

“We believe that...”: changes in an academic stance marker

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Introduction

The importance of authorial stance in academic writing is now widely acknowledged and, indeed, has generated a considerable amount of research in recent years. Concerned with the expression of the writer’s ‘personal feelings, attitudes, value judgements, or assessments’ (Biber, 2006: 87), stance plays a crucial role in negotiating the acceptance of arguments, allowing writers to adopt positions and persuade readers to accept them. Successful authors are those who are able to deploy a range of rhetorical features to underline the novelty of their work, evaluate their findings and build solidarity with their readers. In this paper we explore one of the less researched ways to mark stance, a structure Hyland & Tse (2005a, b) call “evaluative *that*”. This is a pattern which pulls different types of explicit ‘that’ clauses together, and relates them to evaluation, the formal identity reflecting a functional kinship.

Linguists have tended to regard evaluative *that* as a number of separate patterns, although Hyland & Tse (2005a: 40) see a coherent construction which they define as:

a grammatical pattern in which a *that* complement clause is contained in a higher super-ordinate clause to complete its construction and which together project the writer’s attitudes or ideas about something.

Its purpose is to enable writers to front-load utterances with attitudinal meanings and offer an explicit statement of evaluation of the proposition which follows. These examples (from our research article corpus) give some flavour of this:

- (1) Wei (2011) made a similar argument that the act of translanguaging is transformative in nature. (Applied linguistics)
- (2) It is possible that this is connected with the high nonlinearity of the spatially dependent refractive index distribution. (Electrical engineering)

- (3) I will show that the biofunctional account can give us more content specificity than Fodor supposes. (Sociology)

In formal terms, a super-ordinate, or matrix clause (e.g. *I will show*) contains both an evaluation and the source of this evaluation while the complement clause (*that the biofunctional account can give us more content specificity than Fodor supposes*) contains the ‘entity’ that is evaluated. So, we have the following structure: matrix clause [evaluation] + *that* clause [evaluated entity]. The importance of this structure is underlined by its frequency in academic writing, with even the brief, and supposedly neutral factual summary of the article abstract containing about 7 instances per 1000 words (Hyland & Tse, 2005a).

In this paper we examine the contribution of this pattern to the key genre of the academy, the research article, and map changes in its use and frequency in four disciplines from the social and physical sciences over the past 50 years. Our goal is not only to underline the value of regarding evaluative *that* as a single coherent structure, but also to show how it contributes to the creation of authorial stance in these fields and how it is evolving in response to major changes in academic research and publishing practices. First, we examine how the structure is seen in the literature.

2 Evaluative *that* and its relatives: a brief review

In this section we elucidate the value of pulling together the different treatments of related structures into a single coherent construction as Hyland and Tse suggest and propose a common function for this.

Syntactically, one manifestation of this structure has been discussed in terms of extraposition (e.g. Quirk et al, 1985) which refers to the process whereby the notional subject is moved, or extraposed, to a position following the original predicate and replaced by *it* as subject. This enables long and complicated chunks of information to be pushed to the end of the clause in order to preserve the expected end-weighted pattern in English and so assist readers’ processing of

‘new’ information. At the same time, because it delays the notional subject, it is also a marked construction and so emphasizes the extraposed elements. Most importantly from our perspective, however, it allows the writer to express a stance while remaining in the background (e.g. Herriman, 2000; Hewings & Hewings, 2002; Groom, 2005), foregrounding attitudinal meanings at the beginning of the clause while concealing the source of this attitude with an impersonal subject.

This is an effect Halliday (1994) calls ‘explicitly objective modalisation’, and it can be used to comment on either the authors’ study (4) or somebody else’s (5):

(4) So far it has been suggested that *for regular behaviors, respondents have access to a rate of occurrence of the behavior in memory and will use this information.* (Soc)

(5) Recently, however, it has been suggested that *in the final analysis customers are looking for value in services (Holbrook, 1994).* (Soc)

Because extraposition enables writers to depersonalize and qualify their opinions and distance themselves from the following *that*-clause in this way, it is relatively common in academic discourse. Thus Biber et al (1999) and Herriman (2000), for instance, found that the structure is far more frequent in academic prose than in other registers and Hewings and Hewings (2002), observed what they call ‘anticipatory *it*’ to be a key feature of textbooks, articles and student essays in business, science and technology.

These studies, however, are restricted to clauses with *it* as subject and ignore *that* clauses with other subject options. It is clear, for example, that similar constructions may be less coy about explicitly naming the author as the source of the evaluation:

(6) To this end, we note that by integrating the Euler equation of the variational problem (35), i.e., $G = 0$ over a time interval (t, t) , we obtain $G = 0$. (EE)

(7) This represents our intuition that a question is not really radically different from its corresponding statement but is just this statement “plus something”

(AL)

The choice of the source of the evaluation is clearly a key interpersonal option available to authors in taking or shifting responsibility for a claim. Halliday (1994: 354-5), in fact, sees expressions such as “it is likely” to be metaphorical variants of ‘I think’ in conveying an author’s attitude towards the validity of the following information. The difference lies between stating the probability as subjectively or objectively determined. Nor does the notion of extraposition adequately account for how the entire matrix clause of subject + verb serves to frame the following clause and accomplish interactional goals. Davies (1988) and Gosden (1993), for example, call these structures *contextual frames* which can contextualize and hold what follows in their scope. We can thus begin to see the coherence of the entire structure and how what occurs at the beginning of a sentence can encompass what follows in an evaluative judgement.

The evaluative-*that* structure, moreover, also embraces different predicates which tend to be treated as distinct patterns by linguists. Most commonly, academics select a verb to open an evaluative space to comment on the *that clause*, typically these are cognitive or affective verbs such as *think*, *know*, and *believe*, speech act verbs, like *say* and *state*, and other communication verbs such as *suggest* and *prove* (Biber et al, 1999: 661). Charles (2006), for example, explored the *V-that* reporting pattern in theses from politics and materials science and shows how writers can emphasize or hide their responsibility for statements, not only by selecting or avoiding a personal pronoun, but by making judicious verb choices interacting with the source of the evaluation. Thus, despite the impersonal source, the superficially more impersonal and objective construction in (8) establishes a more robust authorial perspective on the following information than that in (9):

- (8) **These results clearly show that** specificity is not absolute and that
coexistence or inversion are possible. (Biology)

(9) In this communication **we report that** a single member of the PPO gene family, PPO F, is transcriptionally and differentially activated in response to abiotic and biotic injuries. (Bio)

Alternatively, the relationship of the matrix to the main clause can be expressed using a noun such as *fact*, *assumption* and *reason* (e.g Charles, 2007; Author & Author, 2015a) (10, 11) or by an adjective (e.g. Biber, 2006) (12, 13):

(10) In addition to **the obvious fact that** such a “diagonalization” simplifies the representation of the operator L (assuming L is “diagonalizable”), several specific aspects should be noted. (EE)

(11) These expectations were based on **the assumption that** classes which focused more on teaching the language code would likely include more activities involving minimal texts ... (AL)

(12) **it is noteworthy that** the decrease in preference for dark observed in animals exposed to 100 r of X-rays without drugs was not observed in animals exposed to 100 r of X-rays after drug treatment. (Bio)

(13) **It was apparent that** the perception of favoured treatment for men engendered a general sense of injustice among the female students. (Soc)

Charles (2007), for example, recognizes the stance functions of the *N + that* pattern, using the analytical categories found in in *Collins COBUILD Grammar Patterns* (Francis et al, 1998) of *idea*, *argument*, *evidence*, *possibility* and *others*. Author and Author (2015a) are more interested in mapping the various stance options available in the complement clauses following stance nouns. While *N + to infinitive* was the most frequent form in their data, they show the importance of *N + that* in marking authorial stance, particularly with regard to expressing the writer’s beliefs, attitudes, reasoning or judgements of epistemic status. Nouns such as *decision*, *idea*, *assumption*, *likelihood* and *possibility* were very frequent in their corpus, carrying the stance of the writing towards a proposition expressed in the complement.

We agree with Hyland and Tse that these apparently diverse patterns should be seen as a coherent rhetorical strategy, with both a formal resemblance and a functional affinity; a structure where the different uses cohere around a core meaning of evaluation. By viewing the matrix plus *that*-clause structure as a single unit, moreover, we can see a powerful way of expressing evaluative meanings in academic discourse, allowing writers to thematize the evaluation and make the attitudinal meaning the starting point of the message and the perspective from which the content of the *that*-clause is interpreted. This means is that we can identify four main choices for authors: 1) what is to be evaluated; 2) the stance to be taken towards it; 3) who to attribute the evaluation to; 4) and the form of expression to use.

Taken together, these represent important rhetorical choices at the interface of lexis and grammar, revealing not only the authorial perspectives of writers but the material they comment on and the voice they adopt to do so. Importantly, this construction contributes to our understanding of the lexical markings of stance in the literature, such as Hyland's (2005) discussion which models stance as hedges (such as *could, may*), boosters (*always, must*) attitude markers (*strikingly, amazingly*) and self mention (*we, my*). The functioning of these features together influence how writers intend their work to be understood and guide readers' reception of their claims.

Despite a growing research interest in evaluation and stance, however, few studies have explored how these might be changing. Biber (2004), Bondi (2014) and Hyland and Jiang (2016) have sought to diachronically map developments in some key stance markers in academic discourse, but have not discussed *evaluative that* and little is known of how these nuanced aspects of the stance-taking machinery in knowledge-making have changed. We address this gap by answering the following questions:

- (1) What changes have occurred in the frequency of evaluative *that* over the past 50 years in research articles?
- (2) What changes have occurred in the entities evaluated and the sources evaluations are attributed to over this period?
- (3) What disciplinary variations have there been in these changes?

3 Corpus and procedures

To track changes in this pattern over the past 50 years we created three corpora taking research articles from the same five journals in four disciplines (applied linguistics, sociology, biology and electronic engineering) spaced at three periods: 1965, 1985 and 2015. The different time spans (20 years + 30 years) were chosen to see if any changes were more pronounced in the later or earlier period, although we were concerned with overall changes during the 50 years. We also chose to use 1985 as a mid-point because this seemed to be on the cusp of the move to electronic academic publishing and a turning point in the use of a number of stance features in different fields. 1985 represents the point at which biology and sociology arrested falling frequencies in stance markers and where applied linguistics began to adopt less ‘author-fronted’ positions (Hyland & Jiang, 2016). We were interested to see whether there were parallel changes in the evaluative *that* structure.

Our journal selection was, in part, constrained by the fact that particular titles come and go, with changing fortunes and scope, but we sought to select robust journals at the top of their respective fields with a long history. Applied linguistics, sociology, electrical engineering and biology were selected as representative of both the social sciences and the hard sciences (Becher & Trowler, 2001), disregarding writing in the humanities which differs in its use of stance marking (e.g. Hyland, 2005). We took six papers at random from each of the five journals which had achieved the top ranking in their category according to the 5 year impact factor in 2015. That is, we selected 30 articles in total from each discipline from each year. The journals are listed in Appendix 1 and the corpus comprised 360 papers of 2.2 million words (see Table 1).

Table 1: Corpus characteristics

Discipline	1965	1985	2015	Overall
Applied linguistics	110,832	144,859	237,452	493,143
Biology	244,706	263,465	237,998	746,169
Engineering	92,062	97,545,	235,681	425,288
Sociology	149,788	196,232	262,203	608,223
Totals	597,388	702,101	973,334	2,272,823

Following Hyland and Tse (2005a, 2005b), we searched the corpus for *that* using *AntConc* (Anthony, 2014) and counted those cases where *that* was used to introduce a complement clause as described above, i.e. where the subject of the projecting clause was either *it* or a participant, where the lexical verb, noun, or adjective presented the type of projecting, and where the *that*-clause presented the projected idea or speech. We manually checked every instance and eliminated all cases where *that* acted as a demonstrative (e.g. *The optimal control law in that case is time-varying*), or a relative pronoun (e.g. *These findings offer valuable insights into the paradox that frames this study*).

Like Hyland and Tse (2005a, 2005b) we chose to disregard cases of *that* omission. This is partly a result of our method as it is much easier in corpus searches to find features which are present rather than those which are not. Thus identifying cases of explicit *that* structures is straightforward while we are not aware of any effective annotation tags which can reliably find *that* omission in a corpus. More importantly, our decision to follow Hyland & Tse in excluding implicit or zero *that* was also guided by corpus data which confirms that there is an overwhelming preference for the retention of *that* in academic writing (Biber et al, 1999: 680-3). Writers are, of course, free to include or omit the *that* complementizer without influencing meaning in any way (Hyland & Tse, 2005a: 45), as here:

(14) We acknowledge that these results are open to question.

We acknowledge these results are open to question.

But generally academics choose to retain it, perhaps this inclusion is to facilitate readers' comprehension by clearly marking the boundary between the superordinate and complement clauses.

We followed, then, the coding scheme devised by Hyland & Tse (2005b) with minor changes.

This is presented in Table 2 with our own examples and summarized below:

Table 2: Modified classification of evaluative that (based on Hyland & Tse, 2005b: 130)

Aspect	Subcategories	Examples
<i>Evaluated entity</i>	a) interpretation of author's claim	Our findings show that <i>the museum visit can be seen as 6 distinct stages</i>
	b) interpretation of previous studies	One limitation from Fransen et al. (2014) was that <i>participants were only asked to evaluate the best...</i>
	c) interpretation of author's goals	It is our hope that <i>the framework will be applied to other contexts....</i>
	d) interpretation of methods, models, theories	It was found that <i>the results of the model were in very good consistency with...</i>
	e) common or accepted knowledge	It is believed that <i>there is a direct relationship between poverty and crime</i>
<i>Evaluative Stance</i>	a) Attitudinal: i) affect	I hope that, It is important to note that
	ii) obligation	It must be recognized that
	b) Epistemic:	It is likely that, We prove that
	c) Neutral:	It means that
<i>Evaluative source</i>	a) Author	We show that, I indicate that
	b) Other humans	Smith notes that
	b) Abstract entity –inanimate source	The findings indicate that
	c) Concealed – source not identified	It is well-known that, a general finding is that
<i>Expression</i>	a) Non-verbal - Noun predicate	We make the assumption that
	Adjectival predicate	It is possible that, it is well-known that
	b) Verbal predicate	
	i) Research acts - actions in real world	This demonstrates that, the analysis indicates that, they found that
	ii) Discourse acts - linguistic activities	We argue that, I propose that
	iii) Cognitive acts - mental processes	they perceive that, we believe that

The evaluated entity. This is what is referred to in the *that* clause and falls into one of five groups: the writer's claim; the content of previous studies; the research goals; and the research methods, models, or theories that had been drawn on; r accepted knowledge.

The evaluative stance. This is typically realized by the controlling predicate (e.g. reporting verbs, nouns or adjectives) in the matrix clause. Following Hyland and Tse, we distinguish between attitudinal stance (concerning the writer's *affective* attitude to the entity or what should be done) and epistemic stance (the writer's assessment of the truth or accuracy of the proposition), and add a neutral category to these two possibilities.

The source of the evaluation. Whether the writer chooses to attribute the source of the evaluation to a human, including the author or other researchers; to an abstract entity, or to a generalized or untraceable source.

The evaluative expression. Evaluation is expressed either verbally or non-verbally (by nouns and adjectives). Verbal forms are: Research acts, representing actions in the real world; Discourse acts, focusing on the expression of research activities; and Cognitive Acts, concerned with the researcher's mental processes.

Our model deviates from Hyland and Tse in three ways:

1. Unlike them, we distinguished human sources of evaluation according to whether these were the author or others, seeking to track changes which reflected the importance of textual voice and self-representation (e.g. Fløttum et al., 2006; Tadros, 1993).
2. We added a neutral category to the attitudinal and epistemic stance taken by the author to acknowledge the importance of this category in our data (e.g. *it means that the gender role is assumed independently of the genetic sex*).
3. We included an additional evaluated entity referring to knowledge which readers are assumed to hold, either as a result of established scientific facts or common popular beliefs (e.g. *This explanation attends to the fact that second language learners as a rule experience differential success*).

Finally, we independently made repeated passes through the concordance lines, examining each context for *that* clauses and annotating each case according to the model, using MAXQDAplus (2012). We gradually refined our agreement through successive passes to achieve an interrater reliability of 96%. We now present the results, beginning with overall quantitative findings.

4 Frequencies of evaluative *that*

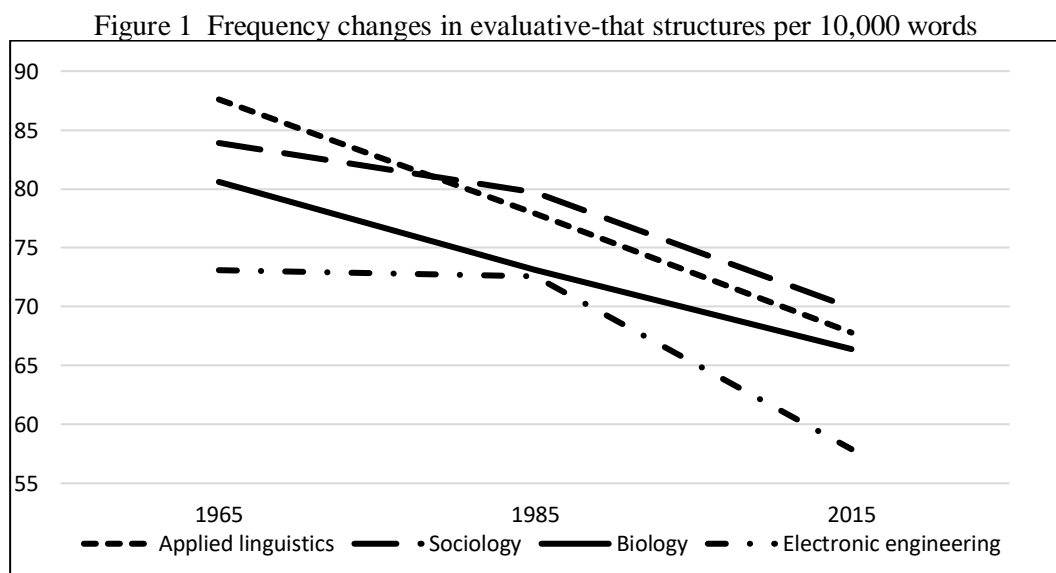
The data show that the use of the structure has fallen in terms of normed frequencies and indicate a change in their use with a shift to less explicit authorial presence.

There has been a substantial increase of 31% in the use of evaluative-that constructions over the past 50 years, rising to nearly 6,400 instances in the 2015 data. This, and the rising number of cases per paper, demonstrates the continuing rhetorical importance of the structure in academic writing and the enduring value it has for authors. We can see from Table 3, however, that this increase has been more than offset by the increased word length of papers, with a 20% decline over the period when normalized to cases per 10,000 words (*log Likelihood* = 129.99, $p < 0.001$).

Table 3 Changes in frequency of Evaluative *that* construction over time

	1965	1985	2015	% change
Total occurrences	4874	5357	6385	31.0
Occurrences per article	40.6	44.6	53.2	31.0
per 10,000 words	81.6	76.3	65.6	-19.6

Figure 1 shows that the decline in use of the structure per 10,000 words has been fairly uniform across disciplines with the heaviest falls in applied linguistics (-23%) (*log Likelihood* = 39.04, $p < 0.001$) and electrical engineering (-21%) (*log Likelihood* = 23.91, $p < 0.001$). Falls in biology and applied linguistics have been fairly steady over the period, but sociology and electrical engineering show the sharpest falls after 1985.



While evaluative *that* remains a significant rhetorical option for writers in all disciplines, with the possible exception of biology, the data indicate fairly important changes in the ways writers seek to mark their alignment with the material they present. One possible explanation for the decline

is the possibility that writers are now becoming more likely to omit *that* and Shank, Van Bogaert and Plevoets (2016) report a diachronic increase in zero complementation of *think*, *suppose* and *believe* in general English. However, there has been no confirmation of this in academic registers.

More probably, we seem to be witnessing either a shift towards less explicit authorial presence in academic claim-making in these disciplines or a change to alternative ways of expressing a stance. Or we are seeing both of these simultaneously as they are, in practice, difficult to pull apart. There are, of course, other evaluative resources available to writers, such as modal adverbs and verbs, which can be used to express attitudinal meanings (e.g. Hyland, 2004), as in these examples:

(14) Actin filaments **may** contribute to establishing the correct microtubule orientation. (Bio)

(15)any study of legal discourse **should perhaps** become **mainly** a study of legal genres. (AL)

(16) The accident of a non-equality-inspired ethos producing the right result is, at least in modern times, **highly unlikely**. (Soc)

Such lexico-grammatical options have the advantage of being more economical of expression and less obviously intrusive than evaluative *that* constructions, offering the writer a less wordy way of communicating the same idea. Such compression corresponds with the ‘stylistic shift’ that Biber and Gray (2016) have observed in relation to a number of grammatical features over the last 250 years. So, for example, it is now more common to see adverbial phrases (such as *caused by*) rather than adverbial clauses (*because ...*). They summarise these changes thus:

These linguistic developments have occurred alongside the proliferation of academic sub-disciplines, which have become increasingly specialised in both topic and readership, resulting in the information explosion’ and the need to present more information in an efficient and concise way.

(Biber & Gray, 2016: 207)

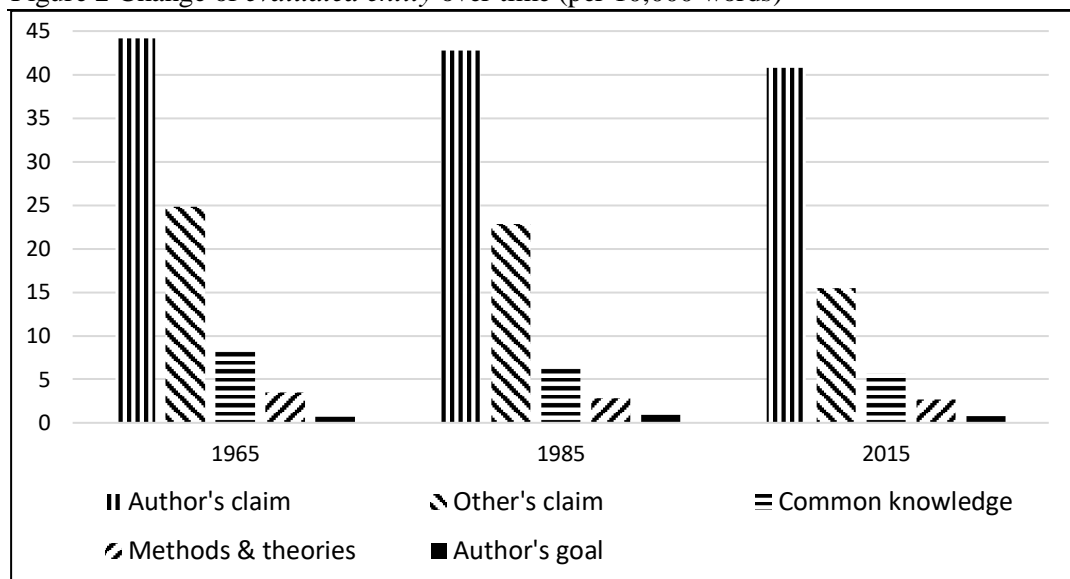
Certainly we may be seeing efforts to express judgements in more compact ways to accommodate the more ‘bottom line’ reading practices of academics searching rapidly for results directly relevant to their own work, but this only tells part of the story. More recent developments in applied fields, particularly engineering, encourage writers to reach beyond a narrow audience of specialists. The fact that more than 60% of research in scientific and technical fields is commercially funded (OECD, 2015) encourages writers to target readers outside the immediate discipline. It may be that the explicit expression of evaluation of results and claims is selected for readers in the industrial and commercial worlds who may be able to make practical use of the research.

We now turn to look at the ways writers use evaluative *that* structures and how these have changed over the past 50 years. We begin by looking at changes in *what* is evaluated and *who* the evaluation is attributed to, and then at the stance taken and how this is expressed.

5 Evaluated entities and sources: who evaluates what?

Evaluative *that* structures function to evaluate the ‘entity’ expressed in the *that*-clause and what is overwhelmingly evaluated is the author’s own claims. Figure 2 shows that, like other categories with frequencies of any significance, numbers in the ‘author claims’ category have fallen since 1965 (by 8%) (*log Likelihood* = 10.13, $p < 0.001$), but they have fallen less than any other and actually increased as a proportion of all evaluated entities, now comprising two thirds of all evaluative *that* structures. Evaluation of others’ claims, for example, have fallen by 38% and of accepted knowledge by 33%.

Figure 2 Change of *evaluated entity* over time (per 10,000 words)



Writers seem to be using the structure to discursively highlight the relevance and importance of their research and underline the value of their interpretations, as in these examples:

17) It is safe to say, however, that **as long as these principles are incorporated into a dictation activity, positive results will necessarily follow for any level and for any teacher.** (AL)

(18) It is clear that **proper separation and reconstruction of the Formula audio signals can be achieved if the elements of the same source at different frequency bins are properly matched.** (EE)

By foregrounding their main claims or findings they can establish both research significance and disciplinary competence, and so strengthen the rhetorical impact of their paper.

While writers overwhelmingly referred to their own findings, they occasionally passed judgement on accepted knowledge (19) or less frequently, on methods or theories (20):

(19) Many have critiqued what Duster calls the creeping molecularization of race in genetics research because it threatens to reinvigorate the belief that **human social classification systems like race have a biological, 'natural' basis.** (Soc)

(20) In terms of S the constraint requires that **any trajectory, as well as its initial state, of the system be confined in S.** (EE)

However, about a quarter of evaluative *that* structures in our corpus evaluated the work of others, although the space given to other voices has declined significantly since 1985. This fall is perhaps only partly due to the potential hazards of critically reviewing others' work, but mainly relates to the increasing need to reinforce one's own claims rather than critique that of others.

(21) Machin (1975) indicated that **he was unable to obtain any evidence in support of the view that oral ingestion of water is involved in rehydration.**

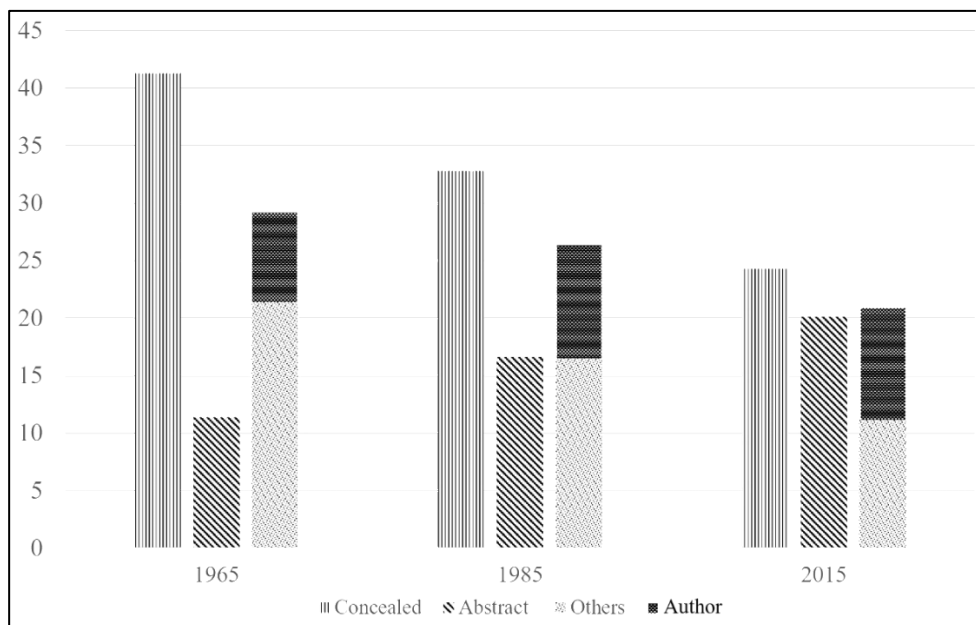
(Bio)

(22) One limitation emerging from Fransen et al. (2014) was that **participants were only asked to evaluate the best leader on their team.**

(Soc)

While writers almost always refer to their own findings in the *that* clause, they typically do so in a way which simultaneously distances them from this content. Figure 3 shows an almost even spread in the proportion of concealed, abstract and human sources in the 2015 figures with considerable changes in the last 50 years.

Figure 3 Change of *evaluative source* over time (per 10,000 words)



The most dramatic changes since 1965 have been the movement away from crediting evaluations to concealed sources (a fall of 41%, $LL = 335.70$, $p < 0.001$) and other researchers (down 48%, $LL = 244.74$, $p < 0.001$) and towards more abstract rhetors (up 76%, $LL = 178.44$, $p < 0.001$) where agency is attributed to inanimate subjects such as results, tables or methods. By shifting attention

to the research itself from those engaged in the evaluating or reporting process, whether by human agents or implicitly by concealed sources, writers have a shorthand way of claiming legitimacy for their claims:

(23) **The results** showed that marking led to significantly better performance relative to the other two learning techniques. (AL)

(24) **This analysis** shows that hybrids present a clear dual pattern of phylogenetic affiliations when the gene phylogenies are examined in the presence of the two parental lineages. (Bio)

In 1965 half of all sources in evaluative *that* constructions were concealed, generally with a dummy *it* subject (e.g. *it is believed that*), thus suppressing personal attribution and helping to remove the implication of human intervention in the expression of claims. Removing the agent in this way helps to strengthen an empiricist position valued by some researchers and in some fields. It promotes objectivity by downplaying personal interest, social allegiance, faulty reasoning and other factors which might suggest non-empirical biases. It is possible, then, that by making aspects of the argument or the research the source of claims instead, writers may be choosing to strengthen support for their statements rather than simply removing themselves from them.

We can see from Table 4 that such concealed sources have fallen and abstract sources risen in every discipline as writers emphasise that interpretations are based on empirical evidence and can therefore be relied on.

Table 4 Changes of source and entity in evaluative *that* constructions by discipline (per 10,000 words)

	Applied linguistics			Sociology			Biology			Engineering		
Feature	1965	1985	2015	1965	1985	2015	1965	1985	2015	1965	1985	2015
Source	87.6	77.9	67.8	84.1	79.7	69.0	80.6	73.1	66.4	73.1	72.6	57.9
Concealed	48.8	31.1	23.6	43.4	33.3	21.4	34.2	28.7	19.3	47.8	45.1	33.5
Abstract	10.8	18.6	19.8	11.3	16.8	23.2	11.4	17.1	24.8	11.9	11.9	12.3
Human	28.0	28.2	24.4	29.4	29.6	24.4	35.0	27.3	22.3	13.4	15.6	12.1
author	12.6	9.7	5.4	8.0	12.2	13.0	2.9	7.2	10.1	13.0	12.3	9.8
others	15.4	18.5	19.0	21.4	17.4	11.4	32.1	20.1	12.2	0.4	3.3	2.3
Entity	87.6	77.9	67.8	84.1	79.7	69.0	80.6	73.1	66.4	73.1	72.6	57.9
Author's claim	49.6	44.8	34.1	46.7	43.8	43.5	36.2	36.9	37.8	54.3	53.9	47.5
Other's claim	13.6	17.9	20.7	25.8	25.0	16.4	38.4	31.7	22.7	0.3	1.8	1.9
Accepted knowledge	17.2	12.4	10.9	10.7	8.7	6.5	5.0	3.0	2.5	3.3	3.1	2.5
Method/ theory	4.5	0.7	1.3	0.7	1.2	1.5	0.8	1.1	2.6	14.1	13.6	5.6
Author's goal	2.7	2.1	0.8	0.2	1.0	1.1	0.2	0.4	0.8	1.1	0.2	0.4

References to human sources, on the other hand, exhibit some surprising variations, with authorial attributions falling by half in applied linguistics while increasing substantially in sociology and biology. Applied linguists, in fact, now massively prefer to attribute evaluations to others rather than themselves, with 80% of the human sources of the structure.

(25) **Hansen and Shlesinger (2007: 96)** suggest that new technologies can be exploited in order to create more self-study materials. (AL)

(26) **Bailey** pointed out that if the starting-point is social meanings, rather than the code or language in use, it is not crucial to ask whether a speaker is switching languages... (AL)

This change from a 50-50 author-other split over 50 years in applied linguistics interestingly mirrors similar attempts to reduce authorial intervention, with considerable falls in the use of self-mention (author and author, 2016) and stance features (author and author, 2015b). Together these indicate a significant change in argument patterns in this discipline towards more author evacuated and empirically-oriented persuasion strategies. Removing the author from the research

and stressing abstract sources helps maintain the legitimacy of knowledge as built on non-contingent pillars of empiricism, careful argument or the rigorous application of approved methods (Hyland, 2004). Interestingly, sociology and biology show trends in the opposite direction, reducing their use of the structure with other sources to more firmly stand behind their interpretations, taking responsibility for their novel claims. We hesitate to offer an explanation for this but assume it is a rational response to disciplinary circumstances or career pressures towards claiming credit for contributions in a competitive market which rewards precedence and visibility.

Table 4 also shows disciplinary variations in the changes in evaluated entities, with the proportional increase in structures referring to authors' claims largely occurring in biology and sociology. These are the same two disciplines where the preference for authorial sources have increased, thus pointing to the greater visibility and explicit involvement of authors in their arguments in these fields. Applied linguistics and engineering, in contrast, now give proportionately more space to other voices, both substantially increasing the number of times they evaluate the work of others rather than their own.

Negative evaluations using this structure are rare in these disciplines and most are non-specific, referring to generalised sources such as 'research' or 'the literature', but virtually all cases seek to align current with previous work and to demonstrate novelty and relevance by showing how the literature is built on:

(27) **Previous research** shows that frequently encountered words tend to produce strong dominant responses... (AL)

(28) **The literature** shows that these measures have been investigated by using Lyapunov functions, see, e.g., [3], [5], [18] ... (EE)

6 Stance and expression: what writers say and how they say it

Together with the source of the evaluation, the stance taken towards the following proposition also occurs in the matrix clause. This is the main purpose of using the structure, to thematise the author's evaluation in order to make it textually prominent. This stance can be either attitudinal or epistemic or the writer may decide to adopt a neutral position to material and, unsurprisingly, the vast majority of assessments relate to the truth or otherwise of evaluated statements. This is shown in Table 5, which also reveals that every category of stance has seen a decline since 1965 ($LL = 10.90, p < 0.001$; $LL = 110.26, p < 0.001$; $LL = 12.09, p < 0.001$) although the overall proportions have remained more or less the same.

Table 5 change of *stance* over time (per 10,000 words and proportion of total)

Stance	1965	1985	2015	% change
Neutral	4.6 (5.6)	4.1 (5.4)	3.5 (5.3)	-23.9
Attitudinal	9.9 (12.1)	10.5 (13.8)	8.2 (12.5)	-17.2
affect	7.7 (77.8)	8.4 (80.0)	6.9 (84.1)	-10.4
obligation	2.3 (23.2)	2.0 (19.0)	1.4 (17.1)	-39.1
Epistemic	67.0 (82.1)	61.3 (80.3)	53.6 (81.7)	-20.0
Total	81.6 (100.0)	75.9 (100.0)	65.4 (100.0)	-19.9

It seems that academics do not tend to make much use of neutral options nor do they use the *evaluative that* structure to express attitudinal meanings such as *affect* (like and dislike, expectation, etc.), or *obligation* (what they think should be done). Neutral (27, 28) and affective (29, 30) examples can certainly be found in the corpus but they are overwhelmingly dispreferred:

(27) This means that the velocity of sliding of actin filaments past myosin filaments is highest in these animals, and that the characteristic ATPase activities of these actomyosin systems are correspondingly higher. (Bio, 1985)

(28) One final point is that the majority of the research literature cited in support of the claims for the Input Hypothesis assumes a second language or an immersion environment, not a foreign language situation involving formal, classroom instruction. (AL, 1985)

(29) It is thus **intriguing that** the spatial distribution of disease in idiopathic pulmonary fibrosis (IPF), a chronic progressive alveolar disease, mimics this pattern [57]. (Bio, 2015)

(30) A second **advantage of the synthesis is that** the teaching of vocabulary within the framework of the foreign culture lends itself to the grouping of words into contextually related categories. (AL, 1985)

What writers principally do, as one might expect, is assess the truth value or credibility of statements about the world.

(31) It is then **true that** every optimal control goes exactly from one optimal point to another... (EE, 1965)

(32) Such a definition offers the **possibility that** change or resolution of the crisis can occur. (Soc, 1985)

Table 5 shows that authors' judgements about the reliability of information or findings comprise over 80% of the stances taken across each of the three periods.

Turning, finally, to how writers typically expressed their stance in evaluative *that* patterns, this remains overwhelmingly verbal with the proportion of verbal predicates increasing slightly to 75% of the total over the 50 years. This contrasts with Rodman's (1991) study of anticipatory *it* in journal articles, where about 40% of predicates were adjectival, with *possible* and *clear*, being the most common. This is largely because *it* subjects offer writers a more restricted range of verbal options than evaluative *that* structures. Table 6 show the changes.

Table 6 change of *expression* over time (per 10,000 words and proportion of total)

	1965		1985		2015		% change
Non-verbal	25.8	(31.6)	20.3	(26.6)	16.3	(24.8)	-36.8
noun	18.9	(73.3)	16.0	(78.8)	12.9	(79.1)	-31.7
adjective	6.9	(26.7)	4.3	(21.2)	3.4	(20.9)	-50.7
Verbal	55.8	(68.4)	55.6	(72.9)	49.0	(74.7)	-12.2
research	20.7	(37.1)	19.5	(35.1)	17.3	(35.3)	-16.4
discourse	15.1	(27.1)	16.0	(28.8)	15.2	(31.0)	0.7
cognition	20.1	(36.0)	20.0	(36.0)	16.5	(33.7)	-17.9
Total	81.6	(100.0)	75.9	(100.0)	65.4	(100.0)	-19.9

Nominal and adjectival forms have become ever less common than verbal uses since 1965 in evaluative *that* structures. The preference for verbs is related to the largely epistemic meanings conveyed in abstracts noted above, as verbal predicates allow writers to fine tune their judgements to not only express doubt or certainty, but also to emphasise a particular type of activity (Hyland, 2004). This means that writers can frame their evaluations to signal whether they intend their judgements to be understood as grounded in research practices (33, 24), interpretive practices (35, 36), or reporting practices (37, 38).

(33) The results of this study **showed** that counting the number of segments correctly written provided an integrative measure of language proficiency ...

(AL, 1985)

(34) Let us **observe** that the found upper bound is guaranteed to be tight from Corollary 1...

(EE)

(35) This **implies** that as long as children are reasonably accurate in their perceptions of their own friends' relationships, the practical assumptions of stochastic actor-based models may still be satisfied.

(Soc)

(36) As the number of genes diminishes, these forces become weaker, and **theory predicts** that gene content will stabilize, or at least decline more slowly.

(Bio)

(37) We suggest that future research be directed at refining the strategy training approaches, targeting evaluative metacognitive strategies for specific language tasks... (AL, 1985)

(38) They argue that, as a result, where humans interact with individuals in modern environments, they continue to behave as if they are interacting ...

(Bio)

These different frames for making claims in evaluative *that* structures are now employed fairly equally by authors, with discourse-based judgements increasing as a proportion of the total since 1965 (see Table 6).

In terms of disciplinary differences in the corpora, we can see from Table 7 that non-verbal expressions have fallen most heavily in the soft knowledge fields, with the proportion of verbal expressions up from 58% in 1965 to 72% in 2015 in applied linguistics and rising from 64% to 75% in sociology. The science and engineering corpora have remained fairly stable in favouring verbal forms. Interestingly, the two soft knowledge fields have also dramatically increased their use of research forms at the expense of cognition verbs, despite the overall decline in the frequency of evaluative *that* structures. This seems to suggest a shift away from evaluations based on interpretive reasoning to those supported by empirical backing. Biologists, on the other hand, have moved away from research forms to emphasize discourse activities, evaluating arguments, topics and information.

Table 7 Changes of expression and stance in evaluative *that* patterns by discipline (per 10,000 words)

	Applied linguistics			Sociology			Biology			Engineering		
	1965	1985	2015	1965	1985	2015	1965	1985	2015	1965	1985	2015
Expression	87.6	77.9	67.8	84.1	79.7	69.0	80.6	73.1	66.4	73.1	72.6	57.9
Non-verbal	37.1	22.9	19.4	30.0	26.0	17.5	19.6	15.2	13.9	21.7	18.7	14.4
noun	30.8	20.2	17.7	24.7	22.4	15.3	11.0	9.9	9.2	16.3	13.3	9.3
adjective	6.3	2.7	1.7	5.3	3.6	2.2	8.6	5.3	4.8	5.4	5.4	5.1
Verbal	50.5	55.0	48.4	54.1	53.7	51.5	61.0	57.9	52.5	51.4	53.9	43.5
research	5.4	10.3	15.6	8.7	15.3	18.2	37.3	29.5	20.6	14.2	15.0	15.9
discourse	19.8	19.7	19.4	19.4	18.3	17.1	12.7	16.3	19.3	8.8	5.1	4.7
cognition	25.3	25.0	13.4	26.0	20.1	16.2	11.0	12.1	12.6	28.4	33.8	22.9
Stance	87.6	77.9	67.8	84.1	79.7	69.0	80.6	73.1	66.4	73.1	72.6	57.9
Neutral	10.9	6.2	4.6	3.2	3.6	1.8	3.0	2.8	2.1	3.6	5.2	5.5
Attitudinal	19.8	15.2	8.8	12.0	13.2	11.1	4.9	6.6	6.7	8.7	8.7	6.1
affect	15.3	13.8	7.5	11.3	11.2	8.8	4.1	5.0	5.0	2.2	4.4	5.9
obligation	4.5	1.4	1.3	0.7	2.0	2.3	0.8	1.6	1.7	6.5	4.3	0.2
Epistemic	56.9	56.5	54.4	68.8	62.9	56.1	72.7	63.7	57.6	60.8	58.7	46.3

In terms of the stance taken in making the evaluation, we can see that the only rise over the period was the increase in the use of attitudinal forms by biologists, which increased by 37% to comprise 10% of all stance forms in that field. In academic contexts, attitude is typically expressed in terms of judgements of *importance*, *novelty* and *interest*, as here:

(39) it is surprising that the dynamics of the difference equation and those of the ratio-dependent differential equation differ from each other. (Bio)

(40) it is striking that the incongruences among our chromosomal trees of rare genomic changes almost perfectly overlap with conflicts among whole-genome sequence trees... (Bio)

When we look at the epistemic forms, we see these comprise a stable proportion of stance orientations over the period with more than 80% of forms in all disciplines. Applied linguists, however, have considerably increased the proportion of epistemic judgements they use. There are also changes in the degree of certainty writers invest in the proposition carried in the projected

clause. Generally, over time, biologists have become more measured in their stance expressions with an increase in hedged statements and electrical engineers are taking a stronger stance with more certainty markers; all disciplines are expressing epistemic judgments less frequently (author & author, 2015b). Hyland and Tse (2005a & b) found considerably less certainty outside the science texts, with some 70% of all tentative predicates in the humanities and social sciences journal abstracts they examined.

In these fields writers offer a less assured indication of the factual status of their interpretations, either because they are uncertain of their veracity or to offer a claim in a more diplomatic way. The effectiveness of arguments in these disciplines often depends on an ability to recognise alternative voices and this is generally done by marking claims as being a suggestion, argument or assumption:

(41) My suggestion is that it may be helpful to introduce a range of tools to advanced-level students as different tools... (AL)

(42) Instead, I argue that racial disparities in transplant receipt among those on the waiting list are better explained by the connections... (Soc)

The author's use of 'instead' in (42) is a clear signal that the author is marking a departure from earlier claims, while toning down his own to avoid blunt disagreement.

Something of these disciplinary differences in the degree of confidence writers invest in their evaluation of the proposition carried in the projected clause can be seen in the most frequent main predicates. Table 8 shows that *suggest*, *show* and *assume* are among the top five collocates of evaluative *that* overall, with a growing tendency towards items indicating greater certainty in the expressed evaluations, particularly in applied linguistics and electrical engineering. *Show* and *demonstrate* have emerged into the applied linguistics list over the period and *clear* and *see* into electronic engineering, perhaps indicating a greater desire by authors to emphasise their interpretations and shut down opportunities for readers to challenge those interpretations. The booster *show*, in fact, occurs in the top two of the 2015 frequencies in all four disciplines and is joined by *find* in two disciplines.

Table 8 The most frequent five stance words over time by discipline (boosters in bold)

Applied linguistics			Sociology			Electronic engineering			Biology		
1965	1985	2015	1965	1985	2015	1965	1985	2015	1965	1985	2015
assume	find	suggest	suggest	suggest	suggest	assume	note	note	show	suggest	suggest
fact	indicate	show	assume	argue	show	note	show	show	find	show	show
suggest	suggest	find	argue	indicate	argue	show	fact	clear	suggest	find	find
claim	assume	argue	fact	fact	indicate	indicate	follow	follow	indicate	indicate	conclude
realize	hope	demonstrate	mean	show	imply	recall	assume	see	observe	report	indicate

Despite this apparent movement towards greater epistemic commitment in evaluative *that* constructions, none of these fields currently have a booster as the most frequent item with the tentative verb *suggest* dominating all disciplines except electrical engineering which favours the more neutral evaluative stance of *note*.

7 Conclusion

Stance-taking is the means by which academics take ownership of their work; making epistemic and evaluative judgment regarding entities, attributes and the relations between material to persuade readers of their right to speak with authority and to establish their reputations. The evaluative *that* construction is one widely used means by which this is achieved and while its popularity has declined in the past 50 years across all the four disciplines we examined, the fact that it has increased *per paper* suggests that it remains a significant rhetorical option for authors. Thus the value of this structure seems clear: enabling writers to present their stance as a separate proposition, to thematise and fine tune their evaluative positions and retain potential for elaboration and further discussion.

The decline of this structure by about 20% since 1965 reminds us, however, that evaluative *that* constructions are only one means of expressing doubt, certainty or attitude in academic writing. As we have mentioned, alternative epistemic resources are available to authors, such as single modal items, which allow more succinct expression and a more compact style of argument.

Interestingly, Hyland & Jiang (2016) have found a similar decline in overall stance markers in academic prose, although the decline in hedges, boosters and markers of attitude is largely confined to the more discursive fields where there is a marked trend towards less authorial explicit signalling of stance.

While further research is needed to determine if the evaluative *that* structure is declining in other disciplines, it appears there may be changes occurring in the assumptions and routines academics bring to their writing about how best to collectively deal with and represent their experiences. Institutional pressures encouraging greater involvement with audiences outside of an immediate specialist group of like-minded academics may be leading this change. It is possible that this gradual movement towards less prominent authorial evaluations may result from a need to disseminate research to new commercially-oriented audiences and to temper judgements for work that will be judged by tenure/promotion committees.

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Appendix 1: Journal list

Applied Linguistics

TESOL Quarterly (1967-)

Language Learning (1948-)

Foreign Language Annals (1967-)

Modern Language Journal (1916-)

College Composition and Communication (1950-)

Sociology

American Journal of Sociology (1895-)

Social problems (1953-)

The British Journal of Sociology (1950-)

American Journal of Economics and Sociology (1941-)

The Sociological Quarterly (1960-)

Biology

The Quarterly Review of Biology (1926-)

Biological Reviews (1923-)

Radiation Research (1954-)

BioScience (1964-)

The Journal of Experimental Biology (1923 -)

Electrical Engineering

Proceedings of the IEEE (1963 -)

Automatica (1963 -)

IEEE Transactions on Automatic Control (1963 -)

IEEE Journal of Solid-State Circuits (1966 -)

IEEE Transactions on Information Theory (1963 -)