

對話世界頂尖學者

Transformative Research in AI and Media: Insights and Innovations

Discussants: Dr. S. Shyam Sundar and Dr. Yuhmiin Chang¹

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Dr. S. Shyam Sundar Dr. Yuhmiin Chang

Abstract

In this enlightening dialogue, Dr. S. Shyam Sundar and Dr. Yuhmiin Chang delve into three major topics: Dr. Sundar's influential research journey, the transformative role of artificial intelligence (AI) in research, and strategies for successful publication in top-tier journals. Dr. Sundar recounts his development of groundbreaking models, such as the MAIN, TIME, and HAII-TIME models, which have shaped the study of communication

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technologies. He explains how AI-driven media platforms like social networking sites and Netflix offer new affordances, fundamentally changing user experiences and necessitating the adaptation of existing theories. The discussion also highlights the revolution AI brings to data retrieval and analysis in the social sciences, with machine learning aiding research tasks that previously required extensive human labor. Dr. Sundar underscores the need for social scientists to become proficient with AI tools, as these advancements are reshaping research methodologies and theoretical frameworks. Additionally, he shares valuable insights into managing a prolific research career and offers practical tips for securing publication in top-tier journals. Emphasizing methodological rigor, theoretical strength, and the importance of open science principles, Dr. Sundar provides guidance on navigating the evolving landscape of academic publishing to ensure research transparency and credibility.

Introduction to Dr. S. Shyam Sundar

Dr. S. Shyam Sundar is the founder of the Media Effects Research Laboratory and Director of the Center for Socially Responsible Artificial Intelligence at Penn State. His theoretical contributions include several original models on the social and psychological consequences of communication technology, such as the MAIN Model, Uses and Gratifications 2.0, Interactivity Effects Model, and the Theory of Interactive Media Effects (TIME). His empirical work investigates the social and psychological effects of human-computer interaction (HCI) and computer-mediated communication (CMC), focusing on interactivity, navigability, multi-modality, and agency in digital media interfaces.

Dr. Sundar's research, supported by the NSF, MacArthur Foundation, Meta, and many others, explores fake news, chatbots, smart speakers, AI algorithms, online privacy, social media effects, and the use of media technologies for promoting healthy behaviors. He was among the first to publish refereed research on internet-based media effects in the *Journal of Communication*. His work also appears in leading journals such as *Communication Research*, *Media Psychology*, and *Human Computer Interaction*.

A frequently cited expert, Dr. Sundar has testified before US Congress and delivered talks worldwide. He has served on the editorial boards of over 20 journals and edited the Handbook on the Psychology of Communication Technology. His accolades include being named an Evan Pugh Professor, the highest honor Penn State bestows upon a faculty member. He is also recipient of the Frederick Williams Prize from the International Communication Association (ICA) for his contribution to the study of technology, and the Deutschmann award for research excellence from the Association for Education in Journalism and Mass Communication (AEJMC). Dr. Sundar is also a Fellow of ICA and serves as chair of its Publications Committee. His hobbies include hosting the radio show Jazz Spectrum on WKPS.

SS: S. Shyam Sundar

YC: Yuhmiin Chang

YC : In 2008, you introduced the MAIN model, followed by the TIME model in 2015, and the HAI-TIME model in 2020. These models have significantly influenced numerous studies. Could you share insights into your research journey, focusing on the processes and experiences that guided you to develop these groundbreaking models?

SS : Early in my career, I realized the need for frameworks to study the psychology of technology. Traditional technology scholars focused on adoption, influenced by the Diffusion of Innovation theory, but I was interested in how people interact psychologically with technology. I began by creating typologies, such as distinguishing between traditional experts and computers as sources, which uncovered distinct psychological responses. At Stanford, working with Cliff Nass on CASA (Computers Are Social Actors) theory, I explored why people treat computers socially. This led to the development of my early typologies, such as computer as source versus computer as medium (CAS vs. CAM). These typologies laid the groundwork for my subsequent models. My research evolved to address how users interact with new media, which demanded more active engagement than traditional media. This shift led to an intense consideration of the features and affordances of media, such as modality, agency, interactivity, and navigability, thus laying the foundation for the MAIN model that hypothesized the effects of interface cues on user perceptions. The later theory, TIME, extended the MAIN model, by claiming that interactive media effects stem not only from cue-based effects but also from actions undertaken by users.

Mentors like Amos Tversky, with his work on cognitive heuristics, and Dolf Zillmann, with Exemplification Theory, influenced my approach. My theoretical frameworks evolved from typologies to models and comprehensive theories over two decades, reflecting the diverse psychological effects of digital media interactions. This journey was driven by the need to understand and classify the unique affordances and effects of technology on user behavior.

YC : Besides your strong educational background and inspiring mentors, what else contributed to your success?

SS : It began with a need to start from scratch, given the lack of existing frameworks. My mentors trained me to think theoretically. In technology research, people often chase after new technologies, focusing on objects rather than concepts. My training emphasized a variable-centered approach, as highlighted by Cliff Nass in his work differentiating between object-centered and variable-centered research. Traditional models like diffusion of innovation and technology acceptance are object-oriented. While they explain technology adoption, they don't predict effects of future technologies. I aimed to conceptualize variables such as interactivity and modality, applying them to technologies that might emerge years later.

In my dissertation, I proposed the concept of “computer as a source,” anticipating future capabilities. Despite skepticism in 1995, I categorized online sources into users (customization), other people (collaborative filtering), traditional journalistic sources, and computers as sources (generative AI). This futurist perspective faced resistance from reviewers who found the idea unrealistic at the time.

The challenge was to think ahead and develop concepts that would remain relevant regardless of the specific technology. This approach allowed me to create adaptable theoretical models that could address the evolving landscape of media technology. The key is to think beyond current technologies, focusing on underlying variables and their interactions. Theoretical models based on affordances, like customization for example, continue to remain applicable as new technologies emerge even though some of the earlier examples of customizable technology may no longer be on the market. Rigorous conceptualization is important for forward-thinking ideas to make a difference.

YC : Could you discuss the challenges you faced during this journey and the strategies you employed to overcome them?

SS : In some ways, I was lucky because technology evolved. I faced many rejections in the late 1990s. Then, around the turn of the century, Yahoo and Google started curating news, making my work more relevant. One reviewer noted its timeliness with emerging technologies. I had to update my introduction to reflect current trends, even though my research was from five years earlier. My dissertation, defended in 1995, was only published in 2001.

Being ahead of the curve is seen as pioneering but is also challenging. Current media trends dominate reviewers' perspectives, so it's difficult to get futuristic ideas accepted. Luckily, my work eventually gained recognition and is still referenced today, like in discussions about ChatGPT as an autonomous source, an idea I proposed 20 years ago.

I was fortunate to be at the right place at the right time, creating models when there were none. Success in academia often depends on timing, perseverance, and sometimes a bit of luck. I'm grateful that my models are used widely by other researchers.

YC : **With the rapid advancement of AI, how are existing theories and methodologies evolving to keep up with AI's impact on media and social sciences, and what new approaches are emerging to assess the effectiveness of AI?**

SS : AI is a new force in our midst, operating at different levels. We now have AI-driven media, such as social networking sites and Netflix, where AI personalizes our experiences. These interfaces are outfitted with AI in the background, offering new affordances like personalization and automation. AI brings new manifestations on the interface and new affordances for people to act upon. Studying media in terms of affordances and variables related to affordances is one way to adapt existing theories.

AI has also revolutionized social sciences as a tool for data retrieval and analysis. With the networked nature of online media, we now have access to vast amounts of data, often reaching millions or even trillions of entries. To make sense of this data, we need powerful tools, especially machine learning, which are now

deployed for tasks like content analysis. Machines can learn from hand-coded labels and classify large datasets, a task that previously required human labor. For example, we can automatically classify millions of stories as political or non-political based on a training set of labeled stories.

Social scientists now need to be knowledgeable about machine learning to deploy these tools. New techniques like topic modeling, which involves clustering topics from large datasets, are emerging. Our brains are too small to cluster millions of data points, but AI can. These methods rely on AI's capabilities in pattern recognition and natural language processing.

So, newer social scientists, not just in communication but across all fields, need to be comfortable with AI tools. These advancements are fundamentally changing how we approach research methodologies and theoretical frameworks to understand and assess the effectiveness of AI.

YC : Given the rise of AI and computational tools in social sciences, what do you think about the integration of these tools with traditional theoretical frameworks? How can experienced scholars and young researchers collaborate effectively in this new landscape?

SS : I think even people like us who are old can learn enough to make sense of these tools. We may not want to dive into actual coding with Python, but the intuition behind these tools is fairly easy to grasp. With our training and experience, we can understand them in a sophisticated way. A lot of students today learn all the technical skills but lack a conceptual or theoretical framework to analyze their data. They have the tools but often miss the bigger picture.

In computational social sciences, there's a heavy emphasis on the tools and methods used to handle data. While it's impressive how they retrieve and reduce data, these studies sometimes fail to answer deeper conceptual or theoretical questions. The findings tend to be simplistic and not very profound.

There needs to be a marriage between experienced scholars and younger

ones who are proficient with tools like Python and R. The former should drive the conceptual and theoretical bus, while the latter handle the data-intensive parts of the work. This collaboration is crucial, especially now that fields like computational social science are growing rapidly.

Old-timers can still engage meaningfully with these tools through their students and labs. Understanding the place of these tools in the larger theoretical and conceptual landscape is essential. Scientific enterprise is often driven by the tools we have. For example, astronomers made significant strides once they had powerful telescopes. These new AI tools are our telescopes, enabling us to test exciting possibilities.

We can now capture everything a person watches and analyze their reactions in ways we only dreamed of in the early days of media effects research. These tools are bringing us closer to the possibilities we envisioned, making this an exciting time for our field.

YC : Your prolific publication record, with numerous papers released annually, is truly remarkable. Managing such a high level of scholarly output is no small feat. Could you please share the strategies you use for time and lab management that enable you to achieve this impressive productivity?

SS : I would attribute it to having a lab group. The lab group is the most organized way forward for doing research. I used to advise using the apprentice model, following the older Germanic tradition. But as I got more advisees, that became less efficient because I found myself repeating the same advice to every student.

I switched to the lab group approach, which I learned from Cliff Nass and the field of computer science and human-computer interaction. Lab groups are a collective effort. We meet every week, and students get to talk about their projects at different stages, from hypothesis development to data analysis. This way, everyone gets to see other people's research, provide feedback, and listen to my advice, which they can then apply to their own work. It has a multiplier effect, leading to more publications.

Much of the work is carried out by the grad students. I provide the theoretical framework and help hone the research question. Once the track is set, the students run with it, and we regroup during the writing phase. This collaborative process and the division of labor make us more efficient. There's also a sense of accountability. Students present their work to the group, and this public accountability helps keep everyone on track.

Deadlines for conferences also push us to work harder. Even if a paper doesn't get accepted, it's done and can be revised for future submission. The group size varies, usually around 12 people, including PhD, master's, and undergraduate students, plus postdocs and other participants. Meetings are about two hours, and at the end of each meeting, we set the agenda for the next week. This structured approach, combined with a sense of community, enhances productivity and research quality.

YC : Having served as editor-in-chief and on editorial boards for prestigious journals, you have extensive experience in academic publishing. What key factors are essential for successfully publishing in top-tier journals?

SS : There are numerous factors that come into play for a successful publication. I agree that it is challenging, especially because we often face rejections when submitting papers. It's not solely about being the best. Some individuals consistently publish in top-tier journals, but there is no definitive formula for success. It involves a combination of rigor, theoretical strength, methodological precision, and effective marketing in terms of framing the research and highlighting its novelty and significance.

The research question must be presented persuasively, requiring a touch of creativity. Methodological rigor, theoretical strength, and creative expression are key ingredients. Demonstrating how the piece advances the field requires multiple approaches. For instance, conducting a study in Taiwan may be novel, but international journals may not see it as significant. Making the case for novelty is

crucial. Typically, the argument is that nobody has done this before, or there is a gap in the literature. However, simply stating that something hasn't been done before doesn't imply value. It's essential to distinguish why it's worth pursuing. Starting an introduction with "People have done x, but nobody has done y, so we are doing it" is not persuasive. Instead, explain why the research is worth undertaking first, then review the literature to show the gap.

In terms of methodological rigor, top-tier journals look for replication to demonstrate that findings are not a fluke. Two-study papers are often considered better than one-study papers. Replication shows that results generalize beyond a single study. Study two should address limitations and open questions from study one, leading to a more developed and convincing piece. This progression within the research piece will be convincing to reviewers as it demonstrates generalizability and the replication of findings. Modern efficiencies, like using micro workers, offer the opportunity to run multiple studies and facilitate replication. The replication crisis in various disciplines highlights the importance of reproducing results to enhance confidence in the phenomenon being reported.

YC : **How did you effectively convince editors and reviewers of the importance and value of your studies to secure their publication?**

SS : In many ways, the scholarly enterprise rewards orthodoxy. You know, there are systems and frameworks in place, and if you work within them, you're more likely to get published because you're following the rules. But you may not have the kind of deep impact if you just follow the rules. Flagship journals often ask for significant contributions beyond what we know, and that's where it gets tricky. Is your work truly a novel contribution, or does it just seem like a crazy idea? This is where it becomes a bit of a subjective evaluation.

To convince editors and reviewers, you need to clearly explain how your study addresses a gap in the literature and highlight what's new and innovative about your work. It's essential to provide strong evidence through robust data and rigorous

methodology. You have to make a compelling case for why your work is potentially very interesting and hope that the reviewers see its value.

Rejection is common. It's crucial to be driven and very sure of yourself to move to the next journal quickly if needed. Remember, it's only two or three people's opinions, and others might see it your way. You need to address their feedback strategically and resubmit. It's an iterative process, responding to the field and reviewers' perspectives. Patience and adaptability are key.

Junior scholars often face time pressure to publish quickly, making theoretical work harder to pursue. Balancing empirical and theoretical research has been my approach. Empirical findings can inform theory development, and vice versa. This allows continuous research output and theoretical advancements. Theorizing involves a combination of inductive and deductive approaches, data, ideas, analysis, and creativity. It's rare because it requires handling uncertainties and criticism from different scholarly camps.

Rejection is part of the process. We get rejected all the time. Pushing the envelope means facing initial rejections, but persistence pays off. Aim for the top journals, learn from feedback, and don't take rejections too seriously. They are opportunities to refine and improve your work.

YC : Before we conclude, is there anything else you'd like to share or any final thoughts you wish to impart?

SS : I can discuss these issues further. They are all important, but one topic that has become increasingly relevant in our field is open science. It's crucial to reiterate the principles of open science that students and the next generation should follow. Register your hypothesis so you have a permanent record of what you are projecting before analyzing the data. This approach improves the quality of our research and its external credibility. Often, researchers selectively report only significant data, leaving out everything else. This can create the impression that they only pursued certain aspects when in fact they cherry-picked the data. Researchers often collect

data with implicit hypotheses in mind but may not articulate them officially, making it difficult to determine whether the hypothesis came before or after seeing the data. This practice, once common, is now frowned upon in top-tier journals.

Taiwanese scholars should adopt the latest open science practices. This includes depositing data publicly, pre-registering hypotheses before data collection, and applying other open science principles to research. When submitting a cover letter to a journal editor, it is a good idea to indicate that the project is pre-registered and follows open science principles. Ideally, the project should be registered with a recognized authority, such as the Open Science Framework.

By following these open science principles, we can enhance the transparency and reliability of our research. This is increasingly important as the field moves towards greater accountability and reproducibility. Adopting these practices will not only improve individual research projects but also contribute to the overall credibility and progress of the scientific community.

對話世界頂尖學者

人工智慧與媒體的變革性研究：洞察與創新 Transformative Research in AI and Media: Insights and Innovations

Discussants: Dr. S. Shyam Sundar、張郁敏 教授¹

Editor: 張郁敏 教授

Time: January 1, 2025



Dr. S. Shyam Sundar Dr. Yuhmiin Chang

摘要

在本期對話中，Dr. S. Shyam Sundar 探討了三個重要的議題：他如何展開其具有深遠影響的研究旅程、人工智慧（AI）在研究中的革新性角色，以及頂尖學術期刊成功發表論文的策略。Dr. S. Shyam Sundar 回顧了他創立的多個重要理論模型，如 MAIN 模型（Modality, Agency, Interactivity, and Navigability Model，MAIN Model）、TIME 模型（Theory of interactive media effects，TIME Model）、和 HAI-

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TIME 模型 (Human-AI Interaction from the perspective of the Theory of Interactive Media Effects Model, HAI-TIME Model)，這些模型對於傳播科技的研究產生了深遠的影響。他解釋 AI 驅動的媒體平台，如社群網路網站和 Netflix，如何因為新的能供性 (affordance)，徹底改變使用者經驗，並促使現有理論進行相應調整。討論中還強調了 AI 在社會科學領域的革命性影響，尤其是在資料檢索與分析方面，機器學習技術已取代了許多過去需要大量人力的研究工作。Dr. S. Shyam Sundar 特別強調，社會科學家應具備使用 AI 工具的能力，因為這些技術正在重構研究方法論和理論基礎。此外，他還分享了如何在繁忙的研究生涯中保持卓越的寶貴經驗，並提供了關於如何在頂尖期刊發表論文的實用策略。他強調方法論的嚴謹性、理論的扎實性以及開放科學原則的重要性，為學者應對學術出版變革、確保研究透明度與可信度提供了關鍵指引。

Dr. S. Shyam Sundar 博士介紹

Dr. S. Shyam Sundar 是賓州州立大學媒體效果研究實驗室的創辦人，同時也是該校社會責任人工智慧中心的主任。他在傳播科技對社會和心理影響的研究中做出了許多理論貢獻，提出了多個原創模型，如 MAIN 模型 (Modality, Agency, Interactivity, and Navigability Model, MAIN Model)、使用與滿足理論 2.0、互動性效果模型 (Interactivity Effects Model) 以及 TIME 模型 (Theory of interactive media effects, TIME Model)。他的實證研究專注於人機互動 (Human Computer Interaction, HCI) 和電腦中介傳播 (Computer-mediated Communication, CMC) 對社會和心理層面的影響，特別關注數位媒體介面中的互動性、可導航性、多模態性和代理性。

Dr. S. Shyam Sundar 的研究得到了國家科學基金會、麥克阿瑟基金會、Meta 等機構的支持，主題涵蓋假新聞、聊天機器人、智慧音響、人工智慧演算法、網路隱私、社群媒體效應及媒體科技在促進健康行為中的應用。他是第一批在 Journal of Communication 上發表關於網路媒體效果研究的學者之一，其研究也見於 Communication Research、Media Psychology、和 Human Computer Interaction 等頂尖期刊。

作為被廣泛引用的學者，Dr. S. Shyam Sundar 曾在美國國會作證，並受邀至全球各地演講。他曾任 20 多本期刊的編輯委員會成員，並編輯了《傳播科技心理學手冊》。他榮獲多項獎項，包括賓州州立大學授予教職員的最高榮譽 Evan Pugh 教授頭銜，並獲得國際傳播學會（ICA）頒發的 Frederick Williams 獎，以表彰他在科技研究方面的傑出貢獻。此外，他還獲得了新聞與大眾傳播教育協會（AEJMC）頒發的 Deutschmann 卓越研究獎。Dr. S. Shyam Sundar 也是 ICA 的院士，並擔任該協會出版委員會主席。他的興趣之一是主持 WKPS 電台的《爵士光譜》（Jazz Spectrum）音樂節目。

SS: Dr. S. Shyam Sundar

YC: 張郁敏 教授

YC： 在 2008 年，您提出了 MAIN 模型，隨後在 2015 年提出了 TIME 模型，並於 2020 年推出了 HAI-TIME 模型。這些模型對眾多研究產生了深遠的影響。您能否分享您的研究旅程，特別是引導您開發這些突破性模型的過程和經驗？

SS： 傳統的科技學者受到創新傳播理論（Diffusion of Innovation Theory）的影響，通常關注於科技的採用過程，但我更感興趣的是人們如何在心理層面與科技互動。我最初通過創建分類法，如區分傳統專家與電腦這兩類信息來源，來揭示它們所引發的不同心理反應。在史丹佛大學與 Cliff Nass 合作研究「電腦作為社會行動者」（Computers Are Social Actors, CASA）理論時，我深入探討了為什麼人們會以社會方式對待電腦，這促成了我早期分類法的發展，例如「電腦作為來源」（computer as source, CAS）與「電腦作為媒介」（computer as medium, CAM）之間的區別，這些分類法也成為後來模型發展的基礎。

隨著我深入研究新媒體與用戶之間的互動，我意識到這些互動比傳統媒體更需要主動參與。這種轉變促使我深入思考媒體的特徵及其能供性（affordance），如模態（modality）、代理性（agency）、互動性（interactivity）和瀏覽性（navigability），這些因素為 MAIN 模型的建立提供了基礎。該模型假設界面提示（cue）會影響用戶的感知。隨後，TIME 模型進一步擴展了 MAIN 模型，認為互動媒體的效果不僅來自界面提示，還來自用戶的具體行動。

我的導師 Amos Tversky 的認知捷思研究以及 Dolf Zillmann 的例證理論（Exemplification Theory）對我的研究方法產生了深遠影響。過去二十年間，我的理論框架從分類法發展為模型，最終形成了綜合性理論，呈現出數位媒體互動所帶來的多樣心理效果，這段旅程的推動力，來自於我對科技獨特能供性如何影響使用者行為的深入理解與系統分類的需求。

YC： 除了堅實的教育背景和具啟發性的導師之外，還有哪些因素促成了您的成功？

SS： 這一切的起點源於從零開始的需求，因為當時並沒有現成的框架可以參考。我的導師教導我從理論的角度來思考問題。在科技研究領域，很多人常常追逐新技術，專注於具體的物件而非背後的概念。而我的訓練則強調以變項為核心的研究方法，正如 Cliff Nass 在他的研究中所區分的：物件導向研究與變

項導向研究。傳統的模型，例如創新傳播理論和技術接受模型（Technology Acceptance Model），都是以物件為導向的。雖然這些模型能解釋技術的採用過程，但它們無法預測未來技術的影響。我則希望能將像互動性和模態這樣的變項進行概念化，並將其應用於未來可能出現的技術上。

在我的博士論文中，我提出了「電腦作為來源」的概念，這個概念具有應用於未來技術的潛力。儘管在 1995 年這一想法遭到了質疑，我仍然將線上資訊來源區分為使用者（客製化）、其他人（協作過濾）、傳統新聞來源以及電腦作為來源（生成式 AI）。這種具前瞻性的視角當時遇到了一些審稿人的阻力，因為他們認為這個想法不切實際。

因此，挑戰在於如何以前瞻性的方式進行思考，並開發出能夠在長期內保持相關性的概念，而不被具體技術所限制。這樣的方法使我能夠創建具有高度適應性的理論模型，來應對不斷變化的媒體技術環境。關鍵在於不僅僅專注於當前技術，而是要關注技術背後的潛在變項及其相互作用。例如，基於能供性的理論模型（如客製化），即使某些早期技術已退出市場，隨著新技術的出現，這些模型仍然適用。嚴謹的概念化對於實現前瞻性的想法至關重要，這樣才能對未來產生深遠的影響。

YC： 您能否談談在這段旅程中所面臨的挑戰，以及您採取了哪些策略來克服這些挑戰？

SS： 在某些方面，我確實很幸運，因為科技在不斷進步。1990 年代末，我的投稿屢次被拒，但隨著世紀之交的到來，Yahoo 和 Google 開始策劃新聞，使我的研究變得更加相關。一位審稿人指出，我的研究與新興科技的發展高度契合，於是儘管我的研究早在五年前已完成，我仍需要更新論文的引言，以反映當時的趨勢。我的博士論文於 1995 年通過口試，但直到 2001 年才正式出版。

走在時代前沿固然被視為開創性的工作，但也伴隨著諸多挑戰。當前的媒體趨勢經常影響審稿人的視角，這使得具前瞻性的想法難以被接受。幸運的是，最終我的研究獲得了認可，至今仍經常被引用。例如，當人們討論 ChatGPT 作為自動化來源時，這正是我 20 年前提出的概念。

我非常慶幸自己能在適當的時機創建出這些模型，當時並沒有任何類似的

框架。學術上的成功往往依賴時機、毅力，有時甚至需要一點運氣。我感到十分感激，看到我的模型能被廣泛應用於其他研究者的工作中。

YC： 隨著 AI 的迅速發展，現有的理論和方法學如何隨著 AI 對媒體和社會科學的影響而演變？

SS： AI 是現代生活中一股強大的新興力量，並在不同層面發揮著作用。我們現在擁有許多由 AI 驅動的媒體平台，如社交網絡和 Netflix，這些平台利用 AI 為我們提供個性化的體驗。在這些平台背後，AI 支撐了個性化和自動化等新功能，為用戶介面帶來了全新的展現，並賦予了更多的操作可能性。從能供性及其相關變量的角度來研究媒體，已成為調整現有理論的一種有效方法。

此外，AI 也是數據檢索和分析的重要工具，徹底改變了社會科學的研究方式。隨著網絡媒體的普及，我們可以接觸到數以百萬甚至數兆計的龐大數據集。為了理解這些數據，我們需要強大的工具，特別是機器學習技術。這些技術如今已被廣泛應用於內容分析等任務。過去依賴人力完成的大規模數據分類，現在可以通過機器學習來實現。例如，基於標籤的新聞故事訓練集，我們可以自動將數百萬篇故事分類為政治或非政治類型。

現今的社會科學家需要具備機器學習的知識，才能有效運用這些工具。像主題建模這樣的新技術正在逐漸普及，能夠從大數據集中聚類不同主題。雖然我們的大腦無法處理數百萬個數據點的聚類，但 AI 可以勝任。這些方法依賴 AI 在模式識別和自然語言處理方面的能力。因此，不僅是傳播學領域，其他所有領域的社會科學家也應該熟悉 AI 工具。這些技術進步正在從根本上改變我們對研究方法論和理論框架的理解，並幫助我們更好地評估 AI 的影響。

YC： 隨著 AI 和計算工具在社會科學中的快速發展，您對這些工具與傳統理論框架的整合有什麼看法？在這個全新的環境下，資深學者與年輕研究者應如何有效合作，以最大限度地發揮各自的優勢並推動學術進步？

SS： 我認為即使是像我們這樣年長的學者，也能學習足夠的知識來理解這些工具。雖然我們可能不會深入學習 Python 編碼，但這些工具背後的原理相對容易掌握。憑藉我們過去的訓練和經驗，我們可以更精確、更深入地理解這些工具的應用。現如今，許多學生雖然掌握了技術技能，但在數據分析上往往缺乏概念

性或理論框架。他們擁有工具，卻容易忽視整體的學術視角。

在計算社會科學領域中，數據處理的工具和方法越來越受到重視，雖然這些工具在數據檢索和處理方面表現出色，但這些研究有時無法解答更深層次的概念或理論問題，結果往往過於簡單，缺乏深度。因此，資深學者和擅長 Python、R 等工具的年輕學者之間，需要建立更加緊密的合作關係。前者應該引領概念和理論的發展，而後者則負責處理數據密集型工作，這種合作在像計算社會科學這樣快速發展的領域尤為重要。

資深學者仍然可以通過學生和實驗室與這些工具進行有意義的互動，並理解它們在更大理論和概念框架中的角色。科學的進步往往依賴於我們擁有的工具。例如，天文學家在獲得強大望遠鏡後，取得了顯著的進展，而這些新的 AI 工具正如同我們的「望遠鏡」，幫助我們探索各種令人興奮的可能性。我們現在能捕捉到人們觀看的所有內容，並以前所未有的方式分析他們的反應。這些工具正在將我們引領至曾經設想的未來，讓我們的研究領域進入一個令人振奮的時代。

YC： 您每年能發表如此多的論文，確實令人敬佩。要保持這麼高的學術產出，實在不容易。您能否分享一些幫助您保持這樣的卓越表現，在時間管理和實驗室管理方面的策略？

SS： 我認為我的高效研究產出，主要得益於實驗室團隊的協作。實驗室團隊是一種最有組織的研究模式。過去，我曾建議採用學徒制模式，這是源自德國的傳統。然而，隨著我指導的學生越來越多，我發現這種方式效率不高，因為我必須反覆對每位學生給予相同的建議。

後來，我學習了 Cliff Nass 在計算機科學和人機互動領域的經驗，改用實驗室團隊模式。這種模式強調集體合作，我們每週會舉行一次會議，讓學生在不同階段分享他們的研究進展，從假設的建立到數據分析皆包括在內。透過這樣的討論，每位成員都能了解彼此的研究，提供意見反饋，並從我的建議中學習，然後將這些建議應用到各自的研究中。這種模式產生了倍增效應，讓我們的研究成果更為豐碩，發表的論文數量也隨之增加。

大部分研究工作主要由研究生負責，我則提供理論框架，幫助他們完善研

究問題。研究方向一旦確立，學生就會進行具體的研究，而到了寫作階段，我們再進行整合討論。這種合作模式與分工，使我們的工作更加高效，同時也增強了每個人的責任感。每位學生都需向團隊匯報研究進展，這種公開的責任機制確保了所有人都能按計劃進行。

此外，研討會設定的截稿期限也激勵我們更加努力，即使論文初次未通過審稿，完成的部分仍可進行修改，為未來的再次投稿做準備。團隊規模不固定，通常有 12 人左右，包括博士生、碩士生、大學生、博士後研究員和其他成員。會議通常持續兩個小時，會議結束時，我們會確定下一週的議程。這種結構化的工作方式，結合團隊的共同體意識，不僅提高了生產力，還大幅提升了研究的質量。

YC： 作為知名期刊的主編和編輯委員會成員，您在學術出版方面經驗豐富。能否分享一些關鍵因素，幫助學者成功在頂尖期刊發表論文？

SS： 成功發表論文涉及多方面的因素，我完全同意這是一項具挑戰性的任務，特別是我們經常會在投稿過程中遇到拒稿。在頂尖期刊發表論文，並不僅僅是要成為最優秀的學者，確實有些人能夠不斷在這些期刊上發表，但成功並沒有固定的公式，這需要嚴謹的研究設計、強大的理論基礎、精確的方法論，並且還要有有效的推廣策略，特別是在如何框架研究並突顯其創新性和重要性上。

研究問題必須具備說服力，而這通常需要一定的創意。方法的嚴謹性、理論的深度以及創意的呈現，都是成功發表的關鍵。要展示研究如何推動該領域的發展，通常需要採用多種方法。例如，在台灣進行的研究或許具有新穎性，但國際期刊未必會認為其具備重大意義。因此，論證研究的創新性至關重要。常見的論點可能是「這項研究前人未曾做過」或「文獻中存在缺口」。然而，僅僅指出某研究未曾有人做過，並不代表其具備足夠的價值，關鍵在於解釋為什麼這項研究值得投入資源和時間。與其在引言中說「其他人做了 X，但沒有人做 Y，所以我們來做 Y」，不如先闡述這項研究為什麼具有重要性，然後回顧文獻，展示研究的空缺。

在方法學的嚴謹性方面，頂尖期刊往往重視重複性研究，以確保結果並非偶然。與僅有一個研究的論文相比，包含兩個研究的論文通常更具說服力，因

為重複性研究表明結果具有超越單一實驗的適用性。第二個研究應該針對第一個研究的局限性和未解決的問題進行更深入的探討，這樣整篇論文會更完整且更具說服力。這樣的發展往往能更好地說服審稿人，因為它展示了結果的普遍性及重複驗證的可靠性。

現代高效的工具，如微工平台（micro workers），幫助研究者進行多次實驗，從而促進結果的重複驗證。各學科中的重複性研究產生不同結果的危機，凸顯了再現研究結果的重要性，這有助於增強對所研究現象的信心。

YC： 您如何有效說服編輯和審稿人，讓他們相信您的研究具有重要性和價值，從而成功發表？

SS： 從許多方面來看，學術界往往獎勵遵循傳統做法。既有的系統和框架已經存在，按部就班地遵守規則確實能提高成功發表的機會，因為這符合標準。然而，僅僅遵守規則可能無法產生真正深遠的影響。頂尖期刊通常要求研究不僅要擴展現有知識，還需要帶來重大的突破，這使得情況變得複雜。你的研究是否真的具有新穎性，還是僅僅看起來像個瘋狂的想法？這也是評估過程中主觀判斷的來源之一。

要說服編輯和審稿人，關鍵在於清楚解釋你的研究如何填補文獻中的空白，並突顯其創新之處。同時，你需要用扎實的證據、可靠的數據和嚴謹的方法來支持你的論點。必須提供有說服力的理由，說明為什麼你的研究是有趣的，並讓審稿人能夠認同其價值。

拒稿是常見的，因此保持積極的心態和對自己研究的信心非常重要。如果有必要，應該迅速轉向下一個期刊投稿。記住，這只是兩三個審稿人的看法，其他人可能會認同你的觀點。你需要有策略地回應他們的反饋，並重新提交。這是一個反覆的過程，需要在學術領域和審稿人的意見之間找到平衡。耐心和靈活性是成功的關鍵。

年輕學者經常面臨快速發表的時間壓力，這使得理論研究難以推進。我的方法是平衡實證研究和理論研究，實證結果能夠促進理論發展，反之亦然。這種方法有助於保持穩定的研究產出，並推動理論發展。構建理論涉及歸納與演繹方法的結合，涵蓋數據、觀點、分析和創造力。這種做法相對罕見，因為它

需要面對來自不同學術陣營的批評和不確定性。

拒稿是學術出版中的一部分，我們經常會遇到拒稿。挑戰現有框架意味著會面臨初步的拒絕，但只要堅持，最終會有收穫。瞄準頂尖期刊，從反饋中學習，不要把拒稿看得太重，因為拒稿其實是完善作品的重要過程。

YC： 在我們結束之前，您是否有其他想分享的內容，或者有任何最後的想法希望傳達給大家？

SS： 我可以進一步探討這些議題，它們都非常重要，但在我們領域中，開放科學（Open Science）已逐漸成為一個備受關注的主題，提醒學生和新一代學者遵守開放科學的原則是至關重要的。首先，註冊你的假設，這樣在進行數據分析之前，你就有了一個永久的記錄，反映你的預測。這種做法不僅能提高研究質量，還能增強外界對研究結果的信任。許多研究者往往選擇性地報告顯著性結果，忽略其他發現，這可能會讓人誤以為他們只研究了某些特定面向，事實上，他們是在挑選對自己有利的數據。研究者在收集數據時，通常會有隱含假設，但未必明確提出，這導致難以判斷假設是在見到數據之前還是之後形成的。這種做法曾經很常見，但如今在頂尖期刊中已經不被接受。

台灣的學者應該積極採用最新的開放科學實踐，這包括公開存放數據、在數據收集之前預先註冊假設，以及將其他開放科學原則應用於研究中。在投稿期刊時，最好在信函中明確表明該研究已預先註冊並遵循開放科學的原則。理想情況下，研究應該註冊在公認的權威機構，例如「開放科學框架」（Open Science Framework）。

通過遵循這些開放科學的原則，我們可以提升研究的透明度和可靠性。隨著學術界越來越重視責任和可重複性，這些做法變得更加重要。採用這些做法，不僅可以提升單個研究的質量，還有助於增強整個科學社群的信譽，推動學術的進步。