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Future Directions in Digital Social Linguistics

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Abstract. The chapter examined the future direction of digital social linguistics, a new branch that has emerged within sociolinguistics, communication studies and digital media studies. With the continued evolution of digital technologies, such as platforms, artificial intelligence, and immersive technologies, that transform the communicative practices of human beings in all their complexity and variety, communication research is presented with new opportunities and methodological challenges. Six topical issues are reviewed in this chapter: (1) artificial intelligence and computational approaches to language; (2) performative identity construction in new media; (3) applied sociolinguistics and virtual/augmented reality; (4) global and multi-lingual phenomena; (5) linguistic norms and algorithmic mediation; and (6) ethics and digital linguistic research. For digital social linguistics, this chapter explores contemporary theoretical frameworks and empirical research to argue for interdisciplinary collaborative work, ethical reflexivity, and imaginative methodology to capture the scale, speed, and variety of digitally mediated communication, as it can productively function in the 21st century.

Keywords: digital sociolinguistics, computational linguistics, AI language models, virtual reality communication, multilingualism, algorithmic language, internet discourse, digital identity, code-switching, corpus linguistics.

1. Introduction: Language at the Digital Frontier

The global research community has increasingly focused on language in digital media. There has also been a shift from mere curiosity about sociolinguistics to a centre of study in this domain. Famous researchers such as David Crystal, Naomi Baron and Susan Herring did pioneer work in the early 1990s and the first decade of the 21st century. Recently, however, the field of digital social linguistics – disseminated under a wealth of names including Internet linguistics, CMC studies and digital discourse research – has certainly taken stock of a wide range of empirical insights and theoretical considerations. Nonetheless, the very things it aims to study are themselves speeding up, branching out and complicating in ways that constantly strain the discipline's conceptual and methodological toolkit [25,26]. For the first two decades, digital language scholars largely focused on demonstrating that communicators on the net were producing a valid and distinct type of language use, which, although sharing some features with speech and writing, also had its own special norms [27,28]. Academics have identified new orthographic practices, the use of punctuation for emotive and prosodic purposes, discourses of identity, the use of acronyms and initialisms, and the creation of genre-specific discourses from email to instant messaging, from weblogs to social-media posts [29,30]. The questions to be asked by the field today are qualitatively different. The ubiquity of smartphones has made digital communication an integral part of everyday social life for billions worldwide [31,32]. From online "dating" to virtual political debates, identity creation, community development, and cultural engagement, social media sites are the platforms for these activities [33,34]. So too do artificial intelligence systems generate, curate, translate, and moderate language at scale, placing algorithmic processes between speakers and their audiences in ways that raise profound questions about agency, authenticity, and linguistic change [35,36].

Immersive technologies – virtual reality (VR), augmented reality (AR), and the possible metaverse – are realising new expressions of bodily digital experience across semiotic domains of linguistic and non-linguistic modalities [37,38]. And the globalisation of digital communication is giving rise (albeit in very nascent forms) to new forms of language contact, multilingualism, and linguistic domination which, once more, may be generating theoretical innovation [39,40]. In this chapter, I will outline six intersecting trends that relate to the

"how" (or at least the "how it ought to") the field of digital social linguistics is currently and/or will be moving if it is to have intellectual and social relevance and vitality [41]. They spare you nothing, and they are not exhaustive, but they represent some of the most theoretically exciting and empirically urgent corners of the space." The aim is not to forecast a blatant future of spurious precision, but to chart the intellectual contours of a discipline at flux and to point out some of the questions, methodologies and conceptual toolkits likely to frame its near future[1,42,43].

2 Artificial Intelligence and Computational Approaches to the Study of Language

2.1 The Dual Nature of Large Language Models as a Research Object and Tool

One could argue that nothing in recent years has so profoundly transformed the objects and tools of study in social digital linguistic analysis as the deployment of large-scale artificial intelligence (AI) language models [1,43,44]. Large language models (LLMs) – deep neural networks trained on massive amounts of digital text – have achieved state-of-the-art results on nearly all natural language processing tasks, including translation, summarisation, dialogue generation, and story writing [2,45,46]. They have also come to form part of the back end of popular digital communications: they power search engine query suggestions, "smart" replies for email and Twitter, social media content moderation, customer support chatbots, and even writing help applications that millions of people rely on every day [47,48].

Digital social linguists will have to take a double look at LLMs. That is because they are potent new tools for research, allowing studies of linguistic corpora with unforeseen scales and speeds on the one hand [49,50]. Researchers can now apply transformer-based models to study discourse, stance and sentiment, track lexical innovation, and perform analysis of pragmatic inference at the level of billions of utterances [51,52]. These new avenues lead to expanding the empirical reaches of the field by enabling finer sociolinguistic analyses. This level was typically thought to be only available to 'native speakers of the language' scholars, as corpus linguists would describe [53]. But LLMs are also objects of inquiry themselves — intricate sociolinguistic artefacts that encode, reproduce, and possibly amplify the linguistic, social, and power asymmetries embedded in the data that trained them, as shown in Figure 1 [2,54].

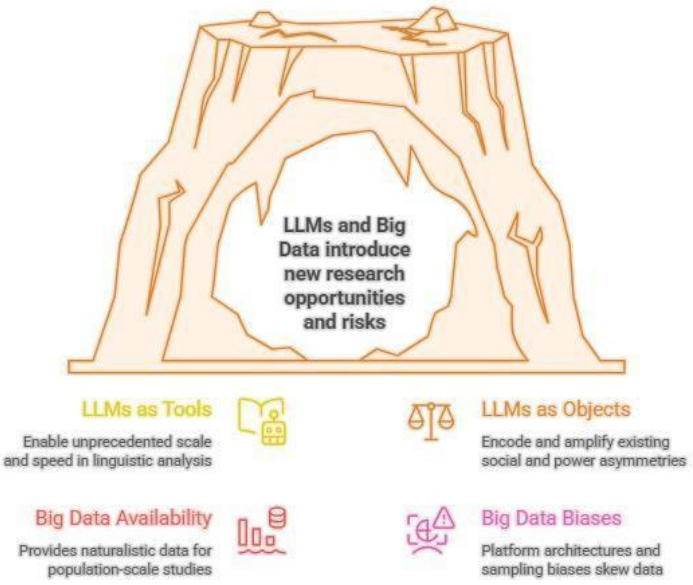

Fig. 1 Artificial Intelligence and Computational Approaches to Language Analysis

2.2 Corpus Methods and Big Data Sociolinguistics

Digital language data are now pouring from the taps of social media posts, chat logs, forum discussions, online news articles, product reviews, podcast transcripts and more, creating the ideal environment for what some researchers are dubbing big data sociolinguistics [3,55]. Where traditional variationist sociolinguistics was based on interviews and elicitation techniques [4,56], with relatively small samples, digital corpora provide access to naturalistic data involving millions of speakers in a wide range of social contexts. This paves the way for new studies on language variation and change as it happens, on the spread of innovations through social networks, and on the connection between linguistic variation and social structure on a population scale [57,58]. But big data methods also entail potentially serious risks, both methodological and epistemic [5] [6]. Users of Twitter, Reddit or WeChat are not representative of their national populations; the language within these platforms is influenced by the affordances of the platform and the policies of governance, both of which may systematically bias it [59,60]. The digital social linguists of the future, therefore, are arguably those who become adept at designing, sampling, and interpreting corpora in a manner that is attuned to the socio-technical conditions of production and collection of digital language data [61].

3. Identity, Self-Presentation, and Community in Digital Spaces

3.1 Liquid Identities and the Performative Turn

The study of the relationship between language and identity has long been a focus of sociolinguistics, but digital spaces have added new challenges and opportunities for shaping and performing identity that the field is just starting to adequately theorise [7,58]. Drawing from Goffman's dramaturgical theory and Butler's performativity, digital sociolinguists understand that identity online is not merely represented but constructed and negotiated via language – through what words to use, what stories to tell, what communities to address, and what voices to embody or disavow[8,59].

In current digital times, identity work is increasingly defined by its multiple, dynamic sense of being, and its strategic use of code switching across and within platforms, registers, and personae [9,60]. For example, a person might maintain a professional LinkedIn profile, a gaming pseudonym on Discord, a political Twitter account with anonymity, and a personal Instagram account, each with its own linguistic style and serving a different imagined community [25,61]. The idea of a one, unified digital identity, if ever it was, has been replaced by a more fragmented, contextual identity which is continuously shaped in and through communication as per fig 2."

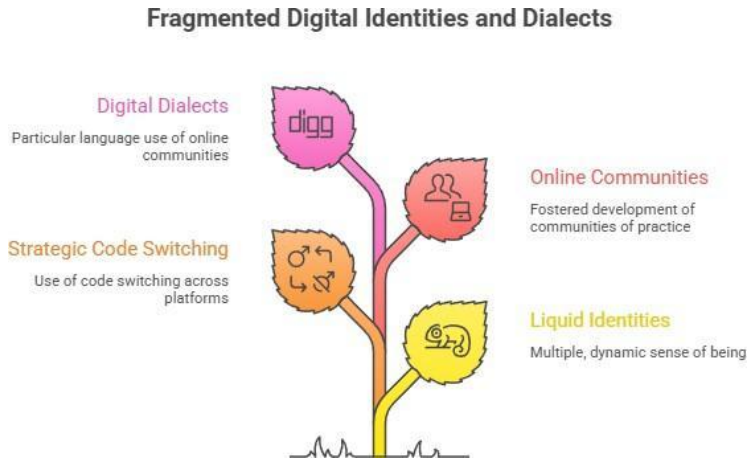

Fig. 2 Fragmented Digital Identities and Dialects

3.2 Online Communities and the Rise of Digital Dialects

These places enable the creation of transnational communities of practice, bringing together people with common interests, identities, experiences, and communicative practices and not just collocated in space [10,62]. These communities create a whole repertoire of language: they share a specialised lexicon, they tell common narratives, they contain particular orthographic and typographic rules, they employ particular interactional models in the telling of narratives, and they contain interactional rituals that function as group markers and that help to strengthen group cohesion[10][11].

The use of the label 'digital (online) dialect' to describe the language practices of existing online collectives has, at the same time, been productive but also raised concern [12,63]. Research on the emergence, consolidation, and perhaps transformation of digital dialects over time, on charting their intersection with offline dialects and the sociolinguistic context of their speakers, as well as on the means by which they may be spread, transformed, and potentially commodified as they leave their communities of origin, will certainly be welcomed in perspectives [13,64]. Feature: Internet slang and its diffusion into mass media and everyday language as demonstrated by long-established entries such as "selfie" and "hashtag", as well as more recent inclusions like "stan", "woke", and "simp" — highlighting the unsettled, and often unsettling, relationship between the lexicon of online communities and that of the lexicon markets more broadly[11,65].

4. Virtual and Augmented Reality: The Embodied Turn in Digital Communication

4.1 Language in Immersive Environments

In contrast to text-based and audiovisual media, immersive media spaces present embodied presence and action in a conspecific virtual environment [12,66]. Communicating in these environments is not just verbal, but profoundly multimodal — as speech, gesture, gaze, spatial organisation, and virtual embodiment collaborate to shape interaction in ways that are more reminiscent of face-to-face than any other type of digital communication [67,68].

This embodied aspect of VR social communication poses critical issues for digital social linguistics. In what ways do speakers adjust their linguistic and paralinguistic behaviours according to avatar presence and movements? What is the interface between linguistic identity performance and the representational identity options that virtual embodiment — choosing, modifying, performing identities through avatar design — makes available? How are social practices, including language, established and policed in virtual worlds that do not have the common spatial and institutional frameworks of physical world interaction? These are questions that require new theoretical perspectives and methodological strategies, informed by, on the one hand, CA, multimodal discourse studies, and on the other hand, the social semiotics of virtual embodiment as per Figure 3.[13,69].

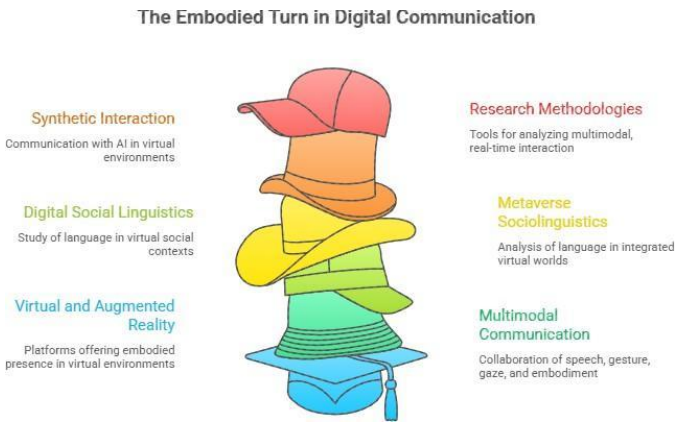

Fig 3 The Embodied Turn in Digital Communication

4.2 Metaverse Sociolinguistics and Synthetic Interaction

Even if the technical and social vision of the metaverse as an integrated matrix of persistent, shared, and interoperable virtual worlds is more aspiration than reality, it has generated significant commercial and cultural hype over the last few years. And if some iteration of the metaverse does come to represent a significant sphere of social life, its implications for sociolinguistics could be profound [14,70]. A metaverse would bring about new language contact and multilingualism situations, new forms of community development and identity enactment, and new human – artificial intelligence interlocutor modes of interaction that might potentially call into question current linguistic analysis categorisations [15,71]. But even in the absence of a fully-fledged metaverse, the current landscape of virtual worlds, online games and social VR platforms already provides a diverse and under-utilised resource for sociolinguistic research [72,73]. Tens of millions of players fill the worlds of games like Fortnite, World of Warcraft, Roblox and VRChat, and have developed intricate ways of communicating that are tailored to the particular affordances of those environments [74]. Further work on this topic will need to use tools that are capable of analysing multimodal, spatially-situated, real-time interaction in virtual space and continue to be informed by conversation analysis, multimodal corpus linguistics, and ethnographic studies of virtual worlds [16,75].

5. Multilingualism, Language Contact, and Digital Linguistic Inequality

5.1 Translanguaging in Digital Contexts

The Conditions of Multilingual Communication Have Changed Dramatically because of the digital revolution, which has brought about new venues, instruments and incentives for the mixing of languages, in the forms of code-switching and translanguaging as described by linguists [76,77]. Platforms such as social media, messaging apps, and web forums have created new spaces where multilingual speakers can deploy their full linguistic arsenal unencumbered by the institutional restrictions that normally shape language choice in educational, governmental, or occupational settings[17,78]. Originally developed in Welsh bilingual education contexts, the idea of translanguaging has been particularly fruitful in analysing digital multilingual practice by focusing on the holistic and dynamic nature of multilingual speakers' linguistic resources as opposed to the rigid compartmentalisation of discrete codes [80,81]. In digital space, translanguaging is not simply a communicative practice that individual users employ but is also a defining characteristic of various online communities that treat language, scripts, and registers as a mixture, as anonymous, normative, and indicative of a cosmopolitan sensibility as well as a sign of communicative competence [18,79].

5.2 Digital Language Inequality and Endangered Languages

Although new opportunities for multilingual practice and teaching have emerged with digital communication, existing language hierarchies have been reproduced, and in some cases amplified [82]. The hegemonic status of English in global digital media infrastructures, particularly the internet, the programming languages of digital platforms, and the training data of large AI language models, also poses serious issues for speakers of minority and low-resource languages [19,83]. The exclusion of those languages from digital platforms threatens not only the functional obsolescence where speakers end up forced to use dominant languages for digital communication while continuing to use their heritage language in other domains, but it also risks accelerating their demise as young generations begin to adopt globally dominant linguistic repertoires[20,84]. On the other hand, these same technologies provide unparalleled means for language documentation, revitalisation, and community maintenance [85]. Social media have facilitated the preservation of heritage languages among diasporas across national borders, mobile phone applications are being developed to teach indigenous and minority languages to new speakers, and digital archives are capturing audio and video recordings of endangered languages for future generations [86,87]. Research in digital social linguistics needs to attend, on the one hand, to the macro-structural inequalities that determine which languages and products of those languages can be accessed and seen in digital spaces, and on the other, to the innovative, resistant, and revitalising repertoires through which marginalised language communities are appropriating digital space as per Fig 4[88,89].

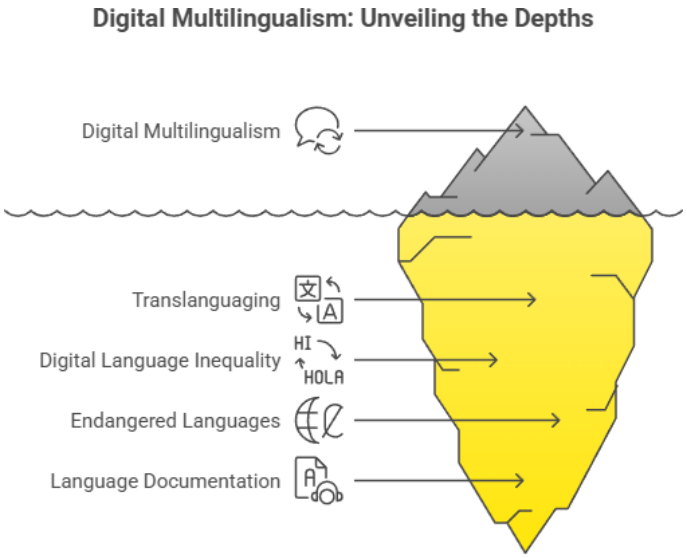

Fig. 4 Digital Multilingualism: Unveiling the Depths

6. Algorithmic Mediation and the Shaping of Linguistic Norms

6.1 Platform Architectures and Language Change

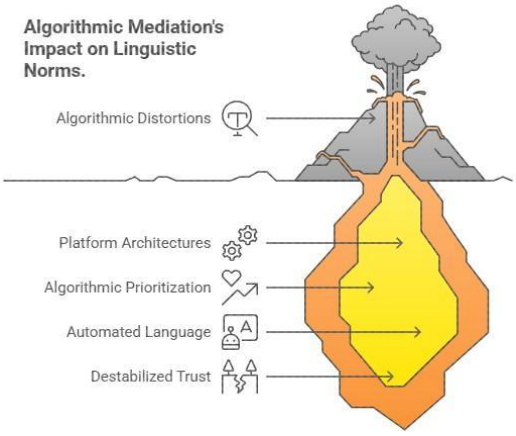

Fig. 5 Algorithmic Mediation and the Shaping of Linguistic Norms

Digital mediation has always been algorithmically curated, but what makes the contemporary digital communication unique relative to mediated language in general is the active involvement of algorithmic systems in the selection, highlighting, filtering and transformation of linguistic content [90,91]. Platform architectures — that is, the technological, institutional, and social web-based social media platforms, search engines, recommender systems, and content moderation mechanisms — do not serve as neutral spaces for language production but rather actively shape language production and circulation [21,92]. They determine which types of language are given visibility and attention, which types of language are suppressed or marginalised, and which types of communicative acts are normalised or pathologised [22,93]. Content's relative ranking in its feed to serve "engagement" – calculated by, among other factors, likes, shares, comments, time-on-platform – is producing various systemic issues with certain kinds of language: sensationalist, emotionally-charged, polarised, and visually-oriented language seems to be rewarded while more muted, nuanced, dialogic language is disincentivised [94,95]. And there "is mounting evidence these algorithmic biases are promoting the dumb-

downing and energisation of public debate, the polarisation of political rhetoric, and the erosion of civility and evidentiary norms in online publics more generally." Digital social linguists are well-placed to aid in and contribute to the documentation and theorisation of these processes, and the language effects of platform design decisions as per Fig 5. [96]

6.2 Automated Language and the Authenticity Question

The workings of language production by AI2 are such that it is raising urgent questions about the authenticity of that language, who authors that language, and whether we should trust it in a medium of digital communication that is inflected by the digital social of linguists%227 [97,98]. When language is generated by an AI that nobody would mistake for a human (social media bots, AI-generated news articles, fake product reviews, or deep-fake voice and video), the trust and accountability mechanisms that a language as a communicative system possesses — and not just among language users themselves — become severely undermined. Linguistic production of what may be AI-generated is not an Interactant from legitimate expectations for an intentional human agent [21,99]. This disjunction has genuinely harmful effects on the politicisation of communication, both in terms of journalism and everyday social interaction, and these are already becoming all too evident insofar as the phenomenon of propaganda, spin and mass collaborative manipulation of the public mind [100,101]. But it also poses more fundamental conceptual questions concerning what a model of linguistic creativity involving intentionality, agency and social responsibility might have to say about the nature of meaning construction [23,102]. Indeed, further work in digital sociolinguistics will have to take up these questions on several fronts – empirically through elaborating and refining methodologies for identifying, describing, and tracing AI--in--the--wild languages, and theoretically by unsettling the "socio-pragmatic" foundations that underpin current conceptualisations of communicative analysis [103].

7. Ethics, Privacy, and the Politics of Digital Linguistic Research

7.1 Research Ethics in the Digital Age

Ethics remain a nagging political aspect of digital SSL research as well. With the scale of digital data collection growing ever more vast, intrusive, and consequential for society at large, hard questions are being raised about how researchers collect, use, and distribute language data harvested from the internet [104]. The very assumption that such massive troves of what is seemingly public language data – social media posts, forum threads, blog entries – can be acquired and analysed without consent from the people who produced it is being increasingly called into question by scholars from ethical, privacy, and language communities alike [105]. They argue that public availability does not equal consent for research purposes. This is especially true when the data contains sensitive information, discussions of marginalised groups, or could be used to identify or harm research participants [24,134]. As such, digital social linguistics will need to think through more nuanced and culturally sensitive approaches to research ethics going forward [106,147]. This might look like adhering to community-based participatory research models, indigenous data sovereignty frameworks, and the principles and guidelines outlined in such ethics-focused works as Rethinking the Politics of Research [145,146]. Ethical Data Practice in the Social Sciences and Digital Humanities [139] There will need to be both individual ethical accountability on behalf of researchers and institutional structures in place to support researchers in doing ethics, as well as broader profession-level standards that can hold members accountable for their use of digital language data [107,137].

7.2 Language, Power, and Digital Justice

Although research ethics is something to consider, the future of digital social linguistics should be dictated by a language justice agenda, which considers the fair distribution of benefits and harms related to digital communication, but also the power relations that decide whose languages/varieties/communicative practices are heard, amplified, and archived in digital media [108,109]. Among the many "battlefields" of language is also the online platform. Platform users also resist some of the norms inscribed in platform architecture, question

the marginalisation of their languages, dialects and ways of communicating, and call to be included and recognised as valid language users within their platforms and according to their platforms [110,150].

In digital social linguistics, it is to be these things by tracking and studying these contests for resources for linguistic vitality, by theorising the sociolinguistic mechanisms that produce digital linguistic inequities, and by developing forms of public intervention that contribute to shifting platform and policy, and infrastructure in more equitable directions [111,149]. This involves a readiness to move beyond description to critique and to interact with the political and capitalist influences that mould the sociolinguistics of the digital world [148]. And it entails forming solidaristic, accountable relationships with the communities whose linguistic practices and language rights are in question, as per Fig 6 [112].

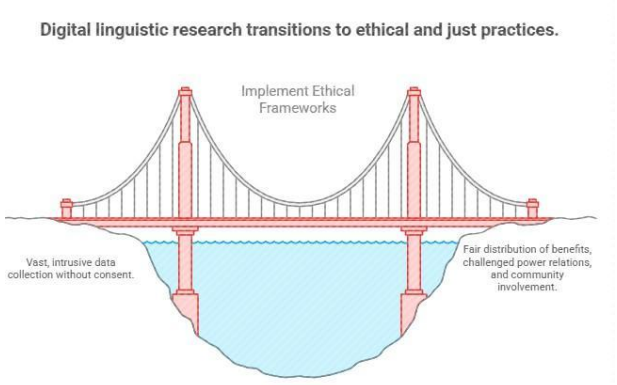

Fig. 6 Digital linguistic research transitions to ethical and just practices.

8. Methodological Horizons: Towards a Digital Social Linguistics Toolkit

The consequence of these trajectories is far-reaching methodologically. Since the object of study, language, is being shaped by the medium in which it is being used, it requires methods that can handle the scale, multimodality, real-time dynamics, and sociotechnical embeddedness of digital communication, which are not entirely compatible with traditional sociolinguistic methodologies [113,114]. In doing so, it will need to develop and enhance a methodological toolkit that combines computational and interpretative methodologies, quantitative and qualitative methods, corpus methodology and ethnographic investigation [115]. A powerful arsenal of natural language processing and machine learning tools allows high-throughput pattern mining and annotation, analysis of linguistic variation and evolution on massive datasets [131,135]. Having said that, these computational instruments have their own theoretical assumptions and constraints of interpretation, and their outcomes should be viewed through the critical lens of sociolinguistic theory and qualitative understanding of communicative context [116]. It may be that the most productive direction for the field is to return to its mixed-methods roots and recalibrate computational and interpretive methodologies as equal partners in dialogue, mutually shaping and constraining one another [117,118].

Ethnographic methods (including digital, virtual, and platform ethnographies) remain crucial for studying digital communication in a social context [119]. The effect of social interactions, cultural presuppositions and institutional setting on a selection of language is not a matter that could be observed only from its surface form [131]. To pursue greater specificity by examining the embedded practices of particular groups, platforms, and modes of interaction remains the irreducible essence of sociolinguistic research - no matter the power of the computational tools that may be available [120]. Interdisciplinary Dialogues and Collaborative Futures. The challenges—both in terms of complexity and scale—of digital social linguistics make it clear that they cannot be adequately addressed by any one discipline working alone [121]. The discipline needs to develop and deepen its conversations with a broad range of neighbouring areas: computer science and computational linguistics, to the design, development and critical evaluation of NLP tools; communication and media studies, to (meta)theories of platform power and media ecology; anthropology and science and technology studies (STS), for ethnographic and sociological analyses of digital practice; cognitive science and psycholinguistics, to the

analysis of the cognitive dimension of digital communication; and political theory and legal studies, to theories of rights, regulation and governance that may apply to digital language policy [121,123]. Digital social linguistics must be open to learning from, as well as enhancing the knowledge of, these related fields, and to having its own basic assumptions and conceptual frameworks interrogated and enriched through exposure to alternative disciplinary perspectives [124]. The image of the sociolinguist as a solitary fieldworker who carefully records the speech of a community in a limited geographic area must be replaced by more collaborative, distributed, and interdisciplinary research models [125].

9. Conclusion:

The future directions discussed in this chapter can be described as a digital social linguistics that is more computationally advanced, theoretically expansive, ethically reflexive, and politically engaged than those that have existed in the past. The field is invited to not only document the sociolinguistic effects of digital transformations, but also to research and critically analyse the power relations endemic to the digital, to intervene in these by making digital language ecologies more equitable and just, and to educate the public about the sociolinguistic dimensions of the technologies that are increasingly structuring human sociality. This too is a tall order, and meeting it will require radical realignments in the institutional arrangements, training modalities, publication norms, and professional cultures of the discipline. Such a task will call for funding to establish interdisciplinary research centres and collaborative projects, for developing digital infrastructure and research tools accessible to all members of the community, as well as for community participation and public communication. And I think that's going to mean perhaps a willingness to interrogate linguistic, technical and power-embedded questions that exist at their intersections with a bit of directness and courage, at those who design, govern and profit from the increasingly central platforms of digital communication in our social lives. Hu—to r into the discourse science are the questions humanity asks in order to know the world, each Other, challenge power and dream of tomorrow. As it increasingly turns out that human communication is more and more taking place on digital channels, is being shaped by algorithms and is becoming embedded in structures of global platforms, questions such as what kind of language can we use, who can we talk to, what are the goals of our speaking and what are the effects of our language appear to be getting tied to larger questions about democracy, justice and even what it means to be human. At its best, digital social linguistics is not just about how people talk online. In terms of answering a question that has been left open for decades, it does deliver, in terms of what it means to be a human in an age of technology. Among perhaps the most unexpected fallout of the field: language matters — that what might appear to be highly technical decisions made by platform engineers and AI developers and policy makers around language not only influence how humans talk, but who and to whom humans can talk, and that those ramifications are worthy of long-term, critical and socially responsible scholarly attention. That's the reality, and it's grounded in empirical realities and a pragmatic appreciation for the power of language that digital social linguistics leaves as a gift to both the knowing and the doing of human communication.

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