行政院國家科學委員會補助專題研究計畫成果報告

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研究論文中報導動詞之語意與言談功能

Reporting Verbs : Semantics and Discourse Functions in Research Papers

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計畫主持人：郭志華

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一、　中文摘要

本計畫探討期刊論文中之引述所用之報導動詞。研究採用質與量的分析，首先找出四種期刊 48 篇論文中的 引言 (Introduction) 及討論與結論 (Discussions and Conclusions) 二章節中共 877 個引述和 174 個報導動詞，並依史威爾氏(Swales)之建議，以引述的研究或研究者是否為論文內文一部分以及引述中是否使用報導動詞兩個原則來將引述分為四類 — 整合式報導 (integral-reporting) 、整合式非報導 (integral-nonreporting) 、非整合式報導 (nonintegral-reporting)、非整合式非報導 (nonintegral-nonreporting) — 以探討不同引述形式在論文中之常用程度與功能。其次，本研究比較了論文的引言和討論與結論二章節中出現的引述與報導動詞使用上之異同。最後，再比較社會科學與科技領域期刊論文中出現的引述與報導動詞使用上之異同。

研究結果顯示，論文中含報導動詞之引述多於不含報導動詞之引述，同時整合式引述比非整合式引述較常使用報導動詞。引言所含的引述與報導動詞均多於討論與結論。社會科學領域論文所含的引述與報導動詞均多於科技領域論文，且二者使用的報導動詞亦有相當差異，反映了學術領域性質上之不同。

另一有趣的分析結果是科技領域論文中出現自我引述(self-citation)之比率遠高於社會科學領域之論文，而在後者中出現含直接引語之引述(direct-quotation citation)的比率則遠大於前者。研究報告中並討論了上述結果之可能原因及其與論文之溝通功能之關係。

由於非母語人士對於撰寫期刊論文的引述常覺困難，本計畫之研究結果提供了各類型引述及報導動詞之用法，具有論文教學上之實用價值。

關鍵詞：引述、報導動詞、整合式報導、整合式非報導、非整合式報導、非整合式非報導、自我引述、含直接引語之引述

Abstract

This project investigated the use of reporting verbs in citations in research papers. Both qualitative and quantitative analyses were conducted. In total, 877 citations and 174 reporting verbs were identified in the Introduction and the Discussions and Conclusions sections of 48 research papers in four major journals. Based on Swales' (1990) proposal, the citations were grouped into four categories – integral-reporting, integral-nonreporting, nonintegral-reporting, and nonintegral-nonreporting – and compared for their occurrences and functions in research papers. Furthermore, reporting verbs and citations in the Introduction section were compared with those in the Discussions and Conclusions section. Finally, a comparison was also made of the reporting verbs and citations in the research papers in social sciences with those in science and technology.

Results from the analyses show that there aare more reporting citations than nonreporting citations. Also, reporting verbs occur more frequently in integral citations than in nonintegral citations. It is also found that the Introduction section contains more re-

porting verbs and citations than the Discussions and Conclusions section. On the other hand, the research papers in social sciences contain more reporting verbs and citations than those in science and technology. In addition, a large percentage of the reporting verbs occurring in the former are different from those occurring in the latter in terms of their evaluative nature, reflecting disciplinary difference.

Another interesting result from the analyses is that research papers in science and technology use self-citations far more frequently than those in social sciences, while the latter use direct-quotation citations far more frequently than the former. Possible interpretations of the results and their relationships with the communicative purposes of the research paper are discussed in the report.

Nonnative writers of research papers often have problems writing citations. The results of this project should provide valuable information about the use of reporting verbs as well as citations in different sections of the research paper and in different disciplines.

Keywords: citation, reporting verb, integral-reporting, integral-nonreporting, nonintegral-reporting, nonintegral-nonreporting, self-citation, direct-quotation citation

二、緣由與目的（Introduction）

Reporting verbs refer to verbs used in reporting, or citing, others' research in academic research papers. Citations may be presented in various forms and perform various discourse functions in a research article (Swales 1990). There has been much interest in this research area. A number of studies have tried to establish a theory of citations (Gilbert 1977; Small 1978; Cronin 1981; Leydesdorff 1987; Leydesdorff & Amsterdamska 1990), while others have focused on the classification of citations in terms of their forms or functions (Moravcsik & Murugesan 1975 ; Chubin & Moitra 1975; Peritz 1983; Swales 1986; Dubois 1988).

The results from the above studies suggest the strategic nature of citations at the discourse level. More recently, investigations have been made into how various reporting structures in citations are signaled or represented through the choice of reporting verbs as well as their tense, voice, or syntactic structures (Oster 1981; Lackstrom, Selinker & Trimble 1972; Malcolm 1987; Shaw 1992; Tarone et al. 1981; Thompson & Ye 1991; Thomas & Hawes 1994). For example, as Swales (1990:154) indicated, "Whatever the reasons, the tense choice may indicate something of the author's stance towards the cited work, and …." The progression from past to present perfect to present is shown as a kind of strategic tense choice suggesting increasing proximity (Een 1982; Malcolm 1987; Lackstrom, Selinker & Trimble 1972; Swales 1981).

Then, a reporting verb itself in a reporting statement could carry the writer's evaluation or degree of commitment towards the cited study (Thompson and Ye 1991; Swales 1990). The semantics of reporting verbs in relation to their rhetorical functions could be identified and categorized to provide options and patterns of choices (Thomas & Hawes 1994).

Shaw (1992), on the other hand, argues that the correlation between tense, voice, and sentence function in reporting verbs could be explained in terms of thematization; in other words, the choice is based on the rhetorical function of the sentence to set the theme or meet the cohesion requirements in the research paper.

Bazerman (1984), examining the style and form of *Physical Review* chronologically, found that there was a decrease in reporting verbs and increase in active verbs. He suggests that the finding or theory has played a more important role in the experimental report as it has been given the grammatical subject position more frequently.

Following Shaw's and Bazerman's findings, we suspected that genre or discourse requirements in the research paper determine largely the forms of citations, which in turn constrain the choice of reporting verbs. This study, therefore, examined

empirically the use of reporting verbs in two forms of citations: integral and non-integral citations (Swales 1990:148).

In addition, it has been found that citations are no longer concentrated in the Introduction section but are distributed throughout the research paper (Swales 1990; Chang & Chang 1999). It is believed that citations and also reporting verbs in different sections of the research article perform different discourse functions. The choice and use of reporting verbs in the Introduction section and the Discussions and Conclusions section, therefore, were compared.

Finally, in addition to the use of different citation systems (Swales 1990), different patterns of thematic development and different natures of knowledge presentation in different disciplines could lead to the use of different forms of citations and reporting verbs. We, therefore, further compared the reporting verbs in research papers in social sciences (SS) and those in science and technology (ST).

Forty-eight research articles were randomly selected from four major journals, two from SS (*Applied Linguistics*, *English for Specific Purposes*) and the other two from ST (*IEEE Transactions on Computers*, *IEEE Journal of Quantum Electronics*). Review papers were excluded as they have a different nature in terms of citations. Each citation in the Introduction section (IN) and the Discussions and Conclusions section (DC) of these articles was identified as integral (I) or non-integral (NI). Then, each was further identified as reporting (R) or non-reporting (NR). The identification of the four categories of citations – IR, NIR, INR, and NINR – was based on Swales' definitions (Swales 1990: 148-150).

Frequency analysis was done for each of the four categories of citations, and for each of the reporting verbs used in the two categories (IR and NIR) where reporting structures were identified. Self-citations and citations with direct quotations were also counted respectively.

A detailed analysis of the various types of sentence structures that occur in integral and non-integral citations was made; in particular, citations with the researcher's name as the grammatical subject and citations not using the researcher's name as the grammatical subject were compared.

Then, the four different categories of citations as well as the reporting verbs occurring in the Introduction section (IN) and the Discussions and Conclusions section (DC) were compared.

The last step was to compare the citations and reporting verbs in the research papers in social sciences with those in science and technology.

三、結果與討論 (Results and Discussions)

Both quantitative and qualitative analyses were made of the citations and reporting verbs in the sample research papers. In the following, however, only major findings from the analyses are presented as a result of the limitation of space in this report. It is also impossible for us to present detailed data in tables and figures.

Integral(I)/Non-integral (NI) and Reporting(R)/Non-reporting (NR) Citations

In total, 877 citations were identified. No significant difference between the number of I (444, 50.6%) and NI (433, 49.4%) was found. However, more reporting structures (619, 70.6%) were found than non-reporting structures (258, 29.4%) in citations. Furthermore, integral citations used more reporting structures (i.e., IR, 378) than non-integral citations (i.e., NIR, 241). Among the four categories of citations, IR (378) occurred most frequently, followed by NIR (241), NINR (192), and INR (66) occurred least frequently.

There were totally 111 self-citations (12.7% of all citations), and 116 direct-quotation citations (13.2% of all citations).

Introduction (IN) vs. Discussions and Conclusions (DC)

Much more citations were found in IN (691) than in DC (186). However, a further

analysis revealed that there were more integral citations (IR + INR, 360) than non-integral citations (NIR + NINR, 331) in IN, while there were more non-integral citations (102) than integral citations (84) in DC.

In both IN and DC, there were more reporting citations (510 and 109 respectively) than non-reporting citations (181 and 77 respectively).

In addition, it was found that there were more self-citations in IN (77) than DC (34), and also more direct-quotation citations in IN (93) than DC (23).

Social sciences (SS) vs. science and technology (ST)

A comparison of the numbers of citations of the various categories between SS and ST clarified and modified our interpretation of the data presented previously, since we could see disciplinary difference plays a role in citation practice.

First, much more citations occurred in SS (639) than ST (238). This was true in both IN and DC.

In terms of citation types, integral citation was preferred to non-integral citation in SS (398:241 or 62.3%:37.7%), but there were more non-integral citations than integral citations in ST(192:46 or 80.7%:19.3%). Although it is possible that a numerical citation system, which is usually adopted by journals in ST, does not easily permit integral citations (Swales 1990:151), we suspect that different styles of information presentation and argumentation in SS and ST may also lead to the use of different types of citations, as indicated in the previous section. A further analysis of the reporting structures and the reporting verbs used in SS and ST shed more light on this point, which will be discussed later.

With respect to reporting or non-reporting citations, both SS and ST used more reporting (447 and 172) than non-reporting citations (192 and 66).

It should also be noted that self-citation occurred much more frequently in ST (69, 29%) than in SS (42, 6.6%). Furthermore, a higher percentage of self-citations occurred in DC than in IN, as indicated earlier. There may be two possible reasons for such results. First, as a result of the continuing nature of their research, ST researchers often need to discuss the findings and results of the present research in relation to their own previous studies. Another interpretation is that citing one's own research is "an important means of demonstrating one's disciplinary credentials and credibility." (Hyland 2001:214) In contrast, self-citing did not, obviously, occur often in SS. It is possible that issues in SS tend to be relatively diverse and there is comparatively little opportunity for self-citation (Becher 1989; Hyland 2001). In addition, it could be that researchers in SS do not prefer blowing their own trumpets. Rather, citation is a practice mainly for the purpose of supporting one's perspectives and propositions, In SS, this would be better achieved by citing other researchers, particularly the more well-established scholars in the field.

On the other hand, research papers in SS (112, 17.5%) used direct-quotation citations much more frequently than those in ST (4, 1.7%). This also suggests the underlying difference of knowledge presentation and style of argumentation between ST and SS.

Reporting verbs

In total, 174 reporting verbs were found in the IN and DC of all sample research papers. There were 162 reporting verbs in IN and 47 in DC. Thirty-five reporting verbs occurred in both IN and DC. In terms of frequency, the top 10 reporting verbs were: *find* (57), *show* (26), *see* (25), *suggest* (23), *report* (16), *use* (15), *indicate* (15), *point (out)* (13), *note* (12), *demonstrate* (11), *describe* (11). A further comparison of the respective lists of the top 10 reporting verbs in IN and DC revealed that *use*, *point (out)*, *demonstrate*, *describe*, and *propose* did not appear in the latter while *discuss*, *argue*, and *confirm* did not appear in the former.

These results suggest: firstly, although reporting verbs may occur in other sections of the research paper, they occur much more frequently in IN since reporting others' research, or literature review, is a major move

in IN; secondly, the more frequently used reporting verbs are those reporting the cited study in a general, non-evaluating, and non-committing way. Finally, some argument verbs or cognition verbs (Thomas & Hawes 1994) may often occur in DC as a result of the discourse functions of DC in the research paper.

With respect to reporting verbs in SS and ST, 174 reporting verbs were found in total; however, there were 139 in SS, and 77 in ST, since 42 reporting verbs (24.1%) occurred in both SS and ST, 35 occurred in ST only, and 97 occurred in SS only. Despite the small sample size, it is of interest to find that reporting verbs referring to scientific research activities such as *calculate, configure, fabricate, feature, incorporate, infer, implement, perform,* and *solve* occur in ST only, while a lot of reporting verbs occurring in SS only, as can be noted, seem to be argumentative, cognitive, or evaluative, such as *agree, attribute, argue, believe, contend, caution, imply, indict, influence, lament, comment, maintain, motivate, overlook, posit, promise, speculate*, and *stress*, to name a few. The results, again, may be linked to disciplinary differences, which are marked in genre conventions.

The occurrences of reporting verbs in integral and non-integral citations were also compared. It was found, as may be expected, that there were more reporting verbs in integral (131) than in non-integral citations (99).

Syntactic forms of citations

The syntactic structures occurring in both integral and non-integral citations were analyzed; in particular, the number of two categories of structures were counted: those in which a researcher's name (or a citation number which represents a cited study) serves as the grammatical subject of the sentence (S), and those in which the grammatical subject is not a researcher's name or a citation number (NS). It was found that, as expected, S did not occur in non-integral citations, while in integral citations, S occurred more frequently than NS. However, it was also found that although S occurred more often than NS in IN, NS occurred more often than S in DC. A possible reason is that an important communicative function of DC is to interpret, discuss, or summarize the major results from research; hence, the focus would be placed on the related information content from the cited study rather than its researcher. NS is more appropriate than S for such information-oriented citations. In other words, citations in a certain section of the research paper may be realized more often through certain syntactic structures than other structures as a result of the specific communicative purposes of the section in the research paper.

In terms of structural variety, the following pattern is typical in S: *Kuo and Fuchs (3) showed….* (or *(3) proposed ….*) But NS shows more structural variety. A number of patterns often occur in:

(a) NS in integral citations
**According to Clark and Hecht (1983), ….*
**…, as has been suggested by Levelt, Sinclair, and Jarrella (1978), ….*
**The model in (10) provides ….*
**These studies follow on earlier studies such as Long (1981, 1983), ….*
**This is confirmed by … developed by Tromborg et al. (4).*
**In (10), ….*

(b) NS in non-integral citations
**Researchers have found … (Hatch 1974; Cancino, Rosansky, and Schumann 1978; Felix 1980a).*
**It was found that …(see Scollon & Scollon 1981).*
**A number of studies have compared … (3-7).*
**There has been increasing interest in … (1-7).*

四、計畫成果自評 (Self-evaluation)

This project investigates reporting verbs in the citations of the research paper. The results show that the use of reporting verbs is associated with the syntactic form of a citations, communicative functions, and disciplinary conventions. There are significant differences between SS and ST in terms of

the number and types of citations as well as specific reporting verbs. There is also a significant difference between IN and DC in the number of citations and reporting verbs.

The analyses mainly rely on human reading, thus taking much time. The sample size, therefore, is not very large and generalizations from the results must be cautious.

On the other hand, this study is a further step from previous studies, which have focused on rhetorical or semantic classification of citations and reporting verbs. We examine reporting verbs in two discourse types of citations. We also compare reporting verbs and citations in two major sections, which have different discourse functions in the research paper. Two disciplines of different nature are compared as well. The results, therefore, provide specific information for a better understanding of the use of reporting verbs and citations in different sections of the research paper as well as different disciplines.

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