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RELATIONSHIPS BETWEEN SOCIAL PSYCHOLOGY AND THE DECISION SUPPORT SYSTEMS AREA: AN EMPIRICAL ASSESSMENT

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Abstract

This research extends earlier studies, which examined the intellectual structure, major themes, and reference disciplines of decision support systems over the past decades. This study empirically investigated the intellectual relationship between the DSS subspecialties and social psychology using factor analysis of an author cocitation frequency matrix derived from a comprehensive database of the DSS literature over the period of 1995 through 1999. This research traces a uni-directional flow of intellectual materials to the DSS area from social psychology to probe how concepts and findings by researchers in social psychology have been picked up by DSS researchers to be applied, extended, and refined in the development of DSS research subspecialties. Factor analysis uncovered five major areas of DSS research (group support systems, design/foundations, model management, user interfaces, and implementation) and two contributing disciplines (social psychology and cognitive psychology). This study focuses on assessing the contributions of social psychology to the group support systems.

Introduction

The area of decision support systems has made meaningful progress since the early 1970s and is in the process of solidifying its domain and demarcating its reference disciplines. This research focuses on empirically investigating the intellectual relationship between the DSS subspecialties and social psychology to facilitate the development of articulated theory in the field. This study builds on a series of previous studies (Eom 1996, 1997, 1998a, b) and traces how concepts and findings by researchers in cognitive science have been picked up by DSS researchers to be applied, extended, and refined in the development of DSS research subspecialties. Studying the reference disciplines improves DSS research as researchers adopt their theories, methodologies, philosophical bases, and assumptions, as well as assessing what these theories imply for DSS research (Goul et al. 1992; Keen 1980).

Data and Research Methodology

A database file was created consisting of *cited* reference records taken from the 537 *citing* articles in the DSS area over the period of 1995-1999. A citing article is selected if: (1) it discussed the development, implementation, operation, use, impact of DSS, or DSS components; or (2) for DSS articles related to contributing disciplines, they were explicitly related to the development, implementation, operation, use, or impact of DSS or DSS components.

This study uses author cocitation analysis (ACA). ACA is the principal bibliometric tool to establish *relationships* among authors in an academic field and thus can identify subspecialties of a field and how closely each subgroup is related to each of the other subgroups. The final author set of 84 was chosen by applying the overall cocitation frequency over 25 with himself/herself. See, McCain (1990) for a detailed discussion of several different approaches to compiling a list of authors. The cocitation matrix generation system we developed gives access to cited coauthors as well as first authors. The raw cocitation matrix of 84 authors is converted to the correlation coefficient matrix. The matrix is further analyzed by the factor analysis program of SAS.

Preliminary Results

Factor analysis extracted nine factors consisting of five major areas of DSS research (group support systems, design/foundation, model management, user-interface, and implementation) and three contributing disciplines (social psychology, cognitive science, and organizational science). Appendices present the factor structure correlations of the nine-factor solution and all authors in each factor with factor loading at .40 or higher. According to McCain (1990 p.440), "Only authors with loadings greater than -0.7 are likely to be useful in interpreting the factor, and only loadings above -0.4 or -0.5 are likely to be reported." Therefore, care must be exercised when interpreting statistical output of citation analysis.

Table 1 indicates that several DSS research fields/contributing disciplines are emerging. In the reference discipline area, social psychology has emerged as the most important DSS reference disciplines. Social psychology is concerned with the study of causes, types, and consequences of human interaction including the effects of group pressure (i.e., conformity), the individual as part of a social group (social loafing tendency, brainstorming, groupthink, and prejudice and discrimination), the formation of impressions, and the development of attitudes. Siegel, et al (1986) conducted experiments to investigate the effects of computer-mediated communication on communication efficiency, participation, interpersonal behavior, and group choice. In doing so, groups of three members were asked to reach consensus on career choice problems via three different communication modes (face-to-face meeting, e-mail conferencing, interactive computer-mediated discussions). Group processes in computer-mediated communication produced fewer remarks and took longer to reach consensus when compared to that of face-to-face meeting. Computer-mediated groups participated more equally in discussions and also exhibited uninhibited behavior such as strong and inflammatory expressions in interpersonal interactions.

Social psychologists have strongly influenced the group support systems researchers in investigating the effect of the group factors on the efficiency of the group decision, analyzing the group decision making for the development of a GSS, probing the impacts of GDSS in the idea-generation phase of group decision making, assessing the effects of group interaction on the performance of group decision making in a GDSS environment, and identifying the effects of group factors on group communication patterns.

Table 1. Inter-Factor Correlations

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9
Factor 1	1.0000								
Factor 2	-0.13506	1.00000							
Factor 3	-0.3329	0.39226	1.00000						
Factor 4	0.48033	-0.28799	-0.31263	1.00000					
Factor 5	0.15769	0.35115	0.18005	-0.00280	1.00000				
Factor 6	0.01337	0.19414	0.09542	-0.04537	0.09874	1.00000			
Factor 7	0.18369	-0.28927	-0.17248	0.36213	-9.95552	-0.22694	1.00000		
Factor 8	0.33574	0.13923	-0.29480	0.15684	0.05441	0.05055	-0.05743	1.00000	
Factor 9	0.25282	0.36298	0.09667	0.04634	0.19308	0.11923	0.07498	0.25101	1.00000

Factor 1 Group support systems

Factor 2 Design

Factor 3 Model management

Factor 4 Social psychology

Factor 5 Cognitive science

Factor 6 Unnamed

Factor 7 Unnamed

Factor 8 User-Interface

Factor 9 Implementation

What We Plan to Present at the Meeting

Based on the preliminary results, we will further analyze the DSS literature (537 articles used in this research) and plan to present a comprehensive result at the meeting to trace how concepts/theories in social psychology have been further extended and refined in the development of DSS theories, especially in the GSS area.

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