Two Chinese medical doctors' English scholarly publishing practices: Challenges, contradictions and coping strategies

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Abstract

Against the backdrop of English being the academic lingua franca, Chinese medical doctors are under tremendous pressure to get their research published in English-medium journals. This paper reports on a multiple-case study of Chinese medical doctors' scholarly publishing in English. Drawing on multiple types of data collected from two doctors at a major hospital affiliated with a top research-intensive university in mainland China, we explored the focal participants' perspectives on their difficulties in scholarly publishing, their strategies for addressing these difficulties, and the factors and resources at work in their navigation of the publishing processes. Informed by Activity Theory, we identified contradictions within the doctors' scholarly publishing activity systems. We focused on the rules and tools that framed the doctors' scholarly publishing activities, and our findings revealed how they drew on an array of tools and signs to resolve the contradictions and meditate their scholarly publishing endeavors. Our study points to the need for institutional policies and initiatives to support Chinese medical doctors aspiring for international publication.

Keywords: International publishing, academic writing, English-as-an-additional-language researchers, Activity Theory, medical doctors.

Resumen

Las prácticas de publicación académica en inglés de dos médicos chinos: desafíos, contradicciones y estrategias

En un contexto en el que el inglés es la lengua franca académica, los médicos chinos se ven sometidos a una enorme presión para publicar sus investigaciones en revistas anglosajonas. Este artículo presenta un estudio de varios casos centrado en las publicaciones académicas en inglés por parte de médicos chinos. Con base en diferentes tipos de datos recogidos de dos médicos de un prestigioso hospital afiliado a una universidad de perfil investigador en China continental, exploramos las perspectivas de los participantes sobre sus dificultades en la publicación académica, sus estrategias para hacer frente a estas ellas y los factores y recursos que intervienen en los procesos de publicación. Basándonos en la Teoría de la Actividad, identificamos contradicciones en los sistemas de actividad de publicación académica de los doctores. Nos centramos en las reglas y herramientas que enmarcaban las actividades de publicación académica de los doctores. Nuestros hallazgos evidenciaron cómo recurrían a una serie de herramientas y signos para resolver esas contradicciones y reflexionar acerca de sus esfuerzos de publicación académica. Nuestro estudio pone de manifiesto la necesidad de políticas e iniciativas institucionales para apoyar a los médicos chinos que aspiran a publicar a nivel internacional.

Palabras clave: publicación internacional, redacción académica, investigadores del inglés como lengua adicional, Teoría de la Actividad, médicos.

1. Introduction

Scholarly publishing has been increasingly prized because research output is widely adopted as a definitive indicator of an institution's quality, performance, rankings, and funding allocations (Lillis & Curry, 2006, 2010; McGrail et al., 2006). Moreover, English has become established as the privileged language of scholarly publication (Curry & Lillis, 2010; Kuteeva & Mauranen, 2014). The dominance of English as the scientific medium is evident in the valorized pecking orders of academic journals, such as the Science Citation Index (SCI), and has shaped academic knowledge production and institutional evaluation systems in significant ways (Curry & Lillis, 2017), especially in English-as-an-additional-language (EAL) countries (Flowerdew & Li, 2009). Consequently, EAL researchers have been under much pressure to publish in international English-medium journals (Belcher, 2009; Canagarajah, 2002; Tardy, 2004). Chinese doctors, or clinician-researchers (Yanos & Ziedonis, 2006), are no exception (e.g., Li, 2013; Li, 2014a, 2014b). According to a news feature published in *Nature* in 2021, the number of English-language journal articles with authors affiliated to

Chinese hospitals has increased 50-fold over the past two decades (Else & Van Noorden, 2021). Despite the huge increase, articles authored by Chinese doctors do not seem to be well received by the international academic community, as can be seen in their relatively low Essential Science Indicators (ESI), an influential database that covers more than 12,000 journals included in the Web of Science (WoS) Core Collection and aims to reveal research trends as well as influential authors, publications, and institutions. One possible contributor is Chinese doctors' inadequate English writing skills, which hamper their effort to translate their research into high-quality publications (Zhang et al., 2020). Although research has shown that such language barriers may pose additional challenges to EAL researchers, much remains unknown about the specific difficulties that Chinese medical doctors may face and the various strategies that they develop to overcome these difficulties, since formal training in scholarly publishing is rare at medical schools (McNeill et al., 2007; Oyibo, 2017).

This study was therefore motivated by the increasing visibility of Chinese medical doctors in the international academic community and the paucity of research on their scholarly publishing experiences and practices. As the types of challenges and difficulties examined in this study are not unique to Chinese medical doctors but are also faced by their counterparts in other EAL countries (Martín et al., 2014; Mungra & Webber, 2010), our findings can contribute to illuminating what is happening in such contexts. Given that scholarly publishing is a situated practice with its dynamics being context-specific, our study can also shed light on how situational constraints faced by Chinese doctors may be similar to or different from those faced by EAL medical doctors with a dual-status identity (i.e., as clinician and researcher) and aspiring to publish in other contexts. By examining how our focal doctors were juggling between the demands of academic research and clinical practice, we hope to develop a contextualized understanding of their scholarly publishing activity system and present an informed critique of the SCI-oriented promotion mechanism widely instated in mainland China and other EAL contexts (Curry & Lillis, 2017).

When aspiring to publish in English-medium journals, EAL researchers often face what have been traditionally characterized as linguistic and content-related challenges (Canagarajah, 2002; Carli & Ammon, 2007; Ferguson et al., 2011; Phillipson, 2008, 2009). These scholars may find their aspirations frustrated by their insufficient English proficiency and inadequate understanding of English academic writing conventions (Martín

et al., 2014; Muresan & Pérez-Llantada, 2014). In addition, content-related difficulties may thwart EAL researchers' efforts to publish impactful research (Huang, 2010; Mišak et al., 2005). These problems include lack of originality (Muresan & Pérez-Llantada, 2014), methodological shortcomings (Lei & Hu, 2019), insufficient procedural rigor (Mungra & Webber, 2010), and invalid interpretations of the results and inappropriate conclusions (Mišak et al., 2005). For example, Martín et al. (2014) found that due to the stiff competition to publish in English-medium journals, EAL medical researchers had to argue for the relevance of their studies in their responses to reviewers' comments, which they deemed an exceptionally daunting task.

To cope with the challenges, EAL scholars may resort to mediating resources of various types: material (e.g., cultural artifacts), financial (e.g., paying for the services of language professionals), and social (e.g., enlisting the help of colleagues) (Lillis & Curry, 2010). Given the situated nature of EAL researchers' challenges and resources, the type and extent of mediation vary from one context to another (Li & Flowerdew, 2007; Luo & Hyland, 2021; McDowell & Liardét, 2019). Research has also shown that EAL researchers' success in scholarly publishing depends to a large extent on whether they can mobilize resources at hand to overcome the challenges that they face (Lillis & Curry, 2010; Luo & Hyland, 2019). For instance, Luo and Hyland's (2019) case study of a Chinese medical doctor's use of translation as a practical text mediation strategy revealed that the participant "[could] hardly write a complete sentence in English but regularly publish[ed] in prestigious international journals" (p. 19). Therefore, Luo and Hyland (2019) argued for the usefulness of text mediation as a strategy for EAL researchers to make up for their inadequate English proficiency.

Although a substantial body of research has focused on the publishing endeavors of EAL researchers based in non-Anglophone countries (Lei & Hu, 2015, 2019), there is still much to learn about Chinese medical doctors' English-medium publishing experiences, especially the array of disciplinary, professional, institutional, and individual factors that both give rise to challenges in their publishing efforts and mediate the strategies they develop to overcome such challenges. Therefore, this study aims to contribute to the current literature by presenting a contextualized and close-up analysis of Chinese medical doctors' scholarly publishing practices and offering pedagogical implications for English for research and publication purposes (ERPP). In light of current scholarship that has started to conceptualize scholarly publishing by EAL scholars as social practice constituted by locally

negotiated and pervasively mediated processes (Lei & Hu, 2019), the present study draws on Activity Theory (Engeström et al., 1999) to capture the complexity of scholarly publishing activities. This theoretical perspective explores the complex interrelations between individual subjects and their community (Engeström, 2015) and provides a useful framework for interrogating various social practices, including scholarly publishing activities.

According to Engeström (2015), an activity system can be represented and studied in terms of seven interrelated analytical elements (i.e., *subject*, *object*, *outcome*, *mediating artifacts*, *community*, *division of labor*, and *rules*) and the fundamental forms of mediation between them. The *subject* is the individual or group whose viewpoint is selected as the analytical perspective. The *object* is the "raw material" or "problem space", which is transformed by the activity into an *outcome* with the assistance of *mediating artifacts* (i.e., tools and signs). The *mediating artifacts* are instruments through which the activity is carried out. The *community* consists of individuals or groups that share the same *object*. The *division of labor* concerns "both the horizontal division of tasks between the members of the community and the vertical division of power and status" (Engeström, 1993, p. 67). Lastly, the *rules* are "the explicit and implicit regulations, norms and conventions that constrain actions and interactions within the activity system" (Engeström, 1993, p. 67).

With specific reference to the activity system of scholarly publishing, the *subject* is a medical doctor, whose *object* is to turn his/her research into publications that create new knowledge, improve clinical work, join the dialogue of the discourse community, and fulfill the hospital's publication requirements. The subject's *mediating resources* and *tools* include relevant scholarly literature, colleagues, supervisors, fellow researchers, language professionals, editorial services, journal editors, manuscript reviewers, among others. The subject's *community* may comprise hospital administrators, supervisors, patients, fellow doctors, various gatekeepers of scholarly publishing, and other academic and professional members. The *division of labor* explores how tasks are shared based on available/adopted roles and power relations. For instance, journal editors and manuscript reviewers serve as gatekeepers of the quality of scholarly publications and offer feedback to improve the manuscripts under review, whereas colleagues are expected to provide mutual support. With respect to the power relations involved in scholarly publishing, journal editors and manuscript reviewers are at higher rungs of power and authority than is the medical doctor who aspires to publish in their journals. The *rules* prevalent in

the activity system comprise both the explicit/implicit norms and conventions of academia and the hospital's policies and regulations regarding scholarly publishing. The *outcome* may be desirable (e.g., published articles, the meeting of institutional publication requirements for promotion, membership in the academic community, and contributions to knowledge) or negative (e.g., rejection of the submitted manuscripts, failure to meet the institutional publication requirements for promotion, and missed opportunities to contribute knowledge).

As a pivotal construct of Activity Theory, contradictions are "historically accumulating structural tensions in and between components of activity, or between activities" (Engeström, 2001, p. 137). Within the structure of an activity system, four levels of contradictions can be distinguished (Engeström, 2015): primary, secondary, tertiary, and quaternary. The present study focuses on the first two levels. A primary contradiction arises within a constitutive component of the activity system, as illustrated by the inherent conflict between the *object* of securing promotions promptly by striving for the quantity of research output and the *object* of contributing to knowledge by producing quality scholarly publications. Secondary contradictions, on the other hand, exist between an activity system's constitutive components, for example, when institutional *rules* encouraging a product-oriented approach to scholarly publication undermine the *subject*'s process-oriented *object* of developing himself/herself into a well-rounded clinician-researcher or the desired *outcome* of producing new scientific knowledge. Notably, primary contradictions manifest themselves in secondary contradictions (Roth & Lee, 2007). Importantly, contradictions are "the principle of [an activity's] self-movement and … the form in which the development is cast" (Ilyenkov, 1977, p. 330). Therefore, an analysis of contradictions in an activity system is critical to an understanding of its developmental trajectory. Because activity systems evolve and develop through the resolution of contradictions, this framework also offers a means of identifying potential tensions and learning opportunities by examining the dynamic relationship between the difficulties faced by doctors and the strategies that they deploy to address those difficulties.

Informed by Activity Theory, the study set out to answer three research questions:

1. What challenges do Chinese medical doctors encounter in scholarly publishing in English?

2. What are the strategies they develop and deploy to address those challenges?

3. How do these challenges and strategies mold their scholarly publishing practices?

2. Method

This study employed a holistic multiple-case study design (Yin, 2018) to examine how two Chinese medical doctors engaged in scholarly publishing in their professional context. This design allowed us to conduct an in-depth investigation into individual cases and understand a complex phenomenon in a real-life context because case-study research is equipped to address exploratory research questions of "what", "how" and "why", and is the preferred methodology when the researcher has little control over the events to be examined (Yin, 2018). Furthermore, given the complexity and multidimensionality of our research problem, the multiple-case design would facilitate a contextualized understanding of Chinese medical doctors' publishing practices and offer cross-case corroboration (Duff, 2008; Yin, 2018). Moreover, it was necessary for our exploratory study to select cases from the same context so as not to "prematurely rule out particular variables or factors" (Duff, 2008, p. 119).

2.1. Research site and participants

The research site chosen for this study was a top-tier hospital (Y Hospital) affiliated with the Medical School of a top research-intensive university (X University) in western China. The medical school offers associate, baccalaureate, master's, and doctoral programs. In addition to clinical duties and research work, the medical doctors at Y Hospital are also required to undertake teaching and supervision. Notably, according to the Nature Index 2020, X University is among the academic institutions that made fast increases in their research productivity between 2015 and 2020. To enhance its competitiveness for national research grants and awards and boost its rankings at inter/national levels, Y Hospital started to include research output (especially SCI-indexed papers) among job responsibilities and rolled out a publication policy around 2010. In the updated version of the policy that was in effect at the time of our study, SCI-indexed English papers carry more weight than Chinese ones do, especially when it comes to promotions and awards, and can catapult hopefuls on the promotion fast track.

Two medical doctors at the focal hospital were selected as participants in this study for three reasons. First, the hospital is renowned for its high rankings in various national leagues of clinical capability and research output. Second, although the SCI-indexed papers produced by its staff outnumber those emanating from other Chinese hospitals, its ESI for the category of Clinical Medicine suggests that its research output does not have much international impact. The issue was highlighted in a recent document circulated by Y Hospital: "The quantity of our SCI-indexed papers is continuing to increase, but the quality of these papers has not much improved". Third, unlike Chinese scholars in other fields whose scholarly publishing has received considerable attention (e.g., Li & Flowerdew, 2007), much less research has focused on Chinese medical doctors. We employed a purposeful sampling strategy, namely criterion sampling, to select the participants for this study. The sampling criteria include: (1) being junior doctors, (2) having experience of publishing in English, and (3) having varying success in their English scholarly publishing. The two medical doctors at Y Hospital, Yang and Pang (pseudonyms), were selected due to both differences and similarities in their English-medium scholarly publishing experience.

Yang was recommended by our contact person (also a medical doctor) at Y Hospital for having published many SCI-indexed articles in English. He was enrolled in an undergraduate-postgraduate-doctoral integrated program at the Medical School of X University in 2008 and graduated with a doctoral degree in 2016. He then started working as a post-doctoral fellow in his doctoral supervisor's team at Y Hospital and finished his post-doctoral research in 2021. At the same time, he was undertaking clinician responsibilities at Y Hospital and was undergoing a clinical training program. Yang did not have any overseas experience. At the time of this study, he had been studying and working at X University and its affiliated Y Hospital for almost 13 years. His good number of English-medium publications notwithstanding, he confided that the quality of his SCI-indexed papers was not high, as indicated by the relatively low impact factors of the journals where his papers appeared and the unsatisfactory language quality of these papers. To secure a promotion, he still needed to publish papers in high-ranking international journals.

Pang was enrolled in an undergraduate-postgraduate integrated program in the Medical School of X University in 2003 and graduated with a master's degree in 2010. In the next three years, he worked at a hospital affiliated with a provincial university. In 2013, he left this job to study in a doctoral program

at a top medical school affiliated with P University, a leading research-intensive university in mainland China, and graduated with a doctoral degree in 2016. He was then recruited by Y Hospital and started working there. Pang later stayed at a medical school in USA as a visiting scholar for three months. Although he published papers in prestigious SCI-indexed journals before he joined Y Hospital, Pang reported that he was struggling with writing papers in English, due to his inadequate English proficiency and heavy workload at Y Hospital. As revealed by our findings in the following sections, such personal and situational factors prevented Pang from pursuing his aspirations to publish research papers in high-quality SCI-indexed journals. He confided that he was not willing to play the numbers game – it was the quality of scholarly publications, not the quantity, that mattered to him. Consequently, Pang lamented that the number of academic papers published during his employment at Y Hospital was far from enough to secure him a promotion to associate professorship.

Yang and Pang were both in their thirties and had similar academic backgrounds and learning experience. Both reported that they had received little training in either academic writing or scholarly publishing. As they were recruited by Y Hospital in the same year, they were under similar pressure to publish and meet the hospital's publication requirements for a promotion to associate professor/deputy chief physician. Table 1 summarizes the two doctors' publication profiles[1].

Name	Sex	Age	Start date	Degree	Professional/ Academic rank	No. of papers before work		No. of papers during work		Manuscripts in progress	
						Chinese	English	Chinese	English	Chinese	English
Pang	M	30s	2016	PhD	Attending physician/ Lecturer	3	4	2	2	0	8[2]
Yang	M	30s	2016	PhD	Attending physician/ Lecturer	0	3	0	16	0	2

Table 1. Participants' publication profile before and during employment at Y Hospital.

2.2. Data collection and analysis

Data collection was conducted in strict accordance with the Institutional Review Board approval of our study. We collected several types of data to achieve data triangulation and enhance the trustworthiness of our findings (Lincoln & Guba, 1985). The collected data comprised: (1) institutional policy documents, (2) the two doctors' drafts, together with related artifacts (e.g., policy documents, editors' letters, and reviewers' reports), and (3) in-

depth, semi-structured interviews with the doctors centering around their manuscripts, their perspectives on and interpretations of selected reviewer comments, and their descriptions of the revisions made by themselves, their colleagues, or language professionals whose services they had solicited. The interviews were the main data source for our study. Information collected in these interviews included their L1 and L2 writing experiences, their perceived skills or lack thereof, their attitudes towards and perceptions of scholarly publishing and publication policy, publication histories, their motives and goals for scholarly publishing, and any involvement of others in their writing processes. Three interviews were held with each of the two doctors, and all the interviews were undertaken by the first author. The interviews were conducted in Chinese, lasted between 1 and 2 hours, were audio-recorded, and later transcribed for subsequent analysis.

Following Yagamata-Lynch's (2010) analytical approach, we conducted a thematic analysis and an activity systems analysis. We followed the guidelines of constructivist grounded theory (Charmaz, 2017) in coding our data. The data coding comprised two phases: an initial coding phase followed by a focused, selective coding phase. In the initial coding phase, we examined the data carefully and iteratively to become thoroughly familiar with the data; we tried to both remain open to, and stay close to, our data by doing line-by-line coding and, wherever possible, using in vivo codes, namely the doctors' own words as codes. We then moved on to focused coding to decide which of the initial codes made the most analytic sense to capture our data incisively and comprehensively in our emerging analysis. This inductive and data-driven approach to coding prevented the imposition of our prior theory on our data. We then constructed themes to capture the patterns indexed by our focused codes, reviewed and defined the themes to "ensure that the themes work well in relation to the coded data, the dataset, and the research question" (Terry et al., 2017, p. 29).

In conducting the activity systems analysis (Yamagata-Lynch, 2010), we looked across individual accounts, developed narratives to describe each doctor's experience with scholarly publishing, and identified themes related to the elements of the doctors' scholarly publishing activity system and to our sensitizing concepts, including difficulties, mediating resources, and coping strategies. We then examined the relationships between the activity system's components to determine contradictions and tensions in the system and identified the ways in which the doctors reduced or resolved these contradictions and tensions.

3. Findings

While the two doctors differed in their scholarly publishing experience, our cross-case analysis generated two common themes: 1) lack of grounding in scholarly publishing, and 2) coping strategies as efforts to resolve contradictions within the scholarly publishing activity system.

3.1. Lack of grounding in scholarly publishing

3.1.1. Inadequate language skills

Both Pang and Yang viewed their inadequate English proficiency as a significant obstacle to their scholarly publishing in English-medium journals. Pang lamented that "To us, especially medical doctors in mainland China, the English language is REALLY a very big obstacle" (Interview, 7 Feb 2021).

His account of drafting English manuscripts captured the stumbling process and the language problems he had with English scholarly writing:

> It was like my mind was in chaos. I cannot figure out the logic in the English language. I feel lost in the meaning I am trying to make. Now if you ask me to write up my manuscripts in English, I just do not know how to organize my language (Interview, 18 April 2021).

He shared his specific language difficulties in scholarly writing, such as "poor vocabulary and grammar knowledge" (Interview, 18 April 2021), and admitted that nearly all his manuscripts had language problems, as evidenced by some reviewers' blunt comments on the unintelligibility of his writing. Much to his frustration, "s/he [the reviewer] simply commented that s/he could not understand your English" (Interview, 14 March 2021). Due to his inadequate language proficiency, Pang felt that "English academic writing was a very time-consuming process" (Interview, 7 Feb 2021).

Likewise, Yang confided that "language is a big problem for me when writing up English manuscripts" (Interview, 14 March 2021):

> I think I'm not equipped with the capacity to think in English. In most cases, I have to do the thinking in Chinese first and then translate it into English (Interview, 14 March 2021).

Yang mentioned his difficulties with metadiscourse markers (e.g., hedges and boosters) to support and construct his argument.

> When I got some evidence that was not particularly strong, I may have used words indicating a higher evidential value than the evidence warranted (Interview, 14 March 2021).

Yang's language difficulties stemmed partly from his restricted store of English phrases and sentence structures and his practice of "borrowing" the needed vocabulary and sentence structures from published articles:

> If you ask me to write up a manuscript on COVID-19, I don't think I can do a good job because there are not so many published journal articles from which I can learn the phrases and sentence patterns. It can be a great challenge to me (Interview, 14 March 2021).

He explained that his inadequate command of English impeded an in-depth discussion on central issues in his manuscripts. Despite these language difficulties, Yang said that his manuscripts were rarely rejected only because of language-related issues. However, he did acknowledge that nearly all his manuscripts had some spelling and grammatical errors identified by journal editors and reviewers.

The language difficulties presented above concern not only sophisticated language features such as metadiscourse but also basic usages of lexicon and grammar. These problems highlight the doctors' lack of adequate English language skills to meet the high linguistic demands of scholarly writing.

3.1.2. Lack of genre knowledge

Another difficulty perceived by the doctors was their lack of explicit genre knowledge. While they had some implicit genre knowledge as manifested in their references to the "logic in writing", both Pang and Yang acknowledged their struggles with different types of writing (i.e., genres or sub-genres) because their manuscripts reported either basic or clinical research. They explained that their basic research was mainly based on biomedical experiments conducted in the laboratories, whereas their clinical research consisted of patient-oriented retrospective and prospective studies (Rubio et al., 2010). Both agreed that conducting and reporting basic research was more challenging due to their insufficient training in such research and scholarly writing during their medical school days. It is important to note that the two doctors also reported that they found it quite challenging to write up clinical research papers.

Although both Yang and Pang were familiar with the components of different types of research articles (e.g., introduction, method, discussion), their perceived difficulties revealed their lack of sophisticated genre knowledge to achieve the desired rhetorical effects in their writing. When it comes to the reporting of clinical research, Pang reported that "my specific difficulty in writing up the Results section has to do with presenting the results in a coherent way"; he found it difficult to accentuate the most relevant details and findings of his studies (Interview, 14 March 2021). Although he did not report difficulty with the Discussion section, Pang found the comments from journal editors and reviewers instructive:

> They [editors and reviewers] often pointed out that in the Discussion section, my explanation of a certain phenomenon was not well supported by my results. I think this is a common problem among Chinese scholars, including myself. Chinese scholars tend to discuss stuff that doesn't come from their own research. I think Chinese scholars infuse too much of their subjectivity in their discussion. It's like that your discussion of the results in your manuscripts is based on your own subjective opinions rather than your data (Interview, 14 March 2021).

Of all the sections, Yang found it easier to write the Methods and Results sections but admitted that the Discussion section was a headache:

> The difficult task for me is how to discuss what my results mean, instead of merely summarizing and repeating them and the related conclusions, and what contributions they can make to clinical practice (Interview, 14 March 2021).

When reflecting on his experience of publishing his first basic research paper, Yang said:

> I was not sure what the logic should be. I just did not know what points I should write about and in which parts I should include these points (Interview, 18 April 2021).

Having published both clinical and basic research, Pang concurred with Yang that "it is more difficult for doctors to write up a manuscript on basic research", especially when it comes to reporting experimental findings in basic research (Interview, 18 April 2021).

The above accounts both demonstrated some genre awareness in the two doctors and attested to their lack of nuanced genre knowledge and familiarity with the discourse conventions of their target academic communities (Martín et al., 2014; Muresan & Pérez-Llantada, 2014). Their candid sharing revealed that they were cognizant of the rhetorical and social functions of different genres but found it challenging to integrate these two dimensions of genre knowledge in a particular research paper (Driscoll et al., 2020; Tardy, 2009). Despite their keen sense of the need to highlight the novel contribution of their research to disciplinary knowledge, their lack of genre expertise prevented them from doing so effectively. Their struggles with the Discussion section stemmed largely from their unfamiliarity with the discourse conventions of the international disciplinary community whose membership they were seeking (Negretti & Kuteeva, 2011). The greater difficulties they had with basic research seemed to have also resulted from their unfamiliarity with the norms and conventions of the disciplinary genre that instantiates and embeds the epistemological assumptions underlying such research (Berkenkotter & Huckin, 2016).

3.1.3. Lack of expertise in conceiving and designing research

Another major difficulty perceived by the doctors was their lack of expertise in spotting novel research topics, developing strong research designs and achieving rigor in data collection and analysis. Both Pang and Yang admitted that their manuscripts were mostly rejected for a lack of novelty and relevance. Pang confided that "on quite a few occasions, the journal editors and reviewers directly pointed out that others have already done similar research before" (Interview, 18 April 2021).

Yang also commented:

> It is rather difficult to publish in a prestigious international journal because this means you need to find a very interesting aspect of a specific clinical practice that not so many researchers in your field have noticed (Interview, 18 April 2021).

Both doctors explained that their difficulty in coming up with novel research problems arose from their inexpertness in clinical practice/research as junior doctors. As Yang further noted, unique clinical research problems that promise novel breakthroughs can only be spotted by those doctors with an in-depth understanding of their field because of their extended engagement

in clinical practice, and it would be difficult for junior doctors to find such a niche because of their lack of such in-depth knowledge and extended clinical practice.

While they were well aware of the importance of methodological rigor and robust research design for publishing in international journals, Yang and Pang shared the methodological problems that they found Chinese medical doctors likely to have. Pang provided an unreserved account of such problems:

> The comments [from editors and reviewers] were often aimed at my research design. They pointed out that my manuscript reported a retrospective study, but I did not include an adequate number of medical records, and that my cases and samples were too few. Or they commented that my follow-up period was too short. Moreover, they also pointed out my research lacked methodological novelty (Interview, 14 March 2021).

Likewise, Yang reported the various unexpected problems he encountered when designing his first basic research study leading to an English-medium publication, and described the process as one of "twists and turns" (Interview, 18 April 2021). For instance, the reviewers directly pointed out the "weakness" in his research design:

> The lack of in vivo evidence on…expression in the rat MI model is a weakness (RC1-EMS1).

He admitted that when he obtained the results of this 2-year study, he found himself unable to interpret them. This issue was raised by the reviewers:

> In Figure..., with respect to normoxia in…, the…did not reduced…Authors should explain it. This result is not supporting the data…. (RC1-EMS1).

From an Activity Theory perspective, the various difficulties and challenges recounted by the doctors were concomitant with several primary and secondary contradictions (Engeström, 2015) in their scholarly publishing activity system. Among them were the primary contradiction between their status as junior clinician-researchers and their expected status as expert knowledge contributors (Lei & Hu, 2019), and the secondary contradiction between their expected expertise in scholarly publishing and the absence of tools concomitant to such expertise (Engeström, 2015). The doctors resorted to an array of strategies to resolve the contradictions.

3.2. Strategies for mediating and resolving structural tensions

To address the above difficulties and challenges, the doctors turned to various mediating resources, namely cultural artifacts, individuals and relationships that could be capitalized on as tools to facilitate their scholarly publishing activities. The effectiveness of these tools varied and depended on the intersection of the doctors' own publishing experience and learning history with a range of factors.

3.2.1. Addressing inadequate language skills

Both Yang and Pang reported that to compensate for their inadequate English proficiency they imitated and borrowed linguistic expressions and sentence templates from published journal articles. Another strategy frequently employed to overcome the negative impact of inadequate English language skills was drafting a manuscript in Chinese before translating it into English. When translating a manuscript into English, Pang used Baidu (an Internet search engine widely used in China) and Google to search for unfamiliar words and phrases, and Yang often used Google Translate to do the initial translation and then revised the translation, as illustrated by the extracts below:

> …most of the… is …~~are in a static state~~ quiescent fibroblast-like…responsible for maintaining…homeostasis,~~mainly secreting moderate extracellular matrix to maintain…homeostasis;~~….
>
> We therefore design ~~The purpose of the present study is to provide~~ a novel method for…(EMS2-First Draft).

As the excerpts show, Yang's revisions were not restricted to linguistic expressions and syntactical structures but also concerned the construction of authorial voice and identity by using the first-person pronoun.

Additionally, the two doctors turned to colleagues/fellow researchers (Yang), language professionals (Pang), and/or editorial services (Yang & Pang) for language support. Yang enlisted the help of members in his local community (e.g., senior colleagues in his department) to proofread and revise his manuscripts, which eliminated many of his language problems. Unlike the Chinese doctors in Li's (2013) study who reported that they rarely used editorial services, the doctors in our study put a premium on such editorial services. Both reported that their manuscripts were mostly free of language

problems after they were edited by the paid editorial services. Pang remarked that of all the mediating resources, "the editorial services are the most useful, as long as you pay the fees" (Interview, 14 March 2021). Despite his favorable experience with such services, Pang reported that "half of his manuscripts were accepted without using English editorial services" (Interview, 14 March 2021). He explained that he endeavored to tackle the language problems himself so as to develop his English competence.

Our study revealed that the EAL researchers sought support from various mediators to navigate their academic text production. Despite the perceived usefulness of these mediators, there were also some limitations. First, while Pang was very positive about the usefulness of paid English editorial services, Yang expressed some reservations about such editorial services. Yang reported that in some cases, the quality of English editorial services failed to meet his expectations because only minor revisions were made to his manuscripts. One possible reason, as Yang explained, was that he paid only for "basic editing service" due to his lack of funding as a junior doctor. He further noted that "different rates are charged for different types of editorial service" and that "if you want to have your manuscripts substantially revised and polished, it will cost a bomb" (Interview, 18 April 2021). Yang said that he would pay for editorial services only at the journal editors' requests. Furthermore, both doctors learnt from their publishing experiences that language problems were not the litmus test for the fate of their manuscripts and consequently they usually opted to solve such problems themselves (Pang) or by seeking collegial support (Yang). They would turn to editorial services when they felt that the language issues were beyond themselves/their colleagues and when they had the financial resources. They explained that while having no language problems would enhance the chance of publication, it was the quality of research (e.g., the appropriateness of the research design adopted) that would be the most important determinant of the fate of their manuscripts. Second, the effectiveness of textual mediation by language professionals depends very much on their possession of relevant disciplinary knowledge (Luo & Hyland, 2021; Willey & Tanimoto, 2015). As Pang noted, English language teachers as mediators were unlikely to deal effectively with specialist knowledge, and "their help often turned to be limited and superficial" (Interview, 14 March 2021). The limited usefulness of the textual mediation may also have reflected a mediator's reluctance to "give *pro bono* discursive support, reflecting the time and effort involved for little return to the

mediator" (Luo & Hyland, 2021, p. 14). Reflecting on his experience with various mediators, Pang concluded that "I have learned that I need to depend on myself for the revision and polishing of my manuscripts" (Interview, 14 March 2021).

3.2.2. Overcoming inadequate genre knowledge

To grapple with their lack of genre knowledge about English research papers, Yang and Pang reported that they learned "the logic of writing" from reading published journal articles. As Yang explained,

> Writing up scientific papers has some rules. If you read enough journal articles, you will just learn the "framework", and can then write up the manuscripts step by step (Interview, 14 March 2021).

To deal with the challenges in writing up his first English manuscript reporting a basic research study, Yang turned to a senior colleague for help when he could not decide how to organize his paper. Despite his endeavor to "construct the logic of scholarly writing", Yang confided that journal editors and reviewers still raised questions about the logical organization of his writing:

> Sometimes I did not know what the problems were. They [editors and reviewers] told me what and how I should write in a certain section. I made the requested revisions accordingly (Interview, 18 April 2021).

Similarly, Pang spoke highly of the journal editors' and reviewers' comments because they helped him improve his Dissuasion section greatly. In his own words, "their comments were really helpful in deepening my understanding of the results", and "it was then much easier for me to structure the discussion when I was able to think clearly about the results" (Interview, 14 March 2021). Additionally, when encountering difficulties in organizing his manuscripts, Pang mentioned that "I also referred to some books, such as *How to Write and Publish a Scientific Paper....* Following the guidance of the books, I then checked and revised my own manuscripts". He commented that "these reference books were of great help" to improve the quality of his research papers, as evidenced by the publication of those manuscripts written and revised solely by himself (Interview, 14 March 2021).

3.2.3. Tackling the lack of expertise in conceiving and designing research

To overcome their inexpertness in identifying novel research problems, developing strong research designs and making sense of their empirical results, the two doctors adopted several strategies. Although he expected his manuscripts to be rejected for a lack of novelty, Yang still submitted them to prestigious journals just to obtain the journal editors' and reviewers' comments: "The reviewers and editors sometimes raise questions about my methodology, which offers useful feedback to improve my research" (Interview, 18 April 2021). As he explained,

> The more highly ranked the journals are, the greater research expertise the editors and reviewers have. I wanted to learn from their original views about research in my field, even though I knew my manuscripts were not of a high quality (Interview, 18 April 2021).

> Their comments made me notice some research problems I had never thought of, and these research problems had the potential to yield novel findings (Interview, 14 March 2021).

For similar reasons, Pang valued the feedback from journal reviewers and editors. Despite multiple rejections of his manuscripts by top journals mainly due to their lack of novelty, he revealed that:

> I have never submitted my manuscripts to journals such as *Scientific Reports* with an expectation that they would be easily accepted …. I only nominated as my reviewers the most influential scholars in my field and corresponding authors of the papers I cited (Interview, 14 March 2021).

Pang reported that their comments enabled him to access their in-depth understanding of the existing body of knowledge and learn about the disciplinary frontiers. Pang shared the story of receiving a reviewer's recommendation of "Accepted as it is. No revision needed" after one of his manuscripts was submitted to a prestigious journal for the seventh time (Interview, 14 March 2021). He attributed this success to the helpful comments he had received from the editors and reviewers of the journals the manuscript had been submitted to. These comments greatly improved his "conceptual skills in conceiving and designing research" because they offered suggestions which made his research methods "more rigorous and better aligned with the scientific paradigm" (Interview, 14 March 2021). Although Pang benefitted greatly from such comments, he admitted that

"the more comments I received from the journal reviewers and editors, the more likely they were to reject my paper" (Interview, 14 March 2021).

Besides journal editors and reviewers, Yang learned novel research designs and methods from published journal articles and turned to his senior colleagues and fellow researchers for methodological advice to compensate for his lack of research expertise. For instance, when Yang was designing his first basic research project, he consulted a senior colleague on its research design and methodological procedure. He also used some new, sophisticated statistical tools to "enhance the validity" and "improve the quality" of his research (Interview, 18 April 2021). Instead of seeking help from members in his local disciplinary community, Pang sought advice on his research methodology from the overseas scholars that he had met during his short stint at the American university. In his own words, "it would be best if you can find native English-speaking scholars to help polish your manuscripts and provide some specialist guidance on your research" (Interview, 14 March 2021).

To alleviate his weaknesses in interpreting empirical results, Yang made strategic use of linguistic resources such as hedges in the Discussion section of his papers. When he found it difficult to interpret some results, he would write in "a relatively humble voice" (Interview, 18 April 2021). He used modal auxiliaries (e.g., *could* and *might*) to hedge his claims and modulate his confidence in them, as illustrated by the following excerpt:

> …*implying increasing…activation could constitute a promising strategy...*
>
> …*in understanding how…might regulate…were Made* (Yang, EMS1-Final Draft).

He went on to explain that "if the reviewers and editors did not question my writing in this part, it means that I was using the right tone" (Interview, 18 April 2021). Although this strategy was somewhat opportunistic, it seemed to work well for Yang.

In summary, Pang and Yang engaged with mediating artifacts (Engeström, 2015; Roth & Lee, 2007), such as published journal articles and linguistic devices, and interacted with social others (e.g., colleagues, manuscript reviewers and journal editors) to address their insufficient research skills. These coping strategies sustained their scholarly publishing endeavors and helped them (re)construct their scholarly identities (Russell, 1997).

4. Discussion and conclusion

In this study, we have examined, through the conceptual lens of Activity Theory, the challenges faced by two Chinese medical doctors in their English-medium publishing endeavors and the various strategies employed by them to tackle the challenges. This theoretical perspective illuminates the root causes of the challenges and the nature of the strategies. These challenges and strategies emanated from several contradictions, or structural tensions, inherent in the doctors' scholarly publishing activity system (Engeström, 2015). Some of these contradictions centered on Y hospital's publication policy. Chief among them was the secondary contradiction between the policy as rules of the game for the subjects (i.e., the doctors) and the institutional as well as the subjects' object of engaging in research. The rules represented a product-oriented approach that valorized quantities (e.g., numbers of publications and impact factors) and drove the doctors to publish SCI-indexed articles (Li, 2014b). Such an approach was at tension with the subjects' object of developing themselves into well-rounded clinician-researchers producing new scientific knowledge and the hospital's object of enhancing its clinical and research capacity, which called for a more process-oriented approach. Another secondary contradiction was the structural tension between the institutional publication policy as rules and the mediating resources needed to comply with the rules. Y Hospital directed the doctors' attention to the expected outcome (i.e., publications in high-impact SCI-indexed journals) but did not provide the tools and signs that they would need to achieve the outcome. This contradiction led to the multiple challenges faced by our participants and EAL researchers in previous studies (Ferguson et al., 2011; Lei & Hu, 2019; Phillipson, 2009) and necessitated the coping strategies adopted by the two doctors.

Related to the structural tensions discussed above was a primary contradiction within the subjects. The two doctors were junior clinician-researchers in the process of developing their clinical skills and scholarly publishing expertise on the one hand and were institutionally expected to be expert contributors of scientific knowledge on the other (Lei & Hu, 2019). This primary contradiction residing in their dual status played out in the secondary contradiction between their institutionally shaped object of scholarly publishing and the lack of grounding in research and scholarly publishing needed to achieve the object. To resolve these contradictions, the two doctors leveraged various mediating resources available in their community ranging from cultural artifacts (i.e., published

articles, sophisticated statistical tools, and linguistic resources) to significant social others (i.e., journal editors, manuscript reviewers, colleagues, fellow academics, and paid editorial services). Notably, many of these coping strategies created valuable learning opportunities for the doctors and contributed to bridging the gap between their dual status. Taken together, these findings indicate that scholarly publishing is an artifact-mediated, socially distributed, and historically embedded activity (Lei & Hu, 2019).

According to Yamagata-Lynch (2010), Activity Theory has been criticized for focusing on observable activities but ignoring "individual cognitive development and its relationship with human activity, cognition, psychology, and cultural settings" (p. 28). Our study has overcome this potential drawback and yielded a contextualized understanding of the structural tensions in the activity system where learning affordances for the doctors emerged (Engeström, 2001). Our findings have shown that the contradictions not only created difficulties and impediments but were also potential "sources of change and development" (Engeström, 2015, p. 137). Drawing on Engeström's (2015) theorizing, the activity system analysis conducted in our study has helped to "render explicit the more tacit elements of an action" (Hashim & Jones, 2007, p. 7). For example, our study has revealed that the doctors were relatively disadvantaged or advantaged in relation to specific mediating tools and prevailing rules, and experienced different levels of development and learning, depending on how they responded to the structural tensions in their scholarly publishing activity systems (Engeström, 2015). Furthermore, our study has shown that individuals and relationships could be drawn on as resources to facilitate the doctors' scholarly publishing activities (Clouder et al., 2020), corroborating the finding of previous studies (Canagarajah, 2018; Lillis & Curry, 2010) that EAL researchers' scholarly publishing is not merely the enactment of individual competence but a networked activity and, consequently, goes beyond discursive issues to include the strategic mobilization of relevant social and material resources.

Thinking through our findings with Activity Theory has also helped to reveal that activity systems are experienced differently by individuals, though "the general structural characteristics" (Engeström, 2001, p.140) remain stable. Individuals inevitably embed an activity in their history (Engeström, 2015), and such historical embedding will shape their attitudes towards rules, tools, and the way these are deployed (e.g., Clouder et al., 2020). For example, the

doctors' previous experiences shaped the tools available (e.g., resources of textual mediation) and how they were utilized. This individualism was charged with a sense of personal agency and allowed the doctors to develop their own strategies to deal with the institutionally imposed rules for scholarly publishing. For instance, Yang focused strategically on increasing the number of his English-medium papers by publishing in SCI-indexed but relatively low-impact journals, whereas Pang put a premium on the quality rather than quantity of his scholarly publications and targeted prestigious journals.

Our study has revealed the strenuous challenges faced by early-career, dual-status practitioners who need to conduct multidisciplinary translational research that intersects with basic and clinical science (Rubio et al., 2010). It has also raised questions about the rationality of implementing assessment-oriented institutional policies without providing the resources and institutional support needed to achieve the policy goals. The findings of this study have several implications. First, although structural tensions in the scholarly publishing activity system bring along rich learning opportunities, our findings indicate that these contradictions cannot be fully resolved by the subjects' personal agency alone. This points to a need for institutional policies and initiatives to support doctors aspiring for international publication. As attested to by our participants' perceived difficulties, these policies and initiatives should make process-oriented and capacity-building support available to enhance their development as clinician-researchers. Second, institutional support can take the form of in-service professional development programs designed to enhance a wide range of discursive competencies and research skills (Smirnova et al., 2021). For instance, skills in conceiving and designing research for international publication and explicit knowledge of different academic genres (e.g., basic research and clinical research articles) are desiderata to include in these programs. The programs should also introduce the various mediating resources that junior clinician-researchers can draw on and effective ways or successful examples of tapping on these resources. Third, since scholarly publishing is a social practice (Lei & Hu, 2019; Luo & Hyland, 2019) and because members of one's community and their relationships can be valuable mediating resources, institutions could scaffold their staff's publishing endeavors by instituting mechanisms that help them form peer groups. Such peer groups would not only allow their members to leverage socially distributed cognition (Cole & Engeström, 1993) and learn from each other's expertise but could also

facilitate the effective division of labor (Engeström, 2015) to enhance research productivity.

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NOTES

[1] Scholarly publications were counted only when the participants were the first and/or corresponding author. All English publications were SCI-indexed articles.

[2] The number includes manuscripts rejected before.

Appendix: The interview guide

1. Could you please share with me your experiences of learning to write in English?

2. Could you please describe your usual processes of writing in English?

3. What are your main problems with English academic writing? How do you cope with them?

4. How would you rate your English-language competence?

5. What difficulties do you think Chinese scholars may experience in writing English manuscripts? Why?

6. How have you dealt with the difficulties? Who/What kind of resources have you turned to when you attempted to deal with the difficulties? How useful do you find each kind of resources? Was any of your earlier experiences helpful? In what ways?

7. Do you think doing research is important for medical doctors? Why (not)?

8. Are you interested in publishing your research? Do you think scholarly publishing is important for medical doctors? Why (not)?

9. Do you like writing and publishing your research in English? Why (not)?