Fagan, Anna; Martín Martín, Pedro

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The use of critical speech acts in Psychology and Chemistry research papers

Anna Fagan and Pedro Martín Martín
Universidad de La Laguna

Abstract

Creating a research space has become increasingly important in today's competitive academic world, where the pressure to publish requires writers to justify publication of their research article (RA) in order present their new claims to the other members of the academic community. This mainly implies the indication of a knowledge gap and/or the criticism of any weak point in the previously published work by other researchers or the academic community itself. This "academic conflict" (AC) is expressed via a critical speech act whose rhetorical expression ranges from blunt criticism to the use of subtle hedging devices, aimed at an individual or the community in general. In this study we discuss the development of a taxonomy to describe the rhetorical choices writers use when making the critical speech act, and the application of this taxonomy to 50 RAs from two distinct disciplines: Psychology, representing the social disciplines, and Chemistry, the natural disciplines. The application of this taxonomy, which categorises AC according to directness, writer mediation, and the target of the criticism, has yielded the following results: AC was manifested far more frequently in Psychology than in Chemistry, not only in total number of AC units, but also in the research articles themselves: it appears to be an essential rhetorical strategy for writers in the field of Psychology, but not so in Chemistry. The two disciplines showed a surprising degree of similarity with respect to writer mediation, directness and personalization overall; however, when these variables are combined, significant differences emerge: researchers in Psychology favour unmediated, direct and personal criticism, whereas those in Chemistry favour impersonal criticism.

Key Words: research article, academic conflict, critical speech act, rhetorical choices.

Resumen

En la actualidad, la delimitación de un hueco epistemológico ha llegado a constituir un elemento primordial en el mundo académico donde la presión por publicar obliga a los académicos a justificar la publicación de sus artículos de investigación en los que presentan sus nuevas reivindicaciones científicas a los otros miembros de la comunidad científica. Esto se manifiesta principalmente por medio de la indicación de una laguna existente o la confrontación con las ideas que han sostenido otros investigadores en concreto o la comunidad científica en general. Este "conflicto académico" (CA) se expresa mediante el uso de actos de habla críticos cuya expresión retórica oscila desde la
crítica más directa hasta el uso de elementos matizadores. En este estudio presentamos una taxonomía para la descripción de las opciones retóricas que utilizan los académicos para la realización de los actos de habla críticos, y aplicamos esta taxonomía en el análisis de 50 artículos pertenecientes a dos disciplinas de dos áreas diferenciadas: Psicología y Química. Los resultados obtenidos de este análisis han revelado que el CA se manifiesta con mayor frecuencia de uso en Psicología que en Química, no sólo en el número total de casos de CA, sino también en el número de artículos, por lo que el CA parece ser una estrategia retórica importante para los escritores en Psicología, aunque no tanto en Química. Por otra parte, ambas disciplinas muestran un alto nivel de similitud con respecto al uso general de opciones retóricas (explicitación del emisor de la crítica, crítica directa/indirecta y crítica personal/impersonal); sin embargo, al combinar estas variables, se encontraron diferencias significativas: los investigadores en Psicología tienden a expresar la crítica de forma implícita, directa y personal, mientras que en Química se tiende a expresar de forma impersonal.

Palabras Claves: Artículo de investigación, conflicto académico, acto de habla crítico, opciones retóricas.

Introduction

The need to publish scientific papers has become an essential issue in the world of academic writing for researchers who want to promote their careers. In order to justify publication, writers must create a research space which permits them to present their new claims to the other members of the academic community. This mainly implies the indication of a knowledge gap and/or the criticism of any weak point in the previously published work by other researchers. The rhetorical strategies used by writers to convey critical speech acts may range from blunt criticism to the use of subtle hedging devices, and the frequency and type of linguistic strategies used to convey disagreement may vary across disciplines, as has been pointed out by Hunston (1993), Kourilová (1996) and Motta-Roth (1998).

The study of the pragmatic phenomenon of academic conflict (AC) has become an important area of research over the last few years, as can be seen in the increasing amount of work on this topic (see for example Salager-Meyer, 1998 & 2000; Salager-Meyer & Zambrano, 1998; Burgess & Fagan, 2002). In this study we attempt to expand this area of knowledge by comparing the frequency of occurrence and types of rhetorical options used by the writers to express AC in research articles (RAs) from two different disciplines (Psychology and Chemistry), representative of two opposing fields of knowledge: the social sciences and the hard sciences.
Hyland (2000), in his study of academic citation, found that writers in the soft knowledge domains (e.g. Humanities and Social Sciences) cited previous research far more frequently than those in the hard knowledge fields (e.g. Chemistry and Biology). A second difference was that the author (the person cited) was not as prominent in the hard disciplines as in the soft. Hyland suggested that these differing discourse practices may be due to differences in social activities, cognitive styles and epistemological beliefs of the specific disciplinary communities. In our study, we expected to find that the softer discipline (Psychology), with a higher frequency of citations, would also have a higher frequency of AC and more personal and direct instances of AC than the hard science discipline (Chemistry).

Corpus and Procedures

The corpus consists of 25 articles from the discipline of Psychology, published in the last decade, that may be considered as representative of the area of the social sciences. The articles were drawn randomly from five of the most influential journals in the speciality, namely Psychological Bulletin, Journal of Applied Psychology, Behavioral and Brain Sciences, Journal of Educational Psychology and Cognitive Psychology. Similarly, 25 articles published in the last decade belonging to Chemistry, a representative area of the natural sciences, were drawn randomly from five leading journals in this field: Journal of Organic Chemistry, Dalton Transactions, Journal of the American Chemical Society, Tetrahedron and Journal of Physical Chemistry.

Following Salager-Meyer’s (1998, 2000) work on AC, we have established a taxonomy of AC based on personal and impersonal critical speech acts. In the former, the name of the author who is the target of criticism can be found somewhere in the text, whereas in the latter the criticism is directed towards the scientific community as a whole, as illustrated in the following examples:

[1] Personal AC– “...we conclude the Susmann-Korth case for synergism is weak.”


Salager-Meyer also divides these two types into direct and indirect criticism. The former refers to those instances in which there is categorical criticism, whereas the latter refers to those cases in which the criticism is mitigated by means of hedges. In our
study, we have termed these two categories as + hedging (direct AC) and – hedging (indirect AC):

[3] + hedging: “Despite this interest, remarkably little information is available concerning the exact mode of this interaction...”

[4] – hedging: “Although previous reviews may have succeeded in evaluating media effects in naturalistic contexts, they did not capture the essence of the concept of aggression.”

We have also added a new dimension: the presence or absence of writer mediation in the criticism (Burgess & Fagan, 2002). We observed that on some occasions the writers of research articles are explicitly present in the critical speech act. This implies a high level of commitment to the truth value of the proposition expressed, that is, writers take full responsibility for the criticism towards other authors or previous research in general, which is lexically realised by means of the personal pronouns I/We. This has been termed writer-mediation following Cherry (1998) and Hyland (2001). Groom (2000), in his study of attribution and averral, notes the important role of writer-mediation in academic argumentation while acknowledging that this is often not transparent to novice writers.

[5] Writer-mediated AC: “We favor this value over that of 96.6 kcal reported by Shum and Benson18 for CH SCHH because in our work there appears to be little or no difference in the BDEs for ROC-H and RSC-H type bonds 12...”

When the writer is syntactically absent from the critical speech act, the criticism seems to result from an outside or unnamed agent, e.g. “some studies have shown that...”, or “it has been found that...”

[6] AC with no writer mediation: “This finding is the opposite of what has traditionally been assumed, and so it seems worthy of further test...”

An in-depth examination of the corpus also revealed that there were cases in which there was not only presence or absence of writer-mediation but in which it was not the author him/herself who made the criticism, but reported the criticism made by other authors. We considered this as being at the opposite end of the continuum from + writer-mediation (see Fig. 1), and it was termed reported AC. The following example illustrates this strategy:

[7] Reported AC: “In contrast, Friedrich-Cofer and Huston (1986) argued that field experiments most plausibly underestimate effects of exposure to media violence...”
Writers have thus several rhetorical options to convey AC: either by being explicitly present in the critical speech act (writer mediation), by remaining uncommitted (no writer mediation), or by reporting the criticism made by another author (reported); the target of criticism can be referred to a specific person (personal) or to the scientific community as a whole (impersonal); and the act of criticising itself can be indirect (with hedging devices) or direct (without hedging devices). This is summarised in the diagram in Figure 1:

![Diagram of rhetorical strategies](image)

**Figure 1. A taxonomy of rhetorical strategies**

**Results**

One of the most striking findings in this study is the sheer quantity of AC units (307) in Psychology when compared to Chemistry (48) (see Table 1). Even when taking into account the fact that articles in Chemistry tend to be much longer than those in Psychology (see the average number of words in Table 1), the total number of AC units in Psychology far surpasses instances of criticism in Chemistry. It would appear that criticising one’s peers or the community in general is an integral part of the research article in Psychology, as can also be seen from the fact that all the articles studied provided instances of AC. This, as seen in Table 1, contrasts sharply with research articles in the field of Chemistry, where almost half of the RAs showed no instances at all of AC, and the rest of the articles had relatively few AC units.

<table>
<thead>
<tr>
<th></th>
<th>Psychology</th>
<th>Chemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of RAs with AC</td>
<td>25 (100%)</td>
<td>13 (52%)</td>
</tr>
<tr>
<td>Word count: average words/article</td>
<td>1100</td>
<td>3000</td>
</tr>
</tbody>
</table>

Table 1. General data
The overall results when AC units are classified within our taxonomy (see Tables 2, 3 and 4) show, however, surprisingly little disciplinary variation. In Chemistry, the writers would seem to commit themselves somewhat more: a slightly higher percentage of the overall instances of AC were writer-mediated than in the field of Psychology (see Table 2). The analyses of the impersonalization and directness dimensions also revealed that writers in both disciplines tend to opt for similar rhetorical strategies to convey their critical speech acts (see Tables 3 and 4).

<table>
<thead>
<tr>
<th></th>
<th>Psychology</th>
<th>Chemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writer Mediated</td>
<td>30 (10%)</td>
<td>7 (15%)</td>
</tr>
<tr>
<td>No writer mediation</td>
<td>244 (79%)</td>
<td>37 (77%)</td>
</tr>
<tr>
<td>Reported</td>
<td>33 (11%)</td>
<td>4 (8%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>307 (100%)</td>
<td>48 (100%)</td>
</tr>
</tbody>
</table>

Table 2. Total number of AC with and without mediation, and reported AC.

<table>
<thead>
<tr>
<th></th>
<th>Psychology</th>
<th>Chemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal</td>
<td>179 (58%)</td>
<td>27 (56%)</td>
</tr>
<tr>
<td>Impersonal</td>
<td>128 (42%)</td>
<td>21 (44%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>307 (100%)</td>
<td>48 (100%)</td>
</tr>
</tbody>
</table>

Table 3. Total number of types of AC: personal/impersonal

<table>
<thead>
<tr>
<th></th>
<th>Psychology</th>
<th>Chemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>180 (59%)</td>
<td>28 (58%)</td>
</tr>
<tr>
<td>Indirect</td>
<td>127 (41%)</td>
<td>20 (42%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>307 (100%)</td>
<td>48 (100%)</td>
</tr>
</tbody>
</table>

Table 4. Total number of types of AC: direct/indirect

However, when the strategies are combined, a more distinct pattern emerges: although the preferred strategy for both disciplines is a shifting of commitment, with the writer absent from the critical speech act (i.e. no writer mediation) writers in Psychology, when expressing direct (- hedging) criticism, tend to be personal, specifically naming the target of their criticism, whereas in Chemistry writers remain impersonal (see Table 6).

<table>
<thead>
<tr>
<th>Writer Mediated</th>
<th>TOTAL</th>
<th>personal/direct</th>
<th>personal/indirect</th>
<th>impersonal/direct</th>
<th>Impersonal/indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology</td>
<td><strong>30 (10%)</strong></td>
<td>14 (5%)</td>
<td>9 (3%)</td>
<td>4 (1%)</td>
<td>3 (1%)</td>
</tr>
<tr>
<td>Chemistry</td>
<td><strong>7 (15%)</strong></td>
<td>4 (8.5%)</td>
<td>3 (6.5%)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 5. Total number of AC with writer mediation, according to personalization and directness.
Disciplinary differences can also be seen in the distribution of AC in the RA (see Table 8). For comparative purposes, we grouped results, discussion and conclusion sections together due to the differences in the macrostructure of the RA in the two disciplines: Psychology articles tend to present the Results, Discussion, and Conclusions (RDC) under separate headings, whereas Chemistry RAs grouped Results and Discussion under the same heading, with a separate section for conclusions. The most significant difference is in the frequency of AC in the introduction section of the RAs, with nearly half the occurrences of AC in this section in Psychology, while only a third of the total number of AC units occurred in this section in Chemistry.

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Conclusion
Our study has revealed that when engaging in academic criticism disciplinary differences can be appreciated, primarily as regards the higher frequency of occurrence of critical
speech acts in the Psychology papers. This disciplinary variation, as pointed out earlier, may be due to several factors, such as differences in social activities, cognitive styles and epistemological beliefs of the specific disciplinary communities. The permeability of the discipline (see Becher, 1989) may also account for the frequency and nature of an academic criticism in a discipline. Becher draws a distinction between disciplines that parallels the division of disciplines into hard and soft in that it looks at how permeable they are to values, beliefs, knowledge and practice from outside. This author notes that unrestricted (soft) disciplines tend to use theories or research methodology from other fields as well as citing work from contiguous disciplines, whereas restricted (hard) disciplines tend to draw almost exclusively on their own resources almost exclusively. Thus, writers in unrestricted disciplines (e.g. Psychology) may feel more comfortable engaging in AC of work carried out in other parallel discourse communities. The underlying assumptions concerning the readers’ background knowledge (see Bazerman, 1988) may also account for disciplinary variation: in the closeknit framework (see Bex, 1996) of the hard disciplines (e.g. Chemistry) it might be unnecessary to engage in critical speech acts, whereas writers from the looser knit networks in the soft disciplines (e.g. Psychology) cannot rely as much on shared knowledge and tend to target explicitly some other work in order to create a gap for their research.

Although writers in both disciplines prefer to remain uncommitted when expressing criticism rather than being explicitly present (i.e. writer-mediation), the slightly higher percentage of instances of AC in Psychology in the writer-mediated dimension could be attributed to the fact that nearly twice as many of the Chemistry RAs had multiple authors: 24 out of 25, compared to only 13 in Psychology (see Appendix). First person plural forms, although seemingly expressing a more personal commitment to the assertion, are perhaps being used “impersonally” in multiple-author scientific papers. Regarding this point, it would be interesting to study the instances of writer mediation in AC in RAs with regard to multiple vs. single authors.

As stated in the previous section, when combining the rhetorical options of directness and personalization, in the unmediated dimension, another significant difference emerges: although in both disciplines there is a similar preference for conveying criticism directly, i.e. without hedging devices, a higher tendency to use personal ACs in Psychology than in Chemistry was observed. Again, this variation may be due to the nature of the discourse communities: in the closeknit framework of Chemistry, the referent of the criticism may actually be evident to other
researchers without explicit mention, whereas in Psychology the readers may come from a broader background, and the writer has to be more explicit. Discursive practices in Psychology may demand more direct forms of writing when criticising one’s peers, in order for the writer’s claims to be made more convincing.

The fact that in Psychology the percentage of critical speech acts in the Introduction section of the RAs is higher than in the same section in Chemistry could possibly be explained in terms of the dependence in Psychology on textual devices for gap creation: in Chemistry, the results are the most powerful support of their knowledge claims, consequently writers prefer to dedicate valuable space (hard science journals sometimes charge writers by the page for their contribution) to this section instead of the introduction. Another factor, as Bazerman (1988) has pointed out, is that the assumed background knowledge in hard science fields allows the writer to avoid having to use an extensive system of references to previous work, thus writers may not have to point out any particular conflict to establish their research space in the introduction.

Discussion

The identification of the rhetorical options available to writers in their disciplines is an important step towards understanding the mechanisms of the expression of academic conflict in RAs. The patterns that we have observed in this study also emerged when other disciplines were analysed (see Burgess & Fagan, 2002), where a larger sample were used. Considering the importance of specificity in academic discourse, further research could be carried out concentrating on subdisciplines within the fields, certain journals, or even, as MacDonald (1994) suggests, in terms of particular problems the discourse communities address. Myers (1993) too, in his examination of ‘boundary setting’ in the field of Linguistics, notes that linguists employ a variety of rhetorics because the various sub-disciplines have very different methods and goals.

At this point, we would also like to discuss the limitations of a quantitative approach to academic criticism. The inclusion in this study of the dimension of writer mediation takes into account, as stated above, the critical role of the writer as mediator in the expression of AC. This aspect may indeed need to be more finely tuned, according to disciplines. In this regard, a closer examination of the entities
used as agents and subjects, much as MacDonald (1992, 1994) suggests, may point up differences between the disciplines that simply counting instances of writer mediation does not reveal. Cases in point are the use of the first person plural in papers produced by a single author and the distinction between first person pronoun use *per se* as opposed to possessive adjectives in nominal groups e.g. ‘I’ versus ‘In our laboratory’ (N.B. no instances of first person singular occurred in Chemistry). Whereas Hyland (2001) sees the use of the personal pronoun “we” as a rhetorical tool for bringing the reader into the text as a member of a disciplinary “in-group”, a qualitative examination of the uses of “we” and “our” in the field of Chemistry indicates the use of “we” more as a shift towards spreading the responsibility of the research among two, three or often many more researchers.

The same acknowledgement of the limitations of quantification applies to directness (see Burgess & Fagan, 2002). In this study, critical speech acts are seen as either direct or indirect, and the taxonomy applied here currently makes no allowance for degrees of directness, though few would deny that what is involved is a continuum rather than an either/or choice. This may also result in low levels of interrater agreement for directness, wherein one rater’s outright attack might be another rater’s couched phrase. However, it is worth mentioning that this was not the case in our study, where a high rate of agreement was obtained.

Likewise, personalization may not be entirely amenable to quantification. For Salager-Meyer (1998, 2000), mention of specific individuals is enough to render an AC personal. But how near to the AC in the text does the naming have to occur? Surely there is both explicit and implicit personalization. And where do we mark the bounds of the text? For many of us, responsibility for knowledge making is derivable from the text exophorically almost as readily as it is anaphorically or cataphorically. Members of discourse communities who work on similar problems probably have little difficulty recognising the specific target of a criticism even if not a single mention is made of the individual.

Nevertheless, the establishment of concrete criteria for the rhetorical expression of AC is surely a useful tool for writers in the delicate act of criticising their peers. The analysis carried out in this study has considerably expanded our knowledge of the rhetorics of engaging in academic criticism, and more extensive research should be carried out in order to offer more insights into this socio-pragmatic area of study.
NOTES

1 The results reported in this paper were taken from a broader multidisciplinary study on AC which was carried out by a research team at the University of La Laguna, Spain.

2 In this study we have considered as hedging devices the modal expressions such as may, perhaps; epistemic verbs (suggest, speculate); semi-auxiliaries (seem, appear), and approximators of quantity, frequency, degree and time (generally, approximately, most, frequently).

BIBLIOGRAPHY


Anna Fagan teaches several ESP courses at the University of La Laguna (Spain). She has published materials for ESP-nursing, and has also co-authored articles related to genre analysis. She is currently working on a multidisciplinary research project on the rhetorical features involved in the publishing of research articles in English.

Pedro Martín-Martín teaches English Text Linguistics in the Department of English Philology at the University of La Laguna (Spain). He has recently completed his Ph.D. on contrastive (English/Spanish) academic discourse, which is his main
area of interest. He has published a number of articles in national and international journals on the rhetorical strategies used by academics in English and Spanish research paper abstracts.

Appendix

PSYCHOLOGY TEXTS


CHEMISTRY TEXTS


