A cross-paradigm macro-structure analysis of research articles in Information Systems

CrossMark

Becky S.C. Kwan

Department of English, City University of Hong Kong, 83 Tat Chee Ave., Kowloon Tong, Hong Kong

A B S T R A C T

The study presented in this paper examined the macro-structures (MSs) of research articles (RAs) in Information Systems (IS). Unlike most previous MS studies, which have tended to look for a single unified MS model to represent the discipline under investigation and have provided post hoc explanations of intra-disciplinary variability, this study set out to examine how MSs of RAs in IS may vary with the epistemological paradigms they follow. Thirty articles of behavioural science research and thirty design science research articles were collected from eight IS journals. Their main sections were subjected to a series of analyses. Results show distinct macro-structural variations across the two corpora. Implications for teaching and future research of MS will be discussed.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

One key feature of the research article (RA) that has long caught the attention of ESP scholars is its macro-structure (MS). The IMRD (Introduction–Methods–Results–Discussion) model is perhaps the most widely known structure to have been taken up in various contexts for different pedagogical and research ends. In writing courses and guidebooks, for example, it is frequently invoked as a prototypical, if not standard, schema for structuring a research text (see e.g., Cargill & O'Connor, 2009; Cotos, Huffman, & Link, 2015; Englander, 2014; Swales & Feak, 2004; Weissberg & Buker, 1990). Many ESP studies of RAs have also referred to the model for different purposes. In some sectional studies of RAs, IMRD has been treated as a conventional structure. In some cases, only texts conforming to the model were chosen for analysis with attention paid to the four sections only (see e.g., Amunai & Wannaruk, 2013; Kanoksilapatham, 2005, 2015; Kawase, 2015; Lim, 2006; Loi, Lim, & Wharton, 2016; Martínez, 2003; Nwogu, 1997; Swales, 1990). Yet, the area in which the model has commanded the most research attention is that of MS studies, in which the structure has been subjected to validation in numerous disciplines (see, e.g., Brett, 1994; Chang & Kuo, 2011; Graves, Moghaddasi, & Hashim, 2014; Holmes, 1997; Kuteeva & McGrath, 2015; Lin, 2015; Lin & Evans, 2012; Maswana, Kamaru, & Tajino, 2015; Pérez-Llantada, 2013; Posteguillo, 1999; Soler-Monreal, Gil-Salom, & Carbonell-Olivares, 2006; Tessuto, 2015). Results from both strands of studies show that the IMRD structure does not always apply. One common observation is the array of ways in which the four sections can be configured. The sections may appear in a different order, for example IRDM (Cargill & O'Connor, 2009; Lin & Evans, 2012) while some may appear in different collapsed forms, for example RD and MRD (Lin & Evans, 2012). It has also been found that in some disciplines M and/or R rarely occur (e.g., Graves et al., 2014; Holmes, 1997; Kuteeva & McGrath, 2015). Meanwhile, new section types continue to be identified in the opening, middle, and closing phases of RAs (see examples in Figure 1A). The plethora of findings points to the varied ways in which RAs can be sectioned and how sections are named.

E-mail address: enbkwan@cityu.edu.hk.

Section	Location	Discipline
Preliminaries	The introductory phase	Computer Science
Algorithms	The introductory/middle phase	
Analysis of problems	The middle phase	
Implementation (Posteguillo, 1999; Chang & Kuo, 2011)	The middle phase	
Complementary Introduction (Graves, Moghaddasi & Hashim, 2014)	The introductory phase: immediately after *Introduction*	Mathematics
Proofs	The middle phase	
Notations	The middle phase	
Questions/Open Questions (Kuteeva & McGrath, 2015)	The closing phase	
Background Review or Background (Holmes, 1997; Tessuto, 2015)	The introductory phase: before *Method*	Law Political Science Sociology
Hypothesis (Holmes, 1997)	The introductory phase: before *Method*	Political Science Sociology
Literature Review	The introductory phase: before *Method*	A variety of disciplines
Others relating to theoretical, contextual and methodological matters (Lin & Evans, 2012)	The introductory phase: before *Method*	
Conclusion	The closing phase sometimes after *Discussion* or sometimes replacing *Discussion*	A variety of disciplines
Future research	The closing phase sometimes after *Discussion* or sometimes replacing *Discussion*	
Implications (Yang & Allison, 2003; Pérez-Llantada, 2013; Kuteeva & McGrath, 2015)	The closing phase sometimes after *Discussion* or sometimes replacing *Discussion*	

A

MS Model	Discipline
Introduction-Background-Hypothesis-Method-Results-Discussion (Holmes, 1997)	Political Science, Sociology and other social sciences
Introduction-Results (Graves, Moghaddasi & Hashim, 2014)	Mathematics
Introduction–Background Review–Method–Results–Discussion–Conclusion (Tessuto, 2015)	Law

B

Figure 1. A. Other section types identified in MS studies. B. Examples of MS models proposed for some disciplines. C. Three journal-specific MS models of Computer Science RAs, proposed by Posteguillo (1999, p.141).

The variety of MS configurations identified is believed to have been shaped by the modes of inquiry and knowledge-producing practices in specific disciplinary domains, which has led to the development of different discipline-specific MS models. It is not uncommon to see that for many of the disciplines investigated, only single models have been proposed (see Figure 1B), which could easily lead to the perception that RAs are structured in a more or less unitary way in a discipline. Yet, such is not the case as reported in several studies that have found great intra-disciplinary MS variability in a number of fields. Earlier evidence comes from Posteguillo's (1999) study of RAs in Computer Science, which shows that R appeared in only about half of the articles in his corpus and M in none while some of the introductory and middle sections were highly variable (see Figure 1C). Kuteeva and McGrath (2015), in their study of theoretical RAs in Pure Mathematics, likewise observed great variability in the content and headings of the sections in the middle and the closing phases. In their study of 400 RAs drawn from 39 disciplines, Lin and Evans (2012) found that MSs differed greatly in a number of disciplines (e.g., Applied Linguistics/ELT, Hotel and Tourism, Industrial and System Engineering as well as Design Studies).

Although there is only a small number of studies reporting intra-disciplinary variations, the fact that the phenomenon has been observed in a broad range of disciplines makes it worthwhile for further investigations. One crucial question to ask is what brings such MS diversity within these fields. Attempts to address the question have been made in the studies yet the answers have mostly been provided in passing, and intra-disciplinary MS variability has rarely been pursued systematically as