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ESSAY

Science marketing: heresy or complement to science communication?

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Abstract

In an era of polarised debate, fragmented media, and eroding trust in institutions, how science is communicated has become as consequential as the knowledge itself. This essay proposes a *science marketing* lens for science communication: an ethically grounded, strategically designed approach that draws on marketing communication — especially storytelling, audience research, strategy, and evaluation — while remaining firmly committed to scientific integrity and public benefit. Rather than "selling" science, science marketing treats communication as an evidence-informed process that connects scientific work to people's values, emotions, and lived realities. Crucially, this essay does not present science marketing as a corrective to science communication, which already encompasses rich traditions of participatory, relational, and outcomes-oriented practice. Instead, it proposes a conceptual lens that may complement existing approaches and open productive dialogue between two fields that have more in common than is often recognised. The essay argues that marketing offers powerful tools for designing impactful science narratives, building relational "brands" for science, and supporting audience-centred engagement. Peter and Olson's [1983] claim that science operates in a marketplace of ideas is revisited as an early provocation, but serves mainly as a springboard for outlining a contemporary framework for science marketing and its implications for both the research and practice of science communication.

Keywords

Science communication: theory and models; Science and media; Popularization of science and technology

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1 ▪ Introduction: why bring science communication and marketing together?

Science communication has long positioned itself as distinct from marketing communication. Where marketing is often associated with persuasion, emotion, and commercial interests, science communication has emphasised accuracy, transparency, and public good. Yet the challenges facing science today — ranging from climate change and pandemics to digital misinformation — are not just informational. They are deeply entangled with values, identities, emotions, and power. In this context, the tools and theories of marketing are not only relevant; they may be indispensable.

It is important to acknowledge at the outset that marketing is frequently associated with "persuasion" in service of commercial ends [Fischhoff, 2013]. These concerns are legitimate, and science communicators are right to be cautious. However, marketing scholarship — particularly when applied to *social marketing* — offers a distinctly different approach that the commercial side of marketing might suggest: marketing in this instance is less about "persuasion" and more about the strategic process of understanding audiences and designing communication that creates public value and supports voluntary behaviour change [Andreasen, 2006; Lee & Kotler, 2015; French & Gordon, 2020]. It is this social marketing tradition, rather than that of commercial advertising, which underpins the science marketing lens proposed in this essay.

This essay argues that science communication and marketing communication, despite appearing fundamentally different at first glance, share a central concern: how to understand audiences and design communication that meaningfully engages what people think, feel, and do. Importantly, this is not a one-way street. Science communication has as much to offer marketing — including its commitments to accuracy, public benefit, transparency, and democratic participation — as social marketing has to offer science communication. The argument here is for mutual learning rather than a wholesale import of marketing logic into science communication.

I propose *science marketing* as a conceptual lens that integrates the strengths of both fields. Science marketing is not about selling products or compromising scientific integrity. Rather, it is a strategic and ethical way of designing science communication processes — grounded in audience insight, behavioural theory, and storytelling — that can support positive social and environmental change.

Peter and Olson's essay "*Is Science Marketing?*" [1983] anticipated some of these debates by pointing out that scientists already operate in a kind of *marketplace of ideas*, where communication, credibility, and persuasion shape which theories gain traction. While their argument is historically important and deliberately provocative, it is not the focus here. Instead, I take their work as an early reminder that scientific knowledge does not "speak for itself": it must be communicated, framed, and negotiated. Building on contemporary scholarship in science communication, social marketing, branding, and narrative persuasion, this essay reflects how a science marketing lens can help re-imagine science communication as a more intentional, relational, and impact-focused practice.

Indeed, current science communication research already does include examples of science communication being used in intentional [e.g., Besley & Dudo, 2022], relational [e.g., Staus

et al., 2025], and impact-focused ways [e.g., Borowiec, 2023] — but that is not the norm [Kelp, 2025] and, as with the examples given here, such studies are often published outside of the mainstream science communication journals. What I am proposing is not that science communication invent something new, but rather, that we give these relatively uncommon aspects of our research more weight and emphasis by integrating social marketing approaches into science communication research more generally.

2 ▪ From deficit to design: the changing landscape of science communication

Science communication has long been shaped by debates surrounding the deficit model, which conceptualised communication as a one-way transfer of scientific knowledge from experts to supposedly uninformed publics [Wynne, 1992; Bucchi & Trench, 2021]. Although this model has been extensively critiqued and the field has increasingly embraced dialogue, participation, and public engagement, deficit thinking remains embedded in some institutional practices. Fact sheets, press releases, and expert-led lectures, for example, continue to dominate certain forms of science outreach.

It is essential, however, to distinguish between the *deficit model* and *one-way communication* more broadly. One-way communication is not inherently problematic; it may represent an entirely legitimate and ethical response to public demand for clear, accurate scientific information. The deficit model's flaw is not one-way transmission per se, but rather the assumption that scientists alone determine what knowledge the public should receive, without listening to the questions, values, and knowledge that publics themselves bring [Wynne, 2006; Irwin, 2021]. As Bucchi and Trench [2021] observe, the goal of contemporary science communication is not to eliminate all one-way communication but to situate it within a more reflexive and relational framework.

Research in public understanding of science has repeatedly shown the limits of purely deficit-oriented approaches. Public responses to scientific issues are shaped less by factual knowledge than by worldviews, cultural identities, and social norms [Allum et al., 2008; Kahan et al., 2011]. In areas such as climate change or vaccination, simply "adding more facts" can even backfire, increasing polarisation when messages threaten people's identities or group loyalties [Kahan, 2015; Moser, 2010].

At the same time, the communication environment has changed dramatically. Digital and social media have fragmented audiences, blurred boundaries between experts and lay voices, and enabled misinformation to spread quickly and emotionally [Brossard & Scheufele, 2013; Denniss & Lindberg, 2025; West & Bergstrom, 2021]. Science communicators now operate in an *attention economy* where emotional resonance, visual appeal, and narrative coherence often determine which messages break through [e.g., Daoudi & Awis, 2026].

These developments have prompted calls for more *strategic, participatory, and context-sensitive* approaches to science communication [Davies & Horst, 2016; Neresini & Bucchi, 2011]. Science communication scholarship increasingly emphasises the relational and political dimensions of communication [Scheufele, 2014; Fähnrich, 2021; Dawson et al., 2022]: it is a site where meanings, identities, and power relations are negotiated [Irwin, 2021; Wynne, 2006]. This includes recognition that publics are not merely recipients of science but

active participants who can, and should, shape scientific agendas [Stilgoe et al., 2014; Rowe & Frewer, 2005]. Science communication is also increasingly understood by researchers as a vehicle for enabling various publics to influence what is researched, how it is researched, and how findings are shared [Kirschke et al., 2025].

A science marketing lens takes these insights seriously and asks: if we accept that communication is inherently strategic and value-laden, how can we design it more deliberately, ethically, and effectively? This is not a critique of what science communicators are already doing — many practitioners across the world already apply audience-centred, outcomes-oriented, and participatory approaches with considerable sophistication. Rather, the marketing lens offers a complementary vocabulary and toolkit for making these design decisions more systematic and visible — especially given that science communicators are typically not taught visual literacy [Rodríguez Estrada & Davis, 2015].

3 ▪ What marketing brings to science communication

Marketing is often caricatured as manipulative persuasion in service of commercial interests. However, marketing scholarship — particularly in *social marketing* — offers a broader definition: marketing as the strategic process of understanding audiences and designing offerings (including messages, services, and experiences) that create value and support voluntary behaviour change [Andreasen, 2006; Lee & Kotler, 2015; French & Gordon, 2020]. Crucially, social marketing does not seek to manipulate but to inform and empower, respecting audience autonomy throughout.

It is worth acknowledging explicitly that many of the principles described below are not alien to science communication. Audience segmentation, strategic planning, storytelling, and evaluation have been championed within the field for some time [Schäfer & Metag, 2021; Besley et al., 2018; Horst, 2013]. The argument here is not that marketing has invented these concepts, but that the marketing literature offers well-developed frameworks and tools that could productively complement and extend existing science communication practice. Several aspects of marketing are particularly relevant:

- *Audience research and segmentation*. Marketing begins with understanding specific audiences, not "the general public". Segmentation (by values, needs, readiness to act, and so on) helps tailor messages that resonate with different groups rather than assuming a one-size-fits-all approach. Schäfer and Metag [2021] have demonstrated the value of audience segmentation in science communication, identifying distinct groups with differing levels of interest and trust.
- *Behavioural focus*. Social marketing emphasises specific behavioural goals (e.g. reduced plastic use, increased vaccination uptake) rather than vague aims such as "raising awareness". It is worth acknowledging the broader argument that all communication, at some level, seeks to influence — whether by shaping awareness, shifting attitudes, or prompting action. The classic AIDA framework [Awareness, Interest, Desire, Action; Strong, 1925] captures this progression: messages move audiences along a continuum from passive awareness through to motivated behaviour [Wijaya, 2012]. Even science communication that aims simply to "inform" is rarely neutral — it implicitly seeks to build trust, correct misconceptions, or cultivate public engagement with science [Fischhoff, 2013; Scheufele, 2013]. Asking clearly "what do

we want people to do, think, or feel as a result of this communication?" is a deceptively simple question that can support communication focus considerably. This does not mean all science communication should pursue observable behaviour change. Equally legitimate goals include supporting informed deliberation, enabling meaningful engagement with science, and facilitating participation in research agendas [Stilgoe et al., 2014; Rowe & Frewer, 2005]. The marketing lens is most generative when a specific outcome — however broadly defined — is named from the outset, and is best understood as one lens among several, selected according to context, audience, and goal.

- *Framing and positioning*. How issues are framed — what is emphasised, which metaphors are used, whose voices are foregrounded — shapes how audiences interpret and respond to scientific information [Nisbet, 2009]. Marketing offers tools for deliberate framing that aligns messages with audience values whilst maintaining accuracy.
- *Evaluation and iteration*. Marketing treats communication as an experiment: messages are pre-tested, monitored, and refined. This iterative mindset is valuable in science communication, though it is important to note that outcomes-based evaluation has been a growing priority in the field [Neresini & Bucchi, 2011; Davies & Horst, 2016].

The idea of *science marketing* emerges at this intersection: it is not about turning scientists into salespeople, but about bringing the discipline of marketing — its well-developed theories, methods, and ethics — into conversation with science communication and drawing attention to important but neglected areas of concern. For example, Medvecky and Leach [2019] examine ethics in science communication, pointing out that oftentimes these are not as considered as they might be. If science communication aims to support evidence-informed decisions and social change, then it must engage with how people actually make decisions: through a mix of emotion, identity, habit, and social influence [Kahneman, 2012]. Marketing provides a language and toolkit for doing so in a structured way. Ethically, this raises legitimate concerns. Some worry that applying marketing to science could encourage oversimplification, emotional manipulation, or the prioritisation of popularity over accuracy [Fischhoff, 2013]. A science marketing lens must confront these risks explicitly by foregrounding transparency, respect for autonomy, and public benefit. In this sense, science marketing is best understood as *strategic design in the service of the public good*, grounded in evidence about communication and behaviour rather than in commercial imperatives. Domegan [2008] and Domegan et al. [2013] have explored related ideas in the context of science outreach, and their work suggests that social marketing principles can be applied to science communication in ways that enhance rather than compromise integrity.

4 ▪ Storytelling and the emotional life of science

One of marketing's most sustained contributions is its attention to *storytelling* and emotional engagement. Narrative is a fundamental way humans organise experience and make sense of the world [Bruner, 1991; Fisher, 1984]. Marketing and branding have developed sophisticated practices around narrative: brands are given characters, arcs, and values that audiences can identify with [Fog et al., 2010; Herskovitz & Crystal, 2010].

It is equally important to recognise that storytelling is not new to science communication. Professional science communicators have long understood that engaging narratives resonate more effectively than dry factual presentations [Dahlstrom, 2014; Davies et al., 2019; Finkler & León, 2019]. A dedicated special edition of this journal — *Storytelling: the Soul of Science Communication* [Joubert et al., 2019] — explored the breadth and depth of storytelling practice in the field. What the marketing lens can add, however, is a more systematic framework for designing and evaluating narrative strategies, particularly in the context of specific audience segments and behavioural objectives. Jensen and Gerber [2020] note the paucity of rigorous evaluation in science communication research; by contrast, rigorous evaluation is an inherent part of a social marketing methodology.

Stories help structure complex information, provide relatable entry points, and foster emotional involvement [Dahlstrom, 2014]. Narratives can increase comprehension, recall, and persuasion, particularly when audiences identify with characters or feel *transported* into a story world [Green & Brock, 2000; Mar & Oatley, 2008]. In climate communication, for example, narratives featuring concrete characters and local impacts have been shown to increase policy support and perceived relevance [Ratcliff & Sun, 2020].

A science marketing lens on storytelling invites at least three shifts:

- *From facts to journeys*. Instead of beginning with abstract data, communicators can design stories around the journeys of people affected by, or engaged in, science. This includes not only "heroes" who adopt desired behaviours, but also scientists themselves as complex, relatable individuals.
- *From expert-centred to audience-centred narratives*. Drawing on narrative structures like the Hero's Journey [Campbell, 2008], marketing often positions the *audience* as the hero and the brand as a mentor. Applied to science, this suggests framing science not as the saviour that rescues a passive public, but as a guide that equips people and communities to tackle their own challenges [Moser, 2010]. In this framing, audiences become the protagonists of their own stories, and science communicators take the role of mentor who equip and empower them — a subtle shift with potentially profound implications for participation and agency.
- *From one-way stories to narrative listening*. Science marketing emphasises listening as much as telling. Understanding the stories communities already tell about issues — such as climate, health, or technology — can help communicators connect scientific narratives to existing values and identities rather than competing with them [Davies & Horst, 2016]. This reciprocal dimension moves storytelling from a broadcast mode into a dialogic practice.

Crucially, storytelling must be used responsibly. Overly simplified, sensational, or misleading narratives can undermine trust and harm vulnerable groups. Science marketing therefore requires narrative ethics: attention to whose stories are told, who is excluded, and how uncertainty and disagreement are represented [Dahlstrom & Ho, 2012]. Used well, however, storytelling is not a distraction from science; it is a vehicle for meaning-making that can deepen understanding, empathy, and agency.

5 ▪ Branding science: identity, trust, and relationship

Branding may sound uncomfortable in a scientific context, yet at its core, *a brand* is simply the set of associations, emotions, and expectations people hold about an organisation, product, or idea [Aaker, 2012]. Science already has a "brand" in the public imagination — often associated with competence, objectivity, and progress, but also with elitism, opacity, or complicity with powerful interests [Gauchat, 2012; Besley & Nisbet, 2013].

The branding concept may be the most novel contribution that the marketing lens brings to science communication, and it therefore requires the most careful articulation. The argument here is decidedly not that science should adopt glossy surface imagery or prioritise perception over substance. Rather, branding in a science marketing sense is about relationship-building: communicating who science is for, what it stands for, and how it listens and responds to those it seeks to serve. This framing connects closely to debates about institutional trust and the social contract between science and society [Wynne, 2006; Irwin, 2021].

Marketing research on branding and trust offers several insights for science communication:

- *Warmth and competence*. People judge social actors — individuals and institutions — along dimensions of *warmth* (benevolence, sincerity) and *competence* (ability, expertise). Science typically scores high on competence but less consistently on warmth [Fiske & Dupree, 2014]. This imbalance can hinder trust, particularly in contested areas where perceptions of intent and values matter. Communicating warmth does not mean abandoning rigour; it means being transparent about values, acknowledging uncertainty honestly, and demonstrating genuine care for the communities affected by scientific work.
- *Emotional connection*. Frameworks such as Roberts' [2005] *Lovemarks* highlight how strong relationships combine respect with emotional attachment. Analogously, science can cultivate stronger relational bonds by communicating curiosity and wonder, using rich visual and experiential media, and revealing the human side of scientists and scientific work [Finkler & León, 2019; Longnecker, 2016].
- *Identity and belonging*. People's responses to scientific messages are often filtered through group identities and cultural narratives [Kahan et al., 2011; Kahan, 2015]. Science marketing acknowledges that science is not just a body of facts but also a *social actor* embedded in these identity landscapes. Brand-like thinking can help institutions articulate and live out values — such as fairness, inclusion, or environmental stewardship — that resonate with diverse publics.

The goal of branding in this sense is to align *perceived* identity with *lived* values and practices. As Wynne [2006] and others have argued, trust in science is undermined not only by poor communication but by institutional behaviour that contradicts stated values. Branding cannot substitute for institutional integrity; it must be grounded in it.

6 ▪ Strategic science marketing: a framework for practice

If science communication is to move to more strategic and intentional design, it needs practical frameworks. It is important to note that many professional science communicators

and their institutions already work within strategic frameworks — planning communications carefully, conducting audience research, and evaluating outcomes [Besley et al., 2018; Horst, 2013]. The framework below is not intended to suggest otherwise. Rather, it synthesises principles from social marketing and communication planning in a form that may be useful for practitioners across different contexts, and especially for those building new science communication programmes or working in resource-constrained settings.

Building on social marketing and communication planning models, a science marketing framework can be summarised in five interconnected pillars:

- *Purpose*. Begin with clear, specific objectives. What change is sought — cognitive (understanding), affective (attitudes, emotions), behavioural (actions), or relational (trust, participation, dialogue)? Importantly, objectives should also include enabling publics to influence science itself: what is researched, how it is conducted, and how results are communicated. Vague aims such as "raising awareness" make it difficult to design or evaluate communication [Andreasen, 2006].
- *Audience*. Treat audiences as diverse and dynamic. Use segmentation and qualitative insight to understand their values, concerns, barriers, and motivations. Develop personas or audience profiles to guide message design [Kahan et al., 2011; Schäfer & Metag, 2021]. Crucially, audiences should be understood not merely as targets but as potential co-creators and partners in the communication process [Stilgoe et al., 2014].
- *Narrative*. Embed evidence within stories that are meaningful to target audiences. Consider narrative structures (e.g. challenge, conflict, resolution), characters (e.g. community members, scientists), and emotional arcs (e.g. moving from worry to agency) that align with your objectives [Dahlstrom, 2014]. Ensure narratives create space for audience voices and lived experience. Position science audiences (rather than scientists) as the heroes of their own stories, empowering agency, reflection, and meaningful engagement. Weave empathy throughout storytelling to foster connection rather than simply delivering instruction.
- *Engagement*. Choose channels, formats, and framings that meet audiences where they are. This includes visual media, social platforms, participatory events, co-created content, and trusted messengers from within communities. Emotional and cultural fit are as important as factual accuracy [Nisbet, 2009; Finkler & León, 2019]. Participatory and dialogic formats — where publics can shape the conversation — are especially valuable where the goal is mutual learning rather than one-way transmission.
- *Evaluation*. Integrate evaluation from the outset. Use mixed methods — surveys, analytics, interviews, observations — to assess reach, comprehension, attitude change, and behavioural or policy impacts [Hornik & Yanovitzky, 2003; Noar, 2006]. Feed results back into iterative improvement. This pillar is already well developed in science communication research; the marketing lens reinforces its centrality for practice.

This framework shifts science communication from "output-driven" (number of talks or tweets) to "outcome-driven" (changes in understanding, trust, behaviour, or participation). It encourages practitioners to make their implicit assumptions explicit, to test their ideas, and to learn systematically from practice.

7 ▪ Revisiting Peter and Olson: provocation without dominance

Peter and Olson's [1983] question, "Is science marketing?", was intentionally provocative. By arguing that scientists must package and "sell" their ideas to peers in a competitive intellectual marketplace, they challenged the notion that science is purely a detached, rational enterprise. Their insight — that legitimacy and influence depend on communication and persuasion — foreshadowed later debates about the politics of expertise and the performative nature of scientific authority.

In the context of this essay, Peter and Olson's contribution is useful precisely because it unsettles the assumption that marketing is something external to science. If scientific communities already use marketing-like dynamics internally — through conferences, publications, and reputation-building — then applying marketing insights to *public* communication is less a radical departure and more a process of making these dynamics transparent, ethical, and accountable.

However, their framing also risks collapsing important differences between commercial marketing and science's epistemic goals. The science marketing lens proposed here resists that collapse. It does not claim that science *is* marketing, but that science communication can be strengthened by appropriating selected tools and theories from marketing in ways that align with scientific norms and public values.

8 ▪ Implications and future directions

A science marketing perspective has several implications for research and practice.

For *practitioners*, it suggests that communication should be treated as a design challenge, not merely a dissemination task. This implies investing in audience research, co-design with stakeholders, and cross-disciplinary collaboration between scientists, communicators, and marketing experts. It also calls for institutional support: time, training, and recognition for strategic communication work. Importantly, many professional science communicators already work in this way; the science marketing lens is offered as a complementary resource rather than a corrective.

For *institutions*, the lens highlights that organisational identity and culture matter. Trust in science is shaped by how institutions handle issues such as transparency, inclusion, and accountability, not just by how well they explain their findings. Brand-like thinking can help align communication with organisational values and practices, but must be accompanied by genuine structural commitments. For many organisations, the challenge is less a lack of strategic intent than a lack of resources and institutional commitment to diverse, participatory forms of engagement [Stilgoe et al., 2014].

For *researchers*, science marketing opens an agenda that bridges science communication, social marketing, and behavioural science. Key questions include: Which marketing strategies are most effective — and ethical — in different science contexts? How do narrative, branding, and framing interact with identity and power? How can marketing and science communication learn from each other? How can evaluation methods be robustly integrated into everyday practice?

For *science communication education*, a science marketing lens suggests integrating modules on marketing theory, audience segmentation, campaign design, and evaluation into training programmes. This does not mean turning science communicators into marketers in the commercial sense, but equipping them with conceptual and practical tools for working strategically in a complex media landscape.

9 ▪ Conclusion: science marketing as an ethically strategic lens

Science communication stands at a crossroads. The traditional repertoire of fact-laden lectures, press releases, and static outreach may fulfil institutional obligations, but it struggles to engage publics whose lives are shaped by emotion, identity, and digital media. At the same time, concerns about manipulation, oversimplification, and loss of integrity understandably make many scientists wary of marketing.

The science marketing lens proposed here is an attempt to navigate this tension. It does not ask science to abandon its values, but to *communicate those values more strategically and relationally*. By drawing on marketing's strengths — audience insight, strategy, storytelling, branding, and evaluation — whilst grounding practice in ethics and public benefit, science marketing reframes communication as a form of intentional, evidence-informed design.

Crucially, this essay recognises that science communicators and their institutions are not starting from zero. Many are already doing much of what has been described here — conducting audience research, building long-term relationships, designing outcomes-based communications, and engaging publics as partners [Domegan et al., 2013; Neresini & Bucchi, 2011]. The potential value of the marketing lens, lies not in correcting science communication but in providing a shared vocabulary that facilitates dialogue between scientists, communicators, marketing professionals, and the publics they all seek to serve.

Returning briefly to Peter and Olson's provocation, the question is no longer whether science behaves *as if* it were marketing, but how the strategic, persuasive dimensions of science communication can be used transparently and responsibly to enable understanding, trust, and collective action. In an age of deepening crises, science cannot afford to be right but unheard. Science marketing offers one complementary way to ensure that scientific knowledge is not only produced, but also *felt, trusted, and acted upon* — and that the publics who need it most have a voice in shaping how it is communicated.

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