CHAPTER 3.

CHANGING TIMES; CHANGING TEXTS

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In *Shaping Written Knowledge*, Charles Bazerman opened a new world to many of us, demonstrating how scholars construct a "stable rhetorical universe" within which their ideas make sense to others. One of the key ideas in this book was how the research article is a child of its time; a response to a particular historical context which shapes both the forms of scientific writing and the communities that use them. Coming from applied linguistics and without Bazerman's unique ability to combine insights from rhetorical, sociological, and literary perspectives, this chapter nevertheless attempts to suggest how today's context has changed writing practices in the academy.

Since Bazerman published his book in 1988, the academic landscape is almost unrecognizable. There has been an explosion of journals, papers, and authors with the globalization of research and the encroaching demands of publishing metrics on scholars across the planet. We have also witnessed a growing imperative for authors to reach new audiences and sponsors and seen the fragmentation and specialization of research. Change has also been relentless in the ways that we communicate and consume research. New digital genres, new electronic platforms, new modes of access and new commercial models are transforming publication. Perhaps at no time since the invention of the printing press has the pace and extent of change been so rapid. How research is done, how collaboration is organized and managed, how the literature is stored and accessed, how texts are constructed and disseminated, how output is measured and rewarded, how claims are discussed and evaluated have all seen a complete transformation. It would, therefore, be surprising if these changes had not had an impact on academic writing, and here I attempt to track an important element of this change on disciplinary knowledge construction.

In this chapter, I explore a corpus of 2.2 million words from the same leading journals in four disciplines at three periods over the past 50 years. My goal is to trace changes in a number of key interactive features I refer to as stance and engagement.

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PERSUASION AND INTERACTION IN ACADEMIC WRITING

One of Bazerman's enduring insights, for me at least, is the idea that writing is social action: It does things in the world. While he may not have been the first to express this position, his work eloquently illustrates it, perhaps most strongly in a collection he edited with James Paradis in 1991. In the introduction of that book, they say:

> Writing is more than socially embedded: it is socially constructive. Writing structures our relations with others and organizes our perceptions of the world. By studying texts within their contexts, we study as well as the dynamics of context building. (Bazerman & Paradis, 1991, p. 3)

While they expressed this view in the context of a challenge to current literary criticism, it does, of course, apply equally to writing in the professions, and particularly to writing in the academy.

The idea that academic writing is an objective and faceless kind of discourse, dealing directly with observable facts, has been questioned since the 1960s. Work by sociologists of knowledge like Thomas Kuhn, Steve Fuller, and Bruno Latour questioned traditional Mertonian accounts of scientific truth that knowledge is built on experiment, induction, replication, and falsifiability. In the Mertonian view, scientific papers are persuasive because they communicate truths based on observing the social or natural world, so that a research article is just the channel through which these observable facts are reported. But this ignores the role of *interpretation* in the process —and the arguments used to support them.

The interpretation of observations depends on the assumptions that scientists bring to the problem. As the celebrated physicist Stephen Hawking one said, "A theory may describe a range of observations, but beyond that it makes no sense to ask if it corresponds to reality, because we do not know what reality is independent of a theory" (Hawking, 1993, p. 44).

Hawking and Mlodinow (2010) go on to talk about "Model-dependent realism" to describe how reality is seen through the lenses of our (sometimes conflicting) theories. In other words, there is always going to be at least one way of understanding data and the fact we can have these competing explanations shifts attention away from the observations to the ways academics argue their interpretations of them. We have to look for "proof" in textual practices for producing agreement—in writing. At the heart of academic persuasion, then, is the attempt to anticipate and head off possible objections to arguments. To do this, writers have to encode ideas, use warrants and frame arguments in ways their audience will find most convincing. They use the language and rhetorical devices

of their disciplines. So this is where interaction comes into the frame as writers need to establish a professionally acceptable voice and a contextually appropriate attitude, both to their readers and their arguments.

The study of interaction has become important for those who study academic discourse for three main reasons:

1. It helps us see how persuasion is achieved through language.
2. It shows us how agreement is collaboratively achieved in particular contexts.
3. It shows us how writing is constitutive of context and vice versa.

Basically, interaction is important in academic writing as writers have to be familiar with a disciplinary audience and wider institutional influences to negotiate their knowledge claims. These language choices therefore tell us something about how writers understand their readers, their disciplines, and the times in which they work. But despite considerable interest in interaction, few studies address how it has changed, and this is the gap I seek to fill here.

INTERACTIVE PRACTICES: STANCE AND ENGAGEMENT

Bazerman and Paradis (1991) use the term "textual dynamics" to refer to the dialectical relationship between texts and context, the fact that written discourse both creates and is created by its context. We can see this operating in the changing milieu of scholarly publishing over the past 50 years, a time of unprecedented change for academics in their careers and working conditions leading to shifts in the ways writers rhetorically manage their interactions with readers and construct their disciplines. To explore this, I will examine diachronic corpus using my model which sees writers as taking a stance to convey their attitudes and credibility and engaging readers by explicitly bringing them into the discourse (Hyland, 2005).

Stance is a writer-oriented aspect of interaction and highlights authorial "positioning:" adopting a point of view in relation to both the issues discussed in a text and to others who hold points of view on those issues. Stance in this sense is a consistent series of rhetorical choices which allow authors to conduct interpersonal negotiations. It has three components: *evidentiality, affect,* and *presence*.

- **Evidentiality** – the writer's commitment to the reliability of information, either toning down a claim with hedges or ramping it up with boosters.
- **Affect** – the writer's attitude towards what is said expressed through attitude markers.

- **Presence** – the extent writers choose to intrude into a text using first person pronouns.

Engagement, on the other hand, is the ways writers recognize the presence of their readers in a text. It is an alignment dimension concerned with galvanizing support, expressing collegiality, resolving difficulties, and heading off objections (Hyland, 2005). By anticipating their background knowledge, interests, and expectations, a writer can seek to monitor readers' understanding and response to a text and manage their impression of the writer. It is more concerned with proximity to a community of readers than authorial positioning (Hyland, 2012). Engagement, then, turns on the degree to which writers present themselves as sharing attitudes with readers and manage affiliation. There are five ways in which authors make these connections.

- **Reader mentions** bring readers into a discourse, normally through second person pronouns, particularly inclusive we.
- **Questions** invite direct collusion because they address the reader as someone with an interest in the issue the question raises.
- **Appeals to shared knowledge** are explicit signals asking readers to recognize something as familiar or accepted (e.g., obviously, of course).
- **Directives** are instructions to the reader, mainly imperatives and obligation modals, which tell readers to perform an action or see things in the way the writer intends.
- **Personal asides** interrupt the argument to offer a comment on what has been said.

CORPUS AND METHOD

To see whether interactivity may have changed in professional academic writing in recent times, Kevin Jiang and I created three corpora to get a snapshot of four disciplines at three points over the past 50 years: 1965, 1985, and 2015 (Hyland & Jiang, 2019). We chose applied linguistics, sociology, electrical engineering, and biology as a cross section of disciplines and took six papers from each of the same five journals in each discipline with the top ranking in their field (according to their 2015 5-year impact factor). Two journals, *TESOL Quarterly* and *Foreign Language Annals*, only began in 1967 and so papers were chosen from issues in that year. This gave us a corpus of 360 papers of 2.2 million words. The most striking thing about the corpus is the massive increase in the length of papers over the period, which rose from some 600,000 words in 1965 to nearly a million in 2015. Figure 3.1 shows how papers in all fields, with the exception of biology, have increased.

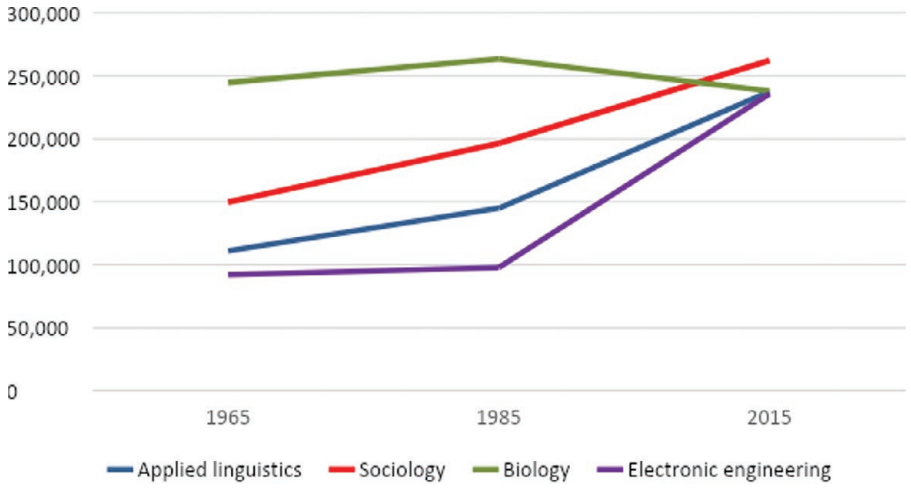

Figure 3.1. Corpus size (words per discipline)

We used *AntConc* (Anthony, 2019) to search the corpora using my 2005 list of most common interactive features in academic writing (Hyland, 2005), plus others we found in the corpus. Overall, 140 different items were examined and each occurrence was checked to establish that the feature was performing a function of stance or engagement.

OVERALL PATTERNS

Overall, we found 29,000 stance markers and almost 4000 engagement features in the 2015 papers, an increase of 54% in the last 50 years. However, when we take the fact that papers were much longer in 2015, this was a statistically significant *fall* of 9%. The figures normed to instances per 10,000 words are shown in Table 3.1 and indicate a steady decline in engagement and a heavy fall followed by a slight rise in stance.

Table 3.1. Distribution of Interactive Features Over Time (per 10,000 words)

	1965	**1985**	**2015**	**% Change**
Stance	324.3	291.6	304.9	- 6.0%
Engagement	46.1	44.4	40.3	- 12.7%
Total	370.4	336.0	345.2	- 9.3%

These falls are perhaps surprising given the increasingly competitive environment in which academics now work, where the rewards of publishing, both

symbolic and financial, have become inseparable from the requirement to publish, secure funding, and gain the credit of citation. We can also see that stance features are about six times more numerous overall and that engagement has fallen more steeply. Interestingly, however, not all features have moved in the same direction.

Figure 3.2 presents the results for stance and shows that although markers of evidentiality and attitude have dropped by around 25%, self-mention has risen substantially. Writers seem less comfortable in marking their confidence in the accuracy or correctness of statements by boosting or hedging their claims and less likely to express an attitude to what they say. So, despite a greater personal presence emerging in academic writing since 1965, with self-mention rising by nearly 50%, there seems to have been a declining preference for strong authorial standpoints. Simply: writers are not getting behind their ideas or intervening as much as in the past while nevertheless ensuring that they are very present in their texts.

Engagement, features, which are used to grab readers' interest and address them personally, have also declined significantly (*log likelihood* = 29.82 $p<0.001$). But we can see in Figure 3.3 that while all other features have fallen, directives, which are used to steer readers to some action or idea, are up by 16%. Perhaps there are stronger reasons now to overtly push readers to agreement, but the overall declines in stance and engagement are puzzling. I will now turn to the disciplinary shifts to show the changes in more detail and to suggest some answers.

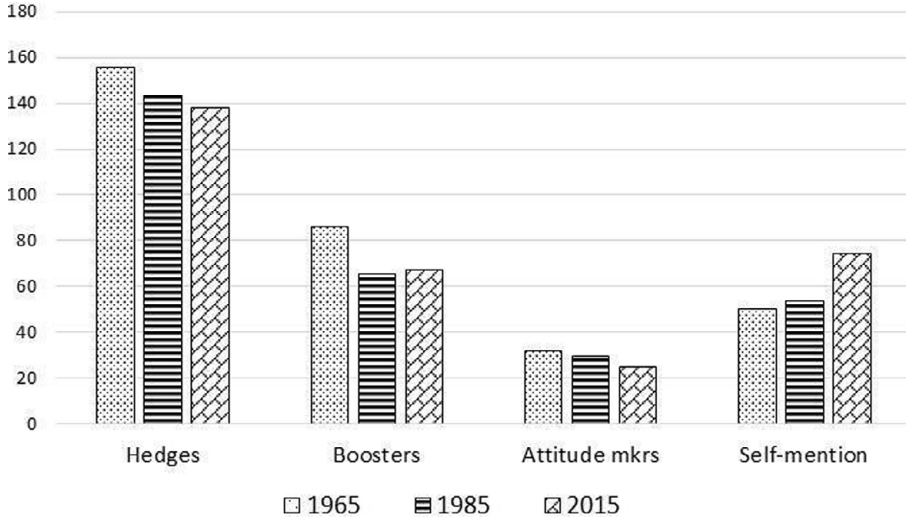

Figure 3.2. Distribution of stance features over time (per 10,000 words)

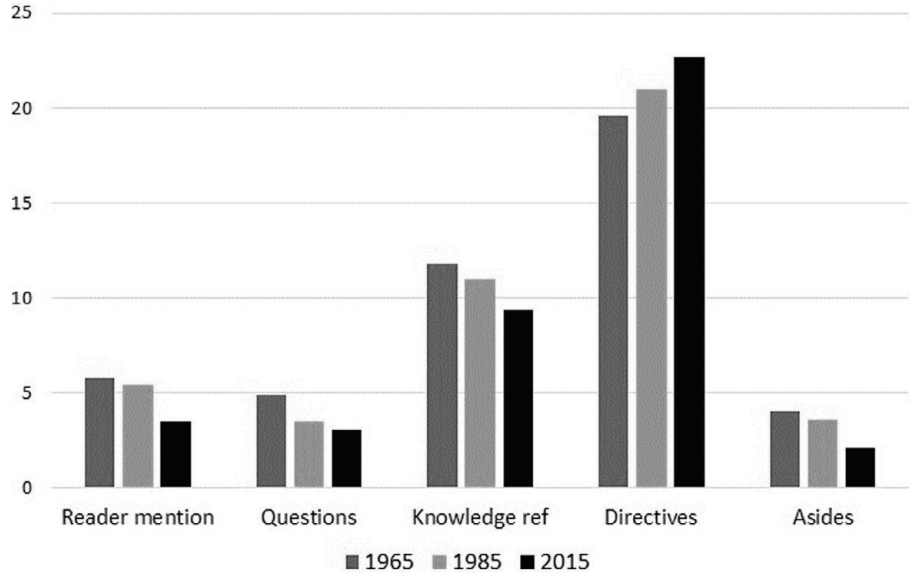

Figure 3.3. Engagement features (per 10,000 words)

CHANGES BY DISCIPLINE

The disciplinary changes turn out to be very surprising. The decline in the use of interactive features is unevenly distributed across fields and suggests that we are witnessing a modification, albeit very slowly, in academic writing conventions.

Figure 3.4 shows changes in stance over the three time points and we can see statistically significant falls in the use of these features in applied linguistics and sociology, although sociology has picked up a little since 1985. The science fields, especially engineering have risen significantly. Obviously, presenting a self is central to the writing process and we cannot avoid projecting an impression of ourselves and how we stand in relation to our arguments, discipline, and readers (Hyland, 2004). There is no "faceless" writing. But while writers in different disciplines represent themselves and their work in very different ways, how they do this seems to be converging. The soft knowledge fields, particularly in the past 30 years in the case of applied linguistics, have been slowly moving towards more "author-evacuated" prose; increasingly mimicking hard science practices. On the other hand, writers in the hard sciences, and spectacularly in the case of electrical engineering, are edging towards greater visibility, especially through self-mention to create a more explicit presence in the text.

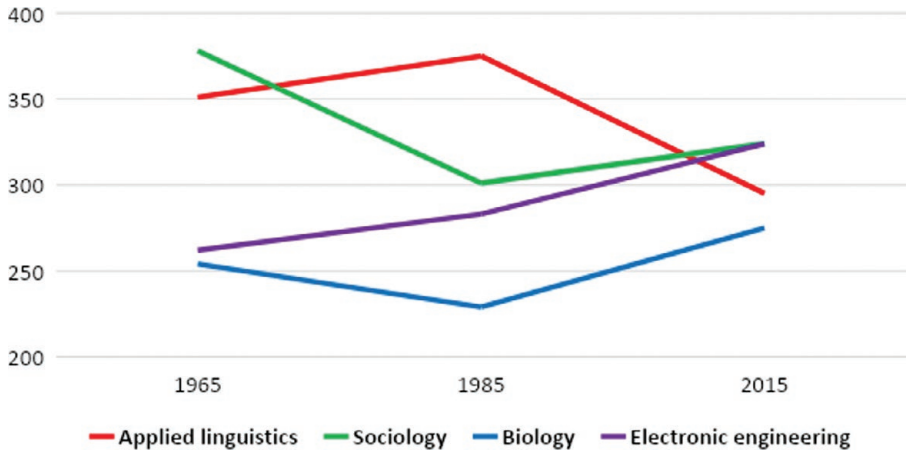

Figure 3.4. Changes in stance by discipline (per 10,000 words)

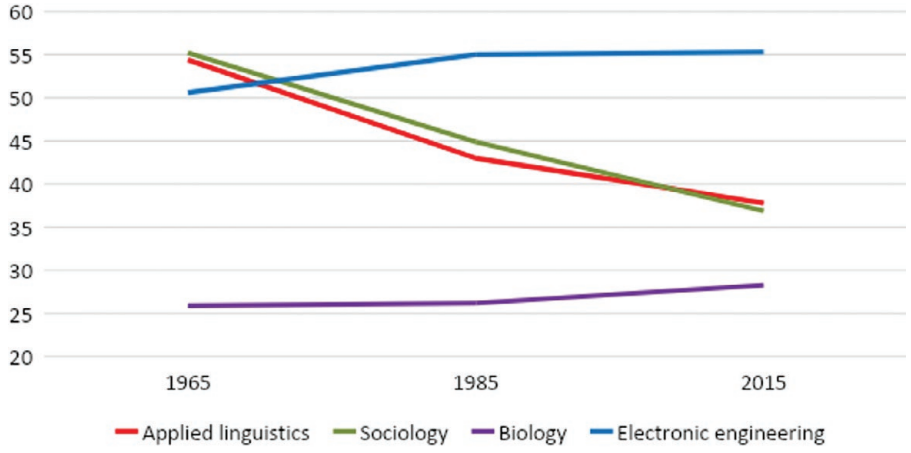

Figure 3.5. Changes in engagement by discipline (per 10,000 words)

Something similar is happening with *engagement*, with a statistically significant fall in the soft knowledge fields. Figure 3.5 indicates that writers in applied linguistics and sociology substantially reduced their use of engagement (LL = 86.60, p <0.001; LL = 110.06, p < 0.001). Biology and electrical engineering authors, on the other hand, have increased their use of engagement, particularly over the last 30 years, so frequencies in electrical engineering proportionately now exceed the other disciplines studied.

Overall, these trends are surprising as disciplines are distinguished as much by their argument patterns as by their epistemological assumptions or research topics (e.g., Bazerman, 1998; Hyland, 2004). Because the social sciences and

humanities work with more interpretive, less abstract kinds of knowledge, writers put themselves into the text far more, with a stronger representation of self, and are also more likely to recognize alternative voices and appeals for solidarity. Their texts are therefore characterized by more extensive use of stance and engagement markers. In the hard disciplines, in contrast, we are used to seeing writers downplay their interactions and rely far more on arguments based on methods and procedures. The greater reliability invested in hard science procedures allows authors to step back from their texts and allow "fact to speak for themselves." This, anyway, is the traditional pattern, but it seems to be breaking down.

The soft-knowledge fields are moving towards more "author-evacuated" prose in a way which mimics the hard sciences with less overt intrusion and calls for solidarity. Hard scientists, however, seem to be edging towards greater visibility, spectacularly so in electrical engineering. Speculatively, we might attribute this to the social sciences adopting more empirical and quantitative studies which restrict opportunities for overt interaction. Alternatively, it may be due to the massive growth of second language writers publishing in English who have been schooled in objective writing styles. However, while plausible responses, we might suspect there is more to it than this. As Bazerman himself observes, "Regularized forms of writing are social institutions, interacting with other social institutions" (1988, p. 22). Creating public knowledge is conducted in a social and economic sphere which impacts on the how interactions are conducted and what is considered to be appropriate argument and we can see this more clearly by looking at some of the main changes, beginning with stance.

CHANGES IN STANCE MARKERS

Stance is the writer's positioning—towards the topic and readers—and the features which most explicitly convey this have dropped 7%, over 50 years, with only self-mention rising overall.

Table 3.2 shows the percentage changes in stance features over the period. Falls are shaded. The table indicates, among other things, that the biologists have become more measured in their stance expression but considerably more "present" in terms of self-mentions. The electrical engineers are, in general, taking a stronger stance, increasing their expression of attitude, presence, and evidentiality. In contrast, while the sociologists are projecting themselves into their texts with self-mentions, they are expressing their attitudes and epistemic judgments less frequently. The applied linguists are becoming more faceless overall, a directly opposite trend to the engineers.

Table 3.2. Percentage Changes in Stance Features 1965-2015 (per 10,000 words)

	App linguistics	Sociology	Biology	Electrical Eng
Hedges	- 36.0	- 20.8	14.0	7.6
Boosters	- 37.8	- 35.5	- 32.2	15.0
Attitude markers	- 26.2	-21.6	2.5	72.6
Self-mention	-27.2	37.7	163.1	62.5

Boosters and attitude markers show the steepest falls, and these are the most explicit ways writers can indicate their position to take a firm stance towards their arguments, conveying commitment and affective evaluations.

Attitude markers fell from a lower height as affect is relatively uncommon in academic writing. But because they are a marked choice, they are salient and so create greater impact when they do occur as these examples show:

1. This was an extraordinary moral position, given Christianity's (and other world religions) long tradition of almsgiving. (Sociology)
2. This was an unexpected result and provides compelling evidence for the importance of deltas based on their size alone. (Applied Linguistics)

By signaling an assumption of shared attitudes to material with an active audience, writers both express a position and seek to bring readers into agreement with it. There is, however, a decline in the explicit marking of affect with fairly dramatic falls in the soft sciences and, once again, an increase in electronic engineering. Frequencies for attitude were down by 26% in applied linguistics and 22% in sociology. So, writers here seem to be adopting stances which are less robust. The most common expressions of attitude are *important* and what I'll call *restrictive even*, which limits the extent of the claim with *even though* or *even if*. Both forms help writers to present a positive stance which aligns with community knowledge or what the discipline already accepts.

3. Even though ACC oxidase is usually considered as a constitutive enzyme, a growing number of recent studies indicate that. (Biology)
4. It is shown that in some particular case one can also estimate the thickness of the domain wall even if it is much smaller than the optical wavelength. (Electrical Engineering)

So, Statement 3 tells readers that the writer shares their position on the properties of ACC oxidase, it also sets up a contrary or unexpected position. Statement 4 highlights unexpectedness, comparing what the writer claims against what is assumed shared knowledge with readers. By categorically asserting statements

which assume shared attitudes the writer constructs a relationship along with a text, but this is a relationship where the writer is firmly in the driving seat.

Boosters have also steadily declined in both soft knowledge disciplines and also show a trend towards more verbal uses. The most common form in 1965 and 1985 in both applied linguistics and sociology was *must*, the predominant modal of inferential certainty, but this had disappeared from the top 20 by 2015. Most interestingly, cognitive verbs such as *think, believe,* and *know* have been replaced by research verbs like *show, demonstrate,* and *find*. This represents a shift from commitments expressed as personal beliefs towards more objective, data-supported claims, from Statements 5 and 6 to those like Statements 7 and 8:

5. As promising as this approach seems, I think it fails. (Sociology)
6. That, I believe must be sought in an unhappy confusion in the minds of the teachers of composition. (Applied Linguistics)
7. We demonstrate that this inconsistency has resulted from inadequate control, . . . including the basis of norm comparisons. (Applied Linguistics)
8. In summary, we find that females are markedly superior to males in recalling social network information. (Sociology)

Writers in the soft knowledge fields are, then, appealing less to their personal convictions that something is true and preferring to attribute claims to their data.

Surprisingly, all stance markers have increased in electrical engineering. Attitude markers, for instance, have risen 73% in this field. Hedges and attitude markers are also up in biology, very much in contrast with the soft knowledge fields.

Hedges have also moved in different directions between the physical and social sciences. These devices allow writers to mark claims as provisional and pacify readers who may hold different views. They help authors to align their position with current thinking in the field, suggesting collegiality, reasonableness, and open-minded inquiry:

9. In this paper we show that a section of a corrugated waveguide may act in the same way. (Electrical Engineering)
10. This would seem to imply that these lamellae are non-planar in the melt, and undergo some form of shear, perhaps when crystallization is terminated by quenching. (Biology)

These writers are signaling a reluctance to be dogmatic and indicating that they are willing to entertain possible alternative views, that the waveguide may behave differently to their findings and that the lamellae do not have the characteristics the authors attribute to them.

The decline of hedges—by 36% in applied linguistics and 21% in sociology—therefore signals a shift in how assured writers wish to seem about their

claims. *May* and *would*, always among the most popular hedges, remain the most common in both applied linguistics and sociology, but their frequencies fell by half. This seems to represent not only a decline in hedging but a shift away from forms which, according to Coates (1983), express assumption (*should* and *ought*), possibilities (*may, might,* and *could*) and hypotheticality (*would*) towards those which carry more speculative judgements, predicated on a reference to the uncertainty of human evaluation such as *suggest* and *likely*.

So, where writers *do* hedge, they seem to be making more speculative interpretations:

11. Humans might inadvertently be altering the relationships between plants and mycorrhizal fungi and so might be affecting the cost: benefit balances. (Biology)
12. It seems that Indo-European poetry must have been governed by isosyllabism, accentual patterns, and alliteration. (Applied Linguistics)
13. We speculate that HNF4oL and HNF4P may already function as transcription factors during oogenesis. (Biology)

In fact, these forms are often used to draw conclusions rather than comment on accuracy. They speculate about possible reasons for something rather than the reliability of the data or the veracity of interpretations.

However, with boosters also falling substantially (38% and 35% in applied linguistics and sociology respectively), this seems to represent a less intrusive stance overall rather than a strengthening of commitment. This fall may be related to what some see as an increasing scientism in the social sciences—with more or a hard science orientation in their methods and approaches. Methods are usually less established and open to question in the soft sciences so that in applied linguistics, for example, there has been debate around legitimate disciplinary methods for years. This has increased with the growth of more powerful and simple to use corpus analysis tools and statistical packages which make quantitative support for findings and more precise measurement of data possible.

Perhaps surprisingly, however, changes in the frequencies of evidential markers have moved in the opposite direction in the sciences. Hedging rose 14% (per 10,000 words) in biology and 8% in electronic engineering and even boosters were up in engineering, by 15%. *Show, must,* and *know* were the preferred forms in both disciplines over the entire period, although engineers have come to use a much wider array of expressions, especially *establish, prove,* and *clearly*, which are used to ensure readers are aware of the strength of results or claims:

14. We shall prove, however, that this is not the case. (Biology)
15. Clearly, the formation of thermal stresses in the monolith structure is a dynamic process, whose prediction requires. (Electrical Engineering)

16. We have established above that (e(i)(t), ω(i)(t)) are bounded for all I = 1,..., j.. (Electrical Engineering)

The most dramatic change is in the rise in *self-mention*, where writers refer to themselves in the text. The use of *I* projects a personal stance and signals the writer's ownership of a claim. But while applied linguists now use this less than before, frequencies for biology are up 163%, electrical engineering 63%, and sociology 38%. All substantial rises. Personal reference is a clear indication of the perspective from which a statement should be interpreted, enabling writers to emphasize their own contribution and to seek agreement for it. As a result, this looks like a turn away from the convention of scientific objectivity—at least rhetorically. In the sciences it is common for writers to downplay their personal role to highlight the phenomena under study, the replicability of research activities, and the generality of the findings, subordinating their own voice to that of unmediated nature. Such a strategy subtly conveys an empiricist ideology that suggests research outcomes would be the same irrespective of the individual conducting it. In the humanities and social sciences, in contrast, the use of the first person is closely related to the desire to both strongly identify oneself with a particular argument and to gain credit for an individual view.

But there is a fine line to walk here. While impersonality helps authors show they are aware of the rhetorical conventions of their community, they must also stake out an individual position and strong persona as they argue for the originality of their claims. Thus:

- Impersonality helps authors display a disciplinary competence—indicating to readers they know how to argue using an appropriate community rhetoric, shaping their texts so readers find claims familiar and convincing.
- At the same time, they must create an independent voice and ownership of their claims.

This is the tension between what I have called *proximity* and *positioning* (Hyland, 2012), that is, the writer's relationship to the discipline and to what is being discussed in the text.

So self-mention, rather than disguising writer involvement, helps scientists to make their work more accessible and their role in it more visible. It is one way in which writers can respond to the growing imperative of "impact" as a measure in annual performance reviews and career assessments. A more visible presence is also a way of ensuring that their individual claims do not go unnoticed by university panels who judge applications for jobs, tenure, and promotion.

More specifically, while we find that *I* is increasing in most fields, *exclusive we* comprises nearly 60% of all self-mention overall. This form has doubled in electrical

engineering and increased by four times in biology, making it the preferred marker of self-mention in the sciences. This is partly a response, no doubt, to the growing trend, driven by institutional pressures, towards collaborative writing and co-authorship. Data from *Thomson Reuters*, for example, shows the average number of authors in papers in the Science Citation Index grew by 50% between 1990 and 2010 (Hyland, 2015). Since then, of course, the free availability of collaborative writing platforms such as *Google Docs* or online tools like *Authorea* and *Overleaf* further facilitate co-authorship, as do lower costs of air travel and communication tools such as *Skype, Zoom,* and *WhatsApp* calls. The fact that disciplines have become more factionalized into areas of specialization, also contributes to co-authorship as researchers may need to cooperate with others to investigate questions and publish their research. Underlying all this, however, are the pressures on academics to increase their outputs, which can more easily be done by the division of labor.

Using exclusive *we* is also an alternative to anonymizing passive constructions and helps authors represent their ownership of claims and get credit for them. In this way it addresses the growing pressure on academics to sell their knowledge to readers outside their specialism—especially the commercial interests which funds its research. So, while *inclusive we* allows authors to create more distance between themselves and their reporting than *I,* it does not create the same anonymity. It is a halfway house of intrusion.

Sociologists have also increased their use of self-mention, but we expect this in the more discursive social sciences. Without the same kind of strong consensus on the explanatory role of experimental methods, the impact of writer intrusion can be crucial in gaining acceptance for statements. More surprising, however, is the 27% fall in the use of self-mention in applied linguistics. One explanation for this might be that linguists are more self-conscious about language and the strong claims that self-mention makes for agency.

There is, however, a more plausible reason. This fall is consistent with the decline in other interactional features in applied linguistics over this 50-year period and does not seem to be related to a more "author evacuated" style (Hyland & Jiang, 2019). In 1965, the earliest period of this data, applied linguistics was at an early stage in its evolution towards becoming a discipline. It was an emergent field with an undeveloped literature and a greater focus on personal accounts of language teaching. Since then, there has been a massive increase in empirically-oriented studies, a broadening of the discipline to include far more topics, and the growth of a dedicated literature (e.g., Hyland & Jiang, 2021). The Blackwell encyclopedia of applied linguistics (Chappelle, 2012), for example, has over 1000 entries covering 27 major areas while the SCImago catalogue lists 884 journals in the field (ca., December 2020). These advances have, of course, brought rhetorical changes in how claims are argued and accepted.

CHANGES IN ENGAGEMENT FEATURES

Now I turn to engagement and how writers step into the text to refer to readers directly, shaping the discourse to readers' assumed needs for involvement. It is concerned with galvanizing support, expressing collegiality, resolving difficulties, and heading off objections (Hyland, 2004; 2005) and has two main purposes:

1. To meet readers' expectations of inclusion. Readers are addressed as participants in an ongoing dialogue using reader mentions and asides, suggesting group membership and solidarity.
2. To rhetorically position the audience, predicting and responding to possible objections. Here the writer pulls the audience along to guide them to interpretations with *questions*, *directives*, and *references to shared knowledge*.

Engagement therefore highlights the dialogic role of discourse in predicting a reader's reaction and in responding to a larger textual conversation among members of a discipline. While it's far less frequent than stance, the fact engagement varies across disciplines shows how it reflects writers' assessments of what readers might know and expect. In other words, like stance, these features are markers of discipline and reflect current institutional priorities.

Table 3.3 shows percentages changes in engagement since 1965. Once again, falls are shaded and show that *asides* and *references to shared knowledge* have fallen steadily in all four disciplines. While *questions* have more than doubled in biology, most of these numbers are very low, just three questions per 10,000 words in biology in 2015 for example. It is, nevertheless, worth looking at those with the highest frequencies: reader mention and directives.

Table 3.3. Changes in Engagement (%)

	App. Linguistics	Sociology	Biology	Electrical Eng.
Reader mention	- 38.2	-65.0	-50.0	65.2
Directives	-7.8	-0.3	8.6	35.3
Knowledge ref	-29.5	-28.6	-28.5	-22.9
Questions	-14.9	-36.8	146.2	-37.5
Asides	-71.7	-25.6	-29.6	-37.1

First, the table shows that *reader mention* has fallen significantly across all fields except electrical engineering. Explicitly referring to the reader is the clearest signal that the writer is thinking about an active audience. But while *you* and *your* are the most obvious acknowledgement of the reader, these are fairly rare in the corpus and almost non-existent in the hard sciences (Table 3.4).

Even linguists and sociologists have largely dropped the use of *you* over the past 50 years, with frequencies in sociology down from 5.0 to 0.5 cases per 10,000 words. This avoidance may indicate that writers may be reluctant to engage their interlocutors in such an explicitly direct and personal way, a trend we have seen above in the decreasing use of stance.

Table 3.4. Changes in Reader Mention Over Time (per 10,000 words)

Features	1965	1985	2015
you/your	1.7	1.3	0.3
one/reader	0.3	0.8	0.5
we/our/us	4.4	2.7	2.6

Where they are used, *you* and *your* rarely initiate a dialogue with a fellow specialist. Examples like Statement 17 from 1965, where the writer tries to engage readers as fellow professionals in a shared world, are uncommon in the 2015 corpus:

17. To evaluate the economics of retrofitting electrotechnologies into existing manufacturing processes, you should, of course, ask yourself: Is the existing process causing problems? If the answer is no, there is little incentive to change. However, if the answer is yes, you must define what the problems are, and you are likely to begin by determining if there is a bottleneck in the process." (Electrical Engineering)

Instead, we now see examples where *you* carries a more encompassing meaning, addressing the reader as an everyman scholar who is not a specialist but an intelligent person interested in the topic and able to follow the logic of the writer's argument, as in Statements 18 and 19:

18. For example, if you break the law, you can expect to be arrested, but if you go along quietly, you can, unless there is a special circumstance, expect to be treated reasonably. (Sociology)
19. That is, though you can see words, you cannot see ideas or content. If you cannot see content, you have no proof that it exists. What you cannot prove the existence of, they say, you have no business theorizing about. (Applied Linguistics)

The reader is thus pulled into the text as a partner, recruited by the writer to unravel a knotty problem together.

This usage functions like the indefinite pronoun *one,* which does the same job of impersonal interaction. *One*, in fact, has increased 4-fold in applied linguistics and is now over twice as frequent as *you*: Examples like these are common:

20. One cannot really see how a television channel could obtain large audiences by presenting news reports or shows in languages which are not understood by most of <u>the</u> people. (Applied Linguistics)
21. One can also expect similar attitudes and values relating to writing and writers. (Applied Linguistics)

This is still involving readers but has a less personally interactive tone than *you*.

Writers are using these forms to express a collegial connection with their readers in order to head off objections to their arguments. So, the falls in the use of *you* may not only be because of its over-personal connotations, but perhaps because it fails to firmly build this kind of relationship. Instead, it seems to emphasize the differences between the writer and reader, establishing a contrast between them—*You* vs *I* rather than *you* and *I*. *Inclusive we,* on the other hand, stresses sharedness. It suggests that the writer and reader have the same interpretations and goals. But while it takes readers into account, it addresses them from a position of power, a superior, condescending *we* which attempts to lead readers through an argument and towards a preferred conclusion. In other words, pronouns claim authority as well as collegiality. They help create a dialogue in order to coax compliance with the author's claims and it may be the transparency of this manipulative strategy which accounts for its decline since 1965.

Electrical engineers have bucked this trend and substantially increased their use of reference to readers through use of *inclusive we*, which have risen considerably by over 65%. We are now more likely to see statements like this:

22. In the case of ti—***we*** can obtain the expectation of E(diK). (Electrical Engineering)
23. <u>So</u> **we** can compute, from the device response (Fig. 7b), the external quality factor, Q, [3]. (Electrical Engineering)
24. These results broaden **our** understanding of bucket brigade devices and their potential role in new areas of application. (Electrical Engineering)

While the reasons for this are unclear, it may be related to the fact that engineers are under pressure to produce knowledge for wider fields of interest. They are increasingly reaching out to new audiences in only peripherally related areas, often outside academia itself, in the commercial world which funds much of its research. More interventionist engagement strategies, which seek to explicitly pull readers along towards particular viewpoints, may therefore help compensate for a less certain ability to rely on the persuasive efficacy of in-group understandings of methods, theories, and the significance of findings.

The final feature I want to mention are *directives.* These are typically imperatives or obligation modals and they instruct readers to perform an action or to

see things in a way determined by the writer (Hyland, 2002; 2005). They are therefore a way of managing the readers' understanding of a text and are typically realized by an imperative (Statement 25); by a modal of obligation addressed to the reader (Statement 26); by a first person inclusive let-imperative (Statement 27); and by an adjective expressing the writer's judgement of necessity/importance with a complement *to*- clause (Statement 28):

25. ***See*** text for discussion of the statistical analyses and curve fitting. (Biology)
26. Such transformations ***should*** be studied in terms of the semantic and ideological transformations they entail. (Applied Linguistics)
27. For the sake of simplicity, ***let us*** consider a one port admittance element with a real pole-residue pair, p and k. (Electrical Engineering)
28. But ***it is important to*** recognize that institutional power is subject to competition and monopoly as well. (Sociology)

In each case there is a clear reader-oriented focus as the writer intervenes to direct the reader to some action or understanding.

Directives are extremely common and comprise about 56% of all engagement devices, having risen by 250% over the 50-years. One major change, however, has been the decline of obligation modals (*must, should, have to,* and *ought*), probably because of their potential interpersonal impact. These forms carry strong connotations of unequal power, claiming greater authority for the writer by requiring readers to act or see things in a way determined by the writer (Hyland, 2002). They therefore come close to violating conventions of democratic peer relationships in research writing, appearing to be explicit attempts to control readers:

29. It ***must*** be understood, however, that there are wide variations in applications that describe themselves as "interactive multimedia." (Applied Linguistics)
30. To calculate temperatures and heat capacities on the TI82, <u>one</u> <u>must</u> use lists instead of tables. (Electrical Engineering)

They have in many cases, been replaced by imperatives, which make less interpersonal impact on readers, especially those which are most frequent in the corpus: *note, let, see, consider, suppose, notice,* and *assume.*

31. <u>Notice</u> that by using the new algorithm the problems become easier with increasing capacities B. (Electrical Engineering)
32. <u>Assume</u> a medial axis as shown in Fig. 9. (Biology)

Essentially, directives bring readers into the text to move them in a particular direction. In fact, they direct readers to three main kinds of activity:

- ***Textual acts*** guide readers to another part of the text or to another text (e.g., Smith, 1999; refer to Table 3.2)
- ***Physical acts*** instruct them how to carry out some action in the real world (e.g., *open the valve, heat the mixture*)
- ***Cognitive acts*** position readers by leading them through a line of reasoning and steer them to certain conclusions (e.g., *note, concede*, or *consider* some argument).

The increase in directives over the last 50 years has largely been in textual and physical acts and, again, mainly in electrical engineering. Cognitive acts have fallen by half in the physical science texts. These are potentially the riskiest kind of directive as they explicitly position readers by telling them how they should understand something in the text:

33. The configuration must be understood as having almost normal reflection, and an external magnetic field along the z-coordinate. (Electrical Engineering)
34. It is important to recognize that social norms, as prescriptions serving as common guidelines for social action, are grounded in values and attitudes. (Sociology)
35. One should be aware that the identification of an MRNA as a maternal component does not necessarily prove the presence of the corresponding protein. (Biology)

The other categories of directives are less overtly manipulative and have declined less. The big rise in electrical engineering, in fact, has been in physical acts, which generally offer succinct experimental instructions:

36. It is important to prevent the front end bending at this point. (Electrical Engineering)
37. When s completes these parts, repeat the above procedure and adjust the value of ivi'j- 1 using (1). (Electrical Engineering)

Physical directives allow both precision and brevity—features valued by information saturated scientists, who often read rapidly for bottom line results pertinent to their own research (Bazerman, 1988). Increasingly, scientific papers are also read by those from the professional world looking for ideas with a potential commercial relevance. Like changes in stance, then, these falls in engagement reflect the growing heterogeneity of audiences. If, as a writer, you are less sure about who is reading your work, it is probably safer not to make assumptions about what your reader already knows and how they would prefer to interact with you.

DISCUSSION AND SOME CONCLUSIONS

In this paper I have traced changes in academic interaction over the past 50 years to discover if they can be explained by the seismic changes which have occurred in the institutional and social contexts of research publishing. The main findings are:

1. Stance and engagement have failed to keep pace with the increasing length of papers and show statistically significant falls.
2. Strong stances expressed through attitude markers and boosters have declined the most.
3. Self-mention and directives are the only markers to have increased overall.
4. Disciplinary changes show declines in sociology and applied linguistics and rises in biology and electrical engineering.

It seems, broadly, that research is now being reported more impersonally, with more subdued involvement and with less explicit effort to finesse the reader. This is not to say that writers are no longer crafting texts which take the processing needs and background knowledge of their readers into account, but that this is now being done with less obvious authorial intervention. These changes are relatively slow, but they seem to show a shift in argument patterns which have gone largely unnoticed.

In the hard sciences the cumulative nature of research and tightly structured procedures have generally allowed for succinct communication and relatively "strong" claims which can be attributed to observations in the lab rather than interpretations at the keyboard. The relatively clear criteria for establishing or refuting claims has allowed authors to remove themselves from the picture, but research papers in both biology and electrical engineering, and particularly the latter, display an increased deployment of stance markers, most noticeably self-mention. We also see the beginning of an authorial repositioning in terms of engagement, and particularly of directives and reader mention in electrical engineering. One reason for this may be the growing need of scientists to address audiences beyond an immediate group of informed insiders to promote both one's research and oneself.

In the more discursive soft knowledge fields there is a marked trend in the opposite direction, towards less explicit engagement and a less visible stance. The changes documented here minimize authorial presence and convey more cautious stances, directing readers to the persuasive strength of data or methodological practice rather than the convictions of the interpreting writer. Speculatively, this may be due to the increasing specialization of research in the social sciences for, as topics become more focused and the literature more concentrated, audiences are themselves becoming more specialized. Academic success ever more demands that

professional academics carve out a very particular niche for themselves and make a contribution to a narrowly specific area. This means audiences are more familiar with issues and perhaps writers have less need for explicit engagement to persuade them. Another possible reason is the influence of style guides, writing textbooks and the massive growth of online writing advice. In a world where the majority of academics are writing in a language which is not their mother tongue, the influence of these sources of assistance may have a greater impact.

In the end, effective academic writing depends on rhetorical decisions about interpersonal intrusion which recognize and align with both disciplinary epistemologies and social practices and with wider political and institutional changes. The most significant of these in recent times would seem to concern the ways knowledge is constructed and disseminated to new audiences outside a traditional peer group, including commercial and industrial sponsors who might make use of the knowledge created and personnel boards who make high stakes decisions regarding the careers of academic writers. Academics are increasingly pushed to write for funders, commercial sponsors, grant awarding bodies, promotion and tenure committees, and other disciplinary outsiders. We are also being driven by career imperatives and an appraisal system obsessed by counting. Academics need to get their papers published, often in less specialized journals, to have their work recognized by more people, to be more widely noticed and cited by as many people as possible. New audiences, less specialized more results driven, and often looking for applications, are key factors which are driving, albeit slowly, how we write.

Overall, this study supports research which shows an inexorable growth in formality and authorial withdrawal since the inception of scientific writing some 350 years ago, a change which Atkinson (1999) describes as a move from a less "author-centered" rhetoric to a highly abstract and "object-centered" one. Bazerman (1988) himself traces this growing "collective intelligence" of the scientific community and the influence of contextual factors on its character as claims are increasingly separated from both nature and the individuals who perceive it. Just as the rhetorical style of articles has emerged over the centuries from the political establishment of a scientific community, the changes we see in these interactional choices similarly reflect changing audiences and material conditions.

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