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Talking to the literature: Stance taking in citing others' work

Ken Hyland & Feng (Kevin) Jiang

1. Introduction

Academic arguments must balance originality with established knowledge, showing that new claims are embedded in an existing disciplinary literature. This is the role that citation contributes to the advance of knowledge. In acknowledging others for their earlier work, authors simultaneously distribute credit for priority, demonstrate their knowledge of the field, distinguish their work from what has gone before and signal their credibility as a member of a disciplinary network. Citation is therefore a crucial component of building knowledge, consolidating disciplines, and establishing reputations.

Citation, moreover, has grown in prominence and significance over the years. The global explosion of journals and the development of online publication has increased the volume of research and the access scholars have to it, while the emergence of citation indexes has brought another dimension to this knowledge-constructing role. Now that institutions take citation counts as a measure of research impact and justify promotion and funding decisions on these counts, citations can contribute decisively to the professional careers of those cited (Slyder et al., 2011). Citations are therefore now the currency of the scholarly economy and having one's work recognized and referenced by others is an increasingly valued commodity in today's fiercely competitive academic world (Siler, 2012; Hyland, 2015).

To use citation effectively in building on prior work and differentiating their own research from it, writers must take a stance towards the reported material and this positioning can be a key aspect of citation. In this chapter we explore the role of reporting verbs and stance markers to convey the writer's evaluation of information imported from other sources, commenting on its evidential status positively, negatively or neutrally. Based on the analysis of a corpus of 2.2 million words from the same leading journals in four disciplines

in 1965, 1990 and 2015, we document the ways in which stance taking towards cited material has changed over the past 50 years.

2. Citation, knowledge creation, and diachronic change

The creation of academic facts is a social process, with acceptance only bestowed on claims after negotiation with editors, reviewers, and journal readers, with the final ratification granted with the citation of the claim by others. Eventually, of course, acknowledgment disappears as the claim is incorporated into the literature as a fact. This process of ratification means that writers must consider the reactions of their audience as readers always have the option of rejecting a writer's message. One consequence of this negotiation is that writers are obliged to situate their research in a larger narrative, and this is most obviously demonstrated through appropriate citation. Setting arguments in networks of references not only suggests a cumulative and linear progression but reminds us that statements are invariably a response to previous statements and are themselves available for further statements by others (Bakhtin, 1982). Citation therefore contributes to the 'manifest intertextuality' where other texts are explicitly present in the text.

Palmer (1986) refers to reporting the views of others, rather than one's own observations, as the 'quotative' mode of knowing, and this has been a feature of academic argument since the Late Middle Ages (Taavitsainen, 2002). As journals have continued to grow—in number, length, and the papers they publish – the number of references in each paper has increased consistently through the 20th century (Bazerman, 1988). Today they are heavily concentrated in the early sections of the article (Hu et al, 2013) to accommodate readers' scanning patterns as they rapidly search for relevance and novelty (Berkenkotter & Huckin, 1995). With journals moving online, the advent of hyperlinked citations and the regular posting of email alerts and social media promotions, the ease of searching and accessing sources has been transformed.

As a result of these changes, Hyland and Jiang (2019) found a massive increase in citations over the past 50 years, with references to prior work doubling per 10,000 words of text in four disciplines since 1965 with increases in applied linguistics and sociology particularly

marked. They also observed a relative decline in the use of reporting verbs, an increase in non-integral structures, and the replacement of summary by generalisation. These trends suggest a movement towards suppressing human agency in knowledge-making and placing greater emphasis on the reported studies rather than those who conducted them. In addition to longer reference lists, references now tend to be more recent and to fewer sources (Evans, 2008) as hyperlinking reduces the potential to encounter unexpected content (Xia, Myers & Wilhoite, 2010). By narrowing the citation base, this helps solidify prevailing opinion and potentially accelerates consensus.

Bibliometric studies have also found that citation follows a pattern of preferential attachment, with new citations referring to papers that are already popular (Maliniak et al. 2013) and are influenced by journal rankings and author seniority (Slyder et al, 2011). It is also the case that empirical papers tend to attract more citations than theoretical studies (White, 2001) over time and that Open Access also has a positive effect (Xia, et al, 2010). In terms of diachronic change, however, bibliometricians have largely focused on identifying researcher networks, the progress of highly cited articles across time, or the factors influencing heavy citation, concentrating on particular journals, authors, papers, and specific areas of study. Previous research, in other words, has tended to neglect the role of stance in citational change and how this might vary by discipline.

3. Stance and citation conventions

Stance refers to the ways that writers project themselves into their texts to comment on their own and others' work, communicating their credibility, involvement and a relationship to their subject matter and audiences (Hyland, 1999). Writers seek readers' agreement that their views are significant and original and that the positions they take towards prior work are appropriate and persuasive. They need to strike the right evaluative tone so that readers accept a judgement which is neither too assertive nor too insipid, while recognising the established views of the discipline.

The expression of stance in academic research writing has therefore been a productive area of study with the frameworks of *evaluation* (Hunston and Thompson 2000), *appraisal* (Martin and White 2005), *attitude* (Halliday, 2004), and *metadiscourse* (Hyland, 2005a) contributing to our understanding of it. Biber (2006), for example, has explored formal grammatical categories of stance such as modal verbs, stance adverbs, and stance

complement clauses while Quirk et al (1985) have examined disjuncts and Hyland (1998) *hedges*. In Hyland's (2005b) work, stance is a *writer-oriented feature* of interaction complementing engagement in a model of intersubjective positioning. This framework encompasses three main components: authorial presence, evidentiality, and affect, which we discuss below.

Reporting verbs have also been studied for how they express stance. This is one of the most explicit ways of both attributing content to another source and allowing writers to convey whether the claims are to be taken as accepted or not (Thompson & Ye, 1991). Most obviously, verbs such as *demonstrate, prove* and *show* reveal the writer's agreement with a prior statement, while those like *suggest, indicate* and *imply* open an "evaluative space" (Thompson & Ye, 1991: 369) in which the writer can withhold commitment to introduce an alternative view. Hyland (1999) agrees that all reporting is mediated by the reporter and that the writer can acknowledge acceptance of the authors' statement with factive verbs (*demonstrate, confirm),* convey disagreement with counter-factives (*fail, overlook*) or offer no clear attitudinal signal using non-factive verbs (*find, identify).*

In this paper we examine stance in by combining analyses of stance features and verb evaluation types, tracking differences between disciplines over 50 years from 1965.

4. Corpora and methods

We started compiling three corpora by taking research articles from the same five journals in four disciplines published in 1965, 1990, and 2015. We selected applied linguistics, sociology, electrical engineering, and biology as representative of applied and pure soft fields, and applied and pure hard science fields, as well as established and emergent fields. We were, then, interested in how writers in very different disciplines have changed their practices. We took six papers at random from each of the five longest-running journals which had achieved the highest ranking in their disciplinary category according to the 5 year impact factor in 2015. That is, 30 articles in total from each discipline from each year, a corpus of 360 papers with 2.2 million words. As can be seen from Table 1, there has been a massive 62% increase in the length of articles over the period.

Table 1: Corpus characteristics

Discipline	**1965**	**1990**	**2015**	**Overall**	**Change (%)**
Applied linguistics	110,832	145,712	237,452	493,143	114.2
Biology	244,706	240,255	237,998	746,169	-2.7
Elec engineering	92,062	124,631	235,681	425,288	156.0
Sociology	149,788	205,238	262,203	608,223	75.0
Totals	597,388	715,836	973,334	2,272,823	62.9

The corpora were then searched for cases of citation using the concordance software *AntConc* (Anthony, 2021) after part of speech tagging the corpora using *Treetagger*. We identified canonical citational forms such as a name or date in brackets (1), a number in squared brackets (2), superscript references (3), and latinate references to other citations (4).

(1) Such models arise naturally in applications of linear networked systems, e.g. for cyclic pursuit (Marshall, Broucke & Francis, 2004). (Elec Eng)

(2) This is due to the fact that ILS has a higher probability of occurring if the time between consecutive speciation events is short [29,30]. (Bio)

(3) As Hughes put it, "Montreal is the port of entry from which English influence and the industrial revolution radiate into the remote French-Canadian world."[3] (Soc)

(4) Those questions designed to probe the encoding function comprise the 'selection of correct lexical item for several types of context' (ibid.: 383). (App Ling)

To identify the stance features associated with citation structures we followed Hyland's (2005b) tripartite model:

- *Evidentiality* - the writer's commitment to the reliability of statements using hedges and boosters
- *Affect* - a range of personal and professional attitudes towards what is said expressed through attitude *markers*
- P*resence* - the extent the writer uses first person pronouns and possessives.

We examined 140 different items from the appendix of Hyland (2005a) and manually examined and counted each concordance in citing contexts to establish that the feature was a) performing a stance function (e.g. only cases of exclusive *we*) and b) related to a citation. Working independently, a 10% sample was coded by both authors to ensure reliability with 95% agreement. We then normalized the results per 100 citations to allow comparisons across time and disciplines.

We then identified all reporting verbs and coded them for evaluative meanings as described above, indicating whether the writer represented the reported information as true with factive verbs, negatively with counter-factives or neutrally, giving no clear signal either way, with non factives. This last option allows the writer to attribute a particular stance to the source author, reporting him or her as taking a positive (*advocate, argue, see*), neutral (*address, comment, look at*), tentative (*allude to, believe, suggest*), or critical *(attack, object, refute*) view. Working independently, both authors coded a 10% sample, about 400 examples, refining our agreement through successive passes to achieve an inter-rater reliability of 91%. We discuss the results in the following sections. In our discussion we follow Hyland (1999) and Thompson and Ye's (1991) useful convention of referring to the person citing as the "writer" and the cited person as the "author".

5 Overall results

Overall, we found nearly 13,500 citations in the 2015 corpus, averaging 13.8 per 1,000 words of text. This represents a substantial increase since 1965, with raw figures increasing by 230% and doubling when adjusted for the large rise in the length of papers (*log Likelihood* = 1734.42, $p < 0.001$). It is clear that the embedding of current work in earlier research remains a key aspect of academic argument, with the massive rise in both the total and normed referencing of prior research indicating both the growing importance of the practice and the expanding literature to cite. Despite this rise, however, there was a remarkable decline in the proportion of structures containing a reporting verb from 31% in 1965 to 12% in 2015. Table 2 shows this significant change.

Table 2 Total citations and verb structures 1965-2015

	1965	1990	2015	% change
total citations	4068	6319	13411	229.7
per 10,000 words	68.1	88.3	137.8	102.0
total reporting verb structures	1265	1309	1655	30.8
reporting as % of citations	31.1	20.7	12.3	-60.5

As we noted above, reporting verbs are among the clearest ways writers have of expressing their judgements concerning whether they accept the cited claims or not. As a result, the decline in the use of this feature reduces the opportunities available to take a stance. We might assume, then, that writers may have shifted their emphasis to now draw on alternative devices to evaluate reported statements, but it appears this is not the case. In fact, there has been a similar large drop in the use of stance markers in citation structures, with a fall of over 30% in their frequency, largely since 1990 (Table 3).

Table 3 Changes in stance features in citation structures (per 100 citations)

	1965	1990	2015	*LL*	*p*
Combined stance markers	88.3	85.5	60.1	265.5	<0.001

Together, the findings suggest what might be described as an increasing reluctance by writers to present their own view on what they are reporting. Instead, there seems to be a growing preference for the neutral incorporation of prior literature into current work. We examine this development in more detail below, starting with reporting verbs

5. Changes in use of reporting verbs

Overall the preferred reporting verbs have changed only a little over the past 50 years. *Show*, *find* and *discuss* have slipped but remain in the top 10 although *consider*, *study* and *demonstrate* have dropped out of it altogether. *Propose* and *describe* have moved up the top 10 and *argue*, *develop*, *observe*, and *suggest* have entered it (Table 4). While these broad frequencies disguise considerable disciplinary variation (Hyland & Jiang, 2019), they do indicate a growing preference for evaluatively neutral forms.

Table 4 The most frequent reporting verbs across time

1965	1990	2015
show	report	argue
find	find	propose
describe	propose	describe
point out	show	introduce
suggest	describe	find
discuss	suggest	show
study	identify	develop
propose	note	observe
consider	point out	discuss
demonstrate	present	suggest

So, in the earliest periods, the most common verbs are those which indicate a clear agreement with the claims of the cited author (5 & 6), while there are also a higher proportion of stance verbs in the top 10 indicating reservations (7 & 8):

(5) Skoog (1944) **showed** that hybrid N. glauca x AT. langsdorffii tissue grew but did not organize itself on an agar medium….. (Bio, 1965)

(6) The diagonalization applied to continuous-time systems is **demonstrated** by Zadeh[4]. (Elec eng, 1965)

(7) Much discussion of the state in cities (e.g.O'Connor 1973) **neglects** its regulatory function. (Soc, 1990)

(8) Barton [9] **failed** to find a relation between handedness and tachistoscopic recognition using multiple-letter stimuli. (Bio, 1965)

In 2015, however, the four most common reporting verbs are all those used to report the cited work in a neutral way, offering neither endorsement nor criticism (9 & 10):

(9) Johnson-Hanks and colleagues (2011) **describe** how schemas influence individual behavior by providing people ways to understand and interact with the world. (Soc, 2015)

(10) Flynn (2007) **argued for** the role of a multiplier based on the 'Matthew effect'. (Biology, 2015)

This movement away from an explicitly evaluative position can be more clearly seen in the quantitative changes shown in Table 5. We can see from this that while all evaluative

options have fallen, the greatest decline has been in those verbs offering a negative judgement.

Table 5 Changes stance of reporting verbs (per 100 citations)

	1965	**1990**	**2015**	**% change**	***LL***	***p***
Factive	21.0	11.6	6.1	-71.0	117.3	<0.001
Counter factive	0.6	0.4	0.2	-75.3	5.2	<0.05
Non-factive	9.4	8.8	6.2	-34.4	21.7	<0.001
neutral	2.2	2.3	1.6	-27.5	9.7	<0.05
tentative	2.2	1.7	0.9	-57.2	1.1	0.302
negative	1.6	0.9	0.2	-91.0	54.1	<0.001
positive	3.5	4.0	3.5	-1.2	58.8	<0.001

It seems that criticality has never been a popular option in selecting a reporting verb. This increasingly rare use of reporting verbs, moreover, has generally avoided face-threatening connotations by adopting non-specific targets. Rather than attack an individual study and its author, writers have tended to use them to broadly exploit an absence or deficiency in the literature more widely. This opens a research space for their own work:

> (11) But this work **overlooks** historical research which suggest there may be a connection between the two (Soc, 1990).
>
> (12) The stability difficulties implied by lack of controllability or observability are often implicitly **ignored**[1], [2]. (Elec Eng, 1965)

Factive verbs, however, have fallen to a third of the frequencies found in 1965. The reason for this is unclear, but writers seem reluctant to make too much of their acceptance, or perhaps their implied dependence, on prior work, preferring to let this remain implicit by simply acknowledging the cited research and moving on. As a result, factive verbs now occur at around the same rate as non-factive, more neutral verbs, which have fallen far less dramatically.

Non-factive stance options not only have the advantage of avoiding a commitment to a particular judgement, but also, as we noted in the previous section, allow the writer to attribute a particular stance to the source author. This is a useful evaluative option as it means the writer can imply that he or she shares a view with the author or disagrees, without the same risk of initial reader dissent. As Table 5 shows, attributing a critical perspective to

the author has, like counter factive verbs themselves, virtually died out as a rhetorical option:

(13) Haggqvist's staining techniques were **criticized** by Speidel (1939), whose view that the Z-disk was not collagenous. (Bio, 1965)

(14) Zeitlin (1976) **decried** the "astonishing consensus" among social scientists regarding the "alleged" separation of ownership from control in large corporations which, he said, derived from inaccurate knowledge of social facts. (Soc, 1990)

Instead, writers are more likely to ascribe a neutral (15) or, less likely, a tentative acceptance (16) to the cited author.

(15) The related subject of the lower limit of mammalian size, imposed by homothermy, has been **discussed** by Pearson (1948). (Bio, 1965)

(16) Thornton (2001, 2005) **suggests** that DI is an important influence on family behavior…. (Soc, 2015)

Overwhelmingly, however, we found writers attributing positive views to authors, and that these have remained fairly steady over the period:

(17) As Reskin (2012) **emphasizes**, discrimination and racial differences are interconnected. (Soc, 2015)

(18) Flynn (2007) **argued for** the role of a multiplier based on the 'Matthew effect'. (Bio, 2015)

The reason for this is, presumably, because positive ascriptions both allow the writer more leeway to respond to the citation by either agreeing or challenging the statement, but, more importantly, to claim support for their own direction of travel in the argument. There are, however, considerable disciplinary differences in the use of attribution markers and in stance reporting verbs overall.

Table 6 shows dramatic variations in both the preferred categories of stance verbs used to cite work by writers in different disciplines and the extent of changes over time. What stands out most obviously, however, are the figures for applied linguistics.

Table 6 Diachronic changes in reporting verbs across disciplines (per 100 citations)

	Applied linguistics			Sociology			Biology			Engineering		
	1965	1990	2015	1965	1990	2015	1965	1990	2015	1965	1990	2015
reporting verbs	**44.2**	**47.9**	**50.2**	**31.0**	**21.7**	**9.9**	**32.1**	**13.9**	**6.1**	**21.6**	**18.8**	**15.3**
factive	22.6	22.0	21.7	16.7	11.4	4.0	22.8	9.0	3.9	16.1	12.2	8.4
counter-factive	1.2	7.1	9.8	2.0	1.3	0.3	0.2	0.1	0.1	1.0	0.8	0.2
non-factive	20.4	18.8	18.7	12.3	9.0	5.6	9.1	4.8	2.1	4.5	5.8	6.7
neutral	11.3	11.7	11.8	0.9	0.8	0.7	2.5	1.5	0.5	2.9	2.0	0.9
tentative	9.0	5.6	4.7	0.7	0.6	0.5	2.8	1.0	0.0	0.3	1.1	1.9
negative	0.1	1.4	2.1	5.1	2.8	0.5	0.8	0.2	0.0	0.0	0.0	0.0
positive	0.0	0.1	0.1	5.6	4.8	3.9	3.0	2.1	1.6	1.3	2.7	3.9

While reporting verbs of each type have fallen across the other disciplines over 50 years, applied linguists have continued to make considerable use of all types and even significantly increased their use of counter-factives:

(19) Unfortunately the earlier research **fails** to acknowledge two important points. (App Ling 1965)

(20) Benveniste (1969: 164), however, does **not systematically observe** the difference between 'swearing' and 'promising', which must be regarded as two different speech acts. (App Ling 1990)

These uses, whether comprehensively addressing prior literature in general (19) or levelling criticism at a single researcher (20), can provide a springboard for writers to launch their own research. Applied linguists, however, made considerably more use of both factives and non-factives that the other fields we studied, with the latter overwhelmingly comprising neutral verbs:

(21) The perceived present-future self-discrepancy has been **conceptualized** by Higgins (1987) as the driver of engagement in self-motivated behaviour directed at attaining a desired future self. (App Ling, 2015)

(22) As Politzer (1965) **notes** in describing the relationship between teaching methods and learning, “the successful language learner is essentially the pupil who has devised a successful self-teaching method” (p. 18). (App Ling, 1965)

The writer is here able to report the prior work without endorsing the claim explicitly, perhaps to better situate it in a greater unfolding narrative leading to the writer’s position.

The only other category to show an increase over the period is the use of positive non-factives by electrical engineers:

(23) Critch[54] and Critch and Morton[55] also **highlight** the similarities between particular types of tensor networks with hidden Markov models. (Elec Eng, 2015)

(24) Building on this, the authors **advocate** the use of heterojunction bipolar transistors (HBTs) at microwave frequencies for large-signal applications (Elec Eng, 1965)

By adopting a neutral stance and attributing a position squarely to the cited author, writers are able to enhance their claims by subsequently challenging or building on that work.

Overall, however, citation verbs have become less frequent over time and less evaluatively loaded. We now turn to look at stance markers in citation structures more generally.

6. Changes in the use of stance in reporting others' work

As we noted in section 4, stance markers have also seen a considerable fall when reporting others' research. Table 6 offers a breakdown of the different markers per 100 citations.

Table 6 Changes in stance in citation structures (per 100 citations)

Feature	**1965**	**1990**	**2015**	***LL***	***p***
hedge	50.7	43.5	35.3	175.3	<0.001
booster	26.8	25.0	14.8	8.3	<0.01
attitude	10.1	16.1	8.5	91.1	<0.001
self-mention	0.7	1.0	1.6	89.4	<0.001
total	**88.3**	**85.5**	**60.1**	265.5	<0.001

As we can see, only self-mention, the explicit identification of the writer as the source of a statement, has increased. Writers often use self-mention to take a favourable stance towards earlier research. This simultaneously positively acknowledges priority by stating that it informs the current paper while subtly implying that the present work extends it:

(27) In the current study, **I** draw from Nan Lin's (2000) theory of inequality in social capital to consider the role of access to and mobilization of social ties across a wide range of settings. (Soc, 2015)

(28) To do this, **we** use a construction originally proposed by Filippov (1988) and then applied to PL systems (Gouzé & Sari, 2002). (Elec Eng, 2015)

Table 6 shows, however, that the most dramatic falls have been in epistemic devices, with both hedges and boosters seeing considerable declines. These are the devices writer's use to modify their commitment to the reliability of statements and, in this case, to evaluate the statements of others. Such assessments of certainty allow authors to review reported work from a particular perspective, either strongly endorsing it (29 & 30) or withholding a positive judgement (31 & 32):

(29) This is **clear** in Green's (2006) observation that there now exist specifically modern contexts and ideas that trans-individuals must negotiate. (Soc, 2015)

(30) Malmborg and Krishnakumar (1990) **prove** the order picking cost optimality for COI layouts that utilize dual command cycles. (Elec Eng, 2015)

(31) Recent techniques **appear** to accomplish this (Lee & Nelder, 1996; Smyth & Verbyla, 1999; Westneat et al., 2013) and can be applied to datasets containing repeated measures of phenotypes within individuals. (Bio, 2015)

(32) This **might**, as McConnell (1994) suggests, involve discussion work on-line about issues raised in the programs. (App Ling, 1990)

Clearly, hedges and boosters can be an effective means of taking a stance towards reported material, but their decline after 1990 indicates a growing reluctance by writers to commit to the earlier work they acknowledge.

As with citation verbs however, there are significant disciplinary differences in both their use and how they have changed over time. Table 7 shows that applied linguistics has seen the heaviest falls in evidential markers as the discipline slowly moves towards a more self-effacing profile. Hyland & Jiang (2019) suggest this is perhaps, at least partly, due to an increase in more quantitative and empirically-oriented studies which restrict opportunities for overt stance-taking compared with the personal accounts of teaching practices in earlier times. An alternative explanation may be the influence of growing numbers of second language writers, most notably from China and the Middle East, who have been schooled in the virtues of eliminating explicit agency from academic writing.

Table 7 Changes in stance in citation structures across disciplines (per 100 citations)

	Applied linguistics			Sociology			Biology			Electrical engineering		
	1965	1990	2015	1965	1990	2015	1965	1990	2015	1965	1990	2015
hedges	173.5	73.2	40.3	14.7	29.7	47.3	64.1	50.3	39.0	6.0	4.1	3.0
boosters	128.6	97.0	21.0	6.6	12.3	19.7	33.6	22.2	12.7	3.6	3.1	2.3
attitude	167.3	88.4	11.4	3.5	6.1	9.4	10.3	11.3	7.2	0.7	3.2	5.5
Self-mention	4.1	4.4	4.9	0.1	0.8	1.1	0.9	0.6	0.3	0.0	0.3	0.5
Total	**473.5**	**262.0**	**77.7**	**24.9**	**48.9**	**77.5**	**108.8**	**83.4**	**59.2**	**10.3**	**10.6**	**11.4**

The stance feature in applied linguistics with the most dramatic fall, however, has been attitude markers. These indicate the writer's affective, rather than epistemic, perspectives and include evaluations and personal feelings towards the introduced content:

(33) **Interestingly**, Blanchard (2011) points out that, unlike other online forums where it is difficult for "newbies" to enter, the informal style of blog engages the interested reader to contribute to the discussion. (App Ling, 2015)

(34) We **agree** with Makoni and Pennycook (2007) that the notion of languages as separate, discrete entities, and "countable institutions" is a social construct. (App Ling, 2015)

The emphatic expression of affect is relatively infrequent in research writing (Hyland, 2004) and tends to be implicitly *invoked* rather than openly *inscribed* (Martin & White, 2005). Yet, despite this fall in applied linguistics, we are more likely to find attitude expressed in this discipline than the others we studied, although this feature has shown a substantial increase among writers in both sociology and electrical engineering:

(35) An **interesting** example is Archer (2003), who brings to focus the phenomenon of 'internal conversation' as the 'mediating process' between structure and agency. (Soc, 2015)

(36) An **important** component of Taguchi's (1986) robust design framework is the categorization of factors into two major (firm-specific) categories: noise factors and parameters. (Elec eng, 2015)

Sociology, in fact, is the only discipline recording an increase in all stance features used to report cited work as writers have seen advantages in ensuring their perspective on earlier work is clearly recognized:

(37) **Our** findings pertaining to wage inequalities, taken alongside **our** prior work on downward mobility (Wilson et al. 2013), are **important** and signal the collapse of the public sector as the long-standing occupational niche for African Americans. (Soc, 2015)

(38) **We** do not question the usefulness of this more tapered approach, but we **agree** with Myra Marx Ferree (2004) that non-state agents can repress. (Soc, 2015)

Personal reference and expressions of attitude are strong indications of how readers should interpret the writer's view towards the imported material, allowing them to emphasize their own contribution and to seek agreement for it.

Interestingly, the only discipline where self-mention is found more as a citation stance marker is in applied linguistics, which is also the only feature to have increased in that field. It is also curious that writers here do not usually intrude to introduce others' work, but to ensure readers are aware of their own earlier publications:

(39) In **our** earlier research (Davis & Morley, 2011), **we** concluded that it was important for EAP tutors to teach the role of re-usable phrases. (App Ling, 2015)

(40) Nevertheless, as **I** noted elsewhere (Block, 2014), it is hard to see what this advocacy hopes to achieve if it is dealing with social class as if it were a dimension of identity like gender, race, ethnicity, or nationality. (App Ling, 2015)

While frequencies remain low, the increase reflects the wider growth of self-citation, which has risen over 45% per 1000 words over the last 50 years (Hyland & Jiang, 2018). Here writers are able to express a clear, and almost always positive, stance towards their own and others' work.

In the hard science disciplines studied here, represented by biology and electrical engineering, we also found a decline in the role of stance to introduce cited material. Both fields have the lowest frequencies for all features, which is perhaps unsurprising given the more cautious and author-evacuated positions of the physical sciences. It is customary for writers in the sciences 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 avoids explicit stance-taking to subtly convey an empiricist ideology that suggests that the outcomes of research would be the same irrespective of who conducts it.

Although biologists have become more measured in their stance, they continue to make some use of hedges in reporting others' results, stepping back from fully endorsing the work they are citing:

(41) Recent techniques **appear** to accomplish this (Lee & Nelder, 1996; Smyth & Verbyla, 1999; Westneat et al., 2013) and can be applied to datasets containing repeated measures of phenotypes within individuals. (Bio, 2015)

(42) Ca2 **may** act by regulating the proposed putative transacting factors involved in the specific degradation of flagellar transcripts in Chlamydomonas [4]. (Bio, 1990).

Electrical engineers have actually increased their use of self-mention and attitude markers. The markers used to convey affect, however, largely refer to judgements of significance rather than emotion:

(43) One **important** contribution of Djehiche and Tembine (in press) is that the derivation of the SMP does not require any (explicit) relationship ...

(Elec eng, 2015)

While the relatively clear criteria for judging work has generally allowed scientists to remove themselves from the picture, there is still some use of stance expressions.

Conclusions

The extensive use of citation in this corpus underlines the fact that, in academic writing, the message presented is always embedded in earlier messages. But while all writers draw intertextual links to earlier work, they seem to be taking a less explicit stance towards this work, with fewer reporting verbs and less use of evaluative markers such as hedges, boosters, attitude markers, and self-mention in citation structures. Preferred reporting verbs are now far more likely to express a non-factive, neutral, stance towards cited material and attribute a positive attitude to the author, while clear stance markers are also far less frequently encountered than 50 years ago. There are, however, disciplinary differences in these changes, with applied linguists showing the most substantial falls in stance markers but increasing their use of counter-factive verbs and self-mention in reporting structures. Biologists showed the greatest fall in their use of stance reporting verbs overall with sociologists close behind, although sociologists were the only writers to increase their use of stance markers, recording a marked rise in all features. Electrical engineers appear to make the least use of stance in reporting others' work.

Overall, then, while citation remains important to professional research writers, and has even increased over the last 50 years with the growth in the scale and availability of published research, there seems to have been a significant shift in how these disciplines address cited material. Taking a critical stance in citing others' work is increasingly a marked choice and where a stance is taken writers are likely to be either positive or neutral, and often represent themselves explicitly using self-mention. While the reasons for this are unclear, there seems to be a drift towards impersonality, and we cannot rule out the influence here of publishing pressures. The imperative to communicate beyond disciplinary boundaries and to gain both attention and citations are the currency of career advancement but create greater risks for failure. Writers may feel that withholding a stance towards colleagues' work is a judicious strategy in this context.

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