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ARTICLE

Science communication in the absence of science journalism: exploring the role of public relations officers in Taiwanese scientific organizations

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Abstract

This research examines how public relations (PR) officers in Taiwanese scientific organizations view their science communication roles in a context with limited professional science journalism. Through a survey of 67 PR officers, we investigate their perceptions of public trust in their organization, their media relations, and communication strategies. Results indicate that while PR officers recognize the importance of science communication, they perceive less media interest in scientific content compared to organizational news. This potentially leads to a self-reinforcing cycle where the perception of low media interests further reduces PR efforts in communicating research findings and potentially harms organizations' perceived legitimacy at scientific research.

Keywords

Science and media; Professionalism, professional development and training in science communication; Diversity, equity, inclusion and accessibility in science communication

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1 ▪ Introduction

Science journalism is declining in many countries, marked by significant job losses. The iconic science magazine National Geographic in the U.S. laid off its last remaining staff writers in 2023, while Popular Science, with its history of over 150 years, eliminated most of its staff. The trend towards marginalization of science journalism has implications for science communication, especially regarding the diversity and comprehension of information. At a time when public trust in science is declining in the U.S. [Kennedy & Tyson, 2023], the consequences of diminishing science journalism may be even more severe.

While professional science journalism is waning, marked by a decline in dedicated journalists or as in the case of Taiwan has never been prominent, scholars have recognized the increasing impact of organizational science communication. Scientific organizations have professionalized their external public communication and enhanced their engagement with potential stakeholders [Peters, 2012]. Empirical studies have confirmed that science communication is partly instrumentalized in organizational PR strategies [Entradas et al., 2024; Schäfer & Fähnrich, 2020; Vogler & Schäfer, 2020]. Public visibility and a positive public image are becoming more crucial in a competitive academic environment in order to attract funding and other kinds of support from government bodies, private donors, and industry partners. As science journalism declines, scholars valuing the tradition of science journalism are critical about the growing influence of public relations and its implications for the role that science journalism has traditionally played [Autzen, 2014; Göpfert, 2007].

Different from other parts of the world, science journalism has never gained significant traction in Taiwan's media ecosystem. Science coverage in its domestic media is not only limited in scope, but is typically handled by general journalists and (relatively few) journalists specializing in medicine, environmental issues, and education rather than by dedicated science journalists. This pattern indicates that science journalism as a specialized field remains underdeveloped in Taiwan [Huang et al., 2020]. Given such a context, this empirical study investigates the potential to integrate scientific organizations' PR efforts into broader science communication initiatives in Taiwan.

2 ▪ Context

2.1 ▪ *Increasing PR influence in the media coverage of science*

Serving as a bridge between the scientific community and the general public, journalistic media play an important role in the PR strategies of scientific organizations. These organizations' managers recognize the importance of media visibility to secure societal support and legitimacy. Their PR departments strategically manage media interactions to boost image and attract funding, like issuing press releases and engaging with journalists to effectively disseminate research findings and organizational news [Entradas et al., 2020; Kohring et al., 2013]. Through such collaboration with journalists, PR officers at scientific organizations can enhance organizational reputation, facilitate engagement with the public and stakeholders, and promote scientific understanding [Kohring et al., 2013; Nelkin, 1995].

These organizational media strategies sometimes include explicit or implicit rules for how scientists should engage with journalists. The literature has presented evidence for the intercedence of scientific organizations into the science-media nexus in a format whereby

prior to media interviews, individual scientists are expected to consult their organization's PR department [Dunwoody & Scott, 1982; Peters, 2012]. One study highlights organizations' influence on the willingness of scientists to engage with the media. For example, scientists who perceive their university's PR department as being active and supportive are more likely to engage with journalists and participate in press releases [Marcinkowski et al., 2014].

While individual scientists' media engagement is one aspect of public communication, PR departments employ broader strategies that shape organizational narratives in the journalistic media. Studies demonstrate the impacts of press releases in science news, such that exaggeration in journalistic media coverage often originates in press releases issued by universities [Adams et al., 2019; Sumner et al., 2014]. Investigating the long-time influence of University of Zurich's PR department on science journalism in Switzerland, Vogler and Schäfer [2020] illustrate an increasing reliance on university PR materials and a shift in focus from research-related topics to organizational aspects of the university such as fundings, policies, and events.

Given the increasing influence of organizations' PR in media coverage of science, scholars note the possible impacts on public communication of science. The main concern is whether scientific organizations' PR can fulfill the societal goals of journalism and at the same time help pursue their organizational goals. Press releases about science by scientific organizations are written to serve particular institutional interests rather than public interests [Franks et al., 2023]. Thus, both goals are incompatible, as one cannot achieve both at the same time. Others argue that PR work can help pursue organizational and societal goals without necessarily sacrificing either one — for example, sharing scientific knowledge with society [Autzen, 2014; Fürst et al., 2022]. Still others recognize a tension between the two goals and contend that organizational goals tend to become dominant [Göpfert, 2007; Lehmkuhl, 2019].

2.2 ▪ Social media as channels of science PR

The affordances of social media and their near-ubiquitous use by the public have enabled and motivated scientists and scientific organizations to create and distribute their own content. Social media platforms not only provide opportunities for content creation, but also offer diverse distribution channels, enabling scientific organizations to reach a broader audience. More specifically, platform algorithms theoretically enable targeted content dissemination, ensuring that content from scientists and scientific organizations reaches relevant audiences. Empirical findings reveal divergent perspectives among PR officers at scientific organizations regarding social media's role. While some view social media as an opportunity for engagement, others question its appropriateness for public communication [Entradas et al., 2020; Biermann et al., 2025], highlighting tension in its adoption within the scientific community. For example, critics note that the informal tone of social media platforms may undermine the credibility of scientific content [Lo et al., 2019].

This shift in content control introduces new dynamics. Competition in content creation and information dissemination on social media challenges the traditional dominance of journalistic media in providing and distributing research-related news. Before the rise of social media, journalists acted as gatekeepers, curating and framing scientific discoveries for public consumption [Peters et al., 2014]. Scientists and organizations now can bypass these intermediaries and directly share their work with audiences. Social media not only amplifies

outreach, but also disrupts established power structures in science-related news dissemination.

While the scientific community is encouraged to engage with emerging media platforms [Bonetta, 2007; Brossard, 2012, 2013; 'Filling the void', 2009], concerns remain about the implications of self-presentation in science communication. Some state that self-produced content, while expanding science communication, lacks the investigative scrutiny and independent verification traditionally provided by journalism [Brumfiel, 2009]. Journalists and editors play a role beyond reporting. Their selection of stories signals social relevance, as coverage in major media outlets conveys a different level of importance than content posted on a university's social media [Peters et al., 2014]. Compounding these concerns, it remains unclear to what extent PR practitioners in scientific organizations integrate social media into their work and how they prioritize different media platforms in their PR strategies. Given these divergent PR perspectives, does the impact of self-presentation on social media differ from the external scrutiny of journalistic media?

2.3 ▪ *Organizational science communication in Taiwan: universities, research institutes, and media relations*

Studies indicate that Taiwanese scientists frequently interact with journalists [Lo & Peters, 2015] and collaborate with public relations (PR) officers at their universities or research institutions [Lo, 2016]. However, there remains a significant gap in research examining how PR officers within Taiwanese scientific organizations mediate interactions with journalistic media in the context of public science communication. Public relations activities in scientific organizations vary across countries [Entradas et al., 2020]. With some exceptions, evidence and arguments about the increasing role of organizational PR in science communication are largely based on studies conducted in Western countries. In one of the few done on an Asian country, Koso [2021] examines the link between research organizations (universities and government-funded research institutions) and domestic media in Japan. In contrast to the professionalization and institutionalization of science PR at research institutions in other countries, no evidence of this appears in Japanese research organizations. A typical working unit for PR in Japanese science organizations is rather small with few staff members and limited decision-making power. Furthermore, PR regarding scientific knowledge relies on researchers to voluntarily provide information about their work and to obtain permission from research collaborators before sharing information with the press [Koso, 2021]. For the use of social media, Japanese research institutes reported using new media channels less frequently than those in other surveyed countries like the United Kingdom and Brazil [Entradas et al., 2020]. These studies highlight a need for research in non-Western contexts, in order to contribute insights into the practices, challenges, and cultural contexts of science communication and to enhance both academic understanding and practical applications in the field.

As mentioned above, unlike the tradition of science journalism in Western countries, Taiwan has not established this profession [Huang et al., 2020], which may be one reason why its public is not satisfied with the quality of media coverage of science. In a global survey, more than one-third of the public (36%) in Taiwan say that news media do a "bad job" covering science, which is above the global average of 28% [Funk et al., 2020, p. 25]; 80% of Taiwanese say the news media oversimplify scientific findings, which is much higher than the

global average of 49%; and 85% of Taiwanese say scientists overstate the implications of their research findings as a problem versus 44% globally [Funk et al., 2020, p. 28]. Is there a chance for Taiwanese science organizations to intervene in the public communication of science? This paper presents whether universities and public-funded research institutions in Taiwan assume responsibility for contributing to the public's understanding of science.

Studies about PR units at Taiwanese scientific organizations focus mostly on universities and suggest different scopes of PR strategy between public and private universities. Although universities' PR usually aims at securing funding and has the strategic characteristic of science PR for promoting organizational interest [Chang, 2008; Cheng, 2008; Yen, 2003], the PR strategies of private universities focus more on attracting new students than do public universities. Public and private universities exhibit several essential differences, as they are stratified in terms of their resources and institutional prestige [Chou, 2015]. Traditionally, public universities are viewed as being more respected than private ones, and public universities are more likely than private ones to receive governmental funding and donations from the private sector. The budgets of private universities depend much more on student enrollment fees (in particular, related to undergraduate programs) and private donations than those of public universities [Fu et al., 2008]. Due to this difference, the PR strategies of private universities may center more on attracting new students than public universities.

Research does not appear to be a strength at private universities nationwide. In terms of funding from the National Science and Technology Council, which provides the most important research grants in Taiwan, the average number of grants per faculty member of private universities is less than half of that of faculty members of public universities [Fu et al., 2008]. While project approval rates are above or around 50% at public universities, they are below 40% at private universities [National Science and Technology Council, 2022]. It is very likely that the PR strategies at private universities emphasize less their research strength than those at public universities.

Public-funded research institutions outside the university system in Taiwan have been created and are supported, because of the neo-developmental state theories proposing that governments in newly industrializing countries should play an initiative role to help domestic firms catch up in high-tech industries [Amsden & Chu, 2003; Breznitz, 2005; Mathews, 2002]. For example, the establishment of the Industrial Technology Research Institute is one of the most inspiring success stories, as it has spurred growth in Taiwan's information technology (IT) industry since the 1970s and co-created the country's prestigious role in the global semiconductor supply chain [Chu et al., 2009; Intarakumnerd & Goto, 2018]. Nevertheless, public-funded research institutions have recently noticed the importance of public visibility so as to raise their legitimization. Academia Sinica, the most pre-eminent research institution in Taiwan, launched a popular science website in 2017 with one mission: to make the public aware of what research is being conducted by it. To increase public visibility, content is provided in a narrative and storytelling style and is also integrated with marketing strategies to promote science communication [Hua, 2021]. The website even received the Public Relations Award in 2018 by Taiwanese Foundation for Public Relations.

Empirical studies suggest that universities and research institutes have different legitimization needs. Based on content analysis of 104 homepages of Taiwanese science organizations, Lo [2021] shows the difference in the presentation of their self-image on their websites. Universities tend to emphasize their role in education rather that in research by

showing more pictures of students than of scientists, for example. In contrast, the homepages of research institutes share more news about their scientific achievement such as important publications, important research grants or patents, as well as more pictures of scientists. Based on semi-structured interviews of Taiwanese PR officers, Lo et al. [2019] suggest that those at research institutes are more aware of their responsibility for the public understanding of science than do PR officers at universities, as the latter focus on the educational function of their schools.

3 ▪ Objectives

This study explores the potential of PR officers at science organizations in Taiwan in order to contribute to the communication of science in view of the lack of professional science journalism. Specifically, it examines the PR officers' perceptions of their own organizations' public image, as well as their organizations' PR strategy, particularly targeting their views concerning relationships with media. Additionally, this study investigates how these perspectives and strategies vary across three different types of scientific organizations: public universities, private universities and public-funded research institutes outside the university system.

This paper is guided by the following questions.

1. How do PR officers in scientific organizations perceive the strengths and weaknesses of their organizations' public image?
2. What PR strategies do their scientific organizations employ?
   2.a. To what extent do PR officers in scientific organizations prioritize relationships with journalistic media over social media engagement?
   2.b. How much weight do PR officers give public science communication within their PR strategies?
3. To what extent do perceptions of organizational strengths and weaknesses influence the PR strategies of their scientific organizations?

Trust in science in Taiwan overall is rather low in an international comparison. Three international surveys exploring trust in science show Taiwan in the lower 25% percentile of country rankings. In the 2018 Wellcome Global Monitor conducted by Gallup [Gallup, 2019] Taiwan occupied the 110th position of 140 countries regarding average trust in scientists based on an index aggregating answers to five questions.[1] An international survey by Pew Research Center [2020] put Taiwan at 19 of 20 countries regarding "trust in scientists to do what is right" [p. 7]. In a recent survey of citizens in 68 countries by a network of cooperating researchers, Taiwan was at 61 of the 68 countries based on a trust scale aggregating 12 items [Cologna et al., 2025, p. 3]. As a high-tech country in terms of information technology and chip production, the available data indicate that Taiwanese citizens on average have lower trust in science than citizens of most other countries surveyed. It is therefore crucial to understand how PR officers perceive the level of public trust in their organizations.

1. The report only offers a breakdown of trust in scientists index by world regions [p. 52–53]. However, Appendix D [wgm2018-dataset-crosstabs-all-countries.xlsx, downloaded from https://wellcome.org/reports/wellcome-global-monitor/2018 on 1.9.2019] provides the index scores by country.

To examine PR strategies for managing organizational legitimacy, this study adopts the principles of trust portfolio by Borchelt and Nielsen [2014] and Hendriks et al. [2016] as a framework for evaluating perceptions of strengths and weaknesses in scientific organizations. Borchelt and Nielsen [2014] propose six principles in managing the relationship between organizations and their stakeholders: accountability, competence, credibility, integrity, legitimacy, and productivity [p. 63]. Accountability refers to the organizations acknowledging responsibility for their decision-making. Competence indicates that both the scientific organization and its employed researchers have suitable credentials to work eminently. Credibility defines how trustworthiness is the organization. Integrity means that researchers and management at the organization follow social rules while conducting research or operating their mission. Legitimacy refers to the recognition that "science is an authority on almost all matter[s]" [p. 63] in which authority is highlighted. Finally, productivity is responding to social demands for useful, relevant knowledge and outputs.

Hendriks et al. [2016] analyze trust in scientific knowledge in the context of science communication and argue three principles are crucial for individual scientists with respect to science PR: (1) expertise — scientists' knowledge and relevant skills; (2) integrity — the public's beliefs that scientists will follow their ethic codes; and (3) benevolence — the beliefs that scientists perform their professions for the public good. Although these three principles refer to individual scientists, they could serve as complementary principles to the ideas proposed by Borchelt and Nielsen [2014]. For example, the notion of integrity proposed by them is comparable to that of Hendriks et al. [2016]. The concept of expertise highlighted in Hendriks et al. [2016] corresponds with competence in Borchelt and Nielsen [2014], while the notion of benevolence, emphasizing that science is for the public good, is missing in the portfolio of six principles proposed by Borchelt and Nielsen [2014].

By integrating these frameworks, this study develops a structured approach for analyzing PR officers' perceptions of their organizations' strengths and weaknesses. Specifically, the six principles from Borchelt and Nielsen [2014] provide a foundation to assess key organizational attributes such as competence, credibility, and productivity, while the partly overlapping and partly complementary principles from Hendriks et al. [2016] highlight the additional dimension of benevolence. By applying this combined framework, the study identifies which attributes PR officers perceive as strengths and which are seen as challenges, offering insights into how organizations navigate their public image and stakeholder relationships.

4 ▪ Methods

This study examines public relations of scientific organizations in a non-Western context based on an online survey of PR officers of all 192 science organizations in Taiwan recognized by the government. These scientific organizations are based on the list of universities provided by the Ministry of Education [Ministry of Education, 2021] and the list of public-funded non-university research institutions in the White Paper on Science and Technology 2015–2018, published by the Ministry of Science and Technology [Ministry of Science and Technology, 2016, p. 6–7]. Public-funded non-university research institutions include Academia Sinica, National Applied Research Laboratories, Industrial Technology Research Institute, and Automotive Research & Testing Center, for example. We collected the e-mail addresses of the PR officers dealing with media contacts or public relations for these organizations. Of the 192 identified PR officers, 47 are employed by public universities, 106 by private universities, and 39 by non-university research institutions.

To offer answers to the issues explicated above, the questionnaire included questions and items exploring PR officers' perceptions of organizational image and trust, their focus on science journalism vs. social media in their strategies, and their perceptions regarding the benefits and difficulties of communicating research (i.e. science communication in the narrow sense) as part of their public relations work. The seven items to capture our respondents' perception of the public image of their organizations are based on the trust portfolio identified by Borchelt and Nielsen [2014] — accountability, competence, credibility, integrity, legitimacy/authority, productivity — and benevolence proposed by Hendriks et al. [2016]. These seven aspects of trust are operationalized by items (see Table 1 below). Respondents were prompted with: "Please try to imagine how the public views your university/research institution. In your opinion, what does the public generally believe about your university/research institution?" Seven items follow up. Responses are on a 5-step scale ranging from "completely false" to "completely true".

Table 1. The principles and their corresponding items in the questionnaire.

Principle	*Questionnaire item*
Accountability	The public believes that we honestly explain and justify our decisions and policies.
Competence	The public believes that we are competent in research and education.
Credibility	The public believes that our public claims can be trusted.
Integrity	The public believes that we reliably follow best practice rules and regulations.
Legitimacy/Authority	The public believes that scientists of our organization are authorities in their field.
Productivity	The public believes that we make efficient use of our resources in research and/or education.
Benevolence	The public believes that our main goal is to pursue the common good.

The survey was implemented by SoSci Survey, which is a German software/server system for online surveys. After collecting e-mail addresses from the PR officers dealing with media contacts or public relations of all 192 scientific organizations in Taiwan mentioned above, invitations were then mailed to them. The study thus comprises the whole population of PR officers of scientific organizations in Taiwan. The initial invitation to participate in the survey by mail was followed by up to three reminders in subsequent weeks that were sent to those who had not responded or yet completed the survey so far.

In total, 67 valid responses were received, yielding a response rate of 35%. Almost 50% of respondents have more than five years of working experience in public relations or public communication. Their training background is diverse, as nearly 60% of respondents report that they come from areas other than journalism, public communication, or public relations (Table 2).

5 ▪ Results

5.1 ▪ *Perception of strengths and weaknesses in scientific organizations' public image*

Across all types of scientific organizations, PR officers generally perceive a positive public image of their organizations. However, their perceptions of strengths and weaknesses vary

Table 2. Social demographics of the press office respondents.

Job description	*Number*	*Percentage*
PR officer	41	61.2%
Responsible for PR works	26	38.8%
Total	67	100.0%
Type of institution		
Public university or college	21	31.3%
Private university or college	30	44.8%
Other institution such as public non-university research institution/government branch or agency	16	23.9%
Total	67	100.0%
Work experience in public relations or public communication		
Less than 3 years	21	31.3%
3–5 years	13	19.4%
More than 5 years	33	49.3%
Total	67	100.0%
Background		
Holds a degree in journalism, communication, or public relations management	27	40.3%
Background in another field	40	59.7%
Total	67	100.0%

across different aspects with some areas viewed more favorably than others. For example, respondents consistently reported that their organizations are perceived as highly credible by the public; i.e. that their public claims can be trusted. In contrast, they identified productivity as a weaker aspect of their organizations' public image (see Figure 1 below).

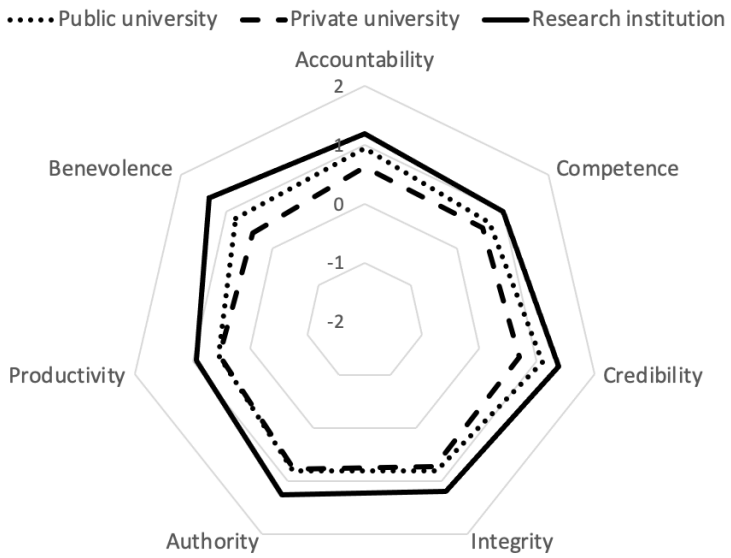

Figure 1. Perception of the organization's public image. Note: each item is measured by a 5-point scale ranging from –2 (completely false) to +2 (completely true).

Perceptions of public image vary across different types of scientific organizations. Overall, PR officers at research institutions perceived a more positive image in all aspects compared to those at public and private universities. Among universities, respondents from public institutions generally perceived their organizations' public image more favorably than their counterparts at private universities, particularly regarding benevolence. This distinction may be influenced by the institutional context, as research institutions are established with the mission of driving national industrialization, potentially reinforcing their perceived strengths in public perception.

The seven aspects of trust portfolio image show a strong inter-item correlation (see Table 1 in Supplementary material). They can be combined in a scale with a high internal reliability of 0.91 (Cronbach's alpha). To further examine how perceptions influence media strategies (see section 5.3 below), an index of perceived public trust was constructed by averaging the responses across the seven aspects for each respondent. This approach, rather than aggregating responses, minimizes the impact of differences in the number of valid responses (e.g., missing data). The overall average index score is 0.82, as PR officers at research institutions report the highest score (1.19), followed by those at public universities (0.82) and private universities (0.62).

5.2 ▪ *PR strategy of scientific organizations*

The respondents were strongly inclined to agree with the statement that it is crucial to attract media coverage ([PR04] in Figure 2). Except for the ambivalent attitude of PR officers in research institutions, the PR officers at universities were oriented toward disagreeing with the statement about staying away from the media spotlight ([PR02] in Figure 2).

Releasing news about scientific achievements is important to scientific organizations in Taiwan. The PR officers strongly agreed with this statement ([PR01] in Figure 2), given the

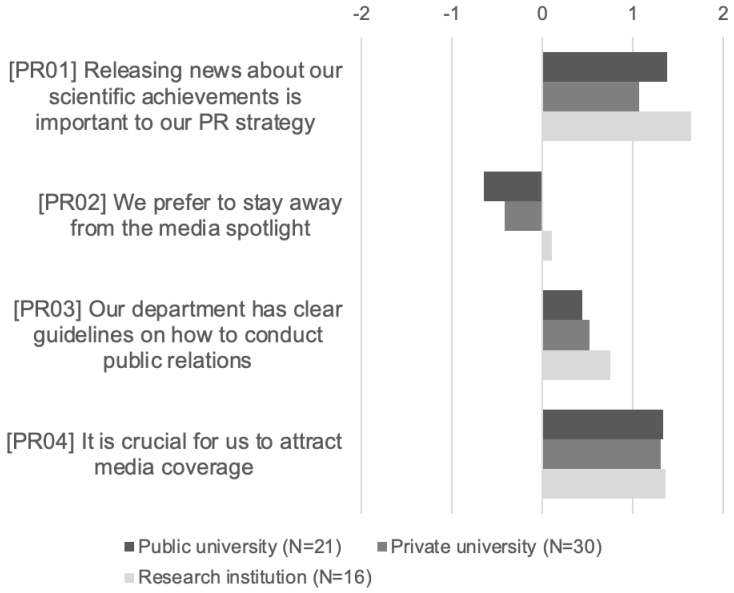

Figure 2. Average agreement with statements about PR strategy. Note: items are measured by a 5-point scale ranging from –2 (strongly disagree) to +2 (strongly agree).

highest score by PR officers at research institutions and the lowest score by those at private universities. This may indicate a different importance of research for the organizations' public legitimization between the types of scientific organizations, as research competence and achievement play more important roles to research institutions than they do to universities.

5.2.1 ▪ *Social media vs. journalistic media coverage: importance of making it news*

The majority of scientific organizations maintain active social media accounts, with Facebook (88%) and YouTube (67%) being the most widely used, while Instagram and LINE have slightly lower adoption rates at 46%. Although the scientific organizations are active in various online networks, seeking resonance in the journalistic media remains an important criterion for evaluating their PR work. They score importance of "number of likes, clicks, and followers in social networks" at 2.91, importance of "number of visitors" on their websites at 2.73, and importance of "amount of journalistic coverage" at 3.14 on a 5-point scale ranging from 0 (not important) to 4 (very important). The respondents clearly rate media coverage as the most important evaluation criterion compared with the number of website visitors and number of activities on social networks (p-value of paired t-test $< .001$). Their evaluation of the importance of journalistic media over social networks is consistent with their agreement to the statement about the media's key role in their PR strategy ([PR04] in Figure 2). Maintaining a good relationship with the media is important to the PR officers.

It is very likely that good media relations are especially crucial for attracting external stakeholders. For example, the respondents strongly agree that media visibility may attract "new students or better staff" ([MR06] in Figure 3) and helps promote "collaborations with the industry" ([MR07] in Figure 3). They mildly agree with the statement that such visibility may help them at "getting grants and public funding" ([MR08] in Figure 3). The responses suggest that benefits from media visibility are asymmetrical. Media visibility is seen as particularly significant for attracting the attention of external stakeholders, but as less effective for increasing possibilities of getting public funding.

PR officers perceive their relationship with journalists as overall positive. The respondents unanimously agree with the statement that they have "good relationships with the media" ([MR01] in Figure 3) and are inclined to say that the media are interested in news about their organizations ([MR04] in Figure 3). The PR officers report that they are "quite satisfied with the coverage" of their scientific organizations ([MR11] in Figure 3) and also note mild disagreement with the statement that the media are hostile towards their organizations ([MR09] in Figure 3) and a slight disagreement that the media "have a lot of misunderstanding" about their organizations ([MR02] in Figure 3).

How effective are PR activities at maintaining positive media relations? The respondents expressed mild agreement to the statement that good service for journalists "often does not pay off for us" ([MR05] in Figure 3). PR officers at public universities have fewer difficulties in attracting media attention than the other PR officers of the other organizations ([MR10] in Figure 3). It is notable that respondents of all three types of organizations perceived media interest in their organizations ([MR04] in Figure 3), but significantly less media interest "in research done" at their organization ([MR03] in Figure 3) (paired t-test, $t = -2.46$, $p < .01$). Given the critical role of media visibility in the public relations strategies of scientific organizations, PR officers' perceptions of media interest significantly shape their

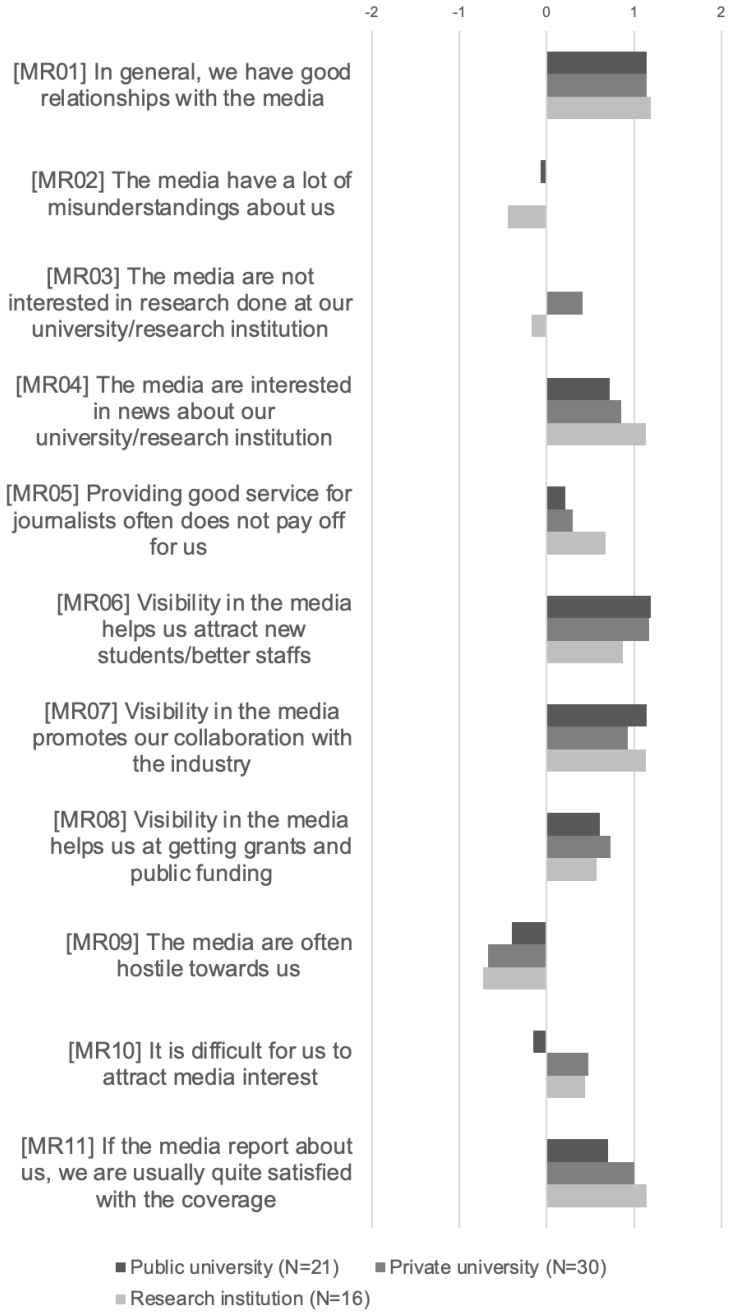

Figure 3. Average agreement with statements about media relations. Note: items are measured by a 5-point scale ranging from –2 (strongly disagree) to +2 (strongly agree).

communication priorities. When PR officers perceive lower media interest in scientific research, they may reduce efforts in public science communication and instead prioritize organizational communication, such as promoting student recruitment or institutional events.

Comparing the average means of each item across types of organizations, several trends appear. The PR officers' responses reflect the different core functions of their organizations, such as the education function of universities and the research function of research institutes. For example, PR officers at public and private universities rated recruiting "new

students/better staffs" the highest against "promoting industrial collaborations", while PR officers at research institutions rated "promoting industrial collaborations" highest against recruiting "new students/better staffs". The response patterns suggest that potential students are crucial to universities, whereas industrial collaborators are crucial to research institutions. The responses of PR officers at research institutions thus reflect their mission to spur industrialization in Taiwan. Mirroring the smaller number of grants and the lower approval rates of grants at private universities [Fu et al., 2008; National Science and Technology Council, 2022], the PR officers at private universities are more inclined to say that the media are not interested in research done at their organizations than are PR officers at the other two types of organizations.

5.2.2 ▪ *The role of public science communication in PR strategies*

Although science news plays a role in PR strategies, the survey responses suggest that it is not a top priority for scientific organizations. A survey question asked, "How frequently do you communicate about the following topics?", presenting five content fields: research and innovation, educational issues, organizational issues, performance, and relationship with society. The topic of research and innovation, described in the questionnaire as covering aspects such as scientific publications, patents, grants, projects, and research collaborations, is not a top priority among the five themes. While 70% of the respondents stated that they "occasionally" or "frequently" communicate about this topic, about 84% reported that they do this about issues related to their organizations' relationship with society, which includes "industrial cooperation, support for community, charity activities, open day, citizen science". Similarly, about 82% stated that showing good performance of their organizations such as "winning a competition, ranking, performance statistics, prizes awarded to a member of your university/research institution" is a frequent or occasional topic.

The selection of communication content by the PR officers matches the perceived interest of the journalistic media. As mentioned above, members of the journalistic media are perceived as having an interest in their organization ([MR04] in Figure 3), but at the same time appear less interested in the research ([MR03] in Figure 3). Studies have shown that if there is a goal conflict between contributing to an organization's legitimization and public communication of science, then the former goal has priority [Lehmkuhl, 2019; Watermeyer, 2016]. The results of this study suggest that the priority may be an outcome of (perceived) media interest. If positive visibility in the media is the core goal, then it is rational that PR officers perceiving stronger media interests in their organization than in science favor communicating about their organization than they do about science.

5.3 ▪ *The influence of perceived organizational strengths and weaknesses on PR strategies in scientific organizations*

To explore whether perceptions of public trust in the respondents' organizations are linked to respondents' other perceptions and strategic beliefs, we correlate the index of "perceived public trust" (see above) with all items of PR strategy and media relations (Tables 2 and 3 in Supplementary material). Overall, perceptions of organizational strengths and weaknesses do not significantly correlate with media relations (Table 3 in Supplementary material). One exception is that the index of perceived public trust mildly yet significantly correlates with

respondents' agreement that the media show interest in their organization (Pearson's $r = 0.30$, $p < .05$).

Two items on PR strategy significantly correlate with perceived public trust (Table 2 in Supplementary material). First, regarding the communication of science, the index moderately correlates with respondents' agreement that releasing news about scientific achievements is important (Pearson's $r = 0.30$, $p < .05$). This suggests when PR officers perceive a more positive public image in their organizations that they are more likely to consider public science communication as a crucial element of their PR strategy.

Second, PR officers' overall perception of public trust in their organization positively correlates with the professionalism of PR. The index of perceived public trust moderately correlates with the presence of clear PR guidelines — an indicator of professionalism (Pearson's $r = 0.35$, $p < .01$). This suggests a potential reciprocal relationship between perceived public image and professionalism of PR. On one hand, PR officers with a more positive perceived public image are more likely to work in organizations that provide structured PR guidelines. This may indicate that organizations prioritizing PR strategies and establishing clear guidelines are more effective at maintaining public trust. On the other hand, working in an organization with well-defined PR strategies may reinforce PR officers' confidence in their organization's public image, thereby enhancing their perception of public trust.

6 ▪ Discussion

Despite low public trust in scientists in the international context, Taiwanese PR officers generally perceive their organizations as having a positive public image, particularly in terms of credibility, while productivity is viewed as a weaker aspect. Perceptions of public image do vary across different types of scientific organizations. In all aspects of the trust portfolio, PR officers at public research institutions outside the university system reported a more positive perception compared to PR officers at public and private universities. Although perceptions of public trust do not significantly shape the media strategy overall, they appear to influence certain beliefs and choices. Specifically, PR officers who perceive their organizations as having a better public image are more likely to consider public science communication as a crucial element of their PR strategy.

Taiwanese scientific organizations' PR strategy is to utilize both social media and journalistic media, but the PR officers consider visibility in journalistic media most important. Generally, the PR officers report a good relationship between their organizations and the media. While they are quite sure that media are interested in news about their organizations, they are less sure about the media's interest in their research achievements. As a consequence, in the pursuit of media visibility to increase their organization's public legitimacy, they are probably not particularly motivated to focus on the communication of research projects or results.

Beyond the positive correlation between a perceived public image and a focus on public science communication in their PR strategy, this study reveals that different types of scientific organizations prioritize research-related news differently in their PR approaches. As part of their legitimization, universities prioritize education over research, whereas research institutes, which have no educational functions, place greater emphasis on research. PR officers at research institutions, who scored highest on the index of perceived

public trust, are also more likely to see themselves responsible for contributing to the public's understanding of science. This suggests that a more positive public image encourages PR officers to take a more active role in science communication. Private universities, which rely more heavily on tuition fees, focus their PR strategies more on students' achievements than public universities do, making them even less likely to emphasize research in their communications.

Unlike optimistic voices predicting that social media will enable the scientific community to engage with the public and thus decrease any dependency on journalistic media, the results of this study imply that PR officers recognize journalistic selection as still sending a different public message about scientific organizations than self-generated social media content is able to do. In a media context where science journalism is weakly developed, they may face difficulties in combining the goals of contributing to media coverage of science and constructing their legitimacy in society.

6.1 ▪ *A self-reinforcing cycle between science PR and the journalistic media*

While scholars are concerned that the involvement of scientific organizations' PR may weaken science journalism [Göpfert, 2007; Lehmkuhl, 2019], the problem is different and more severe in the context without dedicated science journalism. Although PR officers are willing to engage in science communication, they perceive that journalists do not prefer research-related issues.

The lack of dedicated science journalism poses significant challenges for scientific organizations trying to disseminate research findings and related issues through the journalistic media. With fewer dedicated science reporters, many important scientific developments receive little to no media attention, limiting public awareness. At the same time, scientific organizations may find it harder to connect with journalists who understand their work and can effectively communicate it to the public. This reveals a potentially self-reinforcing cycle: the lack of dedicated science journalism leads to a lack of journalistic information demand of scientific research, which in turn reduces the efforts of scientific organizations to communicate their research findings. This may hinder the development of science journalism.

6.2 ▪ *Legitimacy problems of scientific organizations*

Despite the generally positive perceived public image, our study hints at potential challenges for scientific organizations related to legitimacy. PR officers identify productivity and competence as relative weaknesses in their organizations' public image, indicating concerns about how their institutions are perceived by the public. These perceptions may not be unfounded. This finding reflects the results of the global surveys mentioned above [Gallup, 2019; Funk et al., 2020; Cologna et al., 2025] that the Taiwanese public has low trust in scientists.

One may speculate that PR officers' own assessments of their organization's strength and weaknesses imply a bias in the perception of public trust and information demand by journalists. If they are personally less confident about the research achievements of their organizations, they may be more likely to assume the public's low trust in their research

productivity and competence and are also more likely to perceive less interest in science by the media ([MR03] in Figure 3). This becomes a self-fulfilling prophecy as they may act according to their bias by being reluctant to communicate research, and that in turn may reinforce the public's low trust in research quality, indicating a possible damage to the organizations' legitimacy. Further research should link PR officers' own perception of the organizations' strengths and weaknesses to their topic selection and readiness so as to communicate scientific research and expertise.

These findings must be interpreted cautiously due to methodological limitations — particularly, variations in response rates among the three types of scientific organizations. Public universities achieved a 45% response rate (21/47), private universities 28% (30/106), and research institutes 41% (16/39). The substantially lower response rate from private universities suggests potential participation bias, which may underrepresent their perspectives and obscure differences in PR strategies or biases across organization types.

7 ▪ Conclusions

The absence of professional science journalism in Taiwan leaves a vacuum of accurate, contextualized scientific information for the public. This void cannot easily be filled by a general journalist who does not have expertise in selecting and interpreting scientific issues. This may further erode public trust in scientific organizations. Results of this study denote an urgent need to develop and support professional science journalism in Taiwan in order to bridge the communication gap between scientific institutions and the public. Perceiving a lack of interest from journalists in covering research-related issues, research organizations' PR officers may feel demotivated to invest more efforts in communicating about research findings. This could potentially undermine the legitimacy of scientific organizations.

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