed with an aim of illustrating how speakers choose same-turn self-repair operations to achieve the interactive goals from the perspective of epistemics.

In the Chinese civil courtroom, judges perform the basic role, namely, the organizer of courtrooms, who has [K+] epistemic stance in the professional knowledge of court regulation and law enforcement. Plaintiffs and defendants enjoy [K+] epistemic stance when they recount their narratives in relation to the civil case. Plaintiffs and defendants present their versions of the dispute with evidence to convince the judge that their version of events is the most credible and accurate. Therefore, judges deploy same-turn self-repair operations less frequently than plaintiffs, defendants, and their

lawyers, and the choice of plaintiffs' and defendants' same-turn self-repairs operations has many similarities.

Besides, the speaker's epistemic stance in the same-turn self-repair is dynamic. Although speakers deploy different same-turn self-repair operations to express [K+] or [K-] epistemic stance, there are four models of speakers' epistemic stance to achieve single or multiple interactional purposes in the Chinese civil courtroom interaction by employing different same-turn self-repair operations, as shown in Figure 1.

As Figure 1 shows, the first category of changing epistemic stance is the convergence of epistemic stance. Usually, participants in the civil courtroom deploy most same-turn self-repair operations to keep the convergence of their [K+] epistemic stance by improving the accuracy of utterances, highlighting the points of their claims. However, speakers recycle full or partial questions to maintain the convergence [K-] epistemic stance, urging recipients to give responses.

Conversely, the divergence of speakers' epistemic stance is the other category. Speakers sometimes employ repair operations to express [K-] epistemic stance to decrease the certainty of claims by inserting, deleting, and reformatting, when their trouble sources reflect speakers' [K+] epistemic stance. When speakers' trouble sources display [K-] epistemic stance, judges have more opportunities to abort the initial question and restart with a new syntactic form upgrading epistemic stance to [K+].

In the following sections, the two categories including four ways of changing epistemic stance will be illustrated one by one with contextualized examples of the three participants' same-turn self-repair based on a series of selected excerpts.

## 4.1 The convergence of epistemic stance in same-turn self-repair

The convergence of epistemic stance in same-turn self-repairs in the Chinese civil courtroom can be expounded in two ways. Firstly, in Chinese civil courtroom, predominant same-turn self-repair operations are deployed by all participants to keep the convergence of [K+] epistemic stance. As an illustration, judges prefer inserting, replacing, and searching to provide clear instructions and professional knowledge, displaying [K+] epistemic stance, thus positioning in the [K+] epistemic stance in the courtroom context. While defendants, plaintiffs, and their lawyers claim the [K+] epistemic stance in the trial narrative versions of reality, they would express their [K+] epistemic

stance to eliminate troubles and increase the degrees of credibility and accuracy of their statements about the competing versions of narratives by adopting repair operations. Secondly, the convergence of [K-] epistemic stance is mainly found in judges' same-turn self-repairs, employing recycling asserting [K-] epistemic stance. Generally, a request for information positions the requester with an unknowing [K-] epistemic stance and the recipient with a knowing [K+] epistemic stance. Interactants express their [K-] epistemic stance to increase the pressure for the recipient to respond promptly by recycling.

### 4.1.1 The convergence of [K+] epistemic stance

The predominant same-turn self-repairs in Chinese civil courtroom interaction aim to keep the convergence of [K+] epistemic stance. The convergence of [K+] epistemic stance means that speakers express [K+] epistemic stance before and after employing same-turn self-repair operations, which is clearly illustrated by Figure 2.

Speakers, who enjoy [K+] epistemic stance, tend to alter their turns to facilitate their listeners' understanding by expressing their [K+] epistemic stance. The main function of most same-turn self-repair operations is to increase the accuracy and credibility by implementing a [K+] action to claim the interlocutor's [K+] epistemic stance. For example, the lawyer of the plaintiff who enjoys the [K+] epistemic stance in the trial narrative prefers asserting [K+] epistemic stance to offer an accurate narrative by means of error replacing.

**Extract (2) Error Replacing** (<http://tingshen.court.gov.cn/live/5308919>).

01 Plaintiff's lawyer: X 的收房时间也是13年12月15号左右。

de shou fang shijian ye shi nian yue hao zuoyou.

MM own home time also COP year month day or so.

The date when Mr. Fan owned the home was also roughly 15 December, 2013.

(noises)

02 Judge: 不要插话。房间里的人，不要讲。

bu. yao chahuo fangjian li de ren bu. yao jiang.

NEG MV interrupt room Prep. MM person NEG MV talk.

"No interruption. People in the courtroom are not allowed to talk."

03 Plaintiff's lawyer: 啊，对，左右啊，左右。

a dui zuoyou a zuoyou.

ah correct roughly ah roughly.

"Ah, it is correct. Roughly, ah, roughly.

04 具体应该由被告，应当由被告提交原告。

juti yinggai you beigao yingdang you beigao tijiao yuangao. specifically MV by defendant MV by defendant submit plaintiff.

Specifically, the defendant should, the defendant should submit.

05 签字的，房屋交接，这个表，予以核实啊。

qianzi de fangwu jiaojie zhe ge biao yuyi hehsi a.

sign MM house handover this CLF form give confirm SFP.

the house handover form signed by the plaintiff. This should be confirmed,

06 因为这个时间跨度长，

yinwei zhege shijian kuadu chang.

because this time span long.

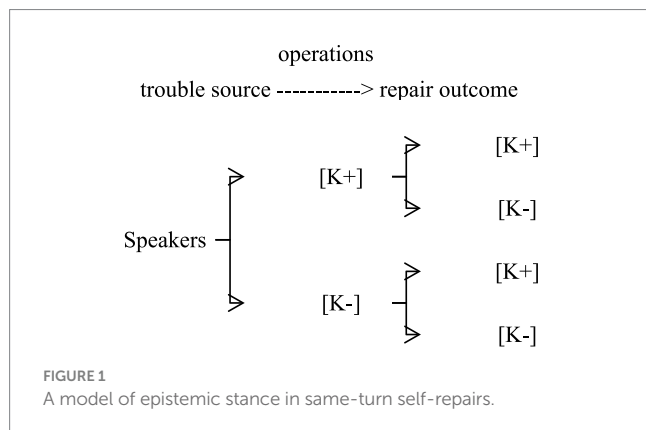


FIGURE 1

A model of epistemic stance in same-turn self-repairs.



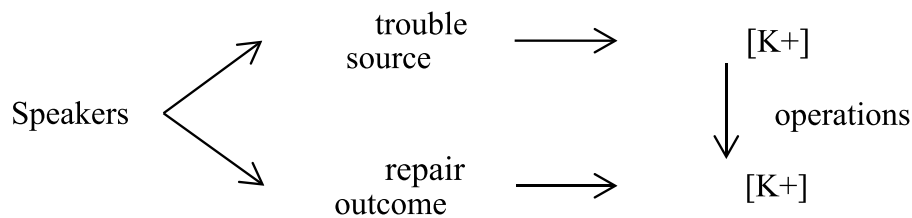


FIGURE 2  
The convergence of [K+] epistemic stance.

because this involves an extended period of time.  
07 → 应当是由，不是有，提交房屋交接表。  
yingdang shi you bu. you you tijiao fangwu jiaojie biao.  
MV COP Prep. NEG COP have submit house  
handover form.  
The word should be “you” (with a rising tone), not “you”  
(with a falling-rising tone), to submit the handover form.

In Extract (2), the judge tends to confirm the date of X’s ownership of the house with the plaintiff’s lawyer. Prior to the segment, both the plaintiff and the defendant mention the house’s completion date and the home ownership form. Thus, the judge requests two parties to submit their originals and checks the date. The plaintiff’s lawyer responds in line 01 and adds details to prove his claims (line 04). In this extract, the phonetic errors are made by the lawyer, who replaces the mispronounced word with the corrected one. Interlocutors repair phonetic errors to ensure their accuracy and credibility of the statements, which is a [K+] self-repair action.

Usually, phonetic errors are slips of tongues. The phonetic errors in the Chinese civil courtroom appear not only in the syllables, but also in tone. In the case of *you* (by) in line 07, the plaintiff’s lawyer intends to supply details to prove the statement in line 04 and enhance his credibility. To be specific, he mispronounces *you* with a falling-rising tone (“*you*”) and replaces with a rising tone (“*you*”). A sound stretch initiates the repair when the plaintiff’s lawyer realizes his tone error (a falling-rising tone), which is followed by the correct tone of “*you*” (a rising tone).

The plaintiff’s lawyer claims the [K+] epistemic stance in the trial narrative, and he would express his [K+] epistemic stance to eliminate troubles and increase the degree of credibility and accuracy of his statements by replacing errors. The following example will demonstrate how participants employ various subtype same-turn self-repair operations, such as inserting (extract 3) to maintain the convergence of [K+] epistemic stance, hence achieving interactional goals.

**Extract (3) Inserting** (<http://tingshen.court.gov.cn/live/5308919>).

01 Judge: 讲慢点，这里，真实性关联性无异议。  
jiang mandia zheli zhenshixing guanlianxing wu yi.  
speak slowly here authenticity relevance NEG disagreement.  
Speak more slowly, here. (You) agree with authenticity  
and relevance.  
02 只对合法性有异议是吧？  
zhi dui hefaxing you yi shi ba.  
only Prep. legality have disagreement COP QP.  
You only doubt the legality (of the evidence), do not you?

03 Defendant’s lawyer: 恩，没有原告本人签字授权。  
en meiyou yuangao benren qianzi shouquan.  
eh NEG plaintiff self sign authorize.  
“Eh. The letter was not signed and authorized by  
the plaintiff.  
(clearing voices) (5 s)  
04 → 并且函件内容对原告合同条款：  
bingqie hanjian neirong dui yuangao hetong tiaokuan::  
and letter content Prep. plaintiff contract terms.  
and in terms of the content of the letter, the terms in  
the contract,  
05 → 合同关键条款陈述有错误。  
hetong guanjian tiaokuan chengshu you cuowu.  
contract critical terms statement have mistakes.  
the statement of the **critical** terms in the contract signed by  
the plaintiff was mistaken.”

In Extract (3), the judge organizes the cross-examination about the fourth piece of evidence (lines 01 and 05). Retrospectively, the plaintiff intends to prove the fact that he has required the compensation for the house for an extended period. However, the defendant’s lawyer disagrees with the legality of the evidence, claiming that the letter does not have the authorized signature of the plaintiff and has inaccurate statement of contract terms (lines 03–05). The defendant’s lawyer stresses that the inaccurate statement of the contract is serious and proves the illegality of the evidence by inserting *guanjian* (key) before *tiaokuan* (term) in line 05. In this instance, the speaker asserts his [K+] epistemic stance in the trial narrative by employing inserting self-repair operation in the same-turn. The same-turn self-repair is initiated with a cut-off or a sound stretch, and then the adjective (critical) is inserted in line 05, which aims to accentuate the importance of the point in question.

#### 4.1.2 The convergence of [K–] epistemic stance

The convergence of [K–] epistemic stance means that speakers express [K–] epistemic stance before and after employing same-turn self-repair operation, which can be clearly understood by looking at Figure 3.

A request for information positions the requester as asserting an unknowing [K–] epistemic stance and the recipient as claiming a knowing [K+] epistemic stance. In fact, the judge employs same-turn self-repair operations to keep the convergence [K–] epistemic stance. Through partial or full recycling, speakers assert their [K–] epistemic stance to urge the respondent to give a reply.

Extract (4) below is a typical example of recycling by the plaintiff, who is not well-educated and speaks without a clear logic or accurate

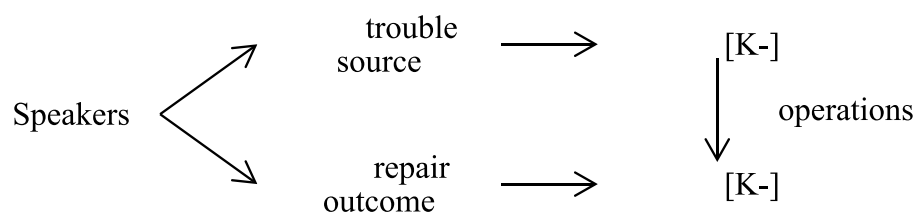


FIGURE 3  
The convergence of [K-] epistemic stance.

grammar. Another striking point is that he delivers his trial narrative in Mandarin Chinese with a strong accent.

**Extract (4)** Recycling (<http://tingshen.court.gov.cn/live/4702467>).

- 01 Judge: 16 年 4 月 21 号 的 这 5 万 块钱 还 给 你 没有?  
nian yue hao de zhe wan kuaiqian huangei ni meiyou.  
year month day MM this 10,000 yuan return 2PS NEG.  
Did you get the 50,000 yuan back on April 21, 2016?
- 02 Plaintiff: 还 了 。 (6s).  
huan le.  
return PRT.  
“Yes, he did.”
- 03 Judge: 那 为 什 么 借 条 原 件 还 在 你 手 上 呢?  
na weishenme jietiao yuanjian hai zai ni shou Shang ne?  
then why loan receipt original still Prep. 2PS hand QP.  
“Then, why did you still have the original loan receipt in your hand?”
- 04 Plaintiff: 这 个 :: 是 他 当 事 人 他 认 为 这 个 钱 他 借 给 谁 去 了 。  
zhege:: shi ta dangshiren ta renwei zhege qian ta jiegei shui qu le.  
this:: COP 3PS party 3PS think this money 3PS lend who go ASP.  
This::, the party involved, he doubted who borrowed the money.
- 05 → 他 向 我 来 要 钱 , 到 底 到 底 是 不 是 借 给 他 了 ,  
ta xiang wo lai yao qian daodi daodi shi bu. shi jiegei ta le.  
3PS Prep. 1PS come ask money really really COP NEG COP lend 3PS ASP.  
He asked me for money. Did I really lend money to him?
- 06 他 就 把 这 个 条 子 拿 出 去 了 ,  
ta jiu ba zhege tiaozhi na chuqu le.  
3PS just Prep. this receipt take away ASP.  
He took this receipt away.

Extract (4) is an instance of lexical recycling, by which the plaintiff displays his [K-] epistemic (Line 05). The judge begins the talk by mentioning the first question to confirm whether the money is paid back or not (line 01). Then, the plaintiff gives a positive response, “Yes, he did,” in line 02. The judge raises the second question why the receipt is still in his hand (in line 03). However, the plaintiff has trouble in understanding and utters irrelevant information in line 04. The word recycling “really” (“*daodi*” in line 05) is treated as implementing a self-repair to keep the convergence [K-] epistemic stance in the details of the case. The plaintiff deploys a recycling to keep the convergence [K-] epistemic stance in the turn to highlight the detail.

## 4.2 The divergence of epistemic stance in same-turn self-repair

The divergence of epistemic stance in same-turn self-repairs in Chinese civil courtroom also includes two ways: [K+] to [K-] or [K-] to [K+]. In terms of the gradients in the formulation of epistemic stance, the fundamental observation is that unknowing speakers ask questions and knowing speakers make assertions (Heritage, 2012a). The gradient from [K+] to [K-] is reflected from syntactical forms as follows: declarative syntax > declarative syntax with a final rising intonation > tag questions > negative interrogative syntax > interrogative syntax. In addition to the gradients, whether utterances are to be understood as requesting or conveying information depends on syntax and intonation, which represents the epistemic stance that speakers assert or attribute to themselves and their recipients at a given point in an interaction.

Given that civil courtroom interaction is organized primarily around question-answer sequences (Heritage and Clayman, 2010), it is perhaps not surprising that same-turn self-repairs are deployed by judges in a way that conforms to constraints on asking questions. While it is generally known that the turn-taking system governing courtroom interaction restricts judges’ turns-at-talk to raise questions, what is perhaps less manifest is the fact that there are also constraints on the form that judges’ questions can take. Indeed, judges use reformatting, deleting, replacing to modify the grammatical format of questions that seemingly satisfy one such constraint in the context. Plaintiffs, defendants, and their lawyers self-repair their utterances to maintain their preferred versions of narratives of reality. However, they would downgrade the epistemic stance from [K+] to [K-] to decrease the definitiveness of claims and responses, obfuscating responsibilities, or skirting questions by employing inserting and deleting to adjust their epistemic stance.

### 4.2.1 The divergence of epistemic stance from [K+] to [K-]

The divergence of epistemic stance from [K+] to [K-] means that speakers allege [K+] epistemic stance in their original utterances, but assert [K-] epistemic stance after employing same-turn self-repair operations. Figure 4 makes the procedure easier to understand.

Although judges could upgrade epistemic stance in the knowledge of the current trial after they have obtained competing versions of narrative from both parties. Judges prefer confirming or rechecking the information to verify the key issues. By way of illustration, they would repeat or restate the utterance in a declarative form, which positions [K+] epistemic stance, and subsequently delete redundant elements with a rising intonation, downgrading the epistemic stance.

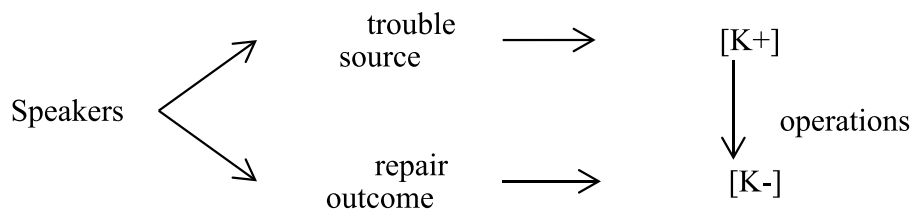


FIGURE 4  
The divergence of epistemic stance from [K+] to [K-].

Judges employ reformatting to alter a declarative syntax, which positions [K+] epistemic stance, to an interrogative syntax asserting [K-] epistemic stance. Generally, judges add interrogative words to or insert tag questions into the declarative construction due to the interactional import.

**Extract (5) Inserting** (<http://tingshen.court.gov.cn/live/5325594>).

- 01→Judge: 我问一下, 这个, 原告方第一个问题.  
wo wen yi xia zhege yuangao fang diyi ge wenti.  
1PS ask one CLF this plaintiff party first CLF question.  
“I ask the plaintiff the first question.”
- 02 啊, 你们买房的时候, 看了他这个房屋销售.  
a, nimen mai fang de shihou kan le ta zhege fangwu xiaoshou.  
ah 2PP buy home MM time see ASP 3PS this house sale.  
Ah, when you bought the house, did you see the plan of this house?  
(raising his right hand)
- 03 这个图没有? 就是他所说的这种图, 表格.  
zhe ge tu meiyou jiushi ta suoshuo de zhe zhong tu biao. ge.  
this GLF plan NEG just 3PS say MM this CLF plan, table.  
That is, the plan or the table he mentioned.
- 04 就这种户型图啊? (raising his right hand with the paper).  
jiu zhe zhong huxing tu a.  
just this CLF floor plan QP.  
Just like this sort of floor plan?
- 05 有没有?  
you mei you.  
have NEG have.  
did not you?
- 06 Plaintiff’s lawyer: 户型图应当是看过 [但是::]  
huxing tu:: yingdang shi kan guo, [danshi::]  
floor plan:: MV COP see ASP [but::]  
I should have seen the floor plan, [but::]
- 07 Judge: [看过]↓ 是吧?  
[kan guo]↓ shi ba?  
[see ASP]↓ right QP  
(You) [saw] it-↓ **did not you?**
- 08 Plaintiff’s lawyer: 但是↓ 我不知道看的户型图是哪种.  
danshi wo bu. zhidao kan de huxing tu shi na yi zhong.  
but 1PS NEG know see MM floor plan COP which one CLF.  
“However, I am not sure which type of floor plan.”
- 09 肯定是没有层高的.  
kending shi mei you cenggao de.

definitely COP NEG have floor height MM.

Definitely, (the floor plan) does not show the floor height.

10 肯定是, 只有这个, 就说是几室几间, .

kending shi zhiyou shege jiu shuo shi ji shi ji jian.

definitely COP only this just say COP several room several room.

Definitely, yes. Only this, that is to say, with several rooms.

11 类似那种的。.

leisi nahzong de.

like sort of MM.

sort of.”

12 Judge: 哦。.

o

oh

“Oh.”

13 Plaintiff’s lawyer: 肯定是没有层高指示.

kending shi meiyou cenggao zhishi.

definitely COP NEG floor height mark.

“Definitely, there was no floor height marked.”

14 Judge: 看过但是那种没有层高的 (0.5) 是不是?

kan guo danshi nahzong meiyou cenggao de shi bu shi?

see ASP but that NEG floor height MM COP NEG COP.

You saw the floor plan but without floor height, (0.5) **did not you?**

15 Plaintiff’s lawyer: 对。.

dui.

right.

Yes.

In extract (5), the judge checks whether the plaintiff has seen the floor plan. In this context, the plaintiff’s lawyer is adopting [K+] epistemic stance, and judge positions [K-] epistemic stance. The judge claims an epistemic stance change from [K+] to [K-] in line 01, who is adopting a particular epistemic stance [K+] toward what is being verified. He nevertheless abandons the declarative construction by a cut-off and selects instead what is perhaps a more cautious interrogative [K-] stance, more cautious insofar as the defendant assigns epistemic primacy, which is the [K+] stance to the plaintiff. When getting the answer from defendant in line 07, the judge repeats the verb – *kanguo* (saw), upgrading the epistemic stance toward [K+], and subsequently downgrades the epistemic stance with a tag question toward [K-]. Therefore, the shift of epistemic stance in line 07 is from [K+] to [K-].

In line 13, the plaintiff’s lawyer emphasizes that he did not see the floor-to-ceiling height. The judge repeats the answer in line 14 and after 0.5-s pause initiates a repair with a tag question — *shi bu shi* (did not

you) in the final position of the turn. Similarly, a change of epistemic stance from [K+] to [K−] occurs in line 14 concerning the trial narrative. In terms of reformatting, the judge begins his turn with a declarative form. Before completing that declarative, he enjoys a [K+] stance which he substitutes with an interrogative form or a tag question by inserting *shi bu shi* in line 14 and downgrades epistemic stance from [K+] to [K−], ceding the primary epistemic stance to his recipient.

It is also worth noting that the judge raises his right hand with the paper in line 04 to draw the plaintiff's lawyer to the floor plan in his hand, which is illustrated in Figure 5. This waving gesture is employed to highlight the topic in question. At the same time, the judge also oriented himself toward the co-participant in the moment-by-moment unfolding interaction.

#### 4.2.2 The divergence of epistemic stance from [K−] to [K+]

The divergence from epistemic stance [K−] to [K+] means that speakers express epistemic stance from [K+] in their original utterances to [K−] after employing same-turn self-repair operations. The detailed process is shown as Figure 6.

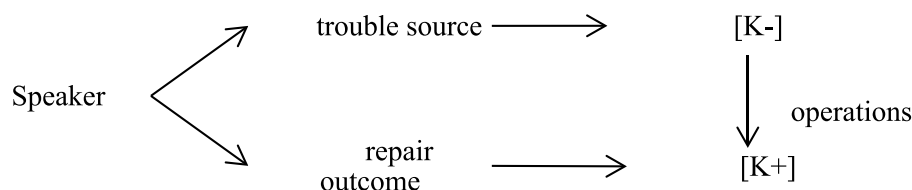
Since judges are supposed to enjoy more power in the courtroom, they have more opportunities to change their epistemic stance when they are in [K−] epistemic stance. Generally, judges abort the initially more open-ended and less “leading” questions (i.e., wh-format), and then restart the question with a new syntactic construction, which indicates a particular answer to the recipient (i.e., yes or no). In the collected data, this way the epistemic stance changes mainly appears in judges' same-turn self-repairs. Judges upgrade their epistemic stance from [K−] to [K+] to narrow down the response scope and push recipients to reply by reformatting (extract 6) to upgrade the constraints on asking for information.

**Extract (6) Reformatting** (<http://tingshen.court.gov.cn/live/5325594>).

- 01 Judge: 第三 一个 问 一 下, 在 17 年, 他 约 定 的 是.  
disan yi ge wen yi xia zai nian ta yueding de shi.  
third one CLF ask one time Prep. year 3PS  
promise MM COP.  
“Thirdly, I confirm one point. In 2017, his promise was.  
02 7 月 份 交 房 嘛, 交 房 的 时 候,  
yuefen jian fang ma jiao fang de shihou.  
month handover house SFP handover house MM time.  
The home handover was due in July. During the handover,  
03 你 们 当 时, 交 房 时, 你 们 当 时.  
nimen dangshi jiao fang shi nimen dangshi.  
2PP when handover home time 2PP when.

- At that time, during the handover; at that time,  
04 → 对 层 高 提 出 异 议 没 有?  
dui cenggao tichu yi yi mei you?  
Prep. floor height raise disagreement NEG have.  
did you question the floor height?  
05 Plaintiff's lawyer: 提 出 了 。 .  
tichu le.  
raise PRT.  
“Yes, I did.”  
06 → Judge: 当 时, 就 提 出 了, .  
dangshi jiu tichu le.  
then just point out ASP.  
“Then, you pointed it out.”  
07 Plaintiff's lawyer: 对 。 .  
dui  
right.  
“Right.”  
08 → Judge: 以 什 么 形 式 啊? 以 书 面 形 式 还 是 什 么?  
yi shenme xingshi a yi shumian xingshi haishi shenme.  
Prep. what form QP with written form or what.  
“Which form? **Written** form or others?”  
09 Plaintiff's lawyer: 额, 包 括, 当 面 也 提 了, 书 面 形 式 也 提 了 。 .  
e baokuo dangmian ye ti le, shumian xingshi ye ti le.  
eh include face-to-face also raise PRT written form also  
raise PRT.  
Erm, including, I point it out in person and in the  
written form.  
10 包 括 后 面, 我 们 交 的 那 两 个 报 告, 那 个.  
baokuo houmian women jiao de na liang ge baogao nage.  
include latter 1PP submit those two CLF report sort of.  
including the latter, those two reports we submitted,  
sort of.”

Extract (6) is drawn from the court examination. Prior to the segment, the court discussion concentrates on the first controversial issue -- the floor-to-ceiling height. The judge wants to know whether the plaintiff checks the floor height when he takes the house (line 01). Moreover, he proposes the second question about the form of the complaint (line 08). Generally, the objection can be raised in two forms: spoken or written. To prevent the possible misunderstanding of the *xingshi* (form), the judge inserts *shumian* (written) before the trouble source. The inserting repair not only inserts an adjective word, but also reformulates a wh-question as a yes-no question, which serves to prevent the possibility of misunderstanding and provide details of the question. The wh-question interrogation shows that the judge



**FIGURE 5**  
The divergence of epistemic stance from [K−] to [K+].





FIGURE 6

A waving gesture of the judge. Reproduced from <http://tingshen.court.gov.cn/live/5325594> with permission from The People's Court of the Yuelu District, Changsha City, Hunan Province, P. R. China.

positions in the [K−] epistemic stance in the trial narrative. However, he moves from a [K−] stance toward [K+] by increasing the certainty of respondents' answer.

Summarily, same-turn self-repairs are usually solicited by asserting the convergence of speakers' epistemic stance of [K+] or [K−] or changing the epistemic stance of interlocutors, which can be embodied by two formats: [K−] to [K+] and [K+] to [K−]. The convergence of [K+] epistemic stance is the principal way in the model of epistemic stance of same-turn self-repairs to achieving the fundamental interactional goal – improving the accuracy of utterances in the trial narrative. Speakers employ most operations to keep the convergence of [K+] epistemic stance, such as replacing (extract 2) and inserting (extract 3). Judges improve the accuracy of their utterances to provide more authenticity and professional instructions, asserting [K+] epistemic stance in the same-turn self-repairs. While plaintiffs, defendants and their lawyers improve the accuracy of their statements to increase the degree of credibility and highlight the key points to accentuate their version of narratives, claiming their [K+] epistemic stance in the same-turn self-repairs. Judges have more opportunities to keep the convergence [K−] epistemic stance in same-turn self-repairs, and they recycle partial or full questions (extract 5) to express his [K−] epistemic stance, imposing the question, and urging respondent to give answer.

While defendants, plaintiffs, and their lawyers enjoy the [K+] epistemic stance in their versions of trial narratives of reality, they may also downgrade epistemic stance [K+] to [K−] to decrease the degree of certainty to avoid judges' questions or shirk responsibilities by adjusting epistemic stance by inserting (extract 5). Judges choose reformatting (extract 6) to upgrade epistemic stance from [K−] to [K+].

Unlike previous studies, which mostly center on the judge's discourse (e.g., Han, 2011), this study explores how judges, plaintiffs, defendants, and their lawyers deploy same-turn self-repair operations to achieve their interactional goals based on the model of epistemic stance. More

importantly, the shift of epistemic stance provides an alternative perspective to explore the choice of same-turn self-repair operations in the courtroom trial, thus enriching the growing body of literature on the study of legal discourse in Mandarin Chinese (see Ge and Wang, 2019) and same-turn self-repair operations (see Ma and Gao, 2018).

Different from the study by Szczyrbak (2021) which only centers on the use of the epistemic lexical verbs regarding certainty and doubt, the present article looks at the correlation between choice of same-turn self-repair and the shift between [K−] and [K+] in the Chinese civil courtroom interaction. In other words, judges, plaintiffs, and defendants can pick out the proper repair operations to converge or diverge their epistemic states flexibly to display their conversational actions and achieve their communicative goals.

In contrast to the research by Dong (2013) and Gibbons (2008) which examine how interactants make use of linguistic resources such as question-answer adjacency pairs in their trial narratives and debate, this article concentrates on same-turn self-repair operations and reveals that all the participants are capable of employing repair operations to demonstrate their epistemic stance in their moment-by-moment unfolding interaction.

## 5 Conclusion

### 5.1 Summary

Based on the data from 5 Chinese civil trials, this article presents a conversation analysis of the same-turn self-repair operations in Chinese civil courtroom interaction from the perspective of epistemic stance. This study attempts to build a functional and multidimensional same-turn self-repair model for judges, plaintiffs, defendants, and their lawyers in the Chinese civil courtroom based on ten operations framework (Schegloff, 2013). Altogether, six out of the ten same-turn self-repair operations appeared in the civil courtroom interaction, namely replacing (25.94%), inserting (24.84%), searching (19.6%), recycling (18.63%), deleting (8.5%), and reformatting (2.94%).

Additionally, in the interactional dynamics of Chinese civil courtroom, judges perform two basic roles, namely, controlling and moderating the talk produced by all the other participants in the courtroom and finding facts or the reality, while plaintiffs, defendants, and their lawyers offer testimony frequently in civil trials. As the co-participants of the case, plaintiffs, defendants, and their lawyers have primary epistemic access to provide repair operations. Thus, they employ more same-turn self-repairs than judges to modify their utterances to achieve communicative goals when they make claims and provide evidence in the question-answer sequences.

Besides, judges, plaintiffs, defendants, and their lawyers assert or change their epistemic stance to improve accuracy of their versions of reality, emphasize their points, or increase the credibility by deploying different operations. Judges prefer employing same-turn self-repair operations to improve the accuracy of instructions and legal interpretations, attempting to maintain the convergence [K+] epistemic stance in terms of their expertise. However, a request for information positions judges with an unknowing [K−] epistemic stance and plaintiffs, defendants, or their lawyers with a knowing [K+] epistemic stance. Therefore, when judges enquire about the trial narratives or confirm statements, they would upgrade or downgrade epistemic stance from [K+] to [K−] or [K−] to [K+] to obtain responses by deleting, reformatting, and replacing. In some cases,

judges keep their [K−] epistemic stance by recycling the question to urge recipients to give responses.

Since defendants, plaintiffs, and their lawyers enjoy the [K+] epistemic stance in their narrative versions, they deploy most of same-turn self-repair operations to assert their [K+] epistemic stance to increase the credibility and accuracy of their statement, especially replacing, inserting, and searching. Besides, they choose recycling and inserting to claim their [K+] epistemic stance by highlighting their points of their narratives. On the contrary, they generally downgrade epistemic stance from [K+] to [K−] to decrease the certainty of statements to avoid judges' questions or shirk responsibilities by inserting and reformatting to achieve epistemic adjustment.

## 5.2 Implications for theory and practice

Overall, this study explores same-turn self-repairs in Chinese civil courtroom in greater details through conversation analysis, which enriches the repair mechanism. Particularly, the features, patterns, and turn-by-turn analyses of repair operations in this study can offer valuable insights into the use of self-repairs in the Chinese institutional context. More importantly, epistemic stance is used to unveil how judges, plaintiffs, defendants, and their lawyers deploy those operations to achieve their interactional goals. The convergence or divergence epistemic stance provides an alternative perspective to explore the choice of same-turn self-repair operations in the courtroom setting.

In terms of pragmatics and discourse analysis, this study can shed light on understanding of the choice of same-turn self-repair operations to display convergence or divergence epistemic stance in the civil trial discourse. This finding suggests that co-participants can deploy same-turn self-repair to shift epistemic stance in the mundane interaction.

## 5.3 Limitations and directions for future research

Despite the contribution to the understanding of same-turn self-repairs in Chinese civil courtroom, there are several limitations of the present study. The data contain more than 50,000 words interaction in Chinese civil courtrooms, including 324 examples of self-repairs in the same turn. However, the sample data is still not big enough. In conversation analysis, the criteria to assess the sample size is not clearly defined. Hoey and Raymond (2022) state that if the conversational phenomenon such as “fourth-position repair” (Schegloff, 1992) is relatively rare, the time needed for collection increases. Another example is that the database consists of 30 videotaped conversations with aphasic Finnish speakers (Helasvuo, 2004) in one study. Obviously, five Mandarin Chinese civil trials are not adequate for both qualitative and quantitative analysis for this study, which can be considered as a limitation in this study.

On top of that, tones, rhythm, gestures, intonations, eye contact, facial expressions, and body movements, which have not been completely analyzed in the data, are equally valuable to

repair initiators or responses in natural interaction for future studies. Since this study only focuses on same-turn self-repair operations, the future research can turn to examine other-initiated repair sequences in interaction. Another limitation of this study is that the research questions do not consider the fact that numbers of self-repairs vary among participants such as judges, plaintiffs, and defendants, and also differ from case to case. The comparison between participants and cases in terms of same-turn self-repairs can be one of the research orientations for our future study. A final limitation of this study is that civil courtroom interactions, procedures, or makeup might be different in Hong Kong, Macau, and Taiwan due to their own jurisdiction or legal system. For example, Hong Kong is currently a Special Administrative Region of China, and operates under the “One Country Two Systems principle. In other words, Hong Kong can retain its own legal system (Verhagena and Yamb, 2021). Consequently, the results concerning the choice of same-turn self-repair operations and the display of epistemic stance might not be applicable outside the mainland China.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## Author contributions

JX: Conceptualization, Funding acquisition, Supervision, Writing – review & editing. LG: Conceptualization, Investigation, Methodology, Writing – original draft.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Appendix A

### **Simplified Transcription Symbols and Transcription Notations.**

[Left brackets indicate the starting point at which a current speaker's talk is overlapped by another's talk.

] Right brackets indicate the finishing point at which a current speaker's talk is overlapped by another's talk.

= Equal signs, one at the end of a line and one at the beginning, indicate no gap between the two lines.

(0.3) Numbers in parentheses indicate elapsed time in silence in tenths of a second.

:: Colons indicate prolongation of the immediately prior sound. The length of the row of colons indicates the length of the prolongation.

? Question marks indicate interrogative intonation.

◦ Periods indicate declarative intonation.

, Commas indicate the level or slight rising intonation of incompleteness in terms of syntax, prosody or pragmatics.

→ Arrows in the left-hand margin of the transcript may be used to call the reader's attention to particular parts of the transcript. The author will inform the reader of the significance of the referent of the arrow by discussing it in the text.

## Appendix B

### **Transcription notations.**

i. In the transcripts, the first line in italics is the original Mandarin utterance in Chinese characters; the second line is pinyin in Mandarin Chinese; the third line is a word-for-word gloss; and the fourth line is a vernacular English gloss.

ii. Arrows in the left-hand margin of the transcript may be used to call the reader's attention to particular parts of the transcript. The author will inform the reader of the significance of the referent of the arrow by discussing it in the text.





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# Role-theoretic discourse analysis of German security policy: a case of German parliamentary debate on the mission in Afghanistan

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This article combines linguistic discourse analysis with role theory to create a role-theoretic discourse analysis framework for German security policy. To illustrate this, we employ topos analysis on 30 plenary minutes of parliamentary debates regarding the International Security Assistance Force mission in Afghanistan, conducted by German Members of Parliament between 2001 and 2014. We interpret their perception of Germany's roles in light of key behavioral norms related to German security policy. The parliamentary discourse, shaped by topoi, sets the stage for decisions on German military operations abroad. The use of topoi is influenced by dominant thought patterns, particularly the perspective on Germany's role in security policy held by the political elite. Political decisions, in turn, reflect behavioral preferences guided by these viewpoints. Our research reveals how changes in German security policy are mirrored in the discourse. This discourse is structured around five categories of topoi for legitimizing or delegitimizing military operations abroad: necessity, obligation, self-interest, capability and preparedness, and solution. An evaluation of the use of topoi through the lens of role theory indicates that perceptions of Germany's role have evolved over time, encompassing roles such as a "civilian power," a "normal state," and an "agenda-setting role" in sync with its foreign military engagements.

## KEYWORDS

role theory, linguistic discourse analysis, topos/topoi, security policy, military operations abroad

## 1 Introduction

Since 1990, extensive research has been dedicated to examining German foreign policy, with a particular emphasis on Germany's role in diplomatic endeavors. In the traditional realm of international relations, security policy is considered an integral component of foreign policy (Hellmann, 2007 p. 605). Following German unification, the nation's security policy underwent a notable transformation characterized by a "proactive" strategy that prioritized "crisis prevention" and "long-range defense." By the mid-1990s, this approach increasingly incorporated the use of military force as a measure of last resort (Hellmann, 2007 p. 612). Within this context, the deployment of the Bundeswehr to Afghanistan held significant importance (Li, 2010 p. 4). The Bundeswehr's involvement in Afghanistan as part of the International Security Assistance Force (ISAF) spanned a period of fourteen years.

This prompts the question: has German security policy evolved as a consequence of this process? This inquiry has been extensively explored in an abundance of scholarly work, employing a range of political science theories and methodologies (Brummer and Fröhlich, 2011; Noetzel, 2011; Hilpert, 2014). During the last Bundestag debate on the Bundeswehr's participation in ISAF, which took place on 13 February 2014, member of parliament (MP) Annen (Social Democratic Party, SPD) remarked, "The Bundeswehr mission has also altered our nation and our political discourse." This paper therefore attempts to construct an analytical framework to scrutinize the development of German security policy through the lens of language.

Prominent international political scholars such as Ashley (1987), Walker (1987), and Shapiro (1988) have already underscored the significance of the "power of language" within the realm of international relations. Drawing upon theories from post-structuralist philosophers, they have recognized that "discourse" serves as a linguistic system for generating meaning (Foucault, 1974). Through this lens, they have conceptualized foreign policy as a "discursive practice" and harnessed discourse theories to provide critical analyses of how states and international institutions construct their foreign policies (Hansen, 2016 p. 95). Milliken (1999) has contributed a valuable introduction to discourse analysis and its underlying theoretical principles. Notably, this work represents one of the early instances of explicit discussions on discourse analytical methodologies. Waever (2003) has presented his widely accepted theory on European integration policies, conceiving them as layered discourses. Furthermore, he has explored the intersection of discourse analysis with the field of foreign policy analysis. Hansen (2016) has positioned post-structuralist discourse analysis within the landscape of international relations, offering methodological guidelines on how to read and select texts and construct research designs. This approach effectively highlights the prevailing representations of social reality and the diverse interpretations of it, as illustrated by post-structuralist discourse theory. However, research employing this methodology sometimes neglects the crucial "linguistic" dimension involved in the creation of subject identities (Aydın-Düzgit, 2014 pp. 355–356).

Linguists like Brown and Yule (1983) adopt a predominantly linguistic perspective for the analysis of discourse. Fairclough (1992) contends that systematic textual analysis forms an integral component of linguistic discourse analysis (LDA). Jensen posits that LDA facilitates the observation of communicators' construction of semantic networks, which reflect their worldviews and elucidate the process of developing a shared understanding (Hacker, 1996 p. 38). Starting from the 2000s, anthologies by Barton (2003), Warnke (2007), Felder et al. (2011), as well as contributions by Busse and Teubert (2013b), and textbooks authored by Niehr (2014) and Bendel Larcher (2015), have collectively contributed to the crystallization of LDA. Linguists regard LDA as an extension of text linguistics, acknowledging that discourse, as a linguistic unit, transcends the boundaries of individual texts (Niehr, 2014 p. 29). LDA, functioning as a descriptive analytical approach, is employed to characterize the distribution, meaning production, and knowledge construction of linguistic phenomena within discourse. It should be noted that the primary aim is not to evaluate or interpret these phenomena (Bendel Larcher, 2015 p. 37). The Düsseldorf School, which builds on the theory of historical

semantics (Spieß, 2011 p. 88), has made significant strides in the development of linguistic discourse theory (Spieß, 2011 p. 107). Their work includes extensive empirical investigations of political discourse and the development of linguistic discourse analysis on three key levels: lexical, metaphorical, and argumentative (Wengeler and Böke, 1997; Wengeler, 2003; Jung, 2013; Stötzel and Wengeler, 2013; Niehr, 2014). While some have critiqued the perceived lack of societal relevance in mere descriptions of language usage, it's essential to recognize that descriptive analysis, with its capacity to deconstruct and reconstruct discourse, can offer valuable insights (Bendel Larcher, 2015 p. 222). It is precisely in this context that interpretive theories in the domains of international relations and political science can offer pathways to comprehending the political connotations inherent in discourse. Post-structuralist research has underscored the pivotal role of discourse in the field of international relations (Hansen, 2016), offering a robust explanatory framework for issues related to security policy.

This study draws inspiration from Schünemann et al. (2018), who employ role attribution to elucidate the political conduct of state actors, asserting that role attribution manifests in the keywords used in government documents. To establish a hybrid approach that amalgamates the descriptive and explanatory capabilities of discourse analysis, we connect role theory (RT) in international relations (IR) research with LDA tools (operating at the argumentative level). This fusion results in a role-theoretic discourse analysis framework for examining German security policy. In order to exemplify the application of this role-theoretic discourse analysis framework in the context of security policy research, we conduct an empirical discourse study on the German parliamentary debate on ISAF. This study seeks to address the following research questions: How did changes in Germany's security policy throughout the fourteen-year ISAF mandate, spanning two Gerhard Schröder administrations and three Angela Merkel governments, manifest within the parliamentary discourse on ISAF? What shifts in Germany's role in security policy do these discourses signify?

## 2 Research theory and methodology

### 2.1 Role theory and study of German security policy

Role theory originated in the 1930s with its foundation by sociologist Mead, primarily as a framework to elucidate human behavior (Breuning, 2017). Subsequently, Holsti (1970) extended RT's application to the realm of international relations, using it to expound upon the varied patterns of foreign policy conduct. Throughout the 1970s, RT underwent further development and emerged as a theoretical paradigm for the examination of comparative foreign policy (Walker, 1987). It is widely acknowledged that RT serves as a valuable analytical variable for investigating the motivations underlying state actions, grasping the perspectives of state actors, and predicting their diplomatic behaviors (Yuan, 2013). According to Harnisch (2015), a state's role can be parsed into two components: the Ego-part and the Alter-part. The Ego-part encompasses the inherent perception

of national interests by decision-makers, reflecting domestic pressures and considerations. Conversely, the Alter-part represents another facet of decision-makers' perception, encapsulating the expectations of other actors within the international community. Foreign policy-related roles are significantly influenced by the expectations of both the domestic departments (ego-expectations) and international counterparts (alter-expectations), playing a pivotal role in shaping and guiding foreign policy behavior (Harnisch, 2011 p. 8). The configuration of Germany's security role is intricately intertwined with the parliamentary discourse surrounding the legitimization or delegitimization of military engagements abroad. The process of this political discourse serves as a mirror, reflecting the perception, establishment, and reshaping of Germany's role by the nation's political decision-makers. Given this context, RT emerges as an apt explanatory framework for understanding how Germany's security role is articulated within the political discourse on security policy. Numerous scholarly contributions have delved into the positioning of Germany's role within the post-Cold War international system. This study has specifically identified "civilian power," "normal state," and "agenda-setting role" as representative role prototypes. These prototypes have been selected as the foundation for a qualitative analysis grounded in RT.

The theory of "civil power" as articulated by Maull (1989, 2000) has been frequently employed in the evaluation of post-unification Germany. "Civilian power" denotes a category of actors that intentionally differentiate themselves from "traditional powers" regarding their objectives and strategies in contributing to the evolution of international relations. Their overarching aim is to promote the advancement of international political civilization, and they exhibit a distinct foreign policy value orientation and style (Kirste and Maull, 1996). The selection of "civilian power" as the archetype for Germany's security role in this study implies that Germany assumes a relatively "demilitarized" character compared to other nations. Furthermore, it conveys that the goals and methods of German foreign policy possess a "civil" quality and are significantly influenced by Germany's "culture of restraint" (Meiers, 1995). Identifying Germany as a "civilian power" does not signify the complete absence of elements related to "power" and "material interests" in German security policy; rather, these aspects must be assessed, deliberated upon, and balanced through a framework of norms and values inherent to the role prototype of a "civilian power" (Harnisch, 2001).

The concept of the "normal state" as used in this article originates from Germany's foreign policy strategy of "normalization", in contrast to the "de-normalization" approach followed by the Federal Republic of Germany during the Cold War. "Normality" emerged as one of the most frequently used terms following German reunification (Walser, 1998). It is the legacy of fascism in Germany's history that challenges this pursuit of "normality" (Wiegel, 2001 p. 28). According to the linguist Assmann and Frevert (1999), "normality" encompasses various interpretations, including the abandonment of the German "Sonderweg," the reclamation of national sovereignty, the termination of occupation, and the removal of political constraints. Authors such as Baring et al. (1991), Schöllgen (1993), and Schwarz (1994) have explored "what Germany's new role should entail" in their publications, and they unanimously concur that the past

should no longer impede the present. In his book *Der deutsche Weg (The German Way)*, SPD politician Barr advocates for a German foreign policy liberated from its excessive preoccupation with the past (Barr, 2003 p. 137). With the Federal Constitutional Court's landmark decision in 1994 permitting the Bundeswehr to engage in extraterritorial military operations, a growing number of observers have asserted that Germany has transitioned into a "normal state," free from historical constraints and capable of employing force when necessary (Baumann and Hellmann, 2001). As Germany's influence has grown, the international community has come to anticipate that it will assume a "normal" international role akin to that of Britain and France, actively participating in international affairs beyond the economic realm (Brunner and Oppermann, 2015).

The third representative role prototype is the "agenda-setting role." In international regimes, the agenda is typically established, or jointly determined, by the Great Powers in alignment with their national interests and value standards. For example, Nye (1990) highlights the United States as a paramount power source in the international system and a crucial component of soft power. By incorporating its ideals into the expansion of the international system, the United States has gradually forged a set of exceptionally legitimate and stable competitive norms. Germany's commitment to the principles of multilateralism, its proactive utilization of its power and resources to enhance its influence, and its increasingly active participation in global organizations such as the European Union (EU) and North Atlantic Treaty Organization (NATO) have been recognized as indicators of its shift toward an "agenda-setting role" (Bulmer and Paterson, 1996; Anderson, 1999). A study by Rittberger's team on German foreign policy after reunification revealed Germany's insistence on delegating authority and responsibilities to supranational and international organizations, even expanding its involvement in various domains (Rittberger, 2001). Becoming a "leader" akin to the United States epitomizes the "agenda-setting role." However, contingent upon the level of influence, it can also assume the role of a "follower with agenda-setting function" (Cooper et al., 1991) or a hybrid role within the "leader" framework, known as a "broker" (Maull, 2008).

These three role prototypes were selected for their relevance to Germany's post-unification security policy, encapsulating the nation's stance in multilateral international relations and its approach to addressing global security concerns through overseas military interventions. While not mutually exclusive, they do entail distinct behavioral norms. In our empirical study, we can categorize the key behavioral norms associated with each prototype, highlighting these distinctions as assessment indicators for evaluating Members of Parliament's role perceptions during parliamentary debates (see Table 1).

## 2.2 Discourse, linguistic discourse analysis and topos analysis

The modern concept of "discourse" traces its roots to Foucault, who defined it as a network of statements within a society during a specific historical period, guided by "structures of order." These

TABLE 1 Representative role prototypes of Germany related to security policy.

Role prototypes	Key behavioral norms
CIVILIAN POWER	<ul style="list-style-type: none"> <li>– Be values-oriented,</li> <li>– Emphasizing the rule of law in international relations,</li> <li>– Willing to assist,</li> <li>– Accepting collective discipline and valuing cooperation and solidarity.</li> <li>– Preference for non-violent means of conflict solution.</li> </ul>
NORMAL STATE	<ul style="list-style-type: none"> <li>– Be national interests- oriented,</li> <li>– Be vulnerable to external expectations,</li> <li>– Emphasizing responsibility and power,</li> <li>– Be relieved of historical constraints and able to use force if necessary.</li> <li>– Adheres to Western alliances and consolidates the trust of allies.</li> </ul>
AGENDA-SETTING ROLE	<ul style="list-style-type: none"> <li>– To seek international influence as a core strategic goal,</li> <li>– Even as a follower, one should strive to play the agenda-setting function,</li> <li>– Make good use of the broker status,</li> <li>– Be an agenda-maker, the absolute leader.</li> </ul>

structures, often implicitly, dictate how individuals can discuss, or not discuss, various aspects of the world in the sciences and public life of that era (Bendel Larcher, 2015 p. 20). This perspective has fostered interpretations within disciplines like philosophy, history, sociology, and political science. The interdisciplinary nature of discourse opens the door to integrating the study of international relations with LDA. Discourse can serve as both a “linguistic unit” and a “practice.”

In the sociological paradigm, discourse encompasses both a communicative act and a social practice that constructs reality and knowledge. Social actors within the discourse assume specific roles, sometimes forming implicit alliances with unequal resources for articulation and resonance generation (Keller, 2011 p. 67). The terms “discourse” and “discursive practice” are interchangeable in this context. The parliamentary debate on ISAF serves as the research discourse, connecting MPs’ role perceptions and operational preferences in an argumentative chain of cause and effect. Military operations are guided by socially constructed beliefs, values, and perceptions that evolve through discursive practice (Schünemann et al., 2018). This research discourse possesses distinctive social characteristics: (1) It exhibits a national trait: parliamentary debates play a pivotal role in shaping the political elite’s perception of the state’s role and serve as a platform for the direct expression of values and perspectives about the state. (2) It conveys group positions: MPs employ pro-arguments to uphold their party or parliamentary group’s stance and anti-arguments to challenge opposing parties. (3) It mirrors German political culture: The Bundeswehr’s engagement in overseas operations was contingent on NATO or United Nations (UN) approval post the German Federal Constitutional Court’s 1994 ruling. Decisions regarding military deployment must be collectively discussed and pre-approved by the Federal Parliament. Consequently, discourse is a window into the evolution of national security policy and changes in the state’s role. Given the role of parliamentary

discourse in identifying and articulating political concerns and interests, analyzing MPs’ recurring linguistic patterns and rhetorical strategies unveils their ideological commitments and argumentation techniques (Ilie, 2015), including their perceptions of the state’s role.

The linguistic definition of discourse provides a methodological foundation for discourse analysis. Discourse, defined as a “corpus of texts” according to Busse and Teubert (2013a), is a widely accepted concept in linguistics. Positioned above the level of individual texts, discourse exhibits thematic relevance, continuity, and a constant state of evolution (Busse and Teubert, 2013a). Chronological discourse analysis allows for the exploration of shifts in meaning through alterations in discourse. LDA serves as a descriptive-analytical approach, enabling the description of texts by examining the distribution of linguistic elements, meaning production, and knowledge construction within discourse (Berry, 2014; Niehr, 2014). In the realm of international relations, people frequently engage in debates concerning various attitudes, intentions, and behaviors. Parliamentary discussions hold particular significance as a form of argumentative behavior in politics, serving to either legitimize or delegitimize government actions, advocate for political claims, and defend political beliefs and practices (Klein, 2019 p. 65). Interpretive patterns, known as “topos” (plural: topoi), within discourse are closely tied to the collective knowledge and meaning construction of political actors. Therefore, topos analysis of parliamentary debates stands as a valuable tool for the study of security policy discourse.

The term “topos,” much like “discourse,” is multifaceted in its meanings (Knoblauch, 2000). Therefore, it is essential to clarify its application in this context. “Topos” originates from Aristotle’s concept of “Topik,” representing a persuasive mode of thought and argumentative structure. Drawing on the Toulmin argument model (Toulmin, 2003), Wengeler (2003) expounds upon topoi and related concepts, elucidating how discourse analysis can be conducted at the argumentative level. Argumentation is the linguistic process wherein a non-controversial (or less controversial) argument, which can be categorized into pro and contra arguments depending on the position, is employed to either support or counter a more contentious conclusion. The foundation for defining and categorizing topoi is the warrant that establishes the link between arguments and conclusions, ensuring arguments can substantiate those conclusions.

Using the ISAF Mission as an example:

Argumentation 1: Given that the ISAF Mission upholds stability in Afghanistan (Argument 1), it follows that the Bundeswehr should be deployed to Afghanistan (Conclusion 1).

Argumentation 2: In cases where the ISAF Mission results in a deterioration of the situation in Afghanistan (Argument 2), the logical conclusion is that the Bundeswehr should not be sent to Afghanistan (Conclusion 2).

Both argumentations rely on the same warrant—the imperative to support actions that preserve stability, employing a stability topos. In this context, the definition of the stability topos is succinctly expressed in a causal sentence: “The decision to deploy or not deploy the Bundeswehr to Afghanistan is contingent on whether the ISAF Mission can or cannot maintain stability there.”



The term “topos” is employed here as an argumentative-analytical category (Wengeler, 2003 p. 177). According to Horsbøl (2019), a topos serves as a versatile lens enabling analysis at various levels of perceptual distance, ranging from in-depth scrutiny of the linguistic articulation of individual topoi to the typological identification of a set of topoi, and even quantitative analysis of the prevalence and distribution of numerous topoi. The quantitative tracking and tallying of each topos’ occurrences over time seek to unveil the predominance, trends, and ubiquity of specific political thought patterns, as well as their relative significance. Consequently, this approach offers a more comprehensive understanding of discourse history and the political treatment of a subject than can be gleaned through the isolated analysis of individually selected texts or the description of the evolving meanings of isolated words (Wengeler, 2003 p. 297). In empirical research, Wengeler (2003) gauges and compares topoi related to pro- and anti-immigration positions in the German press across different periods to illustrate the evolution of the discourse surrounding German immigration policy. Bauder (2008) conducts a quantitative topos analysis on a dataset comprising five prominent Canadian English-language daily newspapers to identify the most frequently occurring and relatively consistent topoi associated with immigration in media discourse. By utilizing quantitative topos analysis, we can unearth the frequently used topoi both in support of and against the deployment of ISAF, as well as track how these topoi have evolved over time. This data can then be leveraged to assess how the discourse mirrors Germany’s prevailing role and role transitions.

## 2.3 Research design for a role-theoretic discourse analysis

With a clear understanding of the concepts associated with LDA and RT, the following diagram provides a detailed illustration of how the examination of German security policy can be carried out within an interdisciplinary framework of role-theoretic discourse analysis (Figure 1).

The majority of foreign and security policy research in the field of international relations (IR) typically adopts a “knowledge-behavior” approach (indicated by the dotted line): the knowledge that international actors possess regarding a particular theme influences their behavior, and this behavior, in turn, influences their knowledge. Previous research based on RT has primarily focused on examining the international role assumed by a national actor or organization during specific time periods or in the context of particular international diplomatic events. This examination is typically carried out through logical reasoning or by comparing individual diplomatic documents and behaviors. Some studies have also delved into the interaction between national roles and foreign policy (Wang, 2008; Harnisch, 2011, 2015; Zheng, 2017).

Drawing upon a sociological and linguistic comprehension of discourse, this article proposes a “knowledge-discourse-behavior” approach (represented by a single arrow). In this framework, discourse functions as a bridge: international actors’ knowledge of particular themes shapes their expressions, and their statements collaboratively construct the pertinent discourses. These discourses, in turn, exert an influence on their subsequent behavior.

Specific political behaviors often serve distinct purposes, thereby determining the specific themes around which the discourse will revolve. The discourse, in this context, serves as a vehicle for conveying the actors’ knowledge of those themes.

Concretely, this paper will follow the subsequent steps in the study (represented by double-line arrows): (1) Creating a corpus of texts is a fundamental requirement for the linguistic analysis of ISAF discourse. The selection criteria, based on the guidelines from Busse and Teubert (2013a p. 14), have been incorporated in this article. These criteria dictate that the chosen texts should pertain to the selected research subject, in this case, the topic “ISAF.” They should also be limited to specific time periods (2001–2014), geographic areas (Germany), and text types (parliamentary debates). (2) To characterize the ISAF discourse, a collection of topoi is extracted. Initial definitions of these topoi, previously developed from relevant research (Baumann, 2006; Ni and Zheng, 2018), are revised during the evaluation of the ISAF discourse. New topoi are introduced, overly broad topoi are refined, and other initially recorded topoi that do not play a quantitatively or qualitatively significant role are excluded from consideration. Achieving a consistent classification of topoi in the ISAF discourse necessitates this additional round of refinement (as indicated in Table 2). (3) Quantitative analysis of the topoi reveals the predominant topoi within each time period, systematically presenting the prevailing patterns of thought among MPs regarding the actions. (4) In order to investigate the shifting roles reflected in the ISAF discourse, a qualitative examination of the dominant discourse formula is carried out in connection to the debate’s content. This analysis utilizes the typical German role prototypes associated with security policy, as outlined in Table 1.

## 3 Topos analysis

### 3.1 Description of data

Following each plenary meeting, a draft stenographic report is generated. This report is presented to each speaker for review and signature before being archived in the parliamentary records as the Plenarprotokoll, along with a complete audio recording of the entire plenary session. The plenary minutes of parliamentary debates are readily accessible on the official website of the German Federal Parliament,<sup>1</sup> serving as a reliable and credible source. The 14-year ISAF Mission (2001–2014) saw the leadership of two generations of leaders, including Gerhard Schröder (Schröder I: 1998–2002, Schröder II: 2002–2005), and Angela Merkel (Merkel I: 2005–2009, Merkel II: 2009–2013, Merkel III: 2013–2017). A total of 18 proposals concerning the involvement and continuous participation of the Bundeswehr in the ISAF Mission were presented, leading to 30 debates among the MPs. These 30 plenary minutes constitute the research corpus. To analyze the evolution of discourse over time, we divided the corpus into segments for the Schröder (I, II) and Merkel (I, II, III) administrations. MAXQDA, a computer-based

<sup>1</sup> [www.bundestag.de](http://www.bundestag.de)

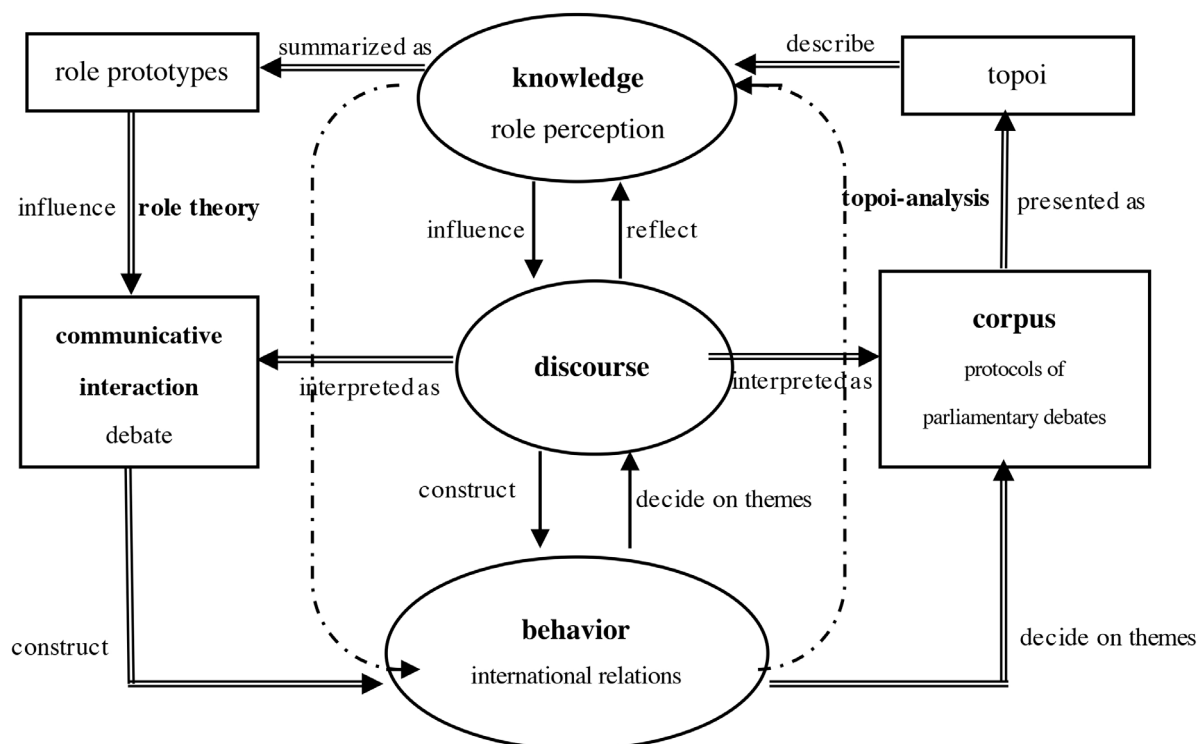


FIGURE 1

A role-theoretic discourse analysis framework for German security policy.

mixed-methods data analysis software, was employed for labeling, coding, and categorizing recurring topoi in the parliamentary debates. The final classification of topoi in the parliamentary debate on ISAF (Table 2) was achieved through iterative manual readings and regular cross-validation. This software facilitates the visualization of trends and unique aspects in quantitative analysis and aids in describing and analyzing the usage of specific topoi in qualitative analysis.

Each parliamentary debate consists of both argumentative and non-argumentative segments (Ajjour et al., 2017). During the non-argumentative portions, speakers often express their party's stance, such as in Leibrecht's (FDP) statement, "[...] we agree with the German government's request to extend the ISAF mandate" (Bundestag, 2005). The argumentative sections comprise argumentative segments, which can range from a single sentence to several paragraphs, and these segments feature specific topoi. These topoi are used either to advocate for authorizing ISAF (indicated by a "+" in the database) or to argue against it (marked with "-"). For example:

Argumentative segment 1 (-): "In the past 3–4 years, the number of soldiers has increased dramatically and at the same time violence has increased."—Paul Schäfer (DIE LINKE), BT PIPr 17/9.

Argumentative segment 2 (+): "It is not only a question of relations with Afghanistan, but it is also a very central European policy issue that Germany is committed to these issues together with its partners. That is why it is very important that the Dutch and the Danes, together with our

soldiers, will participate in this United Nations peace mission in Afghanistan, if the Bundestag agrees."—Joschka Fischer, Federal Minister for Foreign Affairs, BT PIPr 14/210.

From the two argumentations above, we can extract two topoi: one concerning the benefits for Germany and the other about Europe's interests. Both of these topoi fall under the self-interest category used to justify the ISAF operation. When two sub-categories of topoi appear in a single argumentative segment, each is counted once. If they belong to the same main category of topoi, then that category is counted twice. If an MP repeats the same content to emphasize a point, the recurring sub-category of topoi is no longer counted.

### 3.2 Results of topos analysis

According to statistics, MPs used the sub-category of topoi 3,664 times in the ISAF discourse. The (de-)legitimization of ISAF was primarily constructed using five main categories of topoi, ranked by the frequency of use: necessity topos, obligation topos, self-interest topos, capability and preparedness topos, and solution topos (Figure 2). At the macro level, these topoi were used in relatively similar quantities across the periods, as visually demonstrated in Figure 2, indicating a consistent structure in the German parliamentary debate on ISAF over the 14 years. The necessity topos, which prioritizes the interests of the countries and regions involved in the operation, dominated the ISAF discourses under both Schröder and Merkel and tended to increase

TABLE 2 Categorization of topoi in parliamentary debates regarding the ISAF mission.

Characteristics of topoi	Category of topoi	Sub-category of topoi	Keywords for identification of topoi
With the most significant obligatory characteristics	<i>Obligation topoi</i>	<i>Responsibility and obligation</i>	Verpflichtung, Pflicht, verpflichtet, versprechen, zusagen ( <i>obligation</i> ); Verantwortung, verantwortung*, (un)verantwortlich* ( <i>responsibility</i> ) etc.
		<i>Law and regulation</i>	(völker)recht, Grundgesetz ( <i>law</i> ); Beschluss, beschließen, Mandat, mandatieren, Resolution ( <i>authorization</i> ) etc.
		<i>Expectation</i>	Erwartung, erwarten ( <i>expectation</i> ); Bitte, bitten, Aufforderung, auffordern, Ablehnung, ablehnen, Hoffnung, Kritik, Widerstand ( <i>appeal and request</i> )
		<i>Value</i>	international*/ welt*/ Welt- +Frieden, Freiheit, Sicherheit, Krieg, Gefahr, Stabilität, Demokratie, Menschenrecht, Terror*, Drogen* ( <i>universal value</i> ); Solidarität ( <i>coalition solidarity</i> ) etc.
Drift from an ethic of morality to an ethic of success	<i>Necessity topoi</i>	<i>Afghanistan's interests</i>	Afghanistan/ afghanisch* + Freiheit, frei*, Stabilität, stabil*, Frieden, fried*, Menschenrecht, Terror*, Sicherheits*, (Bürger)krieg ( <i>security, stability and human rights in Afghanistan</i> ); Wiederaufbau, Entwicklung, Polizei, Armee/Soldat, Rechtsstaatlichkeit, Sourveränität, Übergabe der Verantwortung, Selbstbestimmung ( <i>Afghan state-building, "good governance", democratization, nomocracy</i> ) etc.
		<i>Interests of the region</i>	Pakistan/pakistan*, Region, Krisenregion ( <i>crisis area</i> ) etc.
Most clearly seeking self-interests	<i>Self-interest topoi</i>	<i>Germany's essential interests</i>	Deutschland/ deutsch* + Interesse, Freiheit/frei*, Stabilität/stabil*, Frieden/fried*, Sicherheit/sicher*, Terror* ( <i>Security, stability and freedom in Germany</i> ) etc.
		<i>Benefits for Germany</i>	Deutschland/ deutsch* + Vertrauen, Ruf (Name, Rolle, Bild, Ansehen) ( <i>reputation and credibility of Germany</i> ); Außen-/ Sicherheits-/ Entwicklungspolitik ( <i>benefits for Germany's foreign, security and development policy</i> ); Einfluss ( <i>Germany's influence</i> ) etc.
		<i>Interests of Europe</i>	Europa/ europäisch* + Interesse, Freiheit/frei*, Stabilität/stabil*, Frieden/fried*, Sicherheit/sicher*, Terror* ( <i>Security, stability and freedom in Europe</i> ) etc.
Focus on actionability of actions	<i>Capability and preparedness-topoi</i>	<i>Capability</i>	erfüllen, in der Lage, können, gerecht, Fähigkeit ( <i>capability</i> ) etc.
		<i>Preparedness</i>	Weiter-so Politik, bereit sein ( <i>preparedness</i> ) etc.
Direct statements on the use of military force	<i>Solution topoi</i>	<i>Military</i>	militärisch* Mittel, Trupp*, Soldat*, Krieg*, zivil* ( <i>military force</i> ) etc.
		<i>Non-military</i>	

as the operation progressed. This suggests that German MPs' views on security policy remained relatively stable throughout this time, consistently emphasizing the "interests of others" rather than "self-interest" in security policy discourse.

Further examination of the subcategories of topoi will uncover the shifts in the German security policy discourse. **Table 3** presents the top four to six subcategories of topoi that were most frequently used over time, taking into consideration tied rankings. In contrast to the previously mentioned consistency, these changes occurred at a micro level.

### 3.2.1 Necessity topoi

The primary topos highlighting the interests of the target nation and its surroundings, often employed by MPs to advocate for or against the legitimacy of the ISAF mission, was consistently the necessity topos. At its core, the ISAF mission aimed to aid in state reconstruction within crisis-stricken areas, with the overarching objective of fostering regional stability through support for indigenous security forces and the eventual establishment of long-term defense mechanisms. A specific focus was placed on Afghanistan's interests, encompassing the creation of a functional state authority, the establishment of a legitimate monopoly over the use of force, and the promotion of democratization processes. These objectives closely aligned with the principles set forth in the Bonn Agreement, which

emerged from the International Conference on Afghanistan hosted by Germany in 2001. The fundamental goal of ISAF was to ensure the successful execution of the "Bonn Process." In the initial stages of ISAF, Defense Minister Struck (SPD) emphasized the necessity for "the protection of an International Security Assistance Force in Kabul and the surrounding area" (Bundestag, 2001). He stressed in the Schröder II that the ongoing stabilization process required reinforcement (Bundestag, 2002a) and that the achieved results necessitated military protection (Bundestag, 2002b). As the operation progressed, concerns arose regarding the major issue of corruption within the Afghan government, particularly its links to the drug trade and warlordism. In response, the Afghanistan Compact was adopted during the Conference on Afghanistan in London in January 2006, shifting the rhetoric among ISAF supporters. This shift emphasized that defending Afghanistan's interests required increased Afghan accountability (Bundestag, 2008). However, a turning point occurred in 2009 when German officials approved an airstrike near Kunduz, resulting in the unfortunate deaths of over 100 civilians. This incident triggered public outcry both domestically and internationally, prompting a reassessment of the topos related to Afghanistan's interests. Some argued that the operation was detrimental to Afghanistan's interests, as it fueled resistance and strengthened international terrorist organizations (Bundestag, 2011b). Left-wing advocates

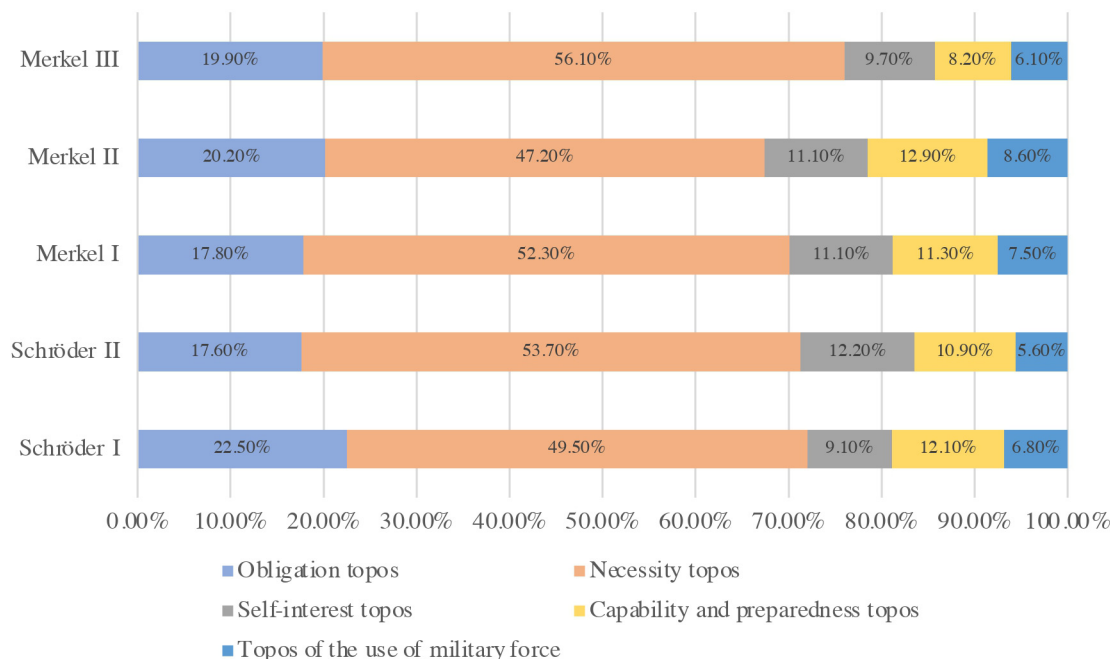


FIGURE 2

Five categories of topoi in the ISAF-discourse. (The frequency of use (%) measures the relative frequency of a specific category of topoi compared to all topoi used during that period.)

TABLE 3 Utilization of sub-categorical topoi in ISAF discourse (Top 4–6).<sup>a</sup>

Periods	Schröder I	Schröder II	Merkel I	Merkel II	Merkel III
Frequency of use of the subcategories of topoi	Afghanistan's interests 47.6	Afghanistan's interests 51.3	Afghanistan's interests 49.6	Afghanistan's interests 41.1	Afghanistan's interests 54.6
	Value 14	Value 8.8	Value 9.9	Value 11	Value 11.2
	Preparedness 9.8	Benefits for Germany 8.4	Capability 6.3	Preparedness 8.1	Benefits for Germany 7.1
	Benefits for Germany 7.2	Preparedness 6	Benefits for Germany 6.2	Benefits for Germany 6.2	Capability 5.1
		Germany's essential interests 4.9	Responsibility and obligation 4.2		
			Germany's essential interests 4.2		

<sup>a</sup>The frequency of use (%) indicates the relative frequency of usage of that specific sub-category of topoi within the specified timeframe, compared to all topoi.

demanded the “withdrawal,” asserting that it marked the first instance since 1945 in which the Bundeswehr had participated in an offensive action resulting in significant casualties. The statement, “this incident shows where we have gone astray” reflects their perspective (Bundestag, 2009c). As the withdrawal date approached, the discourse took on a retrospective and contemplative tone. MPs acknowledged the persistent challenges in nation-building within Afghanistan, while also recognizing the importance of acknowledging the progress made by foreign forces and advocating for ongoing support in the aftermath. Proponents contended that the extended military commitment aimed to facilitate a successful transition of security responsibilities to Afghan security forces (Bundestag, 2014a). In contrast, the

opposition characterized the mission as a continued state of occupation and conflict that had claimed a significant number of lives while leaving Afghanistan among the world's poorest nations (Bundestag, 2014b).

### 3.2.2 Obligation topoi

In terms of usage, the obligation topoi takes second place in prominence. The discourse revolving around values, in particular, exemplifies this category. The utilization of the value topoi to support Germany's participation in ISAF underscores the values-driven nature of foreign policy during Schröder's era. MPs contended that Germany's involvement in ISAF, geared toward addressing Afghanistan's humanitarian needs, combating



international terrorism, and upholding peace, security, and stability in target nations and crisis areas, stemmed from a commitment to safeguard universal values. In the opening debate, Irmer (FDP) asserted that deploying troops represented “a small stride toward global peace” (Bundestag, 2001). In response to critics arguing that ISAF “undermined human rights,” Schröder argued that Afghanistan exemplified the need for military force to protect innocent people from perpetual suffering (Bundestag, 2001). This perspective remained consistent during Schröder’s second term, emphasizing the pivotal role of the security component. Nevertheless, from Merkel I onward, an increasing number of MPs used the value topos (specifically human rights) to challenge ISAF, citing concerns such as the humanitarian fallout of air strikes or the risks associated with deploying early warning and reconnaissance aircraft. For instance, Lafontaine (DIE LINKE) emphasized the right to life, stating that people must first live before any rights can be ascribed to them (Bundestag, 2007). The presidential elections of 2009 and parliamentary elections of 2010 exposed instances of fraud and abuse of power within the Afghan government, diverging from the initial objective of establishing a democratic Afghan government. Opponents argued that democratization should be an indigenous process and cannot be directly imposed by external forces through coercive means. In Merkel II, the usage of the obligation topos increased in frequency. This was driven by debates on whether actions could truly uphold values and the heightened scrutiny and opposition of operational mandates. MPs stressed that Germany’s participation in ISAF fulfilled security responsibilities and obligations under multilateralism. Defense Minister Guttenberg argued that Germany’s responsibility stemmed from its coalition obligations (Bundestag, 2009b), while Federal Minister for Foreign Affairs Westerwelle stated that deployment was an expression of their alliance solidarity with NATO and the Afghan people (Bundestag, 2011a). The debate surrounding values (particularly human rights) persisted until the final stage. While the opposition decried the operation as “detrimental to the right to life,” “morally shameful, politically wrong, and anti-human” (Bundestag, 2014b), the operation endured, with proponents emphasizing the necessity of enforcing and defending universally recognized human rights, acknowledging the complexity and conflicts inherent in achieving these goals.

### 3.2.3 Self-interest topos

The self-interest topos and the capacity and preparedness topos, while used with similar frequency, were notably less prevalent than the previous categories. During the Schröder era, MPs believed that military operations aimed to enhance Germany’s reputation in the targeted countries, regions, and among allies. The self-interest topos placed considerable emphasis on the benefits for Germany. Even the opposition Christian Democratic Union/Christian Social Union (CDU/CSU) supported troop deployment, asserting that Germany should “always be a loyal partner in the multilateral ties between the UN and NATO,” according to Pflüger (CDU/CSU) (Bundestag, 2005). Furthermore, Nachtwei (BÜNDNIS 90/DIE GRÜNEN) noted, “[t]he fact that the German government was a driving force in this global effort [...] is not a matter of blame but, quite the opposite, is deserving of significant praise. It shows trustworthiness” (Bundestag, 2003). The majority of MPs contended that Germany’s participation in ISAF would not

only enhance its credibility and serve its fundamental interests in security, peace, and stability but also yield positive effects on the nation’s economy, politics, and military capabilities. The Federal Minister of Defense in Merkel I emphasized that ISAF was necessary to guarantee stability, reconstruction, and peacemaking, and to ensure the security of German citizens (Bundestag, 2006a). Germany also expanded its influence, taking on lead duties in northern Afghanistan in 2006, assuming the Norwegian Quick Response Force (QRF) in 2008, and initiating the London Conference in 2010. MPs increasingly saw this as a means of enhancing Germany’s influence in the multilateral and international system. The ISAF mission entered an intensified phase during the Merkel administration, marked by a rise in German military casualties and heightened concerns for the nation’s fundamental interests, particularly security. In response to the deteriorating security situation in Afghanistan in 2007, Foreign Minister Jung emphasized the importance of continuing both military and civic engagements (Bundestag, 2006a). In the final phase, questions arose about whether ISAF effectively garnered trust for Germany, and fears emerged about potential damage to Germany’s reputation and the Bundeswehr. Hänsel (DIE LINKE) called for an immediate “complete withdrawal from Afghanistan,” cautioning that failure to do so would perpetuate a “military occupation” and “military intervention,” potentially turning the Bundeswehr into an “occupying force” (Bundestag, 2014b).

### 3.2.4 Capacity and preparedness topos

In comparison to the preparedness topos, which was prominent during the Schröder era, the capacity topos gained more traction during the Merkel administration. The use of the preparedness topos reflects the debate over whether Germany is equipped to shoulder international security responsibilities and effectively manage associated risks. Under Schröder’s leadership, the action received broad support among MPs due to the perceived clarity of the UN Security Council’s authority, soldiers’ right to employ self-defense, and the clear separation between the Operation Enduring Freedom (OEF) and ISAF mandates, which excluded participation in violent combat operations. Schröder emphasized the necessity for a robust mandate under Chapter VII of the UN Charter, which he believed provided a sufficient level of self-security and task fulfillment (Bundestag, 2001). Defense Minister Struck further emphasized that the conditions of the mandate facilitated successful task implementation and ensured soldiers’ protection (Bundestag, 2001). In contrast, the use of the capacity topos in the Merkel era signified a greater emphasis on Germany’s capacity to assume responsibility and make substantial progress. Germany expanded its military presence by deploying Tornado reconnaissance aircraft and AWACS under the ISAF framework. Defense Minister Jung highlighted the significance of these deployments, especially for air surveillance, coordination, and communication. Furthermore, MPs like Mißfelder (CDU/CSU) cited successful civilian construction efforts, such as infrastructure development, electrification, roads, and water well projects in Afghanistan, demonstrating Germany’s capacity to contribute positively to the country’s development (Bundestag, 2009a). During Merkel II, preparedness became more pertinent than capacity as the withdrawal phase neared. It was imperative to establish a detailed and reliable withdrawal strategy. In January 2011, the Federal Government first discussed the possibility of reducing the Bundeswehr’s deployment by the end

of the year, contingent on the situation. Federal Minister for Foreign Affairs Westerwelle highlighted the government's practical approach in Afghanistan, emphasizing realistic goals, means, and a timetable (Bundestag, 2011b).

### 3.2.5 Solution topos

Although the solution topos, which explicitly conveys views on the use of military or non-military means, wasn't frequently used in the discourse, the limited argumentative segments highlight a shared sentiment among MPs from both the Schröder and Merkel eras. They generally opposed engaging in violent combat operations, favoring non-military approaches, peaceful conflict resolution, and post-war reconstruction. In Schröder's administration, Defense Minister Scharping emphasized that military means should be a last resort and play a supporting, not a dominating, role in a comprehensive political process (Bundestag, 2002a). This view was echoed by Federal Minister of Foreign Affairs Fischer, who stressed the importance of an UN-mandated international security force. Under Merkel, Germany's involvement in Afghanistan aimed to contribute substantially to its development and provide temporary, necessary military protection. Foreign Minister Steinmeier outlined these primary goals (Bundestag, 2006b). During this period, opposition to military action increased significantly among MPs due to the rapid deterioration of the security situation since 2007. For the first time, some MPs expressed opposition to any form of violent force, equating military action with "war." They argued against a "dual strategy" involving both military and civil efforts, contending that increased development aid and military involvement couldn't be effectively integrated (Bundestag, 2008). Independent MP Winkelmeier called for an "urgent ceasefire," contrasting it with what he saw as the "wrong track" pushed by the US (Bundestag, 2008). The controversial actions of Task Force 47 and its opaque deployment, particularly the airstrikes near Kunduz in 2009, reignited debates. MPs expressed concerns that the International Security Assistance Force was adopting a more "warlike" and potentially illegal stance. Schäfer (DIE LINKE) voiced the desire for Germany to discontinue participation in what he deemed the "immoral practice of war," contrary to international law, whether directly or indirectly (Bundestag, 2012).

## 4 Role theory-based discussion

Germany's security role and the associated policies are shaped by the values and norms perceived by German MPs, while being inevitably influenced by operational guidelines, laws, and agreements (referred to as the obligation topos). These conceptions of Germany's security role are a response to the international community and target states' expectations regarding Germany's conduct in global affairs, reflecting the necessity topos. Additionally, they are intertwined with Germany's national interests and strategic objectives (self-interest topos), as well as its capacity and readiness to achieve them (capability and preparedness topos). Concerning the ISAF mission, the opinions of MPs about whether Germany should employ military or non-military means to address issues closely align with the perceived security role that Germany should embrace, falling under the solution topos. The role transitions in the discourse occur at a

micro level and are influenced by developments and contingencies within ISAF operations. Depending on the key role-related norms presented in argumentative segments, we will qualitatively examine the segments in which the dominant and representative topos become evident, establishing the prevailing German security role during different periods. These perspectives shape the behavioral preferences of MPs, which not only directly impact the practical implementation of German security policy but also contribute to the collective knowledge about German security policy. The following section explores the presentation of security policy-related roles in ISAF discourse and highlights the changes that have taken place.

### 4.1 Civilian power

Schröder I marked the initiation of Germany's involvement in ISAF. During this period, German MPs predominantly advocated for Germany to participate as a "civilian power." This was evident through recurring themes in their discourse. They emphasized that Germany's role in ISAF was centered on promoting "good governance," democratization, and the establishment of the rule of law in Afghanistan. Cooperation, multilateralism, and coalition solidarity were prioritized, along with adherence to international law and support for the UN's extension and strengthening. They underlined Germany's willingness to engage in peacekeeping missions while distinguishing between war orders and orders for peacekeeping forces. However, there was limited support for Germany's efforts to restore its international standing through a more belligerent approach. Under Schröder II, Germany's position as a "civilian power" remained prominent, with a continued focus on Afghanistan's interests, particularly democracy building and the training of Afghan security forces. Germany's active involvement in multilateral operations was a key feature, and its contributions were widely recognized by international partners and the UN. Although the solution topos was not frequently used, it revealed a reluctance to resort to violence, with the majority of MPs supporting Germany's participation in ISAF for the sake of "collective security" and in accordance with international law. They stressed that the UN-mandated ISAF mission should only be employed as a "last resort" and to maintain peace and stability, as determined by the Bonn Conference. The Merkel administration continued to prioritize Afghan state-building, but there was a growing concern that military action might lead to more casualties among soldiers and civilians. The failure of democracy-building initiatives in Afghanistan highlighted the need to consider regional uniqueness and historical and ethnic aspects, rather than imposing Western ideals. Merkel II witnessed an increase in anti-war sentiment, reflecting Germany's commitment to the role of a "civilian power" and a preference for non-violent conflict management and resolution. The use of laws and regulations as an obligation topos warned against "warlike" behavior, aligning with MPs' cautious stance on the use of force. Toward the operation's conclusion, Germany's values-based foreign policy came to the forefront, with increased cautions about the potential impact on Germany's standing as a "civilian power" if these principles were compromised. The evolving security situation in Afghanistan highlighted the importance of combining military and civilian measures, with an emphasis on political solutions rather than relying solely on civilian construction and its military support.

## 4.2 Normal state

While not predominant in Schröder I's discourse, Germany's aspiration to function as a "normal state" was already discernible. This inclination emerged due to Germany's pre-operational efforts, successful promotion of the Bonn Conference, adoption of the Bonn Agreement, and early-stage Bundeswehr performance in Afghanistan. These accomplishments elevated international expectations of German foreign policy, earning respect from Afghanistan and its allies. Nevertheless, Germany lacked the necessary leadership structures, tools, and support systems for effectively managing international activities over extended distances and periods. Schröder II witnessed a more frequent utilization of the self-interest topos, reflecting the escalating importance of Germany acting as a "normal state" aligned with its national interests. This shift was driven by the perceived threat of terrorist counterattacks originating from Afghanistan, necessitating military action to address these security concerns. The emphasis on modern security and defense within multilateral frameworks such as the UN, NATO, the EU, and the Organization for Security and Co-operation in Europe (OSCE) was stressed, aligning with the focus on coalition solidarity to alleviate concerns in neighboring countries about Germany's "more active" foreign policy. From Merkel I onward, the role of a "normal state" gained prominence in the discourse, accompanied by calls for vigilance against factors that could reverse this trend. This shift was particularly evident in discussions about Germany's essential interests and the value of coalition solidarity. Military operations increasingly leaned toward a policy oriented around national interests, given the transnational nature of the terrorism threat. The use of military means was seen as necessary to safeguard the security of German military and civilian personnel involved in these actions, and the deployment of reconnaissance and early warning planes was justified by the need to protect German economic interests. Coalition solidarity became a primary means of signaling a readiness to shoulder collective responsibility. Under Merkel II, there was growing consensus to conduct foreign policy in the national interest, with the self-interest topos surfacing more frequently. As the reality in Afghanistan deviated from the initial operational objectives, MPs began to approach their objectives with a more rational and realistic perspective aligned with national interests. The discourse underscored that as Germany actively sought to enhance its standing as a "normal state," it faced competition with other players in the multilateral system. The final phase of the operation entailed a "responsibility transfer" period, raising concerns about Germany's long-term capacity to deploy its military abroad and a reevaluation of its policy on extraterritorial military operations. There were fears that Germany's reputation as a "normal state" could be jeopardized, and the interests of all parties might not be optimally served.

## 4.3 Agenda-setting role

Under Schröder I, Germany garnered international respect for its role as the organizer and facilitator of the UN-led Bonn Conference. It made significant contributions to the national reconstruction of Afghanistan, establishing itself as a proactive participant in shaping international relations and addressing global

challenges. However, the concept of "agenda-setting" was not yet fully articulated during this period. Schröder II witnessed an effort to emphasize a "German approach" to collective action, signaling a shift from being a mere "follower" to becoming a proactive actor with an "agenda-setting function." Germany's refusal to comply with American demands for increased military investment and its assertive promotion of a military-civilian approach within the multilateral system were attempts to break away from the past pattern of "unconditional obedience" to the US. Starting from Merkel I, the capability topos became more prominent in the discourse, highlighting that ISAF demonstrated Germany's capacity to address international challenges effectively. Germany took leadership roles in Northern Afghanistan, the EU Police Mission, and supported the broader Afghan mission. In 2008, the Grand Coalition Government initiated discussions on a "gradual withdrawal," calling on international allies to collaborate on a "responsible withdrawal plan." This phase was seen as a significant opportunity for Germany to exercise an "agenda-setting function." In Merkel II, the expanded use of the preparedness topos illustrated Germany's potential to act as a mediator between Afghanistan and the international community during the withdrawal planning phase. Germany's publication of the new Afghanistan plan, considered a document of international coordination, preceded the London Conference, which introduced the third pillar of the political process. This showcased Germany's adeptness in shaping the international agenda. In the final phase, Germany's achievements in its 14 years of operations were highlighted, emphasizing its capacity to assist target countries in civilian reconstruction and provide military security. Germany's "in and out" approach with NATO allies demonstrated both its commitment to the alliance and its endeavor to wield greater influence in the multilateral system. Germany aimed to secure an "agenda-setting role" based on its successful experience as an ISAF strategist and facilitator. The German MPs aspired to see Germany become an "agenda-setter" akin to the US by more actively leveraging its resources and power to influence the global system, although this is likely to be a long-term objective.

## 5 Conclusion

This article demonstrates the effectiveness of a role-theoretic discourse analysis approach, using parliamentary debates on the Bundeswehr's involvement in the ISAF Mission to study German security policy. By adopting a linguistic and sociological interpretation of "discourse," this framework presents a knowledge-discourse-behavior approach, facilitating a theoretical and methodological connection between RT and LDA. In the empirical analysis, quantitative topos analysis is employed to depict and compare the similarities and differences among the various topoi during different time periods. The results reveal that, despite significant variations at the micro level, the ISAF discourses across these five periods generally adhere to a consistent pattern of argumentation. The collective role-related knowledge, as manifested in the prevalent topoi, is then qualitatively assessed through role prototypes. These findings suggest that Germany's identity as a "civil power" has remained relatively stable. Germany's role within the multilateral system has evolved from being a passive

responder and follower to a proactive strategist and advocate, particularly during critical junctures. This transformation can be attributed to Germany's growing strength and the trust and influence it garnered through early initiatives, such as mission commencements, pivotal turning points, and mission conclusions. Especially since the Merkel era, there has been a consensus on the need for the "normalization" of German foreign policy, with a more frequent and overt focus on national interests. Nevertheless, as Germany confronts a "trust crisis" once again, the civilizing attributes of Germany's role will be emphasized.

Due to space constraints, this paper only adopts the topoi analysis at the argumentative level of linguistic discourse analysis, and does not go into detail on the diversity of approaches at the lexical, metaphorical and argumentative levels. The knowledge-discourse-behavior approach offers several avenues for further exploration. Future research could delve into discourse from both lexical and metaphorical perspectives and draw upon a range of international relations theories to address diverse research inquiries. In addition, although computer-assisted methods and regular communication with native speakers were used to improve the objectivity of the analysis process, manual reading was mainly applied in the definition of the discourse and the extraction of codes, so that the paper is mainly based on logical and subjective analyses and elaborations. In terms of follow-up research, computer technology can be applied more to increase the objectivity of the research.

## Data availability statement

The original contributions presented in this study are included in this article/supplementary material, further inquiries can be directed to the corresponding author.

## Author contributions

XN: Writing – original draft.

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# Visuospatial perspective-taking of a protagonist during narrative comprehension: the effects of task load and individual differences in visuospatial working memory

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**Introduction:** This study examined whether visuospatial perspective uses the character perspective during narrative comprehension.

**Method:** Participants read narrative stimuli depicting the spatial positional relationships between characters and objects and judged whether the objects were on the left or right from the character's perspective. We manipulated whether the spatial positional relationships between characters depicted in the narrative stimuli resulted in a visuospatial perspective. We hypothesized that the high-load perspective-taking condition would indicate longer reaction times compared to the low-load perspective-taking condition, as shifting perspectives between characters in the high-load condition require more time for visuospatial perspective-taking.

**Results:** As predicted, the reaction time was longer for high-load perspective-taking than for low-load perspective-taking.

**Discussion:** During narrative comprehension, the reaction time for visuospatial perspective-taking must move virtually within the representation from the main character's perspective to that of another character. Visuospatial perspective-taking is involved in narrative comprehension.

## KEYWORDS

cognitive psychology, sentence comprehension, narrative comprehension, visuospatial working memory, visuospatial perspective-taking

## 1 Introduction

When you read a narrative, you may have the experience of immersing yourself in the narrative and feeling as if you have entered that world. When comprehending a text, it is suggested that the reader is experiencing a mental simulation of an imagined thing or situation as if they were experiencing the real thing (Fincher-Kiefer, 2019). For example, just a description of someone eating a hamburger would conjure up images of the hamburger, fries, and the restaurant setting. Mental representations constructed during text comprehension contain perceptual information, such as visuospatial images. Zwaan et al. (2002) presented participants with sentences implying shapes, such as "The ranger saw the eagle in the sky," followed by images of either a spread-winged eagle (matching condition) or a perched eagle with folded wings (mismatching condition). The

results indicated that participants exhibited significantly faster reaction times when the images matched the sentences. These findings indicate that readers construct perceptual simulations during language comprehension, which facilitates the processing of congruent visual information. Additionally, brain regions involved in visual imagery are more activated when processing imagery-rich texts (Just et al., 2004), including perceptual information derived from readers' experiences and knowledge (Zwaan, 2004).

The perceptual availability hypothesis states that perceptual processing is generated as if the reader is experiencing the constructed narrative world during narrative comprehension (Horton and Rapp, 2003). To test this hypothesis, Horton and Rapp (2003) examined narrative events that affected the perceptual perspective of protagonists, using a task where participants judged whether an object was mentioned in the preceding sentence. They found that reaction times were slower when the sentence described a situation where the object was not visible to the protagonist (e.g., because it was "shielded") compared to when the object was visible to the protagonist. The perceptual availability hypothesis is an important finding that indicates readers could mentally simulate the world in reading. Many studies suggested Visuospatial (VS) representations based on the protagonist's perspective reflect the actual VS perspective (e.g., Borghi et al., 2004; Yaxley and Zwaan, 2007; Horchak and Garrido, 2020). However, these studies used only single-sentence stimuli. At present, the perceptual availability hypothesis has not been tested further because long narrative texts are complex and difficult to control as experimental stimuli. Therefore, this study aims to examine perceptual availability hypothesis by employing multi-sentence texts.

To extend the perceptual availability hypothesis, we focused on spatial cognition studies of VS perspective-taking. In spatial cognition research, VS perspective-taking requires changing perspectives from one's position to that of others (Zacks and Michelon, 2005). VS perspective-taking involves an embodied movement in which the self's body is moved virtually to the position from which the other's perspective is to be taken. Kessler and Thomson (2010) suggested that the greater the angle between the position of the self and the target, the longer the embodied movement time. Therefore, a longer time is required for VS perspective-taking. People transform their body schema into the perspective of the other person and place their own body in that position (Erle and Topolinski, 2017). Consequently, embodied movement toward the other person facilitates VS perspective-taking, while movement away makes it more difficult. In recent years, researchers have hypothesized that there is a shared basis between mental perspective-taking related to empathy and spatial perspective-taking (Erle and Topolinski, 2015, 2017). In the process of mental perspective-taking during narrative comprehension, there is a possibility that taking the perspective of a character enhances the reader's understanding of that character's emotional state. In other words, a richer mental simulation of the protagonist's emotional state is formed when the reader takes on the protagonist's perspective.

Concerning narrative comprehension, Horton and Rapp (2003) demonstrated that VS representations are constructed to reflect whether an object is visible from the protagonist's perspective in reading. This study investigated VS processing during narrative

comprehension based on the perceptual availability hypothesis. According to this hypothesis, readers construct VS mental representations during reading as if they were perceiving the situation. As part of this representation construction, readers adopt the characters' perspectives. Importantly, VS perspective-taking is based on textual information. Determining whether the ability to shift to the perspectives of several characters leads to a more multidimensional understanding of the narrative would clarify if adopting multiple perspective facilitates comprehension. Therefore, by verifying whether VS perspective shifts occur during narrative comprehension, this study examines the validity of the perceptual availability hypothesis to broaden its scope.

Further, VS information such as perspective is likely to depend on individual differences between readers. Readers' visuospatial working memory (VSWM) capacity is related to the activation of VS processing in reading (Vermeulen et al., 2008). VS processing resources are involved and constructing representations of its content during narrative comprehension (Fincher-Kiefer, 2001; Fincher-Kiefer and D'Agostino, 2004). Gillioz et al. (2012) reported that individuals with larger VSWM capacity are more likely to find VS information contained in a narrative more easily, suggesting that individual differences in VSWM capacity may be involved in the activation of perceptual processing. In addition, we controlled for individual differences in mental perspective-taking ability using the Interpersonal Reactivity Index (IRI; Davis, 1983). The IRI, a quantitative measure of dispositional empathy in separate dimensions, investigates the effects of experimental VS perspective-taking manipulation by accounting for the mental perspective-taking variability of related VS perspective-taking.

Therefore, this study examined whether VS perspective-taking from the character's perspective arises by measuring the time required for participants to judge the relative positions of objects from the character's perspective during narrative comprehension. To test this hypothesis, participants read narrative texts in which the spatial positional relationships between characters were manipulated under conditions of perspective-taking. Specifically, the relative positional relationships between characters were set at two levels: next to or opposing. The difficulty of perspective-taking was thus manipulated. Subsequently, the time required for perspective-taking was measured to analyze whether it takes more time as the angle between characters increases. This allowed us to examine whether participants adopted the character's perspective during narrative comprehension. If VS perspective-taking arises from the character's perspective during narrative comprehension, we predicted that perspective-taking would take more time under high-load perspective-taking conditions than low-load perspective-taking conditions.

Another focus of this study was to examine whether individual differences affect perspective-taking manipulation. First, it is conceivable that individual differences in VSWM capacity may influence the manipulation strategies of VS perspective-taking. Additionally, as mentioned earlier, mental perspective-taking ability may be related to the process of VS perspective-taking. Therefore, we examined the influence of individual differences in VSWM capacity while controlling for individual differences in mental perspective-taking ability. We predicted an interaction between performances on



the VS perspective-taking task and individual differences in VSWM.

## 2 Methods

### 2.1 Participants

Fifty-one university students in Japan (21 men and 30 women; mean age =  $22.16 \pm 3.39$  years) participated. All were native Japanese speakers. The sample size was determined by referring to previous studies on narrative comprehension (e.g., Komeda et al., 2013; Magliano et al., 2016), which have established a standard sample size in this research area. Participants were recruited from March 3 to April 30, 2023, within the university. Written informed consent was obtained from all participants before the commencement of the experiment. The consent form provided information regarding anonymity, confidentiality, and the right to voluntarily withdraw at any time. This study received ethical approval from the University's Research Ethics Committee (No. NUPSY-230901-I-01).

### 2.2 Stimuli, tests, and index

#### 2.2.1 Narrative stimuli

The first author constructed eight narrative stimuli, which included three characters (one protagonist and two supporting characters) and two objects. Each narrative contained seven sentences. The composition of each narrative stimulus was as follows: First, the initial two sentences depicted the three characters and their spatial relationship; one character was positioned next to the protagonist and the other was positioned across from the protagonist. The next three sentences introduced two objects and described their spatial relationship. The objects were positioned side-by-side between the three characters. The final two sentences led the participant to take the viewpoint of the protagonist by portraying the protagonist's emotions and actions, concluding the narrative. In addition, the sexes of the characters were separated to match those of the participants and characters. Incidentally, the only difference was in the name of the characters; all the content was the same. Samples used in the experiment are as follows: “Kenta sat at a table in the restaurant and waited for friends./After a while, Takeshi and Yusuke came over. Takeshi sat opposite Kenta and Yusuke sat next to Kenta./While they were talking, the waiter brought the French fries that Kenta had ordered./The waiter placed the fries in the middle of the table./He then placed the salad right next to it./Takeshi and Yusuke looked at the menu and then ordered something else./Kenta asked the waiter as he passed by.”

Before the experiment, a pilot study validated the appropriateness of the narrative stimuli with 12 participants (eight men and four women, mean age = 22.08 years), examining whether they imagined the spatial positions of the characters and perceived differences in liking toward the characters. Finally, eight stimuli with no differences in liking ratings were adopted for the main experiment.

#### 2.2.2 Visuospatial perspective-taking task

The VS perspective-taking task was presented immediately after reading the narrative stimuli. Following the narrative stimulus, participants were presented with a VS perspective-taking task, such as: “From Takashi's perspective, where is the salad located? Right or left?” The VS perspective-taking task will be discussed in further detail in the subsequent section. The stimuli for the VS perspective-taking task consisted of questions asking whether objects in the narrative were positioned to the left or right from the character's perspective. We manipulated differences in processing load for VS perspective-taking by combining objects and characters; specifically, determining the position of objects from the viewpoint of a character facing the protagonist required perspective transformations to correctly solve the task, creating high cognitive demand (Kessler and Thomson, 2010). Contrastingly, for a character positioned next to the protagonist, embodiment transformations into the target's perspective were unnecessary, allowing judging of object positional relationships from the protagonist's position with a low processing load. This was controlled by counterbalancing the arrangement of objects and characters.

#### 2.2.3 Visuospatial working memory capacity test

A VSWM capacity test was conducted to measure participants' VSWM capacity. This task comprised five trials in total. The visual pattern stimuli were displayed on a white computer screen background within a 4 x 4 matrix with black dots positioned inside the grid spaces. The first trial had four dots placed, and the number of dots increased in proportion to the trial number so that the final fifth trial had eight dots placed. Additionally, for all trials regardless of the task, the placement of the visual patterns was made to differ entirely. VS pattern stimuli were first presented for 1,000 ms. Thereafter, participants were asked to read a sequence of numbers aloud to prevent them from verbally remembering the sequence of dots. After 10 s, the screen switched to one that instructed participants to reconstruct the VS pattern stimulus. Once reconstruction was completed, participants could click on the screen at their own pace to proceed to the next trial. The correct response rate was calculated by using the number of dots presented in each trial as the denominator and the number of correct responses as the numerator. The distribution of participants' VSWM capacity is shown in the [Supplementary material](#).

#### 2.2.4 Interpersonal Reactivity Index

The 28-item Japanese version of the IRI (Davis, 1980) was adapted by Himichi et al. (2017). It measures individual differences in mental perspective-taking. It is measured with a five-point Likert scale, including “empathic concern,” “personal distress,” “perspective-taking,” and “fantasy.” Of these, mental perspective-taking is the ability to consider situations from another person's point of view and infer emotions (Davis, 1983). Perspective-taking has been linked to VS perspective-taking (Erle and Topolinski, 2015). Individual differences in participants' mental perspective-taking could affect their performance on VS perspective-taking tasks. Accordingly, perspective-taking as measured by the IRI

perspective-taking subscale was included as an additional predictor in the linear mixed effects models.

## 2.3 Procedure

The experiment comprised three tasks: a VS perspective-taking task, responding to an empathy questionnaire, and a VSWM capacity test. First, a VS perspective-taking task was conducted. The experiment comprised three practice trials and 16 main trials. Out of the 16 critical trials, four trials featured a high-load perspective-taking manipulation and the other four trials had a low-load perspective-taking manipulation. The remaining eight trials served as filler trials.

After reading the on-screen instructions, they clicked the “ready” button to begin the task when they were prepared. In the first part, a narrative stimulus was presented, with each sentence displayed for 7 s. Participants were instructed to read silently to understand. Immediately after the narrative presentation, the task shifted to the VS perspective-taking part. Participants were instructed to respond as quickly and accurately as possible during the part of the trial. VS perspective-taking task began after the narrative stimulus ended and after 500 ms of fixation screen. If participant thought the object was on the left side of the target, they pressed the “C” key. If they thought it was on the right side, they pressed the “M” key. After participants completed the VS perspective-taking task, they completed the IRI and the VSWM capacity test on the screen. Finally, after confirming the participants’ age, native language, and ability to predict the purpose of the experiment, the experimenter explained the study content and the experiment was completed. The experiment lasted for ~30 min.

## 2.4 Data analysis

As described in the Methods section, sample size was set based on prior work in the field. However, a *post-hoc* power analysis indicated an achieved power of 0.98, given the sample size of 48, suggesting adequate statistical power was obtained. Therefore, this study can be considered to have a sufficient sample size both in principle and in terms of power analysis.

Analysis was conducted using linear mixed-effects models in R software (R Core Team, 2021). The models included fixed effects of perspective condition, VSWM capacity, and their interaction. Random intercepts for participants, items, and IRI perspective-taking scores were also modeled. Likelihood ratio tests were used to select the best-fitting model. Coding employed for the perspective condition utilizes (−1, 1) sum coding, where (−1) represents the low-load perspective-taking condition and (1) represents the high-load perspective-taking condition.

The random factors included participants, items, and participants’ IRI perspective-taking scores to perform linear mixed modeling analysis.<sup>1</sup> We directly modeled VSWM capacity as a fixed

effect alongside the experimental conditions. This enabled us to estimate the causal influence of VSWM on the perspective-taking process in narrative comprehension. Moreover, we accounted for individual differences in empathy, as measured by mental perspective-taking in IRI scores, in the variable effects portion.

Model selection was performed through the following procedure. First, the maximal model that converged, including random intercepts for participants, stimuli, and individual differences in mental perspective taking, as well as their random slope, was constructed. Then, models eliminating random slope terms were built incrementally, removing less influential terms first following Jaeger (2009). Likelihood ratio tests were conducted sequentially between the more intricate model relative to each parsimonious model for model comparison and selection balances model complexity and goodness-of-fit. The model best accounting for the data while retaining interpretability was chosen based on likelihood ratio test results.

## 3 Results

### 3.1 Reaction time

Before analysis, 153 false response trials and nine trials with reaction times  $> \pm 2.5$  SD were excluded from the analysis. First, we conducted a Shapiro-Wilk test to assess the normality of the reaction time data. The results indicated that the reaction time data didn’t conform to a normal distribution ( $W = 0.96$ ,  $p < 0.01$ ), leading to the rejection of the null hypothesis. Hence, we applied a square-root transformation to the reaction time data and conducted a Shapiro-Wilk test again, which revealed that the transformation improved the normality of the data ( $W = 0.99$ ,  $p = 0.29$ ).

The main dependent variable in this study was participants’ reaction times to judge the relative positions of objects from the perspective of characters. Longer reaction times were interpreted as reflecting more effortful perspective-taking processes.

Linear mixed model analysis revealed a main effect for the VS perspective [ $Estimate = 2,814.99$ ,  $SE = 1,212.40$ ,  $df = 202.37$ ,  $t = 2.32$ ,  $p = 0.02$ ,  $\eta_p^2 = 0.48$ ], but no main effect for VSWM capacity [ $Estimate = -165.57$ ,  $SE = 1,277.10$ ,  $df = 44.33$ ,  $t = 0.13$ ,  $p = 0.90$ ,  $\eta_p^2 = 0.00$ ]. This confirms that response times were significantly lower for low-load perspective and higher, while participants with higher or lower memory capacity did not differ in their response time. Moreover, the interaction of the VS perspective condition and VSWM capacity was significant [ $Estimate = -3,207.31$ ,  $SE = 1,521.81$ ,  $df = 203.09$ ,  $t = 2.10$ ,  $p = 0.04$ ,  $\eta_p^2 = 0.29$ ]. A simple slope test revealed that reaction times in the high-load perspective-taking condition were reliably longer than those in the low-load perspective-taking condition in VSWM  $-1$  SD [ $Estimate = 718.19$ ,  $SE = 283.64$ ,  $t = 2.53$ ,  $p = 0.01$ ], but there was not a significant difference between the high-load perspective-taking condition and low-load perspective-taking condition in VSWM  $+1$  SD [ $Estimate = -138.67$ ,  $SE = 287.11$ ,  $t = 0.48$ ,  $p = 0.63$ ] (Table 1). Thus, response times were significantly longer for the high-load perspective-taking condition than for the low-load perspective-taking condition, especially for participants with lower VSWM capacity. This suggests that individuals with lower

<sup>1</sup> Additional analyses showed a trend for IRI’s PT subscale negatively influencing RTs ( $\beta = -75.46$ ,  $p = 0.13$ ), although model fit was low.

TABLE 1 Fixed effects estimates for reaction time.

Effect	Reaction time				
	Estimate	SE	df	t	p
Intercept	63.33	7.84	44.16	8.08	0.001
Visuospatial perspective-taking condition	10.84	4.60	202.21	2.36	0.02
Visuospatial working memory capacity	−0.11	9.79	44.49	−0.01	0.99
Perspective-taking × visuospatial working memory capacity	−12.47	5.78	202.92	−2.16	0.03

Reaction times are presented in milliseconds (ms). Data have been preprocessed as described in the Data analysis subsection of the Methods section, including the exclusion of false response trials and outliers, and the application of a square-root transformation to improve normality.

TABLE 2 Fixed effects estimates for correct reaction rate.

Effect	Correct reaction rate			
	Estimate	SE	z	p
Intercept	1.28	0.73	1.75	0.08
Visuospatial perspective-taking condition	−1.24	0.70	−1.78	0.08
Visuospatial working memory capacity	−0.93	0.85	−1.10	0.27
Perspective-taking × visuospatial working memory capacity	1.83	0.81	2.25	0.02

Correct reaction rates using a generalized linear mixed model. Random effects have been factored in for participants, stimuli and mental perspective taking.

visuospatial working memory capacity may have more difficulty with perspective-taking under high cognitive load.

### 3.2 Correct response rate

linear mixed model analysis revealed a non-significant main effect of VS perspective-taking condition [*Estimate* = −1.24, *SE* = 0.70, *z* = −1.78, *p* = 0.08, *OR* = 0.29]. However, no main effect for VSWM capacity [*Estimate* = −0.93, *SE* = 0.85, *z* = −1.10, *p* = 0.27, *OR* = 0.39]. Moreover, the interaction between VS perspective-taking and VSWM capacity was significant [*Estimate* = 1.83, *SE* = 0.81, *z* = 2.25, *p* = 0.02, *OR* = 6.21]. A simple slope test revealed no significant differences in correct response rates between the perspective-taking and low-load perspective-taking conditions at either −1 *SD* (*Estimate* = 0.47, *SE* = 0.28, *z* = 1.65, *p* = 0.10) or +1 *SD* (*Estimate* = −0.03, *SE* = 0.28, *z* = −0.10, *p* = 0.92) of VSWM (Table 2).

## 4 Discussion

This study examined to examine if VS perspective-taking of characters occurs and whether it is influenced by individual differences in VSWM capacity during narrative comprehension. Specially, we examined whether participants read narrative stimuli in which the spatial positioning of characters and objects was described, and judged whether two objects were left or right from the character’s perspective. Consequently, reaction times were significantly longer in the high-load perspective-taking condition than in the low-load perspective-taking condition. This suggests that embodied motion is generated from the perspective of one character within a visual representation of the

perspective of another character. In addition, VS perspective-taking arose despite controlling for individual differences in mental perspective-taking, as measured by the IRI. Our results are consistent with our first hypothesis, indicating that participants represent the characters’ VS perspectives regardless of their ability to engage in mental perspective-taking during narrative comprehension.

Consequently, the most important finding of this study is consistent with and extends Horton and Rapp’s (2003) perceptual availability hypothesis. Moreover, this result demonstrates embodied movement within the representation of the character’s perspective in reading, supporting previous research in the field of spatial cognition (Kessler and Thomson, 2010). Notably, understanding VS perspective-taking may involve comprehending how the world is represented from the character’s perspective. This is, based on both visual and textual information. The Japanese language, compared to languages such as English, is characterized by less frequent use of prepositions and more frequent use of particles to express spatial relationships (Oka, 2007). Thus, Japanese readers may need to allocate more cognitive resources to infer the spatial relationships between characters. Despite such linguistic characteristics, this study suggests the possibility that VS perspective-taking occurs in Japanese narrative comprehension.

Participants with a lower VSWM capacity took more time to develop perspectives. This result provides evidence consistent with our second hypothesis, which is that individual differences in VSWM would also indicate different performances in VS perspective-taking. Although the interaction between VS perspective-taking and VSWM capacity on accuracy was significant, a simple slope test showed a non-significant trend. Participants with lower VSWM capacity needed more time to form perspectives, and individual differences in VSWM would also indicate different performance in VS perspective-taking. The significant interaction between VS perspective-taking and

VSWM capacity on accuracy suggests that VSWM plays a role in the accuracy of perspective-taking. However, the non-significance in the simple slope test indicates that the relationship between VSWM and perspective-taking accuracy is not significant. Comparing the current results of with Gillioz et al. (2012), it is similar that a lower VSWM capacity requires more time for the elaboration of spatial information, highlighting the role of VSWM in processing spatial information efficiently. However, the lack of difference in accuracy based on VSWM size in our study contrasts with Gillioz et al. (2012). This discrepancy may be attributed to task differences. While Gillioz et al. (2012) focused on spatial information extraction, This study involved the additional cognitive demands of maintaining and switching perspectives. This suggests that individuals can compensate for lower VSWM capacity by investing more cognitive resources to achieve comparable levels of elaboration although VSWM differences influence the time required to simulate a situation. The cognitive costs associated with perspective-taking may be higher for lower VSWM capacity. However, they can still perform the task accurately by allocating more cognitive effort.

This study had some methodological limitations. First, we assumed that participants adopted the protagonist's perspective when comprehending the narrative stimuli. However, the reliability of this manipulation was questionable. It should add conditions in which object positions are judged from the perspective of the protagonist, or have participants describe the narrative perspective they adopted after the experiment. Moreover, Using first-person pronouns such as you or I to refer to the protagonist would enable clearer determination of the initial narrative perspective, make perspective easier, and reduce the extraneous cognitive load of memorizing characters' names. Second, the narrative stimuli automatically progressed every seven seconds, preventing rereading of previous sentences. This may introduce confounding factors related to individual differences in memory abilities and strategies. It should investigate memory-related variables by comparing conditions that collect data on both VS and verbal working memory capacities. Third, the non-standardized VS memory task utilized to assess VSWM capacity lacks sufficient evidence of validity, despite being designed to assess core VSWM skills and having been used in previous studies (e.g., Fincher-Kiefer, 2001; Fincher-Kiefer and D'Agostino, 2004; Suto and Hyodo, 2006). To substantiate the veracity of these findings, it is imperative to replicate them using a standardized VSWM test.

Future research should aim to clarify the specific processes in VS perspective-taking during narrative comprehension and their links to individual differences in working memory. This could involve using more fine-grained measures of VSWM and manipulating cognitive load. Further, investigating the linguistic aspects of perspective-taking, such as mental state verb production (Neitzel and Penke, 2021), could yield a more comprehensive understanding of perspective-taking in narrative comprehension. Based on the perceptual availability hypothesis, the relationship between VS and mental perspective-taking (Erle and Topolinski, 2017) may also be reflected during narrative comprehension. By pursuing these research directions, we can develop a more comprehensive understanding of how individual differences in

cognitive abilities and the interaction with VS and linguistic perspective-taking contribute to narrative experience.

## 5 Conclusion

In conclusion, this study suggests that readers construct VS representations based on characters' perspectives and individual differences in VSWM capacity may influence during narrative comprehension. Our findings contribute to the evidence supporting that readers construct embodied simulations constrained by the perceptual availability hypothesis and highlight the influence of individual differences in VSWM during narrative comprehension.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving humans were approved by the Nagoya University's Research Ethics Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

## Author contributions

AH: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Validation, Visualization, Writing – original draft. SK: Supervision, Writing – review & editing.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Supplementary material

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# A high-frequency sense list

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A number of high-frequency word lists have been created to help foreign language learners master English vocabulary. These word lists, despite their widespread use, did not take word meaning into consideration. Foreign language learners are unclear on which meanings they should focus on first. To address this issue, we semantically annotated the Corpus of Contemporary American English (COCA) and the British National Corpus (BNC) with high accuracy using a BERT model. From these annotated corpora, we calculated the semantic frequency of different senses and filtered out 5000 senses to create a High-frequency Sense List. Subsequently, we checked the validity of this list and compared it with established influential word lists. This list exhibits three notable characteristics. First, it achieves stable coverage in different corpora. Second, it identifies high-frequency items with greater accuracy. It achieves comparable coverage with lists like GSL, NGSL, and New-GSL but with significantly fewer items. Especially, it includes everyday words that used to fall off high-frequency lists without requiring manual adjustments. Third, it describes clearly which senses are most frequently used and therefore should be focused on by beginning learners. This study represents a pioneering effort in semantic annotation of large corpora and the creation of a word list based on semantic frequency.

## KEYWORDS

BERT, semantic annotation, sense frequency, word list, large language model

## 1 Introduction

Learning vocabulary is essential for foreign language learners. Beginning learners often face the challenge of determining which words to learn first. Frequency has proven a useful tool in selecting the important words to prioritize and “frequency lists have been used for decades for teaching the most useful general words” (Vilkaite-Lozdiene and Schmitt, 2020, p. 81). Such high-frequency word lists are especially needed for foreign language learners as they have limited exposure to the target language and therefore cannot acquire high-frequency words as native speakers do.

A number of high-frequency word lists have been created to help foreign language learners master English vocabulary. Influential word ones include West’s (1953) General Service List (GSL), Nation’s (2012) BNC/COCA list, Browne et al.’s (2013) NGSL and Brezina and Gablasova’s (2015) New-GSL.<sup>1</sup> It is believed that by using high-frequency word lists, beginning learners can get the best return for their learning efforts (Nation, 2013; Dang et al., 2022). These word lists become important references for classroom teaching, vocabulary assessments, and textbook compiling. Several studies have confirmed the usefulness of these word lists both in terms of coverage and teachers’ perceptions. Nakayama (2022) found the NGSL gave between 92.8 and 95.8% coverage for the three top-selling MEXT-approved high school textbooks.<sup>2</sup> Dang et al. (2022) reported the usefulness of BNC/COCA 2000 in teachers’ perception.

1 The lists developed by Browne et al. (2013) and Brezina and Gablasova (2015) are both referred to as the New General Service List. The former is commonly abbreviated as NGSL, while the latter is New-GSL.

2 Also refer to the introduction of NGSL on its website. <https://www.newgeneralservicelist.com/new-general-service-list>.

These word lists, despite their widespread use, did not take word meaning into consideration.

First, most word lists simply catalog the spelling forms of high-frequency words without explaining their meanings. This seems to imply that the meaning is not important or that all meanings are equally important. When learners consult these word lists, they do not know which meaning(s) to prioritize. Szudarski (2018) raised the question of whether beginning learners should focus only on the most frequent meaning or on all the meanings of these listed words. For example, “act” is usually identified as a high-frequency word in previous word lists. Should a middle school student in China study all the meanings of this word or only focus on the most frequent ones? Szudarski’s doubt invites another question. If learners want to focus on the frequent meanings first, what are the most frequent meanings—those related to “behave,” “perform,” or “written law”? Foreign language learners, even foreign language teachers, are not always clear about such questions. Dictionaries do not provide detailed information on semantic frequency either. Most dictionaries claim that different meanings of a word are usually given in order of frequency, with the most frequent meaning given first. However, a comparison reveals that different dictionaries display senses in quite different orders.

Another issue with earlier word lists was their inability to accurately identify high-frequency terms. Previous high-frequency lists use word family, lemma or flemma as their counting unit. A word family consists of a base word and all its derived and inflected forms that can be understood by a learner without having to learn each form separately (Bauer and Nation, 1993). A lemma is a word family where the family members consist of the headword and inflected forms of the same part of speech (Bauer and Nation, 1993). A flemma is a word family that consists of a headword and inflected forms of different parts of speech (Pinchbeck, 2014). Typically flemmas include more members than lemmas. Word lists based on word families tend to include many low-frequency words. For example, GSL includes such words as “particle” or “unpleasantly.” As pointed out by Brezina and Gablasova (2015), these words are included not because they are highly frequent, but because they belong to the same family of high-frequency items such as “part” and “please.” Such less frequent members, Nation (1990) pointed out, will increase students’ learning burden. On the other hand, previous word lists overlooked many common everyday words such as “Monday” and “April.” When compiling the BNC/COCA list, Nation had to manually include 186 word families of low frequency into high-frequency bands. Such words include days of the week (e.g., “Monday,” “Friday”), months of the year (e.g., “April,” “July”), and children’s language (e.g., “naughty,” “silly,” “rabbit,” and “orange”). Nation made such an adjustment because these words cannot be included in the high-frequency band solely based on frequency (Nation, 2016). Similarly, NGSL consists of 52 words for which frequency ranking information is not available. They include days of the week, months of the year and numerical words.<sup>3</sup> In short, previous lists based on word frequency included some less frequent words while at the same time tending to omit some common words if without manual adjustment.

The root of these problems lies in the conventional definition of “word” which is based solely on its spelling form but neglects the different senses that each form can represent. For example, different forms of “act” are counted as one single word, regardless of their specific senses. These senses are different, especially in the eyes of foreign language learners. Bogaards (2001, p. 324) noted that “the only reason to lump together all these semantically disparate elements in the category of words seems to be the fact that they constitute groups of letters between two blanks.” This form-based definition of “word” brings problems in creating word lists based on frequency. It implies that a word with multiple meanings (such as “act”) is more likely to be categorized as high-frequency compared to a word with only one meaning (like “Monday”).

Previous studies (Gardner, 2007; Gardner and Davies, 2007) proposed to solve this problem by redefining “word” as a union of one single form and one single meaning. That is to say, different senses of “act”—“act<sup>1</sup> (perform),” “act<sup>2</sup> (behave),” or “act<sup>3</sup> (written law)” —will be treated as different items. By so doing, we can solve the two problems raised above. First, we can identify which sense of a word is most frequently used, and therefore provide better reference for learners consulting word lists. Second, when we use sense instead of word as the counting unit, a single-meaning word like “Monday” is no longer in competition with a lump of all the meaning representations of “act,” but with “act<sup>1</sup>,” “act<sup>2</sup>,” or “act<sup>3</sup>,” respectively. Consequently, “Monday” might be able to get into the high-frequency band without necessitating manual adjustments as in Nation’s case.

No attempts have been made to carry out such proposed analysis. Gardner (2007) recognized that it would be virtually impossible to meet the criteria of the same meaning in grouping words unless corpora are semantically tagged. However, corpora of this nature are “in their developmental infancy” (Gardner, 2007, p. 244), or in other terms, “are much easier talked about than constructed” (Gardner and Davies, 2007, p. 353).

The daunting, almost insurmountable task of semantically annotating a large corpus has now become achievable with the recent advancement of large language models. Google’s *Bidirectional Encoder Representations from Transformers* (BERT) can now represent each word in a corpus using a 1024-dimensional vector. A vector can be simply represented as a number list or array. Different meanings of a word will be represented by distinct vectors and subsequently be treated separately.

In this article, we will annotate COCA and BNC semantically with a BERT model, count different senses, calculate semantic frequency, create a high-frequency sense list, check its validity, and finally discuss methodological and pedagogical implications.

## 2 Research questions, data, and tool

### 2.1 Research questions

The objective of this study is to identify the most frequently used senses of English words, with a particular focus on addressing the following key questions. First, what are the high-frequency senses in English? Second, are these high-frequency senses selected from COCA representative of other English varieties? Third, what are the pedagogical and methodological implications the study can bring?

<sup>3</sup> The NGSL supplementary words can be found at: <https://www.newgeneralservicelist.com/new-general-service-list>.

## 2.2 Sense inventory

In this study, “sense” refers to sense entries listed in the Oxford English Dictionary (OED).<sup>4</sup>

There is considerable controversy about what constitutes a sense and how senses are distinguished from one another. Atkins (1991) noted that lexicographers could variously lump senses together, split them apart, or combine elements of meaning in different ways. This point can be easily illustrated when we compare the entries of the same word in different dictionaries.

In this study, we choose to use OED for three reasons. First, a result based on an English dictionary is more suitable for foreign language learning purposes. Natural language processing studies often use WordNet as their sense inventory. WordNet is constructed around sense relationships and its sense definitions are not suitable to be used in foreign language classrooms. Second, OED provides more extensive example sentences compared to other available dictionaries. This, as our preliminary study shows, can improve the accuracy of sense annotation using a BERT model. Third, it provides a general-level sense and a more specific sub-sense. In OED, sense entries are organized into two levels: general senses and sub-senses. The boundary between two general-level senses is usually clear. Some other dictionaries adopt a single-level organization, in which case, boundaries between some senses are not clear-cut. Computer models have difficulty distinguishing fine-grained senses. Previous studies (Edmonds and Kilgariff, 2002; Ide and Wilks, 2007) have shown that even human annotators could not distinguish well between fine-grained senses. To improve annotation accuracy, we use the general-level sense in OED.

Phrasal verbs are treated as unique sense units.<sup>5</sup> Previous research (Yuan et al., 2016; Hu et al., 2019) assigned all occurrences of a word in a corpus to sense entries in a dictionary. However, this approach inevitably leads to some inaccuracies. Phrasal verbs, such as “give up,” have unique meanings as a whole and cannot be classified under any “give” or “up” sense entry. To deal with this issue, we decide to treat phrasal verbs as unique items. There is no consensus about what a phrasal verb is. Different linguistic theories have different definitions and different dictionaries list different entries. For easier operation, we include only the phrasal verbs listed in OED.

To sum up, different sense entries as well as the entries for phrasal verbs in OED will be counted.

## 2.3 Corpora

Three corpora are used in this study. The Corpus of Contemporary American English (COCA) is used to calculate the sense frequencies of English words. The British National Corpus

(BNC) is used to check how much the lexical characteristics of high-frequency senses in COCA can represent both American English and British English.

COCA is a large and balanced corpus of contemporary American English. According to its official introduction, it contains more than one billion words of text from eight genres.<sup>6</sup> COCA is available in several versions, namely DB (suitable for databases), WLP (one word per line), and TXT (the most common text format). We have chosen the TXT version.

BNC is a large collection of over 100 million words of written and spoken language, which were gathered from a wide array of sources to provide an accurate reflection of British English during the latter half of the twentieth century. It has been a source to make frequency lists in a number of vocabulary studies. Several versions of BNC are now available. In this study, the XML edition<sup>7</sup> is used.

It is recognized that there are distinct time frames covered by these two corpora—with COCA spanning materials from 1990 onwards, while BNC focuses on materials in the 1990's. Ideally, a more current corpus of British English such as “BNC 2014” would be preferred. However, access to “BNC 2014” is currently limited to specific web interfaces or software such as LancsBox. This restriction impedes the ability to analyze the entire text using BERT on a local computer. Other contemporary British English corpora such as the Brown family or the LOB family corpora are generally not large enough to produce reliable results, making BNC the 2nd best choice for this study.

## 2.4 Tool

Google has open-sourced multiple BERT models (Devlin et al., 2018). The model used in this study is “wvm\_uncased\_L-24\_H-1024\_A-16,”<sup>8</sup> the largest model released by Google, which consists of 24 layers, 1,024 hidden units and 16 self-attention heads with 340 million parameters. According to the evaluation results on multiple natural language processing tasks released by Google for different versions of models, generally, the larger the model parameters, the better the performance. For this reason, our study has chosen the largest version of BERT.

During the pre-training phase, BERT utilizes two tasks: the Masked Language Model (MLM) and the Next Sentence Prediction (NSP). The MLM task is similar to fill-in-the-blanks on a test; given a sentence, one or more words are randomly masked, and the model must predict the masked words based on the remaining vocabulary. The NSP task involves determining whether the second sentence in a given pair from the same corpus is the sequential follow-up to the first sentence, a binary classification task with only “yes” or “no” as answers. This NSP task is akin to paragraph-ordering questions seen in exams. It is evident that the pre-training process of the BERT model is similar to the human language learning process; the MLM task allows the model to learn vocabulary-related knowledge, while the NSP task enables the model to acquire semantic information at the sentence and even

<sup>4</sup> We are grateful for the Research License provided by Oxford Dictionaries. <https://developer.oxforddictionaries.com>, retrieved on 2022-10-2.

<sup>5</sup> Many phrasal verbs also have multiple meanings. Our attempts to accurately distinguish between these different meanings using the current BERT model have been unsuccessful. In this study, the various meanings of a phrasal verb are treated as a single entity. This issue will be refined in later studies.

<sup>6</sup> <https://www.english-corpora.org/coca/>

<sup>7</sup> <http://www.natcorp.ox.ac.uk/XMLedition/index.xml?ID=intro>

<sup>8</sup> <https://github.com/google-research/bert>



paragraph levels. Combining these two tasks allows the model to produce word vectors that comprehensively and profoundly depict the information in the input text. Essentially, the pre-training process involves continuous adjustment of the model parameters to enhance the model's understanding of language.

The pre-trained model released by Google is based on the English Wikipedia corpus. Although the Wikipedia corpus is extensive in scale, it contains many non-standard languages. To enhance the model's semantic differentiation accuracy, we fine-tuned the model using the entire corpus COCA, BNC, and the Corpus of Historical American English (COHA).

### 3 Methods and procedures

In this article, we annotate COCA semantically by using BERT, a deep-learning language model developed by Google. After the corpora are semantically annotated, we calculate the frequency of each sense and select high-frequency senses. We then check the coverage of these high-frequency senses and their validity. Finally, we discuss methodological and pedagogical implications.

#### 3.1 Data cleaning

The data cleaning in this article mainly involves deleting incomplete sentences from the COCA corpus, as well as tokenization, lemmatization, and part-of-speech tagging.

For the COCA corpus, we used Spacy to segment the text into sentences and then filtered out invalid sentences containing the "@" symbol. Due to copyright reasons, ~5% of the content in the COCA corpus sold by Davies has been randomly replaced with "@" symbols, meaning that every 200 words will have 10 words deleted and replaced with "@." We completely removed such sentences. For the valid sentences remaining, we used Spacy for tokenization, lemmatization, and part-of-speech tagging. After removing these fragmented sentences, the size of COCA used in this study is ~783 million words.

The processing of the BNC data is relatively straightforward. We followed the original annotation scheme of the corpus and extracted four core fields: word, lemma, part of speech, and text type.

#### 3.2 Semantic annotation

The semantic annotation of a large corpus consists of the following steps.

First, given a word  $w$  with  $m$  senses, for the  $i_{th} \in \{1, 2, \dots, m\}$  sense, it has  $n_i$  example sentences. For the  $j_{th} \in \{1, 2, \dots, n_i\}$  example sentence containing the target word  $w$  with the  $i_{th}$  sense, we extract the token vector of the target word  $w$ , denoted as  $e_{ij} \in \mathbb{R}$ . The word vector  $e_i$  of the  $i_{th}$  sense can be obtained by averaging the token vectors of the target word in the example sentences, i.e.,  $e_i = \text{mean}(e_{i1}, e_{i2}, \dots, e_{in_i})$ . Finally, we obtain the word vectors  $e_1, e_2, \dots, e_m$  of the  $m$  senses of word  $w$ , which serve as the sense representation for each sense.

We use a Python program to access Oxford Dictionary API and get an entry in OED. An entry consists of all definitions and example sentences. Then, example sentences for each definition from OED are fed into BERT. BERT analyzes these sentences and represents each definition with a 1024-dimensional vector. As a result, we get a vector for each definition of every entry from OED.

This representation process can be illustrated with a simple example. The word "capital" has eight senses in OED,<sup>9</sup> comprising four nouns, three adjectives, one exclamation. The first noun sense refers to the "city" sense. This sense entry contains 40 example sentences in total. Of these sentences, 28 (70%) example sentences are fed into the BERT model. BERT calculates the vector of this sense from each of the 28 example sentences, computes the average value, and finally represents it with a 1024-dimensional vector. By repeating this process, we get a vector for each of the remaining seven senses of the word "capital."

Second, each sentence in the corpus is analyzed by BERT, and similarly, each word is represented with a vector.

Next, for a sentence containing the target word  $w$  extracted from COCA, we first obtain the token representation  $e_t$  for the target word. Then, we calculate the similarity between  $e_t$  and  $m$  sense representations of the target word  $w$ . The sense with the highest similarity score is selected as the sense of the target word in the sentence. There are many methods to calculate similarity, and this study adopts the most commonly used cosine similarity algorithm. The sense of the target word in a sentence can be formally expressed as:

$$i^* = \arg \max_{i \in \{1, 2, \dots, m\}} \cos\_sim(e_t, e_i)$$

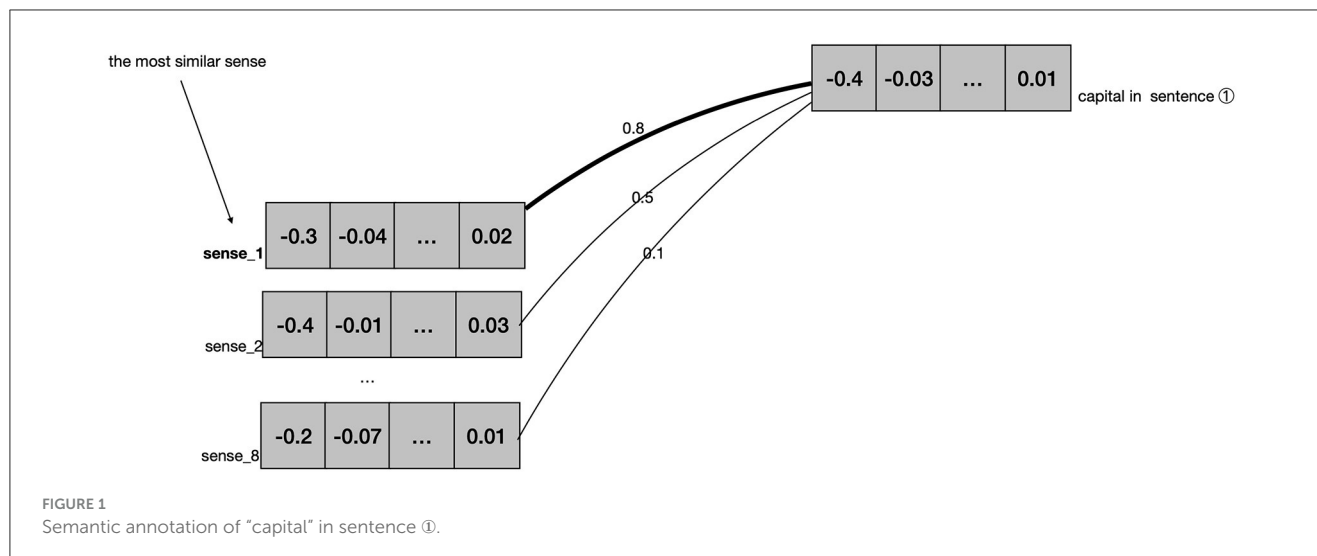
To put it another way, every vector for each word in the corpus (obtained in step 1) is compared with the vectors derived from definitions in OED (obtained in step 2). The similarity between the vectors is assessed. The definition with the highest similarity score is selected as the meaning of the target word.

For instance, let's consider the semantic annotation of the word "capital" in sentence ① in COCA.

- ① The UN escorted buses carrying more than 300 mothers and children out of the Bosnian capital Sarajevo yesterday.

The word "capital" has 8 senses in OED. In the first step, BERT will analyze the example sentences of the word "capital" in OED, and represent each of the eight senses with a vector, as shown in the left part of Figure 1. In the second step, BERT will analyze every sentence that contains the word "capital" in COCA. When BERT meets sentence ① in COCA, it will generate a 1024-dimensional vector to represent the word "capital," as shown in the right part of Figure 1. After that, BERT will compare this vector representing "capital" in sentence ① with each vector representation of the different sense entries for "capital" in OED, selecting the most similar vector as the definition for "capital" in this specific sentence. In this instance, the word "capital" in sentence ① is found to be most similar to the first

<sup>9</sup> We do not distinguish homonymy from polysemy in this study.



sense listed in the OED. Therefore, it is annotated with the first sense.

These steps are repeated for every word in the corpus and consequently, each word in the corpus is matched with a definition in OED. The entire corpus is then semantically annotated.

Phrasal verbs have their meanings as a whole and are analyzed as unique sense units in this study. Regrettably, the BERT model cannot calculate vectors for phrases satisfactorily, phrasal verbs are therefore identified by rules in this study.

We specify four rules to single out phrasal verbs in corpora. First, the first element in a phrasal verb must be a verb, and the second element must be an adverbial particle. Second, at most two words can be inserted between the verb and adverbial particle. Third, if a phrasal verb is made up of three words, the first element must be a verb, the second one must be an adverbial particle and the third must be a preposition. Fourth, phrasal verbs are identified by maximum string matching.

The first two rules are similar to the rules specified in Gardner and Davies (2007). These two rules will rule out false phrasal verbs “take in” in sentence ② and include non-continuous examples such as “look sth up” in sentence ③.

- ② The direction the English novel was to **take in** the post-war era was the subject of much discussion in the late 1950s
- ③ If I want information I can **look it up** and read it far faster than I can get it from a screen.

Gardner and Davies (2007) assume that all phrasal verbs are made up of two items. When studying sentences from COCA, we find that some phrasal verbs consist of three items, such as “look up to” and “look forward to.” We have to make two more rules to include such three-word phrasal verbs.

During the whole annotation process, if a word is part of a phrasal verb, BERT will not associate any specific definition with it. For instance, the phrase “look up to” will be considered as a single entity. The individual words “look,” “up,” or “to” will not be linked to any particular sense entry in OED.

### 3.3 Accuracy check

During the annotation process, the example sentences from the OED are divided into two groups: a training group and a test group. The training group, consisting of 70% of the example sentences, is inputted into BERT to generate vectors for definitions sourced from the OED. The test group, accounting for 30% of the example sentences, is combined with sentences from the COCA. When BERT analyzes sentences in the second step specified in Section 3.2, it does not differentiate whether a sentence is an example sentence for a definition in OED or a random sentence in COCA. After the annotation, the example sentences are singled out, and their annotations are compared with their original definitions. The accuracy of the annotations is determined by calculating the number of words that have been correctly annotated.

### 3.4 Selection of high-frequency sense

Different studies have adopted varying criteria for developing high-frequency word lists. West (1953) used both subjective and objective criteria. Brezina and Gablasova (2015) took a purely quantitative approach. Nation (2012) used frequency as the primary criterion but made some manual adjustments. To ensure replicability, we have predominantly adopted a quantitative approach. While some subjective judgments have been made, they are also conducted automatically and can be replicated easily.

A high-frequency sense list is created according to sense frequency, style neutrality, and range.

First, all semantically annotated words in COCA are ranked in descending order based on their frequency. After COCA is semantically annotated, words of different senses are treated as distinct units. That is to say, the occurrences of “act<sup>1</sup> (perform),” “act<sup>2</sup> (behave),” and “act<sup>3</sup> (a written law)” are not collectively counted as instances of one word “act.” Instead, the occurrence of these different senses is counted individually. All these senses are ranked according to their frequency. Frequency has always been the most important standard in the development of word lists. Similarly, it is used as the first standard in this study.

Second, any senses that possess a register label, are limited to specific domains, or are proper nouns, or are predominantly used in regions outside of the UK or the US, are eliminated. According to West (1953), foreign learners at the early stages of language acquisition should first acquire stylistically or emotionally neutral terms. As such, senses labeled as “formal,” “literary,” “informal,” “archaic,” “vulgar slang,” “rare,” “dialect,” or “derogatory” would be less relevant to beginning learners. Similarly, any senses primarily used within specific domains such as “Physics” or “Law” are also disregarded. Such sense may be common in a large corpus which consists of mainly written texts for adults, but is less relevant to beginning learners. Moreover, words labeled as “proper nouns” are removed. Such words mainly include names of countries, cities or people such as “Britain,” “Rome,” or “Anne.” Terms signifying the language or inhabitants of these regions are also eliminated at this point. Last, senses primarily utilized in countries or areas outside of the UK or the US are dismissed as well. Although different regional dialects are equally important, the UK or the US variety is generally focused on first by young learners in foreign language education contexts.

Third, senses with a range below 0.5 are removed. Relying solely on frequency is unreliable especially when the variable does not follow a normal distribution (Gries, 2021). Thorndike (1932) might be the first to introduce the concept of distributional information in the development of word lists, specifically referring to how many sub-corpora or texts a word appears in at least once. However, this measure of distributional information is not too simple because it does not consider the size of the individual sub-corpora in which a word appears, nor does it take into account the frequency of occurrence of the word in the individual sub-corpora. To address this limitation, we draw from Gardner and Davies (2014) and make the following definition of distribution: if the frequency of a sense in a sub-corpus is  $\geq 20\%$  of its expected frequency, then the sense is said to be “distributed” in that sub-corpus; otherwise, it is not. COCA can be classified into eight sub-corpora based on genre: academic, blog, fiction, magazine, news, spoken, TV and movie, and web. If a sense is distributed in six out of the eight sub-corpora, its distributional score is calculated as  $6/8 = 0.75$ . Although range is considered an important criterion in the development of word lists, no previous study has established a standardized reference for this factor. We choose to use 0.5 as the threshold after several pilot experiments. The standard can be refined in later studies.

Finally, we select the items that cover around 80% of COCA as high-frequency senses.

There is no consensus on the number of items that should be included in a high-frequency list. West's (1953) GSL consists of ~2,000 word families. This figure (2000) has long been utilized as a reference point for defining “high frequency” in the following studies. Nation (2001) also suggested that the 2,000 most frequent word families should be labeled as high-frequency vocabulary. However, the selection of 2,000 as the upper limit for high-frequency vocabulary lacks a specific rationale. Nation (2001) himself clearly stated that this decision is open to debate. Schmitt and Schmitt (2014) proposed that rather than using the traditional figure of the first 2,000 word families as the upper boundary of high-frequency vocabulary, the threshold should be moved and include the first 3,000 word families.

Instead of getting caught up in the debate of whether a high-frequency word list should consist of 2,000 or 3,000 items, we take a different approach. We aim to create a list that achieves a similar level of coverage as influential lists like GSL or New-GSL, which cover ~80% of different corpora. To achieve this, we will calculate the coverage of each set of 1,000 senses and select the number of items that can encompass around 80%.

### 3.5 Validity check

This high-frequency word list is derived from the COCA corpus, which represents contemporary American English. A natural concern is whether this list accurately represents other varieties of English, especially British English. To address this concern, we will check the coverage of this list in BNC, and further we will compare two lists created from an American English corpus and a British English corpus, respectively.

First, we will check the coverage of this list in the BNC corpus. Coverage refers to the percentage of words in a corpus that are represented by items from a specific word list (Nation and Waring, 1997; Dang et al., 2022). It is the primary criterion for evaluating word lists in previous studies, such as Nation (2004), Gilner and Morales (2008), and Brezina and Gablasova (2015). In this article, we will calculate the coverage of our high-frequency sense list in BNC, the only large corpus whose text can be downloaded and analyzed by BERT. If these high-frequency senses can provide a stable coverage in BNC as well as in COCA, we can infer that these senses are not biased toward American English.

A stable coverage, while an important indicator of being representative, is not sufficient. For example, if we create a high-frequency word list from BNC and it contains all the items found in the COCA list but in different ranking positions, the coverage in different corpora would be the same. However, the linguistic characteristics reflected by the two lists would be different. For instance, if on the BNC list Sense X is the first item and Sense Y is the last item, while on the COCA list, Sense Y is the first item and Sense X is the last, these two lists represent language characteristics despite having the same coverage in different corpora.

To address this issue, we will create two high-frequency lists from COCA and BNC respectively, and compare the ranking position of shared items in the lists, using Spearman's  $\rho$  as a statistical measure.

To facilitate comparison, the spelling of American English words in COCA will be adjusted to align them with British spelling.<sup>10</sup>

## 4 Results and discussion

### 4.1 Semantic annotation

We annotated COCA using BERT, and Figure 2 is a snapshot of the annotated corpus. The annotated corpus specifies “source

<sup>10</sup> <http://heiswayi.github.io/spelling-uk-vs-us/>

```

1 source_file»text_type»sent_num» word» lemma»pos»c5» sense_label»
2 A00.xml»NONAC»1»FACTSHEET»factsheet»SUBST»NN1»no_entry»
3 A00.xml»NONAC»1»WHAT» what» PRON» DTQ»0»
4 A00.xml»NONAC»1»IS» be» VERB» VBZ»2»
5 A00.xml»NONAC»1»AIDS» aids» SUBST»NN1»mono»
6 A00.xml»NONAC»1»?»?»» PUN»punct»
7 A00.xml»NONAC»2»AIDS» aids» SUBST»NN1»mono»
8 A00.xml»NONAC»2»(»(»» PUL»punct»
9 A00.xml»NONAC»2»Acquired» acquire»VERB» VVN»AJ0»1»
10 A00.xml»NONAC»2»Immune» immune» ADJ»AJ0»0»
11 A00.xml»NONAC»2»Deficiency» deficiency» SUBST»NN1»mono»
12 A00.xml»NONAC»2»Syndrome» syndrome» SUBST»NN1»mono»
13 A00.xml»NONAC»2»)»»)» PUR»punct»
14 A00.xml»NONAC»2»is» be» VERB» VBZ»2»
15 A00.xml»NONAC»2»a»a» ART»AT0»0»
16 A00.xml»NONAC»2»condition» condition»SUBST»NN1»0»
17 A00.xml»NONAC»2»caused» cause»VERB» VVN»3»
18 A00.xml»NONAC»2»by» by» PREP» PRP»1»
19 A00.xml»NONAC»2»a»a» ART»AT0»0»
20 A00.xml»NONAC»2»virus»virus»SUBST»NN1»0»
21 A00.xml»NONAC»2»called» call» VERB» VVN»0»
22 A00.xml»NONAC»2»HIV» hiv»SUBST»NP0»mono»
23 A00.xml»NONAC»2»(»(»» PUL»punct»
24 A00.xml»NONAC»2»Human»human»ADJ»AJ0»NN1»0»
25 A00.xml»NONAC»2»Immuno» immuno» SUBST»NN1»no_entry»
26 A00.xml»NONAC»2»Deficiency» deficiency» SUBST»NN1»mono»
27 A00.xml»NONAC»2»Virus»virus»SUBST»NN1»0»

```

FIGURE 2

A snapshot of the semantically annotated COCA.

file,” “register,” “sentence No.,” “word type,” “lemma,” “pos,” “C5,” and “sense label.”

After the annotation, each word in COCA has a “sense label,” and each sense label matches a sense entry in the OED dictionary. As illustrated in Figure 2, the sense label assigned to “what” in the sentence “What is AIDS?” is “0.” This indicates that the meaning of “what” in this context corresponds to the first sense entry in the OED dictionary.<sup>11</sup> Likewise, the meaning assigned to “cause” in the 17th line is labeled as “3,” indicating a match with the fourth sense entry in the OED.

## 4.2 Accuracy of annotation

After the annotation was completed, we evaluated the accuracy rate of BERT to disambiguate polysemous words.

The overall correct rate of BERT to disambiguate polysemous words is 94%. There are 63,365 word entries in OED. Out of these words, 19,653 words are polysemous. Of these polysemous words, 14,847 words have enough examples for at least two senses, as is shown in Table 1. Therefore, the annotation accuracy rate is based on 14,847 polysemous words that have a sufficient number of example sentences available.

A total of 272,798 example sentences for these 14,847 words, after being annotated by BERT, are checked against the original

definitions in OED. It is found that 257,285 sentences are correctly annotated. This results in an overall correct rate of 94%.

The accuracy rate in this study is higher than the results of previous sense disambiguation studies. In previous studies (Kilgariff, 2001; Snyder and Palmer, 2004; Yuan et al., 2016), the inter-annotator agreement (IAA) typically falls within the range of 70–80%. It is noteworthy that even among human raters, achieving complete agreement on the exact meaning of a word is not consistently attainable.

It should be noted the rate of 94% indicates BERT’s proficiency in distinguishing between multiple meanings of words. Considering that many words have only one meaning and are accurately annotated at 100%, the overall accuracy rate of COCA annotations is significantly higher.

## 4.3 High-frequency senses

Following the steps specified in Section 3.2, we selected high-frequency senses in COCA.

The overall distribution of sense frequency is found to adhere roughly to Zipf’s law (Zipf, 1949; Nation, 2016). The first 1,000 senses encompass 65.35% of the total coverage, while the second 1,000 senses only contribute 7.39% of the coverage. The coverage gradually decreases with each successive set of 1,000 senses. After the seventh set, the coverage drops below 1%. It has been observed that the distribution of word frequency generally adheres to Zipf’s law. A small number of words account for a significant portion

<sup>11</sup> “0” represents the first sense entry, “1” represents the second sense entry, and so forth in the OED dictionary.



TABLE 1 Different word types in OED.

Word type	Sub-type	Word number	Sense number	Sentences checked
Monosemy	Only one sense	43,712	43,712	142,709
Polysemy	No sense is illustrated with examples	3,473	8,457	0
	Only one sense is illustrated with examples	1,333	3,025	5,403
	At least two senses are illustrated with examples	14,847	46,694	272,798
Total		63,365	101,888	420,910

TABLE 2 The coverage of each 1,000 senses in COCA.

n-th 1,000	Coverage (%)	Cumulative coverage (%)
1	65.35	65.35
2	7.39	72.74
3	4.16	76.89
4	2.72	79.61
5	1.96	81.57

of a given text (Nation, 2016). This pattern is also found in the distribution of sense frequency. The first 1000 high-frequency senses cover 65.35% in COCA, as is shown in Table 2.

Similar to previous findings of word frequency studies, the most commonly occurring items are generally grammatical words. Table 3 shows the first 20 most frequent senses in COCA.<sup>12</sup>

Each word in the list represents a single specific meaning, rather than serving as an umbrella term for multiple meanings. For instance, the word “to,” which ranks 5th in this list, refers exclusively to its infinitive particle usage as shown in example ④ and does not encompass its prepositional meaning as illustrated in ⑤.

- ④ I set out to buy food.
- ⑤ He is married to Emma.

We selected the first 5,000 senses as high-frequency senses and created a high-frequency sense list (HFSL). We set the cut-off point at 5,000 because these senses offer coverage similar to that of previous word lists in large corpora. GSL, NGSL and New-GSL cover ~80% of various corpora such as BNC, BE06, and EnTenTen12. Similarly, the first 5,000 senses we selected cover 81.57% of COCA.

To compare the coverage of different word lists, we first standardized the spelling system. The words in GSL and New-GSL use British English norms, while words in NGSL use American English norms. We converted all the spellings into British English when checking coverage in British English corpora such as BNC, and into American English when checking coverage in American English corpora such as COCA.

Following this spelling standardization, we created a sense list for GSL, NGSL, and New-GSL. Different word lists use different counting units. GSL consists of ~2,000 word families,

NGSL consists of 2,809 flemmas, while New-GSL consists of 2,494 lemmas. To make a valid comparison, we counted the respective number of senses in these lists in OED. The 2,000 words from GSL collectively have 12,616 senses; NGSL has 11,525 senses, and New-GSL has 6,971 senses.

After these standardization steps, we compared the number of senses in different word lists. The results reveal that comparable coverage is achieved with significantly fewer items. As indicated in Table 4, the HFSL achieves similar coverage, around 80%, with only half the senses of GSL or NGSL, or 70% of the senses of New-GSL.

As we transition from larger units like word families to smaller units like flemmas or lemmas, and finally to senses, we can achieve comparable coverage with a reduced number of items. In essence, by using senses as the counting unit, we can select high-frequency items more accurately.

HFSL contains more items than NGSL or New-GSL in terms of lemma or flemma. When the 5,000 senses are converted to lemmas or flemmas, there are 3,621 flemmas or 3,179 lemmas in HFSL. Nonetheless, this aligns with the process of vocabulary acquisition. Language learners typically don’t learn all the senses of a specific word before moving on to the next. They often first acquire the common senses of a word and then proceed to learn a new word.

#### 4.4 Validity of HFSL

The high-frequency list is generally representative of British English, because this list achieves a similar coverage in BNC, and moreover, items in two lists created from BNC and COCA respectively are similar in ranking positions.

First, these high-frequency senses have a similar coverage in BNC. The coverage of these 5,000 high-frequency senses in BNC is 77.47%. It is a bit lower than the coverage in COCA (81.57%), but it is still relatively stable. This means that most high-frequency senses are shared by American English and British English.

Second, the two lists created from BNC and COCA are similar in terms of both shared items and ranking positions. We created two lists of high-frequency senses from COCA and BNC respectively, and then compared the first 5,000 items in two lists. It is found that 81% of the items in the two lists are identical. What is more important, the ranking position of the common items in both lists is similar. The correlation between the common items in both lists was determined using Spearman’s  $\rho$  (Oakes, 1998). The correlation coefficient was found to be 0.82, indicating a strong positive correlation ( $p < 0.001$ ). This

<sup>12</sup> Due to space limitations, we have omitted certain columns in this table, such as “sub-sense,” “example sentence,” “register,” “domain,” etc.

TABLE 3 Examples of high-frequency senses.

Rank	Lemma	Pos	Sense definition	Norm freq
1	Be	Auxiliary verb	Used with a present participle to form continuous tenses.	30,661.48
2	The	Determiner	Denoting one or more people or things already mentioned or assumed to be common knowledge.	20,833.57
3	A	Determiner	Used when referring to someone or something for the first time in a text or conversation.	19,072.07
4	And	Conjunction	Used to connect words of the same part of speech, clauses, or sentences, that are to be taken jointly.	14,297.49
5	To	Infinitive particle	Used with the base form of a verb to indicate that the verb is in the infinitive.	12,970.09
6	I	Pronoun	Used by a speaker to refer to himself or herself.	12,899.41
7	Of	Preposition	Following a noun derived from or related to a verb.	10,738.16
8	You	Pronoun	Used to refer to the person or people that the speaker is addressing.	6,836.45
9	That	Conjunction	Introducing a subordinate clause expressing a statement or hypothesis.	6,777.34
10	He	Pronoun	Used to refer to a man, boy, or male animal previously mentioned or easily identified.	5,623.24
11	It	Pronoun	Used to refer to a thing previously mentioned or easily identified.	5,118.69
12	Have	Verb	Possess, own, or hold.	4,855.55
13	And	Conjunction	Used to introduce an additional comment or interjection.	4,586.23
14	In	Preposition	Expressing the situation of something that is or appears to be enclosed or surrounded by something else.	3,990.29
15	You	Pronoun	Used to refer to any person in general.	3,912.32
16	Of	Preposition	Expressing the relationship between a general category or type and the thing being specified which belongs to such a category.	3,893.89
17	They	Pronoun	Used to refer to two or more people or things previously mentioned or easily identified.	3,793.5
18	We	Pronoun	Used by a speaker to refer to himself or herself and one or more other people considered together.	3,786.81
19	The	Determiner	Used to make a generalized reference to something rather than identifying a particular instance.	3,637.45
20	Say	Verb	Utter words so as to convey information, an opinion, a feeling or intention, or an instruction.	3,494.02

suggests that the ranking position of common items in both lists is similar.

This indicates that high-frequency senses have cross-regional stability, with no significant variations in the two major English varieties, British English and American English. This echoes [Dang and Webb's \(2016\)](#) finding that high-frequency words achieve similar coverage in different regional varieties of English.

Therefore, a list based on American English can serve as a useful resource, at least as a useful starting point, for foreign language learners aiming to understand English in general.

#### 4.5 Pedagogical and methodological implication

Creating such a high-frequency sense list has both pedagogical and methodological implications. Pedagogically, it allows us to confidently suggest which senses should be prioritized by beginning learners. Methodologically, it opens up a new approach to accurately identifying high-frequency items.

TABLE 4 Comparison of the coverage of GSL, New-GSL, and HFSL.

	Word family	Flemma	Lemma	Sense	Coverage in COCA (%)
GSL	2,000		4,114	12,616	79.25
NGSL		2,809		11,525	80.12
New-GSL			2,494	6,971	78.49
HFSL		3,621	3,179	5,000	81.57

The list indicates which senses are more frequently used and therefore should be focused on in foreign language education. [Table 5](#) presents the semantic frequency of different senses of the word “act,” from which we can safely say that “act<sup>1</sup>” (the written law) is more frequently used than other senses, while “act<sup>8</sup>” (pretense) is less frequently used.

This has great pedagogical implications. As previous word lists failed to describe which senses are frequent and which are less widely used. Classroom teachers and curriculum designers

TABLE 5 Semantic frequency of the lemma “act.”

Sense no.	Pos	Sense definition	Example	Frequency in COCA
1	Noun	A written law passed by Parliament, Congress, etc.	The 1989 Children Act	45,360
2	Noun	A thing done; a deed.	A criminal act	41,691
3	Verb	Take action; do something.	They urged Washington to act.	30,671
4	Verb	Behave in the way specified.	They challenged a man who was seen acting suspiciously	29,803
5	Verb	Perform a role in a play, film, or television.	She acted in her first professional role at the age of six	16,224
6	Verb	Take effect; have a particular effect.	Blood samples are analyzed to find out how the drug acts in the body	14,484
7	Noun	A main division of a play, ballet, or opera.	The first act	13,873
8	Noun	A pretense.	She was putting on an act and laughing a lot.	4,678

TABLE 6 Definition of “case” in OED.

No.	Definition
Case <sup>1</sup>	An instance of a particular situation; an example of something occurring.
Case <sup>2</sup>	A legal action, especially one to be decided in a court of law.
Case <sup>3</sup>	An instance of a disease, injury, or problem.
Case <sup>4</sup>	A container designed to hold or protect something.
Case <sup>5</sup>	Surround in a material or substance.
Case <sup>6</sup>	Each of the two forms, capital or minuscule, in which a letter of the alphabet may be written or printed.
Case <sup>7</sup>	Any of the forms of a noun, adjective, or pronoun that express the semantic relation of the word to other words in the sentence.

have had to rely on their expertise to determine which meanings should be prioritized initially. However, it is not always reliable. For example, the word list in the *Shanghai Guideline for English Teaching in Middle School* (“*Shanghai Teaching Guideline*”) includes some less frequent senses while excluding lots of high-frequency senses.

In *Shanghai Teaching Guideline* some less frequent senses are required to be mastered in middle school. Some typical examples include the “intelligent” sense of “able,” the verbal use of “pain,” and the “pulling” sense of “draw.” These words—“able,” “pain,” and “draw”—are undoubtedly common, but these specified meanings mentioned above are not common. For example, despite “able” is a commonly used word, its “intelligence” sense is not frequently used. In COCA, there are 214,842 occurrences of “able” with the sense of “having the power, skill, means, or opportunity to do something.” In contrast, there are only 4,951 occurrences of its “intelligent” sense. Similarly, “pain” is a common word, with over 80,000 occurrences in COCA, but its verbal sense is infrequent, appearing only 1,110 times. It is recognized that frequency alone does not determine which words or senses should be prioritized. West (1953) points out that factors such as ease of difficulty in learning, necessity in communication, and stylistic impact all play significant roles. However, the mentioned senses do not meet these

standards. The “intelligent” sense of “able” can easily be substituted by more common words, and the verbal use of “pain” is primarily found in literature.

On the other hand, a lot of high-frequency senses are omitted in the *Shanghai Teaching Guideline*. For instance, the word “case” has seven senses in OED, as is shown in Table 6. These senses have different frequencies in COCA, as exhibited in Figure 3. The first meaning is most frequently used, occurring 175,295 times, but it is not specified in the *Shanghai Teaching Guideline*, where the word “case” only has two meanings, the legal action sense (case<sup>2</sup>) and the container meaning (case<sup>4</sup>).

More examples can be given easily. “Certain” can mean either “able to be firmly relied on to happen or be the case” or “specific but not explicitly named or stated;” “adopt” can mean either “legally take (another person’s child) and bring it up as one’s own” or “choose to take up, follow, or use;” “base” can mean either “a place used as a center of operations by the armed forces or others” or “use (something specified) as the foundation or starting point for something.” Each sense is illustrated with the following examples.

- ⑥ There are many people eager to adopt a baby (adopt<sup>1</sup>).
- ⑦ This approach has been adopted by many big banks (adopt<sup>2</sup>).
- ⑧ He headed back to base (base<sup>1</sup>).
- ⑨ The film is based on a novel by Pat (base<sup>2</sup>).
- ⑩ I’m not certain who was there (certain<sup>1</sup>).
- ⑪ The museum is only open at certain times of the day (certain<sup>2</sup>).

As is shown in Figure 4, the second meaning in each pair is much more frequent in COCA. However, in the *Shanghai Teaching Guideline*, only the first meaning is provided. That is to say, the most frequent sense is omitted.

Another systematic omission in the *Shanghai Teaching Guideline* is the neglect of high-frequency metaphorical meanings. The word “beat” has a metaphorical meaning (example ⑫) as well as a literal meaning (example ⑬). Statistics of COCA show that the metaphorical meanings are much more frequently used. However, only the literal meaning is listed in the *Shanghai Teaching Guideline*. Similar examples include “aim,” “circle,” “degree,” “argue,” “direction,” etc.

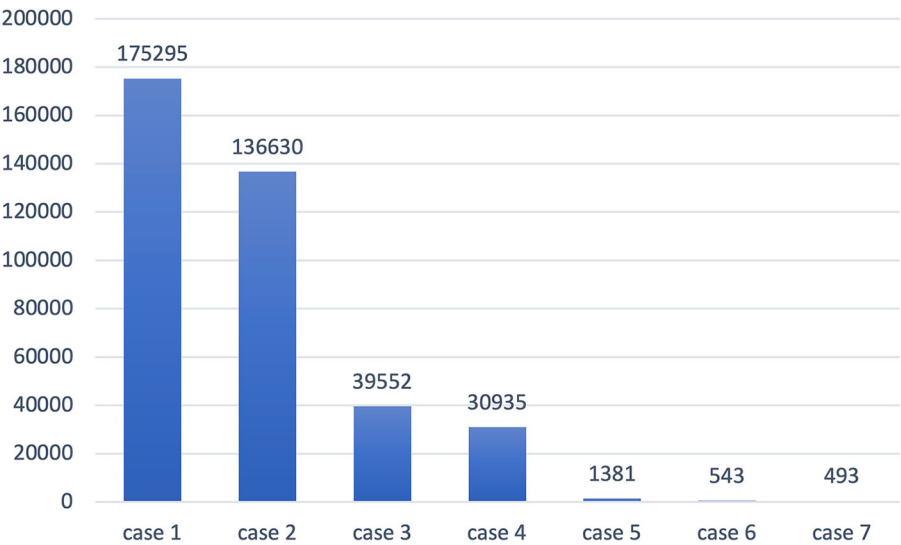


FIGURE 3  
Frequency of different senses of the word “case.”

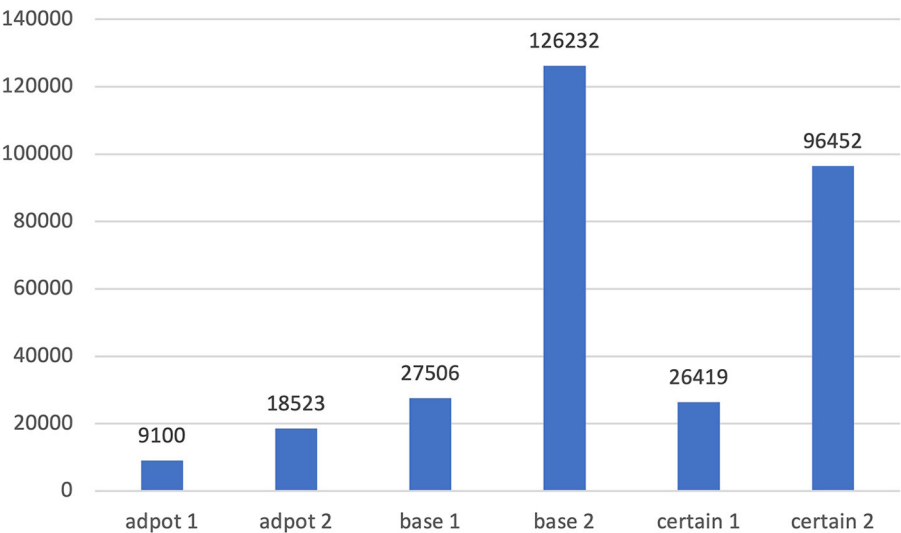


FIGURE 4  
Frequency comparison of different senses of “adopt,” “base,” and “certain.”

- ⑫ Our team beat Germany 3-1.
- ⑬ She beat the dog with a stick.

The neglect of metaphorical meanings can also be observed in such words as “deep,” “large,” and “heavy.” Their metaphorical meanings are used at least as frequently as their literal meanings in COCA. In the case of “deep,” there are 45,382 occurrences of its metaphorical meaning, twice the occurrences of its literal meaning.

- ⑭ She was in deep trouble.
- ⑮ A deep gorge.

Metaphorical meanings have generally been excluded in previous foreign language curricula because they are thought to be hard for children to understand. It is indeed true that children acquire concrete meanings first before they learn and use them metaphorically. However, this does not entail that middle school students in foreign language contexts have trouble learning these meanings. As Laufer (1997) pointed out, foreign language learners in middle school have already developed abstract thinking and are capable of understanding metaphorical meanings.

To sum up the pedagogical implications, the high-frequency sense list created in this study can help teachers and learners understand clearly which senses should be mastered first.



TABLE 7 Ranks of common words.

Word	Ranking position in COCA
Monday	1,541
Thursday	1,856
April	1,434
Tiger (the large cat sense)	3,939
Apple (the fruit sense)	2,351
Hungry	3,485

Methodologically, this study changed the counting unit in lexical frequency studies from word family or lemma to senses. By narrowing the counting unit, we can identify high-frequency items accurately.

This list includes common words without requiring any additional adjustment. When creating the BNC/COCA list, Nation found that many common words, such as days of the week cannot enter the high-frequency band solely based on frequency. The problem is similarly faced by [Brezina and Gablasova \(2015\)](#). In New-GSL, common words such as “apple” and “tiger” did not get into the list.

The concept of “word” in previous studies represents a number of distinct or even unrelated meanings. Naturally, words of only one or a few senses such as “Monday” do not have more occurrences than those words that have a large number of senses. To solve this problem, a spelling form should be matched with a single meaning. This has never been achieved in previous studies due to technical constraints ([Gardner, 2007](#); [Gardner and Davies, 2007](#)). The recent advancement of large language models presents an opportunity to bridge this gap. In this study, we, using BERT, annotated large English corpora semantically, which is an aim that has long been expected to achieve.

After the semantic annotation of COCA, we counted the frequency of different senses. This method automatically includes words with single meanings in the high-frequency range. As illustrated in [Table 7](#), words such as “Monday” or “April” attain a high position in the list.

## 5 Conclusion

In this article, we use BERT to annotate COCA semantically and create a high-frequency list of senses. This list boasts a comparable coverage as GSL, NGSL, or New-GSL, but with a significantly reduced number of items. Despite being sourced from COCA, this list represents both American English and British English. It has stable coverage in BNC; it exhibits similar ranking positions with a list created from BNC.

By creating such as list, we can explicitly identify the frequently used senses of polysemous words. Such a word list, complete with semantic frequency information, better meets the needs of both teachers and students compared to previous word lists. Furthermore, by counting senses rather than word families or lemmas, we can more precisely identify high-frequency items.

This list can serve as a starting point for developing word lists. Although we are aware that frequency is not the sole criterion for creating an ideal word list. Additional factors such as psychological reality are also important. In children’s eyes, high-frequency words such as “government” or “president” are not necessarily more important than less frequent words such as “tiger” or “bear.” Similarly, these high-frequency senses are not necessarily the earliest usage acquired by young learners. In children’s life,  $act^3$ ,  $act^4$ , and  $act^5$  might be more important. Children will learn these senses first. Similarly, children might acquire the literal meaning of “deep” first before the metaphorical meaning. However, these high-frequency senses still deserve serious attention, as they are used widely in future life. This list can serve as a starting point for further refinement.

A limitation of this study is we only annotated single words and phrasal verbs. We did not treat longer language units such as idioms and sayings separately. This will be addressed in the future when the capacity of large language models continues to advance.

## Data availability statement

The datasets presented in this article are not readily available because they can be used for academic purpose only. Requests to access the datasets should be directed to the corresponding author.

## Author contributions

TG: Writing – original draft. LL: Data curation, Writing – original draft. JS: Conceptualization, Writing – review & editing. YG: Validation, Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# Age-related changes in connected speech production: evidence from eye-tracking in the culturally adapted picture description task

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**Purpose:** Age-related changes in connected speech production remain a subject of debate, yielding inconsistent findings across various tasks and measures. This study aimed to investigate the effects of aging on picture description tasks using two types of pictures: a standardized picture (the Beach picture) and a culturally and linguistically modified picture tailored for Korean speakers (the Han River picture).

**Method:** Twenty-four young adults and 22 older adults participated in two picture description tasks while their eye movements were recorded. Word-level linguistic variables were used to assess informativeness (Correct Information Units per minute) and productivity (noun and verb counts per utterance) of connected speech production. Eye-movement measures were employed to evaluate real-time cognitive processing associated with planning connected speech (pre-speech fixation counts and durations; eye fixations before the speech onset of each utterance).

**Results and conclusions:** The findings revealed age-related declines in linguistic measures, with older adults exhibiting decreased CIUs per minute and smaller counts of nouns and verbs per utterance. Age-related changes in eye movement measures were evident in that older adults displayed longer pre-speech fixation durations. Unlike younger adults, older adults exhibited higher pre-speech fixation counts on the Han River picture compared to the Beach picture, suggesting cognitive challenges in performing the task that requires producing more words and detailed descriptions. These results suggest that aging is associated with reduced informativeness and productivity of connected speech, as well as a decline in cognitive processing efficiency.

## KEYWORDS

age-related changes, connected speech, picture description tasks, eye tracking, cultural adaptation

## 1 Introduction

The aging population has been increasing globally at an unprecedented rate. A recent report from the World Health Organization projected that one in six people worldwide will be aged 60 years or older by 2030. Among the significant concerns associated with aging are the risks of neurodegenerative conditions, such as dementia or mild cognitive impairment,

which have posed substantial socioeconomic burdens on family caregivers and governments. Early detection of cognitive-linguistic changes associated with aging could be used as a guide for normal aging and clinical populations in the prevention and treatment of neurodegenerative conditions.

Recent research has aimed to capture subtle alterations in the cognitive-linguistic abilities of older adults through language production tasks. Some studies sought to demonstrate that early symptoms can be discerned by analyzing connected speech samples obtained from tasks such as picture descriptions, interviews, or storytelling tasks (cf. Mueller et al., 2016; Filiou et al., 2019). Connected speech refers to spontaneously spoken discourse with minimal speaker monitoring, representing the most systematic form of language production (Ash and Grossman, 2015). Connected speech production imposes various cognitive and linguistic demands on the speakers, including processing speed, working memory, attention, semantic storage and retrieval, syntactic formulation, and alignment with a communication goal or topic to create a coherent discourse (cf. Griffin and Spieler, 2006; Collette et al., 2009; Mueller et al., 2018). Given its complexity and cognitive demands, examining connected speech production may serve as a valuable method to detect age-related changes in cognitive-linguistic domains among aging populations. Moreover, it offers an opportunity to identify changes in language production that are more akin to real-life communications than to the language elicited by the tasks of single-word naming or verbal fluency.

The primary objective of this study is to explore the linguistic and cognitive attributes associated with connected speech production, aiming to discern age-related change among young-old adults (typically defined as individuals in late middle age to early old age). Existing evidence from language production studies suggests that the aging process manifests from late midlife to young-old age. Schmitter-Edgecombe et al. (2000) reported that the young-old group (aged 58–74 years) exhibited a higher proportion of word-finding errors compared to younger adults (aged 18–22 years). Also, Verhaegen and Poncelet (2013) reported slowed processing in word retrieval from the age of 50. While individuals in their 50s and younger adults (aged 25–35) exhibited no difference in naming accuracy, those in their 50s showed significantly longer naming latencies. A longitudinal study by Connor et al. (2004) documented a gradual decline in word retrieval abilities over time among participants aged 30 to 87, indicating that the participants in the late midlife and young-old age were experiencing a decline in naming abilities.

The extent to which aging affects connected speech production, particularly in terms of word retrieval, has been a matter of debate. The variability in research findings is partly attributed to two factors: the diverse tasks and various linguistic outcome measures employed in previous studies (Kavé and Goral, 2016). To begin with, the task paradigms have ranged from picture description to story narration and to conversations or interviews (Saffran et al., 1989; Schmitter-Edgecombe et al., 2000; Kemper and Sumner, 2001; Boschi et al., 2017). Older adults tended to produce more words (James et al., 1998) and retrieve a greater variety of words (Kemper and Sumner, 2001) in spontaneous conversations or interviews. In contrast, older adults were less talkative (James et al., 1998) and showed a more restricted selection of words (Capilouto et al., 2015) in structured tasks such as picture descriptions.

One of the most frequently employed methods to elicit connected speech samples is the picture description task. In the task, participants are presented with a picture depicting characters engaged in familiar activities and instructed to describe it (Brookshire and Mcneil, 2014). It creates a constrained environment for identifying intended words and assessing the success of word retrieval, enabling easy cross-group comparisons (Chenery and Murdoch, 1994). Picture descriptions are widely adopted and proven to be invaluable across diverse populations, ranging from healthy older adults to individuals with neurodegenerative diseases and aphasia (Ash and Grossman, 2015; Drummond et al., 2015; Vandenborre et al., 2017; Hameister and Nickels, 2018; Mueller et al., 2018; Boucher et al., 2019; Richardson and Dalton, 2019). Moreover, the task enables researchers to examine real-time measures of eye movements as the speakers are looking at the picture while performing the task. Eye movements have been suggested to provide valuable insights into the cognitive processes underlying language production. Notably, prolonged and frequent eye fixations are indicative of heightened cognitive processing demands (Rayner, 1998; Schotter, 2011).

In adopting picture description tasks, studies have used various types of pictures, including single pictures, sequential pictures, or story pictures (cf. Mueller et al., 2018). Recently, researchers have emphasized cultural and linguistic factors in the pictures that may significantly influence speakers' interpretation and description of them. Some studies attempted to enhance linguistic and cultural sensitivity in pictures. The 'Cookie Theft' picture from the Boston Diagnostic Aphasia Examination (BDAA; Goodglass and Kaplan, 1972), which was standardized and is the most commonly used picture stimuli in the field of communication disorders, has been critiqued for containing gender, racial, and socioeconomic stereotypes (Steinberg et al., 2022). Thus, there have been attempts to address these limitations by modifying the background scene and characters and adding more objects and actions to it (Berube et al., 2019). Additionally, some studies have examined the influence of ethnicity on descriptions of the Cookie Theft picture by comparing the connected speech of Black/African Americans and non-Hispanic whites (Evans et al., 2022). Another study compared Turkish speakers' descriptions of the Cookie Theft picture to a picture tailored for Turkish speakers and found the tailored one elicited more distinctive morphosyntactic features unique to the Turkish language (Seçkin and Savaş, 2023). These studies demonstrate the importance of using pictures that resonated with participants' linguistic, cultural, and social backgrounds to effectively capture linguistic characteristics and semantic knowledge in connected speech samples (Mueller et al., 2018). Therefore, picture stimuli tailored for a specific language would produce a more accurate assessment of the cultural and linguistic differences of diverse populations.

In South Korea, the Beach picture from the Paradise-Korean version of the Western Aphasia Battery-Revised (PK-WAB-R; Kim and Na, 2012) has been the standardized picture most commonly used in picture description tasks, both in research and clinical settings. It has also been extensively utilized in various populations including healthy young and older adults (Kwon et al., 1998; Lee and Kim, 2001; Jeon and Kim, 2015; Kim et al., 2015; Choi, 2020), individuals with dementia (Kim et al., 2006; Ha et al., 2009), and those with aphasia (Kim et al., 1998; Lee et al., 2009; Kim and Sung, 2022), to name a few. However, the Beach picture exhibits certain inherent linguistic and cultural issues. The objects and actions depicted in the picture may



be less familiar to Korean speakers. This is because the Beach picture was adopted from the Western Aphasia Battery (Kertesz, 2007), with its fundamental scenery remaining unchanged. Furthermore, the picture portrays limited events that may not sufficiently elicit action-related information or specific lexical items, such as verbs. The presence of only six active agents (see ‘Materials and methods’ section for further detailed descriptions), contributes to this limitation. This presents a crucial concern given that Korean is characterized as a pro-drop and verb-salient language, which allows the omission of verb arguments (e.g., subject or object, which are nouns) from a sentence when their identity can be inferred from context (Kwon et al., 2006; Jung and Lee, 2018). This verb saliency in Korean has been observed in previous studies on connected speech, where Korean speakers with aphasia demonstrated a greater number of verbs compared to that of English speakers with aphasia for the same picture description tasks (Sung et al., 2016).

With the limitations of the Beach picture in consideration, Sung and colleagues (Jeong et al., 2023) introduced a new picture called the ‘Han River’ picture (Patent no. D2022-0004KR), which was specifically designed for Korean speakers. They took the verb saliency of the Korean language as a key variable and included diverse action drawings in the picture scene in order to elicit more verbs (e.g., daily activities seen on the river banks). Furthermore, cultural familiarity was enhanced by depicting the background scene as the Han River and including daily activities happening there. The Han River holds a symbolic significance in Korean cultural identity as the river passes through the center of Seoul. It has served as a social and economic hub for residents and visitors alike and represents a familiar space intertwined with the daily lives, aspirations, and emotions of Korean people (Baik and Kim, 2012). Along the river bank parks, people gather to exercise, have picnics, and take leisurely walks while enjoying the scenic river.

One of the objectives of this study was to investigate how different picture types influence age-related differences in the task of describing picture scenes. We are particularly interested in whether the Han River picture would evoke a greater number of information units and action-related words, particularly verbs for Korean speakers. In Korean, verbs are hypothesized to impose a greater cognitive load due to their complex grammatical structure. Korean sentences follow an “SOV” (Subject-Object-Verb) structure, where verbs typically appear at the end of the sentence. Thus, activation of semantic and syntactic elements preceding the verb would be necessary before its production. Previous studies with the tasks of single-word production have already shown the age-related difficulties in producing heavy verbs compared to light verbs in generative naming tasks (Choi et al., 2021), as well as challenges in generating verbs compared to nouns in verbal fluency tasks (Östberg et al., 2005; Stokholm et al., 2013; Clark et al., 2014). However, to our knowledge, no studies have specifically investigated age-related changes in eliciting verbs within the context of connected speech. By utilizing the Han River picture, which was designed to draw out many verbs, our study aimed to investigate age-related changes in verb production abilities in connected speech.

Turning to the second factor, outcome measures in previous studies have also shown considerable variation. Thus far, the examination of outcome measures in language studies involved two analyses: (1) linguistic variable analysis and (2) real-time variable analysis. First, different linguistic variables have been used in connected speech analysis, which includes productivity (e.g., the

number of words produced) and communication efficiency (e.g., correct words per unit of time). These measures have yielded mixed results, reporting both age-related declines and no significant changes. Some studies have reported significant age-related decreases in the number of produced words (Heller and Dobbs, 1993; Kemper and Sumner, 2001; Cho et al., 2021), while others have found no change with age (Cooper, 1990; Castro and James, 2013; Capilouto et al., 2015). Additionally, some studies have found fewer propositions relative to the total number of words produced (MacKenzie, 2000), while others have reported no decline in measures such as the number of propositions per minute (Cooper, 1990), the number of words needed to convey an information unit (Boucher et al., 2019), or the number of Correct Information Units per minute (Capilouto et al., 2005).

Among those linguistic measures, Correct Information Units (CIUs) serve as one of the most frequently used linguistic measures for capturing semantic deficits across languages. Originally developed by Nicholas and Brookshire (1993), CIUs represent words that are both (1) intelligible in context and (2) accurate, relevant, and informative about the picture or topic of connected speech. To count CIUs, intelligible words are first collected, excluding unintelligible words or non-word fillers. From those intelligible words, CIUs are determined according to the specific criteria; importantly, they do not have to be used in a grammatically correct manner, but words that incorrectly describe the picture or attempts to correct sound errors are excluded (see Nicholas and Brookshire, 1993, for further details).

The current study investigated age-related differences in word retrieval ability in the context of connected speech production by utilizing CIUs per minute and counting the number of nouns and verbs produced. These single-word measures were employed since word retrieval was the domain of interest. The CIUs per minute represented informativeness, and the number of nouns and verbs showed productivity in connected speech samples. Nouns and verbs were chosen as dependent measures because they constitute the core lexicon in Korean, making them representative indicators of lexico-semantic retrieval abilities and core words in constructing sentences.

Secondly, real-time measures, such as eye movements, have been employed in language production tasks. Eye-tracking can provide a direct measure of visual attention and cognitive effort during picture description tasks, which is an aspect not fully captured by analyses of spoken data after task completion (Rayner, 1998; Henderson and Ferreira, 2004; Schotter, 2011; Conklin et al., 2018). Given the complex interplay between cognitive and linguistic processes in picture description tasks, the cognitive-linguistic challenges faced by older adults may result in distinct eye movement patterns compared to the ones from younger adults. During these tasks, speakers must visually process a scene, identify key elements, retrieve and organize words, and make inferences about relationships among the depicted elements (Cummings, 2019). Age-related changes in cognitive processes, such as declines in working memory capacity and attentional control (Salthouse, 1990; Zacks and Hasher, 1994), may affect the process of generating verbal descriptions. For instance, decreased working memory resources may hinder the maintenance of active lexical representations for production and the tracking of information already produced in preceding utterances (Martin and Slevc, 2012; Marini, 2023).

Researchers have temporally synchronized language and eye movement data to investigate cognitive processing during a

specific period of time. Eye movements have been scrutinized during the planning stage of language production when speakers were to comprehend events, assign roles to subjects, and possibly select verbs (Meyer and Dobel, 2003). While speakers selected words and assembled phonemes to name specific objects, eyes often fixated on them (Meyer et al., 1998; Griffin, 2004). Many studies consistently reported a close temporal relationship between eye movements and language production. The time interval between initiating eye gaze on an object and uttering its name typically remains consistent across studies, which lasts approximately a second. Even if speakers had previously fixated on an object, they often redirect their gaze back to it for about a second before naming it (Griffin and Bock, 2000). Additionally, the duration of gaze on an object before its naming reflects one's cognitive efforts that are required to name it (Griffin, 2004). For example, individuals tend to spend more time observing objects before verbally describing them rather than simply scanning them to form a general impression (Griffin and Bock, 2000). These findings collectively suggested a deliberate cognitive effort for language production, reflected in looking time.

Most studies have employed an eye-tracking paradigm to study the production of simple phrases. Albeit few, some studies have examined eye movements during sentence- or connected speech-level production. Spieler and Griffin (2006) investigated the description of a simple array of objects into simple sentences following a fixed format ("The A and the B are above the C") for the older and younger adults. Their findings revealed that older adults exhibited longer fixation durations on the picture before initiating the first object ("the A") compared to those for younger adults. This suggested that older adults required more time to prepare and retrieve the name of the first noun before initiating the sentence. Jang et al. (2021) examined connected speech and eye movements during the description of the 'Cookie Theft' picture (Goodglass and Kaplan, 1972). With the goal of classifying individuals with Alzheimer's disease, mild cognitive impairment, and subjective memory complaints from healthy controls, they analyzed a linguistic variable (e.g., information units) and eye movement measures (e.g., eye fixations). Findings from machine learning experiments showed that the combination of eye movement and language features yielded the most accurate classification performance, highlighting the effectiveness of eye-tracking data in assessing language production skills. Additionally, Holšánová (2008) investigated connected speech in the description of complex, realistic scenes, with a focus on the temporal relationship between eye fixations and verbal descriptions. During the message planning stage, eye fixations tended to shift to the next region to be described, indicating the preparation stage for language production.

Drawing upon these findings, which suggested that eye movements indicate cognitive processing and reveal patterns of pre-fixation while planning language production, the current study aimed to investigate age-related changes in the planning process of connected speech by analyzing eye fixations. Specifically, we focused on pre-speech fixations, those fixations that occur during the planning stage of the utterance. Our approach is guided by the hypothesis that the planning and retrieval of words or information units influence speech onset and timing, drawing from previous research findings (Griffin and Oppenheimer, 2006; Griffin and Spieler, 2006). Building upon the established temporal correlation between eye movements and verbal descriptions of scenes, where

fixations on objects typically precede their corresponding naming (Meyer et al., 1998; Griffin and Bock, 2000; Holsanova, 2001; Meyer and Dobel, 2003; Meyer, 2004), we seek to explore whether older speakers engage in an increased pre-speech preparation which would be reflected in their eye movements during the picture description tasks.

This study aimed to examine differences in connected speech production between older and younger adults, focusing on linguistic (informativeness and productivity) and real-time (eye fixation) measures, using two picture types. Participants were presented with a standardized Beach picture and a culturally adapted Han River picture, from which connected speech samples were obtained while eye movements were recorded. The study addressed two primary questions. Firstly, we anticipated that older adults would demonstrate decreased word retrieval abilities in terms of informativeness (CIUs per minute) and productivity (noun and verb count per utterance). We expected the Han River picture to elicit greater differences between the two age groups due to its cultural and linguistic modifications, which include a more diverse array of familiar actions and objects occurring in the culturally symbolic background of the Han River. Secondly, we hypothesized that older adults would exhibit decreased processing efficiency in connected speech production, as evidenced by increased pre-speech fixation count and duration. Additionally, we anticipated that the Han River picture would evoke larger group differences, as it would require more cognitive effort to process due to the greater number of elements to describe compared to the Beach picture.

The research questions are as follows.

- 1 Are there age-related differences in linguistic measures (CIUs per minute, noun and verb count per utterance) depending on the picture types (traditional vs. modified picture)?
- 2 Are there age-related differences in real-time eye movement measures (pre-speech fixation count, duration) depending on the picture types (traditional vs. modified picture)?

## 2 Materials and methods

### 2.1 Participants

A total of 25 younger and 25 older adults consented to participate in the study, which was approved by the Institutional Review Board on Human Subjects of Ewha Womans University (No. ewha-202209-0028-01). All participants (a) were native Korean speakers, (b) had a normal or corrected-to-normal vision, (c) reported no history of neurological or psychiatric diseases based on a health screening questionnaire (Christensen et al., 1992), and (d) showed a normal range of performance in Korean Mini-Mental State Examination (K-MMSE; Kang, 2006; age- and education-adjusted scores >16th percentile). Additionally, the older adults presented within the normal range in (a) a Short version of the Geriatric Depression Scale (S-GDS; Jung et al., 1997; scored below 7) and (b) the Seoul Verbal Learning Test (SVLT; Kang et al., 2012; age- and education-adjusted scores >16th percentile). The K-MMSE and SVLT are parts of the standardized neuropsychological assessments that are part of the Seoul Neuropsychological Screening Battery-II (SNSB-II; Kang et al.,

2012). These tests were conducted to ensure that all participants were cognitively healthy.

The quality of eye movement recordings was visually inspected in EyeLink Data Viewer 4.2.1 (SR Research Ltd., 2020b). One younger and three older participants were excluded from the final analysis due to the errors caused by eyelashes or eye makeup, excessive eye blinking, or head movements during the task. The final analysis included 24 younger (Mean age = 23.54 years, SD = 3.44, range = 19–32 years, 15 women) and 22 older adults (Mean age = 63.73 years, SD = 4.38, range = 59–78 years, 13 women). There were no significant differences in years of education ( $t_{30.036} = 0.277$ ,  $p > 0.05$ ) between the younger adults (Mean years of education = 13.82 years, SD = 3.065) and the older adults (Mean years of education = 14.25 years, SD = 1.511) (Figure 1 and Table 1).

## 2.2 Eye-tracking

During the picture description task, each participant's eye movements were recorded using an EyeLink Portable Duo (SR Research Ltd.) at a sampling rate of 1,000 Hz. The participants were seated approximately 650 mm from the top of the monitor, 690 mm from the bottom of the monitor, and 450 mm from the eye-tracker camera. To ensure a stable head position, participants placed their foreheads and chins against the rest while their monocular eye movements were recorded. The experiment was programmed using Experiment Builder 2.3.1 (SR Research Ltd., 2020a), and the picture stimuli were presented on a 550 mm × 300 mm monitor screen with a resolution of 1680 × 1050 pixels. Each participant's speech during the task was recorded via a sound card (model M-Audio Air 192 I 4) using a condenser microphone (model BM800).

Each participant was tested individually in a soundproof room. Before the task began, a practice trial was conducted using a standardized picture from the Screening Test for Aphasia and Neurogenic-communication Disorders (STAND; Kim et al., 2009). During the practice trial, participants were instructed to verbally describe everything happening in the picture using complete sentences. The picture depicted

a crosswalk with various individuals on the crosswalk, and participants were required to provide detailed descriptions about who was doing what activities at what place while the picture was displayed on the monitor. Additionally, participants were prompted to indicate when they had finished by saying, "I'm done." The practice session ended when each participant provided his/her explanations for all the elements in the picture and signaled that they had completed the task.

After the practice session, each participant was informed about the calibration and validation process before the main task of describing the Beach and the Han River, in the same manner as the practice session. The 13-point calibration and validation process was conducted in order to ensure accurate eye tracking. After the calibration and validation with an average error of  $<0.5^\circ$  and a maximum error of  $<1.0^\circ$ , the computer displayed either the Beach or Han River picture and began recording data. The participants were instructed to describe the pictures at their own pace without a time limit. The order of picture presentation was randomized to prevent any bias. No additional instructions were provided once the participants began the task of describing. When each participant completed one picture and indicated to have done so, he/she was provided with the other picture to describe. The experimental procedures are illustrated in Figure 2. Each participant's eye movement recordings were then analyzed in EyeLink Data Viewer 4.2.1 (SR Research Ltd., 2020b). The fixation counts and durations of eye movements within Areas of Interest (AOIs) were extracted and documented in a Microsoft Excel file.

## 2.3 Outcome variables

### 2.3.1 Linguistic measures

The linguistic outcome measures for this study included the number of Correct Information Units (CIUs; Nicholas and Brookshire, 1993) per minute and the counts of nouns and verbs per utterance.

#### 2.3.1.1 Transcriptions and utterances

The connected speech samples obtained from picture description tasks were transcribed verbatim and then segmented into utterances

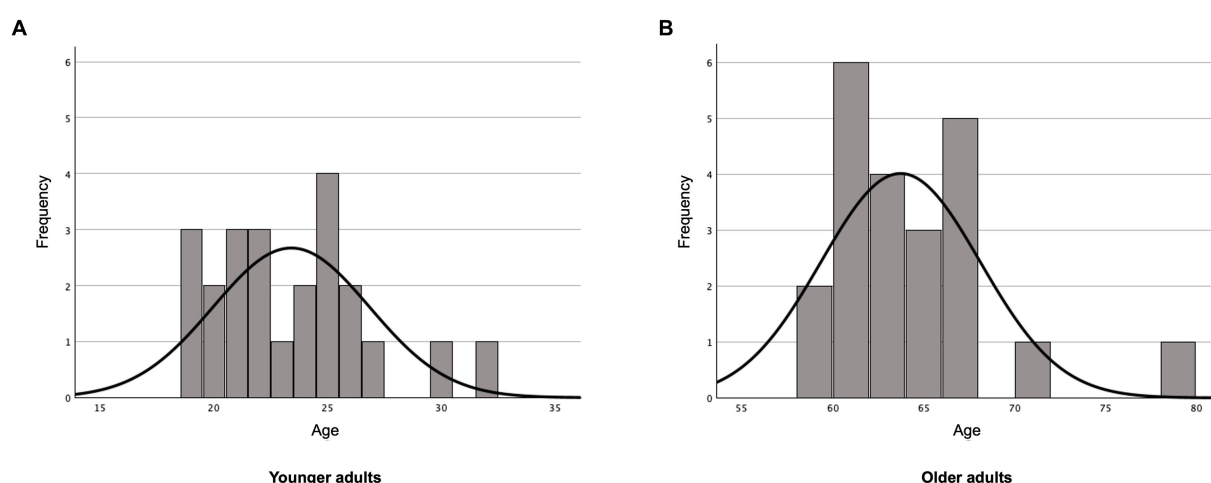


FIGURE 1  
Histograms of participants by age. (A) Younger adults, (B) older adults.

TABLE 1 Descriptive information for participants.

Characteristic	Younger adults <sup>a</sup>	Older adults <sup>b</sup>	Test statistics	p-value
Gender (male:female)	9:15	9:13	–	–
Age (yrs)	23.54 (3.44) 19–32	63.73 (4.38) 59–78	–	–
K-MMSE	29.75 (0.44) 29–30	29.09 (0.87) 27–30	–	–
Years of education	14.25 (1.51) 12–18	13.82 (3.07) 9–18	0.277	>0.05

Values are presented as means (SD). <sup>a</sup>*n* = 24, <sup>b</sup>*n* = 22. K-MMSE = Korean-Mini Mental State Examination (Kang, 2006).

based on the criteria established in the previous studies on connected speech analysis in Korean (Kim et al., 1998; Lee and Kim, 2001). An utterance was defined as a sentence or a shorter unit of language. Thus, each utterance in this study typically was counted for a sentence or phrase related to a specific Area of Interest (AOI).

The segmentation rules for utterances (Kim et al., 1998; Lee and Kim, 2001) are outlined as follows. First, an utterance is segmented at the point of a sentence-ending particle (e.g., ‘-ta’). If a sentence-ending particle is present but followed by contextually connected words, those words are included in the same utterance. Second, if a conjunction (e.g., “and”) appears, the utterance is segmented from the conjunction to the sentence-ending particle. Third, an utterance is segmented if a pause of more than 2 seconds occurs between words. Finally, if speech continues with a conjunctive suffix (e.g., ‘-ko’), segmentation happens at the junction of a significant change in intonation or a pause exceeding 2 seconds. Without such changes or pauses, the utterance extends to the second conjunctive suffix.

### 2.3.1.2 CIUs per minute

The number of words and CIUs were counted according to the rules of Nicholas and Brookshire (1993). The words in the collected data were initially identified based on the detailed set of rules, adhering to the comprehensive guidelines outlined by Nicholas and Brookshire. The inclusion criterion stipulated that words must be “intelligible in context but did not have to be accurate, relevant, or informative relative to the eliciting stimulus” (Nicholas and Brookshire, 1993, p. 340). Subsequently, among the collected words, those that are “accurate, relevant, and informative relative to the eliciting stimulus” (Nicholas and Brookshire, 1993, p. 340) were designated as CIUs. A CIU corresponded to a single word, and only the words initially counted in the word count were counted for the CIUs (see Nicholas and Brookshire, 1993, for further elaboration). The resulting CIU count was then normalized by the duration of the picture description task in minutes, yielding the measure of CIUs per minute.

### 2.3.1.3 The number of nouns and verbs

Both nouns and verbs were tallied in terms of ‘type’ or ‘token.’ The number of nouns-token, nouns-type, verbs-token, and verbs-type were counted from the transcriptions of the connected speech data. These measures were then normalized by the number of utterances to mitigate the influence of the total number of utterances on the number of words. The method of tallying the number of nouns and verbs was adapted from Sung et al. (2016). The noun counts included common nouns, proper nouns, and pronouns. The

pronouns were counted as nouns for two primary reasons: firstly, pronouns serve a similar grammatical function to content nouns. In Korean grammar, content nouns and pronouns are both frequently marked by case markers to signal grammatical roles in sentences. Secondly, pronouns have specific referents and function similarly to content nouns by referring to specific contents depicted in the pictures (Sung et al., 2016).

In the counts of verbs, both regular verbs and auxiliary verbs were included to capture verbs involved in serial verb construction, which is one of the characteristics of Korean verb usage. Auxiliary verbs are also expressed as distinct verbs with semantic significance in the Korean language (Lee, 1976; Sohn, 1996) and are integrated with the preceding main verbs, functioning as independent syntactic elements. They convey information regarding not only tense and aspect but also psychological attitudes (Park, 2005; Hwang et al., 2009). For example, the auxiliary verb ‘ju-da’ (‘give’) is appended to the main verb ‘nol-da’ (‘play’) to form ‘nol-a juda’ (‘play-give’, to allow him/herself a play with someone).

## 2.3.2 Eye movement measures

### 2.3.2.1 Areas of interest (AOIs)

Previous studies have utilized the concept of information units to identify key components of a picture and defined corresponding Areas of Interest (AOIs) (e.g., Jang et al., 2021). In this study, AOIs in the pictures were selected to correspond to the expected CIUs. The Han River picture was assigned 12 AOIs, comprised of nine AOIs of people or animals (active agents) and three AOIs of background elements (static objects). Those AOIs encompassed (1) a family eating a lunch box, (2) a girl lying on the lawn, (3) a girl listening to music, (4) a boy kicking a ball, (5) a boy throwing a ball with his dog, (6) three friends taking a picture, (7) a man running along the track, (8) a man drinking beverage, (9) two bikers, (10) a yacht, (11) buildings, and (12) a tree. Twelve AOIs were also defined for the Beach picture which consisted of six AOIs depicting people or animals (active agents) and six AOIs of background elements (static objects). The AOIs included (1) a family building a sandcastle, (2) a woman reading a book, (3) a guitar, (4) a parasol, (5) a barking dog, (6) a couple walking together, (7) three friends playing volleyball, (8) the sea, (9) a yacht, (10) seagulls, (11) condominiums, and (12) a mountain.

The AOIs were delineated in a freehand shape using the EyeLink Data Viewer 4.2.1 (SR Research Ltd., 2020b). Given the picture’s crowded nature, the AOIs were set with a buffer around the individuals and objects. These AOIs were slightly larger than the targets themselves, ensuring that eye fixations recorded in the proximity to the target would



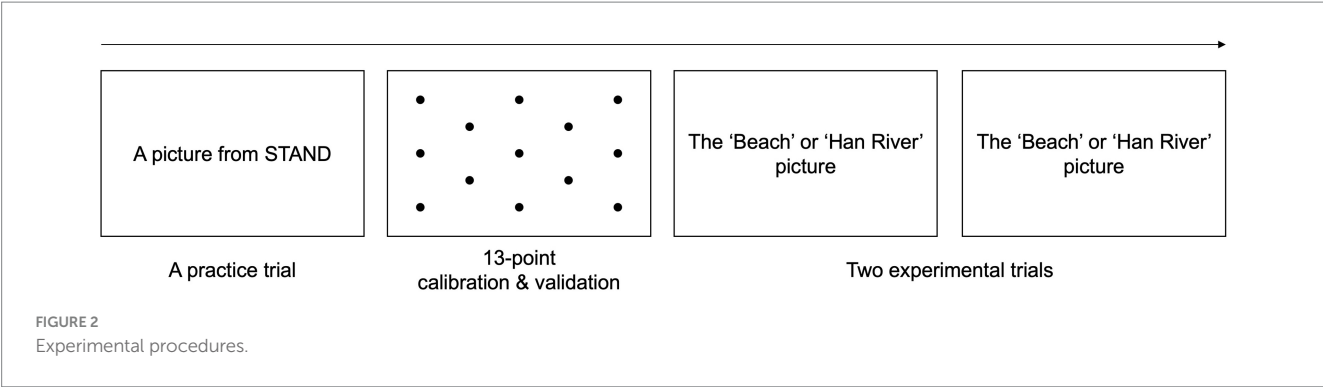
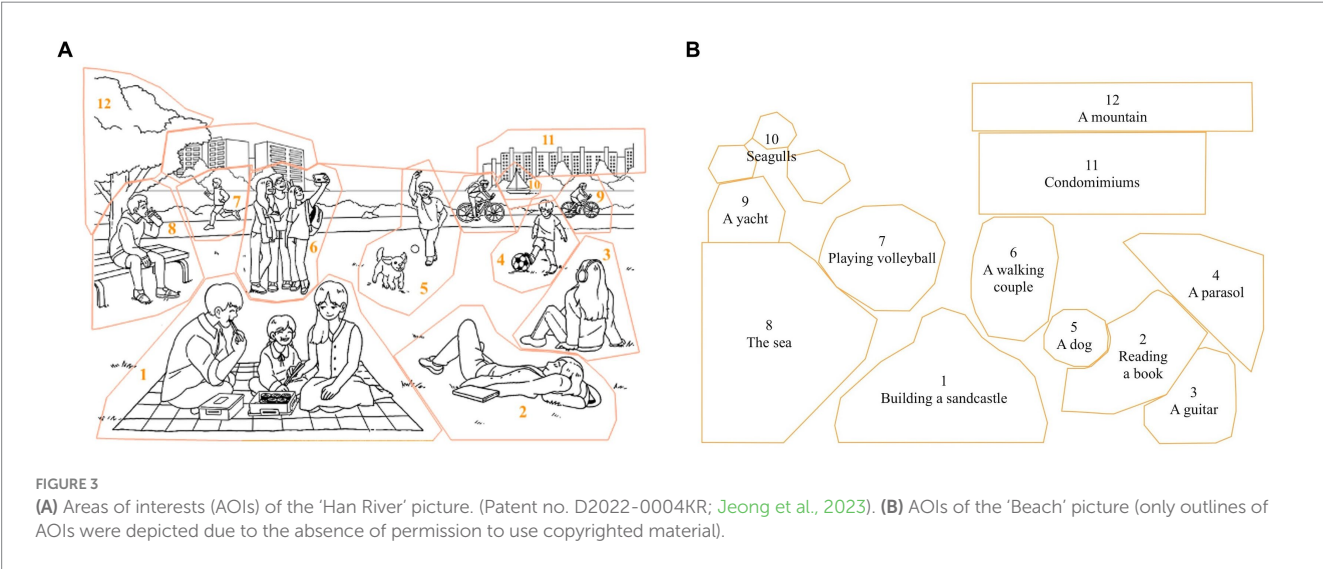


TABLE 2 Areas of interests (AOIs).

AOI number	Han River picture	Beach picture
1	A family eating a lunch box	A family building a sandcastle
2	A girl lying on the lawn	A woman reading a book
3	A girl listening to music	A guitar
4	A boy kicking a ball	A parasol
5	A boy throwing a ball with his dog	A barking dog
6	Three friends taking a picture	A couple walking together
7	A man drinking beverage	Three friends playing volleyball
8	A man running along the track	The sea
9	Two bikers riding bicycles	A yacht
10	A yacht	Seagulls
11	Buildings	Condominiums
12	A tree	A mountain



still be included in the AOIs. Table 2 and Figure 3 illustrate AOIs in two pictures.

2.3.2.2 Pre-speech fixation count and duration

The starts and ends of each utterance in the connected speech samples were manually checked in milliseconds using Praat

software (Boersma and Weenink, 2022). For the eye fixation measures, pre-speech fixations included fixations on AOIs which occurred right before each participant began his/her AOI-related utterances. It is important to note that only the AOI-related utterances were considered, as those picture elements were expected to be described in the form of CIUs during the picture

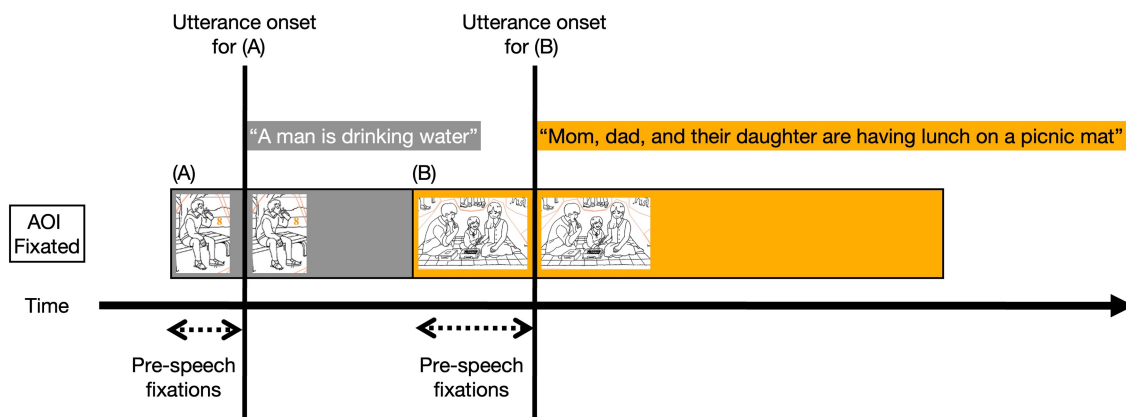


FIGURE 4

Idealized Illustration of Pre-speech Fixations. The duration of fixations is represented by box size. The figure is adapted from Griffin and Oppenheimer (2006).

description task. For example, if an eye fixation lands on an AOI representing a dog, the corresponding utterance should ideally contain the CIU 'dog'. If the utterance did not specifically contain information about the AOI, no pre-speech fixations were counted. For example, statements of personal thoughts such as "This picture reminds me of my vacation" were excluded from the eye movement measurements since a direct relationship could not be verified between the visually attended region in the picture and the spoken description.

To determine pre-speech fixation counts and durations for each utterance, the onset of the previous utterance was set as the starting point and the onset of the current utterance was determined as the endpoint. Within this defined time span, the only eye fixations on the AOI corresponding to the current utterance were counted as pre-speech fixations. A typical pattern of eye fixations in connected speech production is represented in Figure 4. The eyes begin to fixate on the man drinking water shortly before the onset of utterance (A): "A man is drinking water." As the utterance is about to finish, the eyes shift to the next AOI to be described, which is a family having lunch, and then begin the utterance (B): "Mom, dad, and their daughter..." Thus, the pre-speech fixations for (B) are the fixations on the family picture that occur between the utterance onset for (A) and the onset for (B). These pre-speech fixation counts and fixations for each utterance were then aggregated and divided by the total number of AOI-related utterances.

Studies investigating simple phrase or sentence production have examined eye fixations preceding the target word (e.g., Meyer et al., 1998; Griffin and Bock, 2000; Meyer and Dobel, 2003; Meyer, 2004; Spieler and Griffin, 2006). However, in the context of connected speech, which involves higher-level and more complex language production, eye fixations were reported to correspond to larger linguistic units beyond single words or phrases (Holšánová, 2008). Furthermore, studies indicate that language planning unfolds incrementally in that speakers continuously strategize small and sequential units rather than composing entire sentences at once (Griffin, 2001; Wheeldon et al., 2013). This perspective implies that planning for subsequent utterances may begin while simultaneously expressing the current one. Therefore, in this study, pre-speech

fixations were counted as those occurring during the duration of the preceding utterance. Through this investigation, we aimed to uncover age-related changes in the covert cognitive processes involved in planning connected speech production.

## 2.4 Data analysis

Statistical analysis was performed using IBM SPSS Statistics (Version 29.0) (IBM Corp., 2021). A two-way mixed-design (2×2) ANOVA was employed to explore potential interactions between age groups (young vs. older adults) and between the two picture types ('Han River' vs. 'Beach') using the linguistic (CIUs per minute) and eye-tracking measures (pre-speech fixation count and duration). Additionally, a three-way mixed-design (2×2×2) ANOVA was conducted to investigate noun and verb counts for the variables of age, picture types, and parts of speech (noun vs. verb).

## 3 Results

### 3.1 Linguistic measures

#### 3.1.1 CIUs per minute

The analysis for CIUs per minute showed a significant main effect for the picture types [ $F_{(1,44)} = 26.812, p < 0.001, \eta_p^2 = 0.379$ ] and group [ $F_{(1,44)} = 5.324, p = 0.026, \eta_p^2 = 0.108$ ]. The Han River picture elicited more CIUs per minute than the Beach picture, and younger adults produced more CIUs than older adults. However, there were no significant interactions between the picture types and group [ $F_{(1,44)} = 0.371, p = 0.546, \eta_p^2 = 0.008$ ]. These results are visualized in Figure 5.

#### 3.1.2 Token analysis (nouns and verbs)

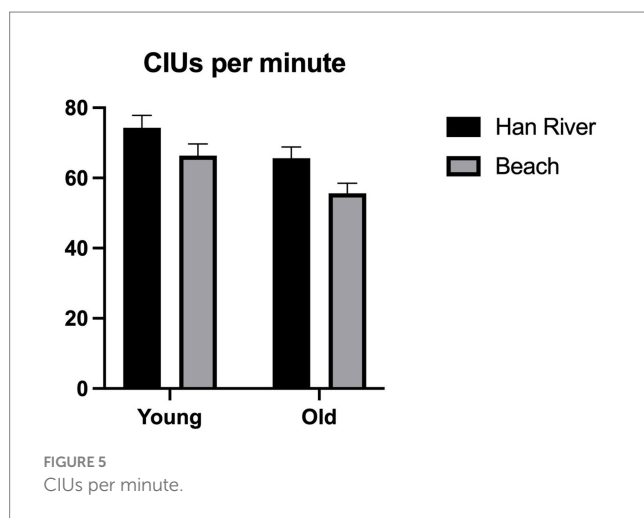
Analysis of the tokens revealed significant main effects for picture types [ $F_{(1,44)} = 31.298, p < 0.001, \eta_p^2 = 0.416$ ], group [ $F_{(1,44)} = 19.624, p < 0.001, \eta_p^2 = 0.308$ ], and parts of speech [ $F_{(1,44)} = 192.764, p < 0.001, \eta_p^2 = 0.814$ ]. The Han River picture elicited significantly more tokens than the Beach picture and the younger adults produced significantly

more tokens than older adults. A larger number of nouns were produced compared to verbs.

Significant two-way interactions were observed between the picture types and group [ $F(1,44)=5.385, p=0.025, \eta_p^2=0.109$ ] and between the picture types and parts of speech [ $F(1,44)=11.017, p=0.002, \eta_p^2=0.200$ ], but not between the parts of speech and group [ $F(1,44)=0.983, p=0.327, \eta_p^2=0.022$ ]. The younger adults produced significantly more tokens than the older adults and the group difference in tokens was more pronounced for the Han River picture compared to the Beach picture. The Han River picture elicited more tokens than the Beach picture and the difference between the picture types was more prominent in verbs than in nouns. There was no significant three-way interaction among the picture types, groups, and parts of speech [ $F(1,44)=1.062, p=0.308, \eta_p^2=0.024$ ]. These results are visually represented in Figure 6A.

### 3.1.3 Type analysis (nouns and verbs)

Analysis of the types showed significant main effects for picture types [ $F(1,44)=14.842, p<0.001, \eta_p^2=0.252$ ], group [ $F(1,44)=20.960, p<0.001, \eta_p^2=0.323$ ], and parts of speech [ $F(1,44)=494.336, p<0.001, \eta_p^2=0.918$ ]. The results showed Han River picture elicited significantly more types than the Beach picture, the younger adults produced significantly more types than older adults, and more nouns were used compared to verbs.



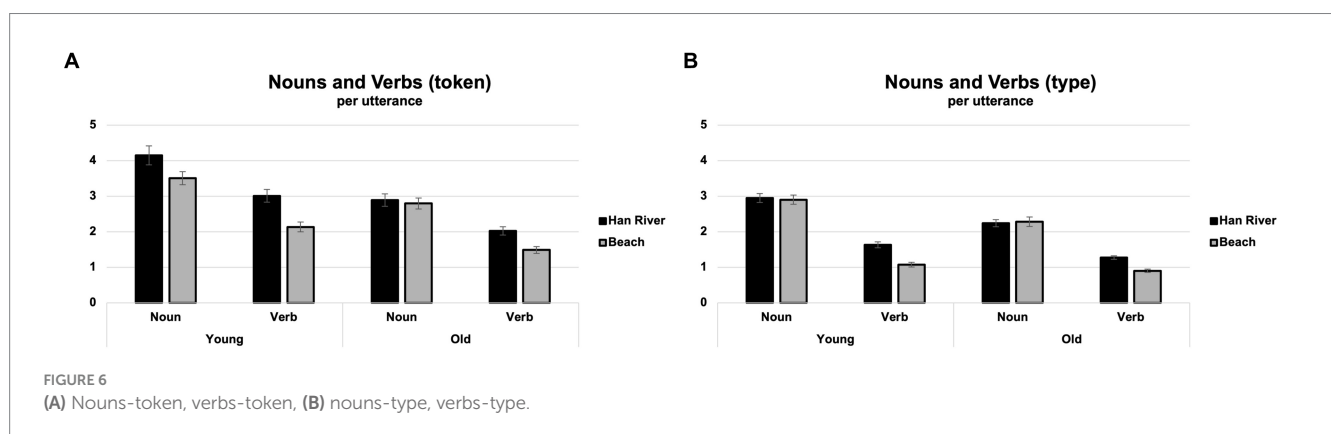
Significant two-way interactions were observed between the groups and parts of speech [ $F(1,44)=10.429, p=0.002, \eta_p^2=0.192$ ], picture types and parts of speech [ $F(1,44)=35.807, p<0.001, \eta_p^2=0.449$ ], but not between the picture types and groups [ $F(1,44)=1.260, p=0.268, \eta_p^2=0.028$ ]. The younger adults produced a significantly higher number of types than the older adults, and the difference between the groups was more pronounced in the nouns than the verbs. The Han River picture elicited more types than the Beach picture, and the difference between pictures was more prominent in the verbs than nouns. No significant three-way interaction was observed amongst the picture types, group, and parts of speech [ $F(1,44)=0.426, p=0.518, \eta_p^2=0.010$ ]. These results are visually represented in Figure 6B.

## 3.2 Eye movement measures

Results on the pre-speech fixation count indicated a significant main effect for the picture types [ $F(1,44)=4.438, p=0.041, \eta_p^2=0.092$ ] but not for the group [ $F(1,44)=0.001, p=0.979, \eta_p^2=0.000$ ]. The 'Han River' picture elicited a higher pre-speech fixation count for both groups, while there was no statistically significant difference between the groups. A significant interaction between the picture types and group was found [ $F(1,44)=6.748, p=0.013, \eta_p^2=0.133$ ]. The older group exhibited significantly more fixation counts on the Han River than those on the Beach picture, whereas the younger group did not show significant differences between the two pictures. These outcomes are shown in Figure 7A.

In terms of the pre-speech fixation duration, the main effect was not significant for the picture types [ $F(1,44)=2.468, p=0.123, \eta_p^2=0.053$ ] but significant for the groups [ $F(1,44)=5.067, p=0.029, \eta_p^2=0.103$ ]. The older adults showed a longer duration of fixation than that of younger participants. No significant interaction was between the picture types and groups [ $F(1,44)=1.216, p=0.276, \eta_p^2=0.027$ ]. Figure 7B provides a visual display of these results.

Words per minute (WPM) were analyzed to examine the potential impact of different speech rates of age groups on pre-speech fixations. The results of the independent samples t-tests showed no significant difference in WPM between the younger and older adult groups for either of the 'Han River' ( $t_{44}=1.671, p=0.102$ ) or 'Beach' ( $t_{44}=1.122, p=0.268$ ) pictures. Therefore, any potential differences in pre-speech fixation duration between groups could not be attributed to differences in speech rate.



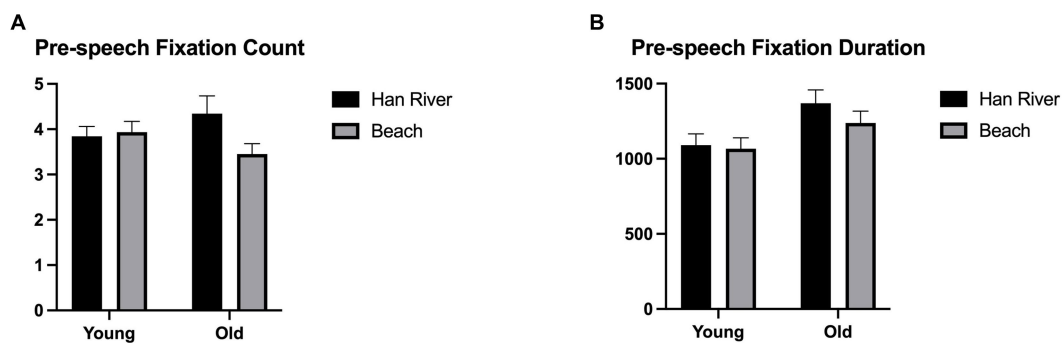


FIGURE 7  
(A) Pre-speech fixation count (# counts/# utterances), (B) pre-speech fixation duration [durations (ms)/# utterances].

## 4 Discussion

The purpose of this study was to investigate age-related differences in connected speech produced for a picture description task using two pictures: a standardized picture ('Beach') and a culturally and linguistically tailored picture ('Han River'). The investigation employed linguistic measures (i.e., informativeness and productivity of connected speech) and real-time eye movement measures (eye fixations). The hypothesis was that older adults would demonstrate reduced CIUs per minute and fewer noun and verb counts per utterance, which could indicate age-related declines in informativeness and productivity. Additionally, we explored the possibility of the older adult's increased pre-speech fixation duration and count during the task, which would indicate greater cognitive processing effort and reduced processing efficiency in producing connected speech. Furthermore, the effects of picture types on the connected speech production were also explored. The hypothesis was that the Han River picture, which was designed with considerations for Korean cultural and linguistic factors, was expected to elicit greater age-related differences than the other picture.

### 4.1 Age-related changes in linguistic measures

Age-related differences were investigated in linguistic measures for the Beach and the Han River picture. We analyzed CIUs per minute (CIUs/min) and the noun and verb types and tokens per utterance (NV types and tokens). Our findings revealed significant group differences in all linguistic measures: the older adults demonstrated a marked decrease in informativeness (CIUs/min), lexical quantity (NV tokens), and lexical diversity (NV types) compared to those of younger adults. Our findings were consistent with previous research in that older adults convey less informational content in connected speech compared to their younger counterparts (e.g., Kemper et al., 2001).

Another age-related difficulty was in verb production in which the older adults showed decreased type and token counts. In our study, older adults tended to convey non-specific verbs, while the younger adults employed specific verbs to vividly describe many actions in the picture. For example, the younger adults might say, "Three seagulls are

flying in the sky," whereas the older adults might simply state that "There are seagulls too." This non-specific verb usage in older adults may be attributed to the semantic and syntactic requirements in verbs in the Korean language. Given that Korean sentences follow a Subject-Object-Verb (SOV) construction, verb arguments must be activated and structured before the verb is produced in a grammatically correct sentence structure. Consequently, older adults may encounter challenges in verb production due to the increased cognitive load associated with this process. Our findings of reduced verb production are consistent with a previous study in regard to older adults' challenges in generating heavy verbs compared to light verbs in older adults (Choi et al., 2021). Additionally, difficulties in verb production relative to nouns have been reported in both healthy older adults and individuals with mild cognitive impairment during verbal fluency tasks (Östberg et al., 2005; Stokholm et al., 2013; Clark et al., 2014). Our findings suggest that the age-related decline in verb production observed at the single-word level may extend to connected speech.

Our results revealed that the Han River picture elicited a higher number of CIUs/min and NV types and tokens compared to the Beach picture. This difference could be attributed to the Han River picture portraying more objects and actions, thus facilitating the elicitation of information units and verb production in Korean speakers. Korean is considered a verb-salient language, which makes eliciting a sufficient number of verbs crucial in assessing language production abilities in this population. Furthermore, culturally familiar elements like the setting of the Han River or the daily life activities depicted in the picture may have contributed to eliciting more words. The participants' prior knowledge and own experiences might have facilitated easier identification and description of the elements and activities in the Han River picture. Our findings support the premise of incorporating cultural and linguistic factors in picture stimuli for language assessments (Evans et al., 2022; Steinberg et al., 2022) in order to effectively evaluate speakers' language production abilities.

The analysis of group differences between the two picture types revealed that the age-related decline in NV tokens was more pronounced in the Han River picture compared to the Beach picture. This discrepancy seems to pinpoint the decreased productivity in older adults, especially for the Han River picture, where detailed descriptions were required for diverse people, objects, and actions. These findings support that the Han River picture would be sensitive to age-related distinctions, particularly in terms of productivity



measures. Even with richer contents in the Han River picture, older adults did not elaborate as extensively as their younger counterparts.

## 4.2 Age-related changes in eye movement measures

Age-related differences were explored in real-time eye movement measures for the picture types. Two measures, the count and duration of pre-speech fixation, were employed to investigate younger and older adults' cognitive processing efficiency during the planning stage of connected speech production. These measures included eye fixations preceding each utterance rather than encompassing all fixation values throughout the picture description task. This was to understand the cognitive efforts specific to planning utterances within continuous connected speech production.

The analysis of pre-speech fixation duration revealed significant age-related differences. The older individuals exhibited longer pre-speech fixation duration, indicating increased cognitive efforts required for encoding and planning the utterances about those fixated AOIs. The effort hypothesis states that eye fixations reflect attention and mental effort (cf. Griffin, 2004). Longer and more frequent fixations would indicate greater cognitive efforts required for processing information at the AOIs, while shorter and a skipping manner of fixations would imply decreased cognitive processing (Rayner, 2009; Conklin et al., 2018). Additionally, longer pre-speech fixation durations could be interpreted as indicative of slowed processing. The theory of general cognitive slowing (Salthouse, 1996) posits an overall deceleration in cognitive processes among older adults, impacting the efficiency of language processes. In this context, the duration would reflect the time course of language planning processes and would imply reduced efficiency due to the prolonged time required for planning and initiating utterances. Our results are in line with the findings of the previous research. Spieler and Griffin (2006) reported that older participants showed longer fixation durations on the first noun when generating simple sentences compared to younger adults. Verhaegen and Poncelet (2013) noted that older adults showed increased latencies in single-word retrieval in picture naming tasks. Considering the age-related decline in CIUs per minute and noun and verb count along with the longer pre-speech fixation duration, older adults required more time to prepare their utterances than young adults while still displaying a lower level of content measures, such as CIUs per minute and the number of nouns and verbs produced.

The analysis of pre-speech fixation count revealed a significant difference between the picture types; the Han River picture induced greater fixation counts. A significant interaction between the groups and picture types was observed. While the older adults showed significantly greater pre-speech fixation counts in the Han River picture, the younger adults showed no significant difference between the two pictures. This suggests that, unlike younger adults, the older adults might have responded to the increased complexity of the Han River picture. The Han River picture included more referents to describe compared to the less referents in the Beach picture. This finding could be interpreted as the increased cognitive demand may have tapped into the older adults' experiences in the more complex picture description task. It has been studied that visually complex (e.g., highly cluttered) scenes tend to elicit more words in verbal descriptions (Clarke et al., 2013). The increased visual complexity and demands to produce more words may have posed

additional cognitive challenges for older adults. Notably, this discrepancy was not observed among younger adults. Older adults seem to be more susceptible to visual complexity during picture descriptions, showing declined efficiency in language planning in the more complex picture description task. Our findings suggest that the Han River picture appears to demonstrate its sensitivity in distinguishing between age groups compared to the Beach picture. The modified picture effectively addresses some inherent limitations of the traditional image while effectively eliciting information units, particularly verbs.

Both pre-speech fixation duration and counts revealed patterns of inefficient cognitive processing for planning connected speech production in older adults. Previous literature has also employed eye movements as a real-time index in sentence production and reported decreased efficiency in cognitive processing for sentence production in people with aphasia. Several studies have shown that as the complexity of sentence production increases, people with aphasia display different fixation patterns compared to normal adults. Shin and Sung (2020) interpreted these patterns as a sign of difficulty in allocating thematic roles, leading to more errors in producing passive sentences. Additionally, Thompson et al. (2007) found that eye fixation patterns indicated greater processing difficulty when producing sentences with verbs that have complex argument structures in people with aphasia. Our study supports these findings and further extends the discussion on real-time indicators of challenges in language production.

## 4.3 Limitations and future implications

A limitation and future implications of this study are as follows. Firstly, more comprehensive measures for the exploration of language and speech fluency could offer a deeper understanding of connected speech production. Future research endeavors might consider incorporating diverse metrics, such as grammaticality and syntactic complexity, in order to examine language production. Another area could involve the aspect of dysfluency, which often signals word retrieval challenges in older adults (Bortfeld et al., 2001; Castro and James, 2013). Beyond the quantitative analysis of linguistic measures employed in this study (i.e., CIUs per minute, noun and verb counts per utterance), investigating speech fluency measures (i.e., fillers, hesitations, and pauses) could offer other insights into critical aspects of older adults' connected speech production.

Second, mapping the instances of disfluency with eye fixations during language production could deepen our understanding of the cognitive processes involved. Qualitative analysis of eye movements at the moments of speech disfluency could illuminate the interplay between speech disfluency and visual attention during language production. Moreover, although our study aimed to explore the cognitive processing involved in connected speech production, the specific cognitive demands required in connected speech production remain unspecified. Future research could target various cognitive functions using in-depth assessment to explore potential correlations between specific cognitive functions and pre-speech fixations.

Third, while our study did not primarily investigate social factors as independent variables, previous research has suggested a relationship between older adults' cognitive and linguistic abilities and various social factors. For instance, social isolation and segregation in older adults' later years in life have been linked to cognitive declines (Read et al., 2020; Cardona and Andrés, 2023; Ren et al., 2023). Additionally, socioeconomic status (SES) has been

associated with cognitive ability in older age. The lower SES has been correlated with lower cognitive ability or cognitive decline (Zahodne et al., 2015; Park et al., 2017; Muhammad et al., 2022; Shi et al., 2023). Future studies could explore the impact of social factors on the connected speech of the aging population.

Also, there is a possibility that social-interactional factors may have influenced the volubility of older adults in our study. While the fixation data suggest slowed processing, it may be plausible that the more limited language output observed in older adults could be influenced by their attitude toward the task and the experimenter. Unfortunately, our analysis did not allow us to disentangle these factors. Addressing the influence of social-interactional factors in future studies could provide valuable insights into age-related differences in language production.

Lastly, although we did not incorporate measures related to eyesight, it is plausible to note that age-related changes in eyesight at the physiological level could potentially influence eye movement measures. Spieler and Griffin (2006) suggested that aging may impact the utilization of extrafoveal information, as there is a decline in extrafoveal sensitivity associated with age. “Extrafoveal” refers to the area of vision outside the central fovea of the retina, which is responsible for sharp central vision. The extrafoveal region encompasses the surrounding peripheral visual field. Extrafoveal visual information may be utilized to gather information about an object while individuals are moving their eyes to begin identifying it. Typically, directing attention to an object occurs approximately 200 ms faster than moving the eyes to the object’s location. Younger adults may preprocess objects before fixation more efficiently than their older counterparts, potentially resulting in shorter fixation durations or fewer fixations due to their relatively physiologically sensitive and faster abilities to explore extrafoveal information (Spieler and Griffin, 2006). In future research, it would be beneficial to investigate how age affects peripheral vision. If this influence is significant, efforts could be made to statistically control for oculomotor changes when analyzing eye movement measures for language processing.

In conclusion, the current study examined the impact of aging on connected speech and eye movement measures during the picture description tasks, utilizing both standardized and modified pictures that incorporated Korean cultural and linguistic factors. It was demonstrated that older adults produced fewer CIUs/min and NV types and tokens per utterance, indicating reduced informativeness and productivity during connected speech production. The eye movement measures also revealed that older participants experienced cognitive challenges, as evidenced by the longer durations of pre-speech fixation on both of the picture types and more pre-speech fixation counts on the modified picture. These findings highlight the need for further investigation into age-related changes in connected speech production in both linguistic and cognitive processes.

## Data availability statement

The datasets presented in this article are not readily available because of approved ethical conditions. Further inquiries can be directed to the corresponding author JES, [jeesung@ewha.ac.kr](mailto:jeesung@ewha.ac.kr).

## Ethics statement

The studies involving humans were approved by Institutional Review Board on Human Subjects of Ewha Womans University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

HL: Conceptualization, Methodology, Writing – review & editing, Data curation, Formal analysis, Investigation, Software, Visualization, Writing – original draft, Project administration. YC: Resources, Writing – review & editing. JES: Conceptualization, Funding acquisition, Methodology, Supervision, Writing – review & editing, Validation.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# Theory of affective pragmatics under biolinguistics

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This paper introduces a pioneering investigation into affective pragmatics through the perspective of Darwinian Biolinguistics, an interdisciplinary field at the nexus of biological and linguistic principles. Anchored in Darwin's theory of evolution and the latest developments in neurobiology, this study delves into the influence of biological factors---especially those pertaining to the brain's emotional processing on pragmatic communication. The research posits that human emotional responses, inherent in our biological constitution, profoundly influence the usage and interpretation of language in social interactions.

## KEYWORDS

affective pragmatics, Darwinian biolinguistics, threshold, speech acts, emotional

## 1 Introduction

Affective pragmatics represents an emerging interdisciplinary field at the intersection of linguistics, psychology, and neuroscience. This area of study delves into the significant influence emotions have on language use and interpersonal communication. It conceptualizes affect as the emotional attitude or psychological state linked to particular objects or phenomena, marked by feelings of attachment or detachment, and exhibiting a consistent orientation (Jacobson, 1988:18).

Pragmatics, with a history of less than a century, has long been dominated by rationalist theories, like the Cooperative Principle, Speech Act Theory, Relevance Theory, and the Neo-Gricean school. They concentrated primarily on deciphering meaning in information exchange, leaving less examined influence of emotional factors upon linguistic communication. Recent years, however, have witnessed the rising of interpersonal pragmatics which takes affect as a significant influencing factor in communication, yet the affect explored under interpersonal pragmatics is a mild one under rational control that leaves the atypical peripheral affective pragmatic behaviors out of its research list. In contrast, Theory of Affective Pragmatics, proposed by Scarantino (2017a) who is inspired by Darwin's theory of evolution (Darwin, 1871) and Tomkins' affect motivation theory (Tomkins, 1962), is the first one that aims to explore affect as the driving force behind speech acts and to infer pragmatic intentions through analysis of affect. By providing insights into "affective-cognitive-volitional (ACV) and affective-volitional-cognitive (AVC) types of speech acts" (Kopytko, 2004), it hopes to make up for the deficiency left by the rationalist approach. This paper consolidates the foundational concepts and examines the evolution of and the current debates over affect pragmatics to foster further academic exploration in this field, expecting to offer readers a panoramic view of the emerging field of study.

## 2 Literature review

Affect, integral to both humans and other animals, encapsulates an individual's behavioral intentions and modes, as highlighted by Dewey (1895). Physiological needs, suggested by

Tomkins (1962), often transform into emotions, which then serve as a driving force for behaviors. For instance, the physiological state of dehydration triggers an urgent sense of thirst, subsequently leading to the behavior of drinking (*ibid*). Building on this foundation, behaviorist psychology (e.g., Skinner, 1957), argues that psychological phenomena can essentially be represented through behaviors, with human actions being responses to external stimuli, leading to muscle contractions and gland secretions. This perspective posits that emotions, such as anger, can provoke aggressive behaviors, while unresolved negative emotions like anxiety may result in repetitive verbal behaviors (Skinner, 1957). Moreover, emotional development, transformation, and restraint in behaviors that provoke negative reactions are part of an individual's growth, influenced by evaluative signal stimuli.

However, verbal behaviors may not always accurately reflect an individual's true emotional state due to social conditioning and education that align expressions with mainstream values. It is in untrained nonverbal behaviors, such as micro-expressions, that one's genuine emotions are more transparent. Along the line, affective pragmatics, emphasizes the importance of such nonverbal cues in discerning the truthfulness of speech. This understanding allows for the inference of behavioral tendencies and the preparation of corresponding strategies by interpreting emotional signals, as proposed by Darwin (1872) and Skinner (1957). Emotions can be categorized into positive and negative (Jacobson, 1988), further into specific types like joy, anger, and sadness, evolving from primitive to advanced stages, with the latter influenced by social development and encompassing moral, esthetic, and rational feelings.

Following Skinner (1957), cognitive behaviorism (e.g., Bandura, 2001), which merges cognitive psychology elements with the behaviorist approach, emerged as a dominant school of thought. By the late 20th century, both affect science and cognitive behaviorism had underscored the critical role of emotions in cognition, motivation, and human behavior. The debate between Zajonc (1980, 1984) and Lazarus (1991a, 1991b), focusing on the interplay between emotional and cognitive processes and questioning the necessity of cognitive appraisal for emotional responses, propelled the notion that emotions span a spectrum from minimally to highly cognitive. This spectrum suggests that basic emotions may conform more closely to Zajonc's perspective, while complex emotions might be more in line with Lazarus's conceptualization. Regardless, the influence of emotion on speech acts is undeniable and indispensable in pragmatic research. In the era marked by the affective turn, interpersonal pragmatics has embarked on exploring affective pragmatics. Nonetheless, this line of inquiry, particularly adopting Lazarus's stance on affect (e.g., Langlotz and Locher, 2013, 2017), reveals limitations in addressing speech acts driven by strong emotions, indicating a significant potential for further application of affective pragmatics. Recently, there has been a resurgence of research in linguistic field. Some researchers (e.g., Vergis, 2023) have pointed out the vital role affect plays in shaping inferential processes, arguing that affect is integral to communication and essential for interpreting conversational nuances.

## 2.1 The development of affective pragmatics

Pragmatics, as Morris (1938) articulates, is the study of the interplay between individuals and symbols, intersecting with fields such as biology, psychology, and sociology. This discipline

encompasses three primary branches: conversational pragmatics, functional pragmatics, and psychological pragmatics, with the foundational works of Austin (1962) and Searle (1969) in conversational pragmatics, often aligned with classical Gricean pragmatics—standing out as particularly influential (Horn, 1988). These pioneers laid the groundwork by delineating speech acts and advocating the Cooperative Principle, thus emphasizing the crucial role of meaning in effective communication.

Classical Gricean pragmatics advocates for adherence to the Cooperative Principle, which necessitates that communicators observe maxims of quantity, quality, relevance, and manner. However, real-world communication frequently exhibits deviations from these rational guidelines, presenting a challenge to Grice's framework, especially in the theory of conversational implicature. Grice (1957) posited that the essence of understanding utterances lies in grasping the speaker's intent, a process foundational to successful communication. Grice (1968) further pointed out that the foundation of successful communication lies in one party's ability to clearly convey their mental intentions through speech, and the other party's ability to accurately decode these intentions from the speech signals and respond appropriately. However, Austin's classification of speech acts reveals a complexity of overlapping meanings and functions, highlighting the nuanced interplay between speaker intention and listener interpretation.

The intricate dance of communication also involves non-verbal elements such as sequence, stress, intonation, and tone, as Searle (1965) noted, which play a pivotal role in conveying intentions and eliciting appropriate responses under the Cooperative Principle. These speech elements primarily serve to express emotions, underscoring the affective dimensions of communication. Searle (1969) further explored how the efficacy of perlocutionary acts depend on the speaker's ability to communicate intentions within the bounds of social conventions, which are influenced by esthetics, morality, and rationality.

Building on this, Searle (1975) in his exploration of '*Indirect Speech Acts*', elucidated how communicators often relay implicit intentions through indirect means, enabling hearers to infer intentions beyond the literal meaning. This aspect of communication, where expressive speech acts serve multiple functions, resonates with the core principles of affective pragmatics and provides indirect evidence supporting the utility of affective illocutionary/perlocutionary mechanisms. Searle's acknowledgment of the significance of emotions in communication and the multifunctionality of expressive acts aligns closely with affective pragmatics, enriching our understanding of the affective illocutionary/perlocutionary mechanism's role in the nuanced landscape of human interaction.

In the realm of daily interactions, emotions play an indispensable role as pragmatic elements, significantly influencing the intentions behind speech acts. The introduction of the politeness principle by Leech (1983) aims to mitigate the limitations inherent in the cooperative principle, offering a nuanced understanding of speech acts motivated by emotions. This perspective marks a departure from traditional pragmatics, which primarily focuses on the logical dimensions of language, such as speech acts and implicatures, highlighting the complex interplay between volition, cognition, and affect within the human psyche. Each of these aspects contributes distinctly to the construction and interpretation of speech acts.

Emerging from this critique, relational pragmatics, as exemplified by Kopytko (2004), expands the horizon of pragmatic research beyond

the rational framework. This approach identifies six distinct emotional pragmatic behaviors, delineated by the interplay among cognitive, affective, and volitional factors: cognitive-affective-volitional (CAV), cognitive-volitional-affective (CVA), volitional-cognitive-affective (VCA), volitional-affective-cognitive (VAC), affective-cognitive-volitional (ACV), and affective-volitional-cognitive (AVC) (*ibid*:543). The classification underscores a bifurcation where the initial three types, with cognition as the precursor to emotion, align with rational affective pragmatic behaviors. Conversely, the latter three categories, where emotion precedes cognition, epitomize emotional affective pragmatic behaviors.

Further enriching this discourse, neurophysiological research has elucidated the correlation between specific emotions and brain regions, such as the amygdala's association with fear, the anterior cingulate gyrus with sadness, the orbitofrontal cortex with anger, and the insula with disgust (Figure 1) (Lindquist et al., 2012). This neurobiological grounding reveals how emotions elicit physiological neural responses, manifesting in facial expressions and speech acts. Such responses are indicative of the intricate relationship between physiological states, psychological experiences, and behavioral tendencies associated with each emotion. Building upon these insights, the field has witnessed the formal introduction of affective pragmatics, which delves into the operational mechanisms of emotional signals (Scarantino, 2017a). This development signifies a pivotal expansion in the study of pragmatics, embracing the profound impact of emotions on the intricacies of human communication.

Affective pragmatics, anchored in the theory of affect motivation, posits that verbal emotional signals are instrumental in deciphering an individual's behavioral intentions and predispositions. This approach reconceptualizes human conversational behavior as a tripartite communicative act—signifying, acting, and

accomplishing—mediated through verbal emotional cues (Scarantino, 2017a). While Searle (1969) delineates speech acts into assertive, directive, commissive, expressive, and declarative functions, affective pragmatics extends the expressive verbal acts to encompass asserting, committing, and directing functions as well (Scarantino, 2017a). It's suggested that the expressive function in communication is not limited to verbal acts but also includes paralanguage, enriching the conveyance of emotions and intentions.

The alignment of verbal and nonverbal languages facilitates a unified transmission of emotions and intentions. Discrepancies between them, however, can lead to mixed messages, embodying conflicting emotions and intentions. For instance, directives can be conveyed both linguistically and paralinguistically, with apologies using paralinguistic behaviors to express shame and seek forgiveness. Similarly, assertive functions may indirectly communicate emotional evaluations through verbal or paralinguistic cues, indicating harm or danger through respective emotional expressions.

Scarantino (2017b) posits that emotional signals can substitute for verbal communication and enhance the accuracy of pragmatic inference, reducing errors. Recognizing paralinguistic cues, such as expressions of anger, can enable an accurate understanding of conversational functions and guard against deception by verbal signals (Scarantino, 2018). Despite the potential for feigning both verbal and paralinguistic acts, authentic emotional signals—often involuntarily expressed—distinguish themselves markedly from insincere manifestations. In everyday interactions, individuals may mask their anger to maintain a courteous image, yet involuntary facial expressions and paralinguistic behaviors may inadvertently reveal true emotions. Consequently, paralinguistic signals, such as facial expressions and posture, become critical in assessing emotions (Scarantino, 2019). In this way, affective pragmatics illustrates how communicators can

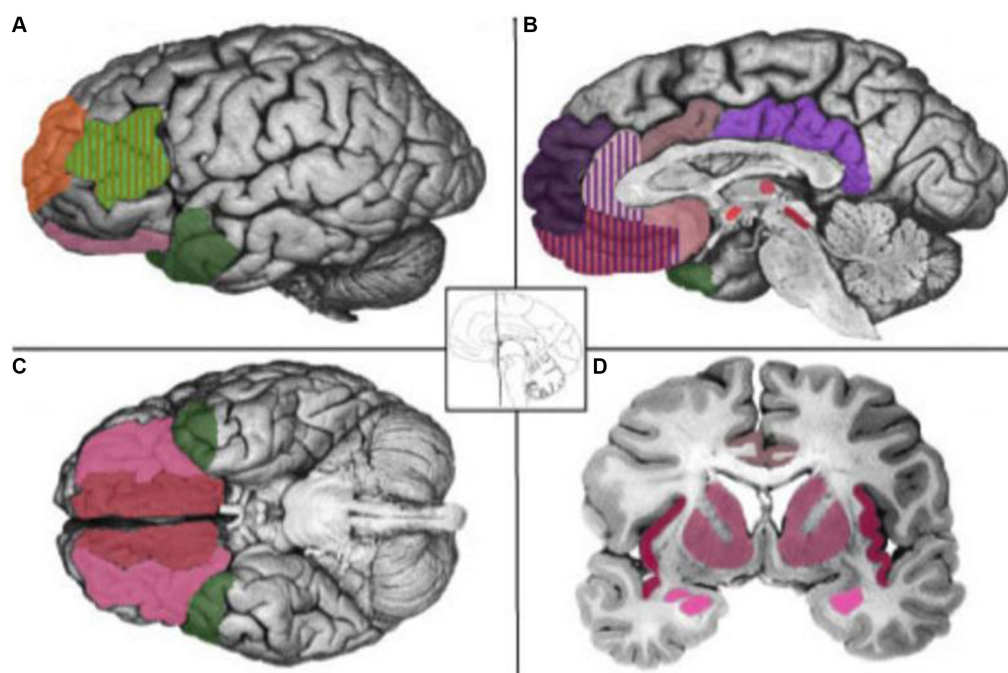


FIGURE 1  
Psychological Constructionist Hypotheses of Brain-Emotion Correspondence (A) Lateral view. (B) Sagittal view at the midline. (C) Ventral view. (D) Coronal view. Reproduced with permission from Lindquist et al. (2012).

achieve the objectives of speech acts through the recognition and interpretation of paralinguistic emotional cues, highlighting paths for both theoretical and applied research. Scarantino (2020) further explores how affect-driven actions enable individuals to engage in self-regulation by selectively focusing on specific emotions, thereby influencing others through emitted emotional signals to arouse their emotions.

However, the ambiguity inherent in emotional signals complicates speech acts and poses challenges for research. Scarantino et al. (2022) discuss how collective verbal aggression can stem from strong emotions, indicating that emotions can amplify and influence the collective. This insight underpins the theory that collective actions, sometimes unconscious, are motivated by affect. For instance, Blitvich (2022) identifies emotion as a primary catalyst for online verbal aggression, challenging the traditional pragmatic research perspective that often interprets violent behaviors through a moral lens. A deeper investigation into verbal aggression, guided by affective pragmatics, acknowledges the role of affect and facilitates a more accurate interpretation of intentions based on emotions, thereby enriching our understanding of human communicative behaviors by taking affect parameters into account and enabling the deduction of intentions based on emotions. Besides, prosodic features like pitch, duration, and intensity could contribute to emotion recognition and the pragmatic interpretation of emotional expressions. Saeed and Ashraf (2023) utilized the Hidden Markov Model (HMM) as a quantitative data and prosodic modeling tool to analyze emotional recordings and enhance the understanding of affective pragmatics, which provides deeper insights into the intersection of emotional prosody and pragmatic meaning.

In conclusion, affective pragmatic behavior is an inescapable phenomenon, deeply rooted in the psychological and biological characteristics of humans. As research progresses, our understanding of individuals' affective pragmatics will deepen, making the theory of affective pragmatics a vital supplement to existing pragmatic theories.

## 2.2 Affective pragmatics belongs to Darwinian biolinguistics

The affinity between affective pragmatics and Darwinian biolinguistics could be traced back to the foundational theories of Charles Darwin. Darwin posited that the evolutionary trajectory of the human species led to the dispersion of various tribes across different geographical landscapes, resulting in notable diversifications in physical characteristics such as skin colour, hair texture and facial features, as well as temperamental and esthetic inclinations. He further articulated that the inherent sexual, parental, and social instincts in humans form the biological underpinnings of moral emotions (Darwin, 1871). This proposition implies that prior to the development of language, humans likely experienced emotional responses to their environment. Moreover, Darwin suggested that the lives of early humans were predominantly driven by instinctual desires over rational deliberation, a behavior pattern that has been perpetuated through evolutionary inheritance (Darwin, 1871). This historical perspective underscores the significance of understanding the role of innate biological factors in shaping affective responses and highlights the evolutionary continuity present in human affective pragmatics. Infants start to express unconscious emotions through specific facial expressions caused by muscle movements of the facial features

(eyebrows, eyes, ears, nose, lips) early on. Gradually, a habitual association among specific situational stimuli, emotions, and behaviors will be established, such as trembling triggered by fear from a danger signal (e.g., Darwin, 1872; Watson and Rayner, 1920). Whenever a person encounters a stimulus that evokes emotions and prompts action plans, their nervous and muscular systems must adapt and prepare, resulting in visible expressions. Genuine expressions are the outcome of a holistic response involving the animal's internal organs, nervous system, and facial muscles, distinctly contrasting with expressions rooted in learned, insincere emotions like a forced smile (Darwin, 1872). This perspective of the natural response mechanism of emotions lays the biological theoretical foundation for affective pragmatics to infer pragmatic intentions from emotional signals.

Biologically, human desires and emotions stem from numerous processes within the cerebral cortex. Positive emotions emerge when the processes of excitation and inhibition within the cerebral cortex proceed smoothly, whereas negative emotions (such as fear and timidity) arise when these processes are disrupted (Jacobson, 1988:102). This mechanism ensures that the human brain generates precise and consistent responses to the external environment, including societal stimuli. Human emotions also produce complex responses as the context changes (Jacobson, 1988:111). In alignment with Darwin's perspective, Basic Emotion Theory posits a direct correlation between emotions and brain neurons, proposing that each emotion is governed by a unique neural circuitry, distinctively separate from those of other emotions. Furthermore, it suggests that human genes encapsulate a fundamental emotional defense system (Ekman, 1992). It's proved by experimental data that emotion is the result of a combination of synaptic connections, cell interactions and electrical responses, as the result of embodied cognition, confirming that emotions are situated between reactions and consciousness in a pre-linguistic stage between stimulus and behavior (Papoulias and Callard, 2010). Advancements in the fields of emotion research and neuroscience, particularly through the application of fMRI brain imaging, have substantiated the theory by identifying specific neural correlates of emotions. Notably, there is a demonstrable mapping between fear and the amygdala, sadness and the anterior cingulate gyrus, anger and the orbitofrontal cortex, as well as disgust and the insula (Lindquist et al., 2012). This empirical evidence reinforces the foundational premise of Basic Emotion Theory by elucidating the neural substrates underpinning distinct emotional responses. It can be understood that external stimuli will trigger an individual's emotional neural response, which is then displayed as speech acts and paralinguistic signals in communication.

These discussions have established the foundation for the field of affective pragmatics and Darwinian biolinguistics, which scrutinizes the evolution of language from a biological perspective. Pennisi and Falzone (2016) have argued that pragmatics can be seen as a biolinguistics of performance, suggesting that the way language is used in real-life situations can be studied through the lens of biological evolution. Because pragmatics, different from syntax and semantics, refers to the use of language in context, including how speakers understand and convey meaning based on the situation, Pragmatic intentions behind the speech acts and the inference of meanings are usually not explicitly stated. This research perspective aligns with the Darwinian approach to biolinguistics, which views language not just as a system of communication but as a complex, adaptive system that has evolved to meet the communicative and social needs of humans.



Thus, it suggests that to fully understand the nature of language, one must consider not only its structural aspects but also its functional and adaptive roles in human life. This holistic approach has expanded the field of linguistics to include insights from biology, anthropology, and psychology, enriching our understanding of language as a fundamental aspect of human nature and evolution.

Furthermore, the physiological and psychological foundations of affective pragmatics are deeply intertwined with the biological traits of individuals, which are not only capable of evolution but also subject to dynamic changes. Building on the factors previously mentioned, the exploration of affective pragmatics is intrinsically connected to Darwinian biolinguistics, embodying an evolutionary viewpoint on the significance of language in human cognition and communication. In other words, affective pragmatics and Darwinian biolinguistics converge on the essential role of language in facilitating cognitive processes and thought. “Pragmatic approach to a cultural paradigm depends on the way we understand cognitive intentionality” (Pennisi and Falzone, 2016:258).

Moreover, individual cognitive intentionality is directly linked to biolinguistics, or more accurately, to Darwinian biolinguistics. “Emotions, feelings, and other mental states, in fact, constitute cognitive pre-conditions for any type of expression” (Pennisi and Falzone, 2016:65). “They may have played an initial role to enable increasingly complex cognitive functions, performing in different communication modalities” (*ibid*). These elements likely played a crucial role in the evolution of complex cognitive functions and diverse modes of communication. Additionally, affective pragmatics highlights the profound impact of emotion on cognition and speech acts, underscoring that research in this area should commence with the identification of individuals’ emotions. However, emotions, being internal human activities, prove challenging to monitor. Biologically, unconscious emotional physiological responses include changes in the sympathetic and parasympathetic nervous systems, such as dilation of skin capillaries, trembling, sweating, shrinking or bulging of the forehead veins, blushing, deep or shallow breathing, or pupil dilation (Scarantino, 2017a,b). Individuals’ biological parameters could facilitate the interpretation of internal emotions but depend on a specific amygdala neural pathway in the brain for recognizing these signals. If this pathway is interrupted or damaged, people’s ability to recognize and distinguish facial expressions will decrease (Evans, 2002). Therefore, both the production and identification of emotions are closely linked to individuals’ biological attributes. Current EEG techniques are capable of monitoring brain activity associated with both positive and negative emotions, as demonstrated by studies (e.g., Prete et al., 2022). This implies that the tools used in biolinguistic research are beneficial for studies in affective pragmatics. Given the intertwined nature of emotion and cognition, where emotion is considered an integral component of cognition (Wharton and de Saussure, 2024), biological data collected by EEG or fMRI technology can yield scientific evidence allowing us to observe participants’ emotional fluctuations and cognitive pathways, thereby offering profound insights into the intentions behind their speech acts.

### 3 Examples of affective pragmatic analysis

Affective pragmatics recognizes that language serves not just as a conduit for conveying factual information but also as a potent means

for expressing and invoking emotions. In the realm of practical communication, even individuals renowned for their rationality and reason can, at times, express themselves in ways that seem irrational, driven by strong emotions. For instance, Oscar Wilde, the celebrated Irish playwright and writer, penned a notable letter voicing his indignation at societal injustice and suffering. This letter, famously known as the ‘De Profundis’ letter, serves as a poignant example of emotion-driven communication. Similarly, Donald Trump, a figure of political leadership, often made statements and took actions that many viewed as surpassing the rational expectations typically held for political figures. These instances underscore the reality that individuals, regardless of their status or achievements, are capable of displaying behavior that deviates from rational norms, influenced by intense emotional states, leading to speech acts displaying irrational reasoning.

There, it is essential to consider not merely the explicit meanings of words but also the contextual, cultural, and personal elements that shape the emotional resonance and reception of messages. The application of affective pragmatics to understand those real-world situations is particularly revealing. With illustrative examples, the dynamic essence of affective pragmatics is brought to the forefront, providing deep insights into the emotional currents that permeate everyday exchanges. In so doing, one should bear in mind the basics that are affective pragmatics, including its core assumption, new understanding of emotional expressions, and its basic tenets and how they are applied to judging the pragmatic results of the specific communication events.

The core proposal of affective pragmatics is that “emotional expressions are a means of expressing inner states, of representing what the world is like, of directing other people’s behavior, and of committing to future courses of action” (Scarantino, 2019: 49). Meanwhile, emotion can be expressed by either verbal forms or nonverbal forms or both, dependent on context. This proposal differs affective pragmatics from that of the Gricean tradition which prioritizes interrogating what people infer from what is verbally conveyed to them (Grice, 1957; Sperber and Wilson, 1995; Levenson, 2000) and ignores the nonpropositional meaning in interpersonal communication, that is expressed beyond words (attitudes, beliefs, emotions, etc.), whose primary and possibly most efficient medium is nonverbal language and which is also parasitic on and omnipresent in verbal language.

Emotional expressions include overt emotional expression and natural emotional expression. The former means “A sequence of bodily changes X of some agent A in context C overtly expresses A’s emotion E relative to recipient R insofar as X was produced by A to make R infer that A is experiencing E while making A’s intention manifest to R” (Scarantino, 2019: 51), the latter means “A sequence of bodily changes X of some agent A in context C naturally expresses A’s emotion E relative to recipient R insofar as X increases the probability that A is undergoing E, relative to R’s background knowledge” (*ibid*). Both can be produced in either verbal form or nonverbal form; both can be produced voluntarily or involuntarily; both can carry either natural or non-natural information. Taking all the above considerations, emotional expression can be further divided into five sub-types, as follows (Figure 2).

Emotional expressions, whether in verbal forms or nonverbal forms, perform speech act analogs that produce communicative effects.

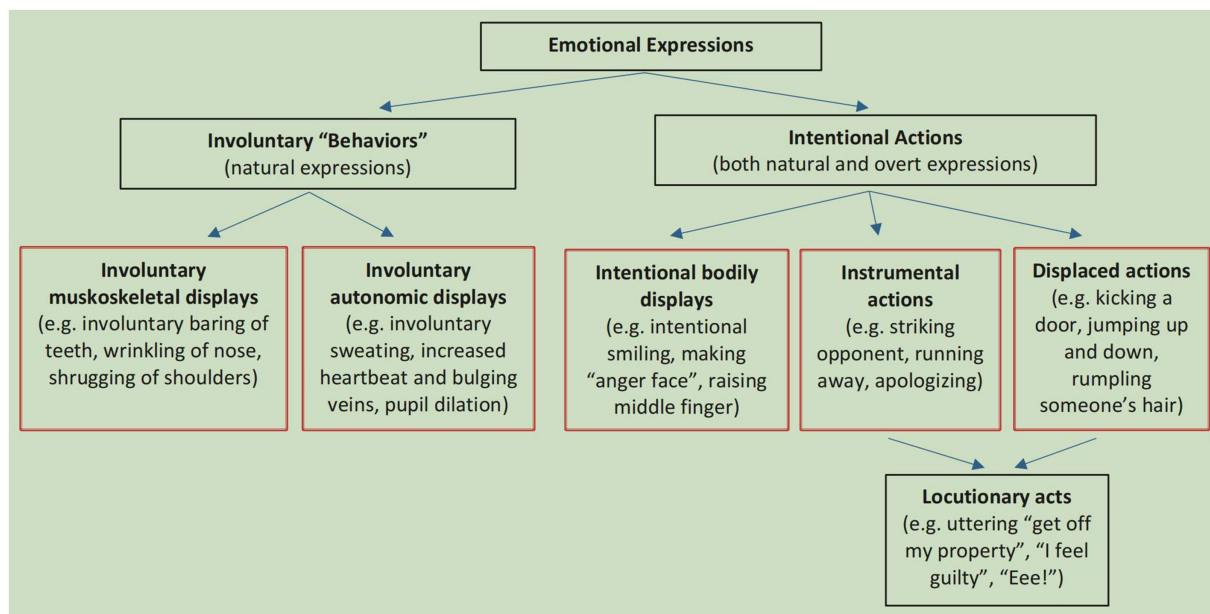


FIGURE 2  
Five main ways to express emotions. Reproduced with permission from Scarantino (2019: 60).

Specifically, with emotional expressions, interlocutors involve themselves in communicative moves that are analogous to such illocutionary acts as follows:

Expressives<sub>EE</sub> have the communicative point of expressing the signaler's emotions by means of natural or non-natural information transfer. Commissives<sub>EE</sub> have the communicative point of committing the signaler to a future course of action by means of natural or non-natural information transfer. Imperatives<sub>EE</sub> have the communicative point of trying to get the recipient to do something by means of natural or non-natural information transfer. Declaratives<sub>EE</sub> have the communicative point of representing how things are in the world by means of natural or non-natural information transfer. (Scarantino, 2019: 67)

Summarily, the above core assumptions, the classification of emotional expressions, and the main tenets are essential for people to understand affective pragmatics. On the other hand, they are the principles and guides that people can adopt to examine the role emotional expressions play and to grasp the differences among rational, emotional, and neutral speech acts in specific communication events, as demonstrated by the examples provided below.

Here, the rational and neutral dialogues are meticulously crafted to resemble everyday conversations, while the emotional dialogue is derived from a drama in presidential debate.

#### (1) Rational:

*Context:* A scientific conference on climate change.

*Participants:* Dr. Alice (a climate scientist) and Dr. Bob (an environmental policy expert).

*Dialogue:*

Dr. Alice: *Based on the data we have collected, there is a 90% likelihood that temperature increases are significantly influenced by human activities. Our models predict a 2-degree Celsius rise by 2050.*

Dr. Bob: *That aligns with policy recommendations. To mitigate this, global emissions must be reduced by 40% in the next decade. What are your thoughts on implementing carbon capture technology?*

Dr. Alice: *It's a viable solution but requires international co-operation and substantial investment. We should also consider the socioeconomic impacts.*

Predominantly, this is a verbal communication in which participants engage in discussions centered around data, scientific prognostications, and the policy implications. Both sides depend on data and policy implications for arguments, with no overt emotions being expressed. They perform Declaratives<sub>EE</sub> that have the communicative point of representing how things are in the world using natural or non-natural information transfer. Their ultimate purpose is to exchange ideas and reach an agreement on the issue in question.

In this rational scenario, belonging to CAV or CVA type, both participants adhere to the four cooperative principles, allowing their intentions to be effortlessly inferred from the literal meaning of their words. Despite its rational nature, this dialogue can still be analyzed through the lens of affective pragmatics to elucidate their underlying pragmatic intentions. To be specific, Dr. Alice's initial statement exemplifies her intent to disseminate scientific discoveries, showcasing a comprehensive grasp of the data and its ramifications. The tone is neutral—factual and stripped of personal emotion, categorizing it as a rational speech act dedicated to the dissemination of scientific knowledge, firmly anchored in empirical evidence. In contrast, Dr. Bob's reply manifests his ambition to bridge the gap between scientific insights and policy formulation. He not only grasps the significance of the data but also

contemplates actionable steps (policy suggestions), focusing on policy implications rather than personal sentiments. This, too, is a rational speech act, with Dr. Bob zeroing in on the pragmatic application of data within the sphere of policy-making. Dr. Alice's subsequent comment reveals her keenness to voice her perspective on a viable solution. Her familiarity with carbon capture technology and its prerequisites is evident.

A subtle hint of caution or concern betrays a slight emotional undercurrent, reflecting apprehensions about the solution's practicality and broader societal impacts. Though this speech act is predominantly rational, concentrating on the logistical execution of a solution, it encompasses an emotional dimension as it navigates the societal repercussions and underscores the necessity for collective action. In all, this dialogue is to maintain a rational demeanor. A latent concern for the future permeates their exchange, albeit viewed through a rational prism. The employment of specialized terminology and the citation of concrete data and policy measures reveal an elevated level of cognitive engagement. Their shared determination to tackle climate change and investigate potential remedies is apparent, showcasing volition. Emotional elements are restrained yet detectable, especially in Dr. Alice's reflections on the socio-economic consequences, introducing a human element into the scientific discourse.

To encapsulate, the discourse is chiefly rational, motivated by an earnest endeavor to comprehend and mitigate a critical issue, subtly laced with emotional undertones regarding the consequences of their deliberations and suggestions. Consequently, both speakers exhibit a composed psychological demeanor with no pronounced biological manifestations, rendering their discourse predominantly rational.

## (2) Emotional:

*Context:* parody show of the presidential campaign debate.

*Participants:* Trump and Clinton.

*Dialogue:*

Trump: *They are ripping babies out of vaginas* (pointing finger in the air).

Clinton: (Opens her mouth, widens her eyes, and shakes her head) *Chris. I'm glad you raised this topic, because what better people are there to talk about women's issues? Me, a woman who has had a child and has taken birth control, and him, a man who is a child and whose face is birth control.*

Trump: (Shakes his head, opens his mouth, leans forward).

The above dialogue is a clip taken from a parody show called SNL (Saturday Night Live). The actors' performance serves as a quintessential example of ACV or AVC type, and should be best analyzed through the lens of affective pragmatics. Both participants notably deviate from the four cooperative maxims of Gricean pragmatics as well as from established politeness principles. The two participants are involved in verbal as well as nonverbal forms of communication. Both sides scratch their brain to present evidences for their arguments, with overt emotional expressions, voluntary and involuntary, being used to help. They perform the Declaratives<sub>EE</sub> which have the communicative point of representing how things are in the world using natural or non-natural information transfer and the Expressives<sub>EE</sub> which have the communicative point of expressing the signaler's emotions by means of natural or non-natural information

transfer. Their ultimate purpose is to struggle against each other and to win support from the voters.

Particularly, this debate differs strikingly in emotional expression from the previous rational discussion. As illustrated in the debate, when emotions surpass the threshold, interlocutors' biological state becomes the signal to deliver additional cues of intention. Trump, articulating his stance on abortion from a position of anger, described it as inhumane, particularly criticizing late-term procedures. Clinton, taken aback by Trump's assertions, showcased her disagreement through verbal and nonverbal cues including open-mouthed stares and head shakes. Embracing the opportunity to address the topic, Clinton appeared to leverage it to underscore her policy strengths and connect with voters, positioning herself as uniquely qualified to discuss the issue due to her personal and professional experiences related to childbirth and contraception. Clinton's strategy seemed to pivot on showcasing her distinct perspective as a woman, aiming to resonate with voters on a deeply personal level. She attempted to cast Trump's views in a negative light, suggesting they were out of touch and offensive, which she punctuated with humor aimed at his expense, suggesting his opinions were as ineffective as "failed birth control." This tactic appeared designed to provoke frustration in Trump, who responded with his own set of nonverbal cues that included mouth opening, head shaking, and leaning forward, perhaps to maintain composure and project a respectful demeanor despite the heated exchange. The debate highlights not just the content of what was said but the complex interplay of emotion, gender dynamics, and political strategy, revealing how both candidates sought to navigate the highly charged atmosphere and connect with the electorate.

The natural and visible physical reactions to intense emotions, such as those displayed by actors through their expressions, body language, and gazes, underscore the physical manifestations of their emotional states. Given that "affect is a part of cognition" (Wharton and de Saussure, 2024), the speech acts of both participants were significantly influenced by their strong emotions. The evident incivility between them during the debate exposed their genuine perceptions of each other under the influence of those emotions. Thus, affective pragmatics takes the view that emotions, when uncontrolled, can escalate to provocation, abuse, or even violence, inflicting both physical and psychological damage.

## (3) Neutral:

*Context:* A casual conversation between two colleagues during lunch break.

*Participants:* Sarah (a graphic designer) and Mark (an IT specialist).

*Dialogue:*

Sarah: *I saw the forecast; it might rain later this afternoon.*

Mark: *Oh, really? I guess I should have brought my umbrella. Thanks for letting me know.*

Sarah: *No problem. Have you tried the new coffee machine in the break room?*

Mark: *Not yet, but I heard it's good. I'll give it a try after lunch.*

The aforementioned neutral dialogue, mostly belonging to VCA or VAC type, represents typical lunchtime conversations among office



workers, occurring almost daily. In these exchanges, they discuss everyday tasks and mundane facts in an informal manner, without the explicit expression of emotions. Both participants mainly observe the cooperative principles and politeness principles. Thus it could be explained from the Gricean pragmatics or affective pragmatics. Overall, both participants perform Declaratives<sub>EE</sub> that have the communicative point of representing how things are in the world by means of natural or non-natural information transfer. Their ultimate purpose is to maintain a smooth and friendly relationship in the workplace.

In specific, Sarah's first statement displays her wish to share useful information about the weather. She is aware of the weather forecast and its potential impact. Her statement is neutral, as it conveys information without emotional emphasis. This is a rational and neutral speech act. Sarah is sharing information that could be useful for planning the day, without any emotional overtones. As to Mark's response, he expresses a realization and appreciation for the information. He acknowledges the usefulness of the information and its practical implication (carrying an umbrella). Mark's speech act is rational and neutral. He recognizes the utility of the information and expresses a mild regret for not being prepared, but no strong emotional content is present. Sarah's second statement aims to shift the conversation to another topic of potential interest. She is aware of changes in the workplace environment (new coffee machine). The statement is neutral, aiming to engage in light and friendly conversation, serving to continue the conversation, and potentially deepening the social connection with a colleague. Mark's second response expresses his want to respond to the new topic and maintain the conversation. He knew about the coffee machine and expresses his intent to try it. This response is also neutral, indicative of casual workplace dialogue. Mark's speech act is neutral and slightly rational, focusing on his intention to try the new machine based on its reported quality.

Overall, both speakers are engaging in a typical workplace conversation that is more informational and practical than emotional. Their volition in this context is about sharing information and maintaining a pleasant conversation. Cognition is evident as both Sarah and Mark are aware of their environment (weather, workplace amenities) and its implications. Affect plays a minimal role, as the conversation remains in the realm of casual workplace small talk without delving into personal or emotional topics. Thus, it can be inferred that both of them did not have apparent physical reactions; their dialogues just revolved around sharing useful information in an everyday, common conversation.

Such everyday conversations, as seen in examples 1 and 3, are typically categorized as either rational or neutral and have traditionally been analyzed through the lens of Gricean pragmatics, which elucidates how participants' speech acts adhere to cooperative principles. However, through psychological analysis, affective pragmatics goes a step further, not only illustrating participants' intentions but also shedding light on the reasons behind their rational, neutral, or emotional responses. This approach offers a more detailed insight into the underlying logic of their behavior, because affective pragmatics views emotional acts as catalysts for actions, as posited by Scarantino (2017a,b).

Nevertheless, this perspective raises certain questions. One may wonder why individuals continue to engage in rational and neutral speech acts. The psychological concept of a 'threshold' offers an explanation. This is because, for an emotional response to influence behavior, it must exceed a specific threshold. This affective threshold varies among individuals and is influenced by a range of factors,

including cultural background, personal experiences, and psychological state. To comprehend affective thresholds, one can imagine a scale measuring emotional intensity. When emotions are subdued, an individual's speech typically remains rational, unaffected by these minimal emotional states. However, as emotional intensity crosses this threshold, it starts to impact cognition, resulting in speech acts that are emotional or imbued with affect. Therefore, rational speech acts, characterized by logic, clarity, and objectivity, prevail when emotional intensity lies below this threshold. In contrast, when emotional intensity exists but does not reach extreme highs or lows, individuals are likely to produce neutral speech acts—that are neither overtly rational nor emotional. It's essential to recognize that individuals with a lower affective threshold might respond with emotional speech acts to relatively mild emotional triggers, whereas those with a higher threshold might continue to exhibit rational speech patterns, even in contexts with more pronounced emotional undercurrents. The way emotions are expressed and interpreted is significantly shaped by cultural norms, which in turn affect these thresholds. As a result, understanding the impact of cultural and contextual factors is key to comprehending these thresholds and their effect on speech acts. Those emotional ones are the focus of affective pragmatics and bio-linguistics.

Delving into the nexus between affective thresholds and speech acts unveils deeper insights into the dynamics of affective pragmatics. When an individual's emotional intensity skyrockets, it may even lead to disordered speech patterns. A common subject within affective pragmatics is stuttering. Moreover, as a complex phenomenon influenced by genetic, developmental, and environmental factors, it occupies a central place in the field of biological linguistics, as highlighted by scholars such as Benítez-Burraco (2023). Consider the case of King George VI, who found himself thrust onto the throne following his brother's abdication. This unexpected rise to monarchy brought with it an enormous weight of responsibility, compounded by his struggle with a stammer—a challenge magnified under the public and personal pressures of his new role. King George VI serves as a quintessential example. It's a pity we do not have direct EGG or fMRI data on him, but it is plausible to infer that the emotional stress and anxiety associated with the overwhelming demands of his role aggravated his speech impediment. This scenario underscores the profound influence emotional states can exert on speech capabilities. Affective pragmatics posits that our emotions significantly shape our communicative methods. In instances of emotional disturbances, these influences can manifest as notable disruptions in regular speech patterns, emphasizing the intricate interplay between emotional well-being and linguistic expression. It's reasonable to assert that stress and anxiety can exacerbate the neurological and cognitive disturbances associated with stuttering, leading to exacerbated speech impediments. This situation often results in a vicious cycle, where the dread of speaking and ensuing speech difficulties feed into each other, further aggravating the condition. The complex interrelation between emotional states and language disorders serves as a poignant illustration of the critical juncture between affective disorders and linguistic challenges. This case highlights the necessity of adopting a comprehensive approach toward language and emotional health, acknowledging the interconnectedness of these spheres in both clinical and historical settings.

The common biological foundations of emotional speech acts linking the theoretical and practical aspects of affective pragmatics and biolinguistics hinting at a conjoined future for these fields. Thus, exploring affective pragmatics may shed light on the mechanisms underlying



atypical speech acts in bio-linguistics, providing insightful perspectives on the complex interplay between emotional states and language disorders.

## 4 Queries of affective pragmatics and its shared prospects with biolinguistics

Although affective pragmatics has complemented rationalist pragmatics by taking affect into the analysis of daily communication, it has faced great challenges (Scarantino, 2017b). One of the oppositions is that paralinguistic behaviors like facial expressions cannot perform a declarative function as verbal codes do, so they cannot fully replace the communicative function of language (Fischer, 2017). This question could be answered by Darwinian biolinguistics, as “human cries and bodily symbols, such as emotional signals, are the origin of language and the basis of cognition and communication” (Darwin, 1872). So nonverbal language is the first language. The para-languages cannot perform directly a declarative function, but they convey subconsciously more important information related to identity, attitude, stance, etc. Besides, behaviors such as body orientation, standing position, and eye contact suggest people’s subconscious psychological distance from and focus on events. Indeed, beyond paralinguistic, affective pragmatics leverages the speaker’s speech behaviors to discern emotions and deduce intentions. The intricate nature of emotions and technical constraints distinguish the research methodologies of affective pragmatics from those of traditional pragmatics.

In fact, affective pragmatics aligns with Carnap’s philosophy, emphasizing the decoding of natural meanings embedded in emotional signals (Scarantino, 2017b:218). It’s a project of Carnapian pragmatics rather than Gricean pragmatics (*ibid*:219). Proponents argue that the meaning of discourse ought to be inferred from psychological constructs, advocating for an in-depth examination of the internal emotional states of individuals engaged in communication, which is also the argument of Post-Gricean pragmatics.

Affective pragmatics also incorporates into its research insights from psychology and neuroscience. They believe all affective phenomena are experientially and mechanistically organized from the perspective of the human organism (Schiller et al., 2023: 31). Tools like fMRI scans have been instrumental in linking specific emotions to brain activity, further solidifying the biological basis of this field. Empirical studies in linguistics and real-world observations help people to understand better how emotions influence language in diverse cultural and social contexts. The analysis of affect offers valuable insights into interpersonal relationships, enhancing our understanding of empathy, conflict resolution, and emotional intelligence, especially in cross-cultural communication where interpreting emotional nuances in different cultural contexts is vital.

Thus, emotional signals, subjects’ verbal thoughts, and researchers’ data analysis of subjects’ speech behaviors can form a triangulation of data verification for affective pragmatic research. Although current applications of affective pragmatics are limited, European scholars have detected, through EEG devices in the laboratory, that subjects produce corresponding ERP potentials in the brain when faced with words carrying different emotional loads, indicating that the evoked emotional responses affect subsequent pragmatic behaviors (Jończyk, 2016). Since neurolinguistics can provide empirical data for affective pragmatics research, their integration can give rise to a new research direction of Affective Neuro-Pragmatics (*ibid*). Recent studies show that different speech acts, such as requests or apologies, activate different brain regions, and constructing pragmatic models based on the correlation

between numerous speech acts and neural potentials is a direction actively explored in academia (Boux et al., 2021). The process of attempting to construct affective pragmatic models can enhance the understanding, tolerance, and control of affective-cognitive-volitional or affective-volitional-cognitive behaviors, promoting social harmony.

Now more and more researchers (e.g., Ding and Zhang, 2023) have noticed the role that emotion plays in language disorders, which means affective pragmatics could help language education and therapy. The principles of affective pragmatics may help educators and therapists to better address the emotional aspects of language learning or language disorders. Also, it may help to inform the development of artificial intelligence, particularly in creating more emotionally intelligent and responsive communication technologies.

Biological linguistics explores the brain regions and neural pathways involved in language processing. Affective pragmatics is concerned with how emotional meaning is conveyed and interpreted in language. By studying the neural correlates of both language and emotion, researchers can understand how the brain integrates emotional content into linguistic expressions. The prefrontal cortex, known for its role in emotion regulation, is also involved in language processing. Biological linguistics can reveal how this area of the brain helps manage emotional responses during communication, a key interest of affective pragmatics. From an evolutionary perspective, biological linguistics examines how language evolved as a cognitive faculty in humans. Affective pragmatics can benefit from this by revealing how the evolution of language included the capacity for emotional expression and understanding, essential for social bonding and survival since some biological research (e.g., Benítez-Burraco, 2023) delves into language disorders and co-occurrences of language and emotion (e.g., Toseeb et al., 2023). For example, in autism, the ‘so-called “contextual information” is tightly linked to people’s affective dispositions, how the meanings retrieved are often less than a research topic of fully determinate propositions and how these testable predictions help to understand pragmatic language difficulties have only begun to be explored’ (Ifantidou and Wharton, 2024:35). Thus, affective pragmatics may provide clues about language disorders, or even insights into the roots of the problems, bridging biological linguistics with affective pragmatics. Biological linguistics can illustrate the biological causes of language disorders, while affective pragmatics can extend this to explore how these disorders influence emotional aspects of language, which, in turn, cause language disorders. Similarly, insights into the biological bases of emotional dysregulation can inform affective pragmatics, particularly in how such dysregulation impacts language use and interpretation.

In conclusion, the symbiotic and multidimensional relationship between affective pragmatics and biolinguistics underpins significant advancements in understanding the interplay between emotion and language. Biolinguistics lays the groundwork by elucidating the brain’s language capabilities and genetic foundations, essential for affective pragmatics to investigate the encoding, processing, and comprehension of emotional content in language. This interdisciplinary approach not only propels theoretical knowledge forward but also bears practical implications in fields such as therapy for communication disorders, artificial language processing, and the analysis of social interaction dynamics.

The integration of affective pragmatics with new technologies and biological linguistics is poised for a dynamic and promising future. The collaboration between linguists, neuroscientists, and psychologists is expected to become increasingly prevalent, fostering holistic studies on the nexus of emotion and language. Insights from affective

pragmatics are set to translate into tangible benefits, enhancing communication strategies for individuals with emotional or language impairments. The advent of wearable technology for the real-time tracking of physiological responses during communication promises to deliver concrete data, enabling the exploration of emotions' impact on language in naturalistic settings. Researchers can also use natural language processing tools like Python to automatically extract and analyze emotional clues in large text datasets. Such methods have proved to successfully identify emotional disorders. It's a matter that Theory of Affective Pragmatics and Biolinguistics could cooperate, and their collaboration will have a promising future.

Anticipating future research in affective pragmatics, it's clear that technological progress and a deeper understanding of biolinguistics will significantly influence the field. These advancements will facilitate a comprehensive grasp of the complex relationship between affect and language, potentially revolutionizing theoretical perspectives and practical applications across linguistics, psychology, and communication technologies. The convergence of theoretical and practical aspects of affective pragmatics and biolinguistics is expected to uncover profound insights into how emotions shape language usage and comprehension, heralding a new era of interdisciplinary research and application.

## 5 Conclusion

This paper provides a succinct overview of the evolution of affective pragmatics, illustrating the indissoluble link between biological constitution and linguistic capabilities. It highlights how affective pragmatics, drawing inspiration from Darwinist biolinguistics, promises fresh insights into the pragmatic meanings of affect—insights that rationalist approaches often overlook. Indeed, emotional expressions transcend simple linguistic constructs; they are deeply enmeshed with our biological core, simultaneously influencing and being shaped by our cognitive processes.

Despite the challenges affective pragmatics faces in interpreting and categorizing the complexity of human emotions, it opens up novel avenues for investigating the interplay between language and emotion in communication. With technological advancements, affective pragmatics is poised to shed light on a broader range of communication issues, captivating the interest of linguists, psychologists, physiologists and cognitive scientists alike.

In conclusion, this paper advocates for a holistic approach to pragmatics. Adopting a biolinguistic viewpoint not only deepens our comprehension of affective pragmatics but also unveils new pathways for research in the domains of language, communication, and cognitive science.

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## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

## Author contributions

LZ: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

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## Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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