

Editorial: The Information Processing Approach as a Perspective for Groups Research

Elisabeth Brauner and Wolfgang Scholl

Humboldt-University in Berlin

THE IMPORTANCE of the information processing approach in groups research may best be understood in the context of the possible decline in groups research. In his 1974 analysis of the fate of groups research in social psychology, Steiner concluded that its long decline would soon be followed by a resurgence. He stated:

... I am compelled to predict that there's a new day acoming. I make this fearless forecast knowing that you can't expect that day to arrive for a few more years. And if it doesn't come, you will have forgotten I ever mentioned it. (Steiner, 1974, pp. 105–106)

Neither of these predictions came true. Groups research did not experience a resurgence 8 to 10 years later as Steiner believed, nor did the scientific community forget his prediction. Steiner himself raised the issue again several years later, noting with disappointment that the 'new day' had not come (Steiner, 1983, 1986). Other articles dealing with the destiny of groups research have been published since, and many attempts have been made to analyze its sad decline and hopes for a renewal (cf., Abrams & Hogg, 1998). We will briefly outline this discussion before turning to the topic of this special issue, *Information Processing in Groups*.

Decline and Rise of Groups Research

Three major reasons have been offered for the decline of small groups research: theoretical problems, methodological problems, and a paradigm shift in social psychology (cf., Abrams & Hogg, 1998; Davis, 1996; Fisch & Daniel, 1982; Levine & Moreland, 1990, 1995; McGrath, 1997; Paulus, 1989; Sanna & Parks, 1997; Simpson & Wood, 1992; Steiner, 1974; Tindale & Anderson, 1998). Theoretical problems include the lack of interesting theoretical issues (Steiner, 1974), the difficulty of formulating hypotheses for groups compared to individuals (Paulus, 1989), and the fact that some groups findings could be explained at individual level (Tindale & Anderson, 1998).

Methodological problems include the difficulty of finding a sufficient number of research participants (Davis, 1996), the time-consuming nature of groups research (Steiner, 1974), and problems with the analysis of complex data sets (Simpson & Wood, 1992).

Editor's note

Address correspondence to Elisabeth Brauner, Institut für Psychologie, Humboldt-Universität zu Berlin, Oranienburger Str. 18, D – 10178 Berlin, Germany. [email: brauner@psy.ch]

Finally, a 'turning inwards' (Davis 1996; Simpson & Wood, 1992) or cognitive shift (Tindale & Anderson, 1998) in social psychology that favored a subjectivist and individualistic view has been a factor. Steiner (1974) identified dissonance theory and attribution theory as the core concepts emerging from this new trend. This shift can be understood as a paradigm shift (Kuhn, 1970) that concerned not only social psychology (with its research on groups), but also psychology as a discipline. The cognitive approach replaced a more behaviorist approach that favored looking at inputs and outputs rather than processes. The latter approach had been characteristic of both individual psychology and early group psychology (Simpson & Wood, 1992).

The cognitive approach eventually outperformed the behaviorist approach, not only for theoretical reasons, but also due to the methodological problems of transferring the former approach to groups research. Even Bales' (1950) interaction process analysis could not prevent this trend, because it focused exclusively on the functional aspects of the interaction process. In order to adopt a cognitive approach it would have been necessary to deal with the content of interaction instead (Brauner, 1998). Although behavior and cognition are both essential to fully comprehend group processes, only an analysis of content allows us to understand why, for instance, group discussion results in a specific outcome.

Moreland (1996) describes a further reason for these trends. In his opinion, Kurt Lewin's influence on groups research was not only helpful for the field, but also harmful. Coming from a Gestalt background, from his work at Humboldt-University in Berlin with Wolfgang Koehler, Kurt Koffka, and Max Wertheimer, Lewin was primarily a subjectivist. Following the implications of his field theory, Lewin was convinced that the individual perspective should predominate and that it was the only way to understand human behavior (Moreland, 1996). Interestingly, Lewin's work is viewed in Germany as more environmental than 'groupy'. Lewin's laboratory research, according to

Moreland (1996, p. 18), led to 'more dubious work on less interesting phenomena'. Moreover, as action research was highly dependent on his charisma, the resolution of conflicts between scientists and practitioners failed after his death, and collaboration between them ended. Hence, Moreland concludes that Lewin contributed to the loss of interest in doing groups research among social psychologists.

Another factor in this new approach was the rise of the 'New Look in Perception' (Graumann, 1955), activated by Jerome Bruner's research on how individuals' needs can affect the perception of socially valued objects (e.g. Bruner & Goodman, 1947). This development completely changed psychologists' understanding of how perception works, and it promoted the integration of cognitive and social psychology and the emergence of social cognition as a powerful research area within social psychology.

All these occurrences eventually resulted in a decline of groups research in social psychology, but apparently groups research has actually grown in related fields. Levine and Moreland (1990, 1995) concluded, in their review of groups research, that 'groups are alive and well, but living elsewhere' (1990, p. 620). And Davis (1996, p. 3) outlined the birth of a 'general behavioral science' that encompasses diverse disciplines, all favoring more applied research.

As for the predicted resurgence of interest in groups, Steiner's own explanation, that research in social psychology reflects societal events and changes, with an 8 to 10 year delay, did not hold. Although there has indisputably been a growth of research in groups since the mid 1980s, it was not caused by societal changes or events during the late 1960s and early 1970s. Levine and Moreland's (1990) notion that groups research is prospering in other fields, such as organizational psychology, is not satisfactory either. Despite the fact that groups research is flourishing in applied disciplines, several reviews of journal publications show that its growth mainly comprises publications in journals that focus more on basic than applied issues.

In an archival study on publication trends in three major social psychological journals (*Journal of Experimental Social Psychology*, *Journal of Personality and Social Psychology*, and *Personality and Social Psychology Bulletin*), Moreland, Hogg and Hains (1994) analyzed the proportion of total journal pages that was devoted to articles dealing with groups issues. The results showed little support for Steiner's prediction. Moreland and his colleagues also found that patterns of interest changed over the years, and that there was considerable influence from social cognition and European social psychology on groups researchers. But even when these influences were excluded from the analysis, there was still a slight trend toward more research on groups. This trend remains to be explored.

But if Levine and Moreland (1990) are correct, and the larger part of groups research is now found outside of social psychology, then the journals selected by Moreland et al. (1994) would not be representative of the field. Abrams and Hogg (1998) conducted a later study and included a much broader range of journals in their analyses. They found a similar positive trend upwards, but they did not carry out a content classification, as did Moreland and his colleagues. Such a classification could have revealed whether European and social cognition influences are still responsible for the growing interest in groups research.

Perhaps there is something like a historical loop in social psychology: One of the major figures in the social perception approach in the 1950s was Henri Tajfel (e.g. Tajfel, 1957). His analysis of the overestimation of differences between (social and valued) objects led to his theory on stereotypes and intergroup processes. Thus, a factor that led social psychologists away from groups eventually brought them back as well. Nevertheless, some social psychologists are concerned that some of this new work on groups is more individualistic than 'groupy'.

Information Processing in Groups

None of these analyses took into account something described by Hinsz, Tindale, and Vollrath (1997) in their review of groups as information processors. In that review, Hinsz et al. described a new paradigm that offers a new perspective on groups. Groups are viewed as information processing units, analogous to how cognitive psychology views individuals. Like individuals, groups process information: they encode, store, and retrieve it. Groups have objectives for processing information, and a focus of attention. They produce responses and process feedback they receive. After reviewing more than 250 articles, Hinsz et al. (1997) concluded that this approach is already active and prospering in groups research.

How does this new approach relate to the factors responsible for the decline of groups research? As far as theoretical issues are concerned, the notion of groups as information processors clearly suggests many interesting and fascinating theoretical issues that Steiner (1974) missed. For example, the information processing approach focuses attention on process instead of structure, and content instead of function. Thorough procedural investigation of action and communication within groups is essential to reveal such processes as encoding, storing, and retrieving information. Paulus' (1989) objection regarding the difficulty of formulating plausible hypotheses about groups should be dispelled as well. As individual information processing is used as metaphor from cognitive psychology, it should become easier to generate such hypotheses.

As for methodological problems associated with the cognitive approach, some may be dealt with, others are newly created, and others remain unchanged. The costs of groups research remain, and new problems of measurement and operationalization arise, such as how to measure knowledge acquisition in groups, or the development of a group identity. Statistical problems in groups research, such as achieving higher reliability in measurement, or taking statistical dependency in

interaction processes into account, can be dealt with (Simpson & Wood, 1992).

A paradigm shift has finally reached groups research (Hinsz et al., 1997), but this does not mean that everyone has to take an individualist perspective on groups. Despite all of its cognitivist connotations, the new work can remedy one of the shortcomings of social cognition by giving the 'social' more meaning, as it suggests that *the group* should be the unit of analysis. A reduction of group processes to individual cognition would not be suitable for analyzing the processing of information in groups. Hence, the cognitive approach bears a new quality, namely to break with behaviorism, yet still preserve the 'groupiness' of groups research. McGrath (1997) argued once that a paradigm shift would be necessary to promote the revival of social psychology. The concept of information processing in groups can be viewed as such a paradigm shift, one that moves us towards a new, dynamic and non-reductionist understanding of groups, and social interaction in general.

Although the Hinsz et al. (1997) review suggests that the notion of groups as information processors is new and has only emerged in the past few years there is much evidence of earlier interest in that notion (see Galegher et al., 1990; Larson & Christensen, 1993; Levine et al., 1993). Nye and Brower (1996), for example, have already asked 'What is social about social cognition?'

Traditionally, social cognition is viewed as 'the process by which people think about and make sense of people' (Fiske, 1995, p. 151). The information processing approach to groups embraces social cognition as a product of communication and interaction, and focuses directly on how the content of individual cognition is shared with other people. The information processing approach applied to groups combines individual cognitive processes with social processes of communication, thereby offering a richer framework for future research.

Viewing groups as information processors is not an invention of the 1990s, but can be traced back to the 1950s and 1960s. A brief look at the roots of this approach seems worthwhile.

In 1960, James G. Miller published a paper on information input overload that clearly suggests groups are information processors. He gave many examples of empirical work on the processing of information in groups and organizations, such as 'behaving systems' (Miller, 1960, p. 696). Miller identified three basic aspects of behaving systems that are important for information input overload: performance, mechanisms of defense or adjustment, and the costs of information transmission.

Performance and costs represent attempts to quantify the effects of information processing, whereas mechanisms of defense deal with the procedure of information processing itself. Examples for these mechanisms are (1) the temporary non-processing of information, (2) processing incorrect information, (3) delaying response, (4) filtering information, (5) cutting categories of discrimination and responding with less precision, and (6) escaping from the task. In Miller's view, the more complex a behaving system is, the more of these mechanisms it has available. Furthermore, Miller (1971) analyzed the group as a system in great detail. He discussed information processing and communication processes, and described memory processes, including the basic idea of a transactive memory (Wegner, 1995) in a group. He also promoted the simulation of groups in order to reduce the costs of groups research (Miller, 1971). Even today, Miller's approach could still provide guidelines for the analysis of group processing of information.

Another early example of the information processing approach to groups is the work of Driver and Streufert (1969). Their main interest was the productivity of information processing systems. Although the model they proposed was reminiscent of general systems theory, where output is simply controlled by variation in input, they examined perception, information search, communication, and decision-making as basic aspects of information processing in individuals *and* groups.

Finally, Von Cranach, Ochsenbein and Valach (1986) should be mentioned here as well, although their work is comparatively new. They viewed the group as a self-active system, and their

approach is probably the most 'groupy' one of those reviewed here. Individual level and group level information processing were integrated in their model. They also saw an analogy between individual level cognition and group level information processing (communication).

The key element in all these pioneers was a view of groups as (social) systems. As Forsyth (1999, p. 47) noted, the definition of a system 'could easily serve as a definition of a group'. Although it is just one theoretical approach among others, systems theory is generally compatible with the information processing analysis to groups, and only time will tell whether it can also provide a theoretical framework for groups research in general.

Although Davis (1996) concluded impatiently that it is time to talk less about the decline and fall of groups research, and time to address important theoretical and methodological problems, we believe that it is worthwhile to examine the trends in order to determine the impact of an information processing approach to groups. Talking about the decline and fall of groups research at least suggests possible new directions for growth.

The special issue 'Information Processing in Groups'

The articles in this special issue are based on a selection of papers presented at the 1st International German Conference on Groups Research, entitled 'Information Processing in Groups'. The conference was held at the Psychological Institute of Humboldt-University in Berlin, Germany, 25–28 June, 1998. The institute has an impressive history including distinguished faculty (Hermann Ebbinghaus, Carl Stumpf, Kurt Koffka, Wolfgang Köhler, Kurt Lewin, Max Wertheimer, and Friedhart Klix) and many national and international conferences. The value of a groups perspective was recognized recently when the institute established a Chair in Organizational and Social Psychology, which is held by Wolfgang Scholl.

The idea for a conference on groups arose from a problem perceived by many groups researchers in German-speaking countries –

that no regular international platform for the discussion of progress in groups research exists in Germany, Switzerland, or Austria. For this reason, Elisabeth Brauner and Wolfgang Scholl decided to host the first of a series of conferences in Berlin. The specific topic for this conference was the idea of Richard Moreland, suggested on the way back to Pittsburgh from the conference of the Society for Experimental Social Psychology (SESP) held in Toronto in 1997.

Groups research is expanding and diversifying as reflected by the range of material covered in this issue. Many fascinating research topics were presented at the conference and doubtless much of it is likely to be published in groups journals in the future. We hope that we have captured the most important and exciting of these papers in this special issue. We aim to shed light on new aspects of the cognitive approach to groups, and include theoretical, methodological, and research papers.

R. Scott Tindale and Tatsuya Kameda introduce their concept of 'social sharedness', something that can provide a unifying theme for the understanding of groups as information processors. Many characteristics of individuals, such as attitudes, identities, or cognitions, can be socially shared. Tindale and Kameda see 'social sharedness' as what makes group information processing possible. The degree of sharedness affects many group outcomes, and thus merits consideration. The concept of sharedness constitutes the specifically social aspect in information processing in groups.

René Ziegler, Michael Diehl and Gavin Zijlstra present new results involving computer brainstorming by groups. They investigate idea production in nominal and virtual groups and explore whether reading other's ideas via computer-mediated communication stimulates ideas and therefore improves group brainstorming. Again, the basic question relates individual cognition to social communication.

Felix Brodbeck and Tobias Greitemeyer introduce a dynamic model of group performance that is based on the group learning approach and social combinations research, i.e. on social and cognitive factors determining the

groups' outcomes. They report two experiments using a rule induction task. They argue that their model is not restricted to such tasks, but can be applied also to other tasks that groups perform.

Dieter Beck and Rudolf Fisch offer a methodological approach to groups that combines behavioral themes and content analysis. They claim that any attempt to understand group processes and group decision-making inevitably requires a multi-level approach. They illustrate that claim by analyzing the film 'Twelve Angry Men' using their Conference Coding System and focusing on critical incidents during jury deliberation. Thus, they provide a tool for a precise analysis of the social origins of changes in individual cognition through group discussion.

Finally, Norbert Kerr, Keith Niedermeyer, and Martin Kaplan discuss the value of assuming genuine information processing by groups, which differs from individual processing. They argue for the advantages of social decision schemes which involve member's characteristics (contributions, preferences, solutions) and some rule or scheme for how these characteristics should be combined. They conclude that social decision schemes help us to understand the performance of task groups. However, if theory is meant not only to predict group outcomes, but also to clarify group processes, as the information processing approach to groups implies that it should, then it will be necessary to take a closer look at the content of group behavior and the social and cognitive processes in groups.

Acknowledgments

Most projects are the result of the work by not just one or two individuals, but by small or larger groups. We want to thank all of the conference participants and the authors, whose cooperation and effort made the conference a success and produced this special issue.

The conference would have been far less successful if a group of students had not solved all the problems (big and small) that occurred. In particular, Bertram Gawronski helped with planning and organizing the conference, and

kept things going while it lasted. Furthermore, Thomas Dallüge, Ina Finke, Iain Glen, Uta Kletzing, Jana Löffler, Heike Maduekwe, Corinna Scholz, and Karen Viereck all worked hard at taking care of participants and doing important, but not always visible things. Iain Glen also helped with the production of this special issue. Financial support for the conference was mainly provided by the Deutsche Forschungsgemeinschaft (4850/197/98). We also received a grant from the Daimler Benz AG (now DaimlerChrysler). We are very grateful to both organizations.

The articles in this issue have all been through the standard peer review procedures for papers submitted to *Group Processes and Intergroup Relations* (GPIR). We should like to thank the many reviewers whose comments and suggestions have provided a valuable contribution to this issue. We should also like to thank the editors of GPIR, Dominic Abrams and Michael Hogg. They supported the proposal to publish this special issue when the journal was first establishing itself – the first issue of *Group Processes and Intergroup Relations* only appeared a few days before the conference. Sabina Aharpour and Georgina Randsley de Moura from GPIR and Anna Williamson from Sage Publications were always helpful, friendly and patient throughout the development of this special issue.

Optimistic and pessimistic views about the future of groups research have alternated over the years. We can only conclude that groups research is still 'under construction'. Change is inevitable. We are confident, that groups research will live long and prosper, and maybe even 'boldly go where no one has gone before' – hopefully with a little help from the work presented here on the information processing approach to groups.

References

- Abrams, D., & Hogg, M. (1998). Prospects for research in group processes and intergroup relations. *Group Processes and Intergroup Relations*, 1, 7–20.
- Bales, R. F. (1950). *Interaction process analysis. A*

- method for the study of small groups. Cambridge, MA: Addison-Wesley.
- Brauner, E. (1998). Die Qual der Wahl am Methodenbuffet oder: Wie der Gegenstand nach der passenden Methode sucht [The strenuous choice at the buffet of methods or: How a topic is searching for the right method]. In E. Ardelt-Gattinger, H. Lechner, & W. Schlögl (Eds.), *Gruppendynamik. Anspruch und Wirklichkeit der Arbeit in Gruppen* (pp. 176–193). Göttingen: Verlag für Angewandte Psychologie.
- Bruner, J. S., & Goodman, C. C. (1947). Value and need as organizing factors in perception. *Journal of Abnormal and Social Psychology*, 42, 33–44.
- Davis, J. H. (1996). Small group research and the Steiner question: The once and future thing. In E. Witte & J. H. Davis (Eds.), *Understanding group behavior* (Vol. 1, pp. 4–16). Mahwah, NJ: Erlbaum.
- Driver, M. J., & Streufert S. (1969). Integrative complexity: An approach to individuals and groups as information-processing systems. *Administrative Science Quarterly*, 14, 272–285.
- Fisch, R., & Daniel, H.-D. (1982). Research and publication trends in experimental social psychology: 1971–1980 – A thematic analysis of the *Journal of Experimental Social Psychology*, the *European Journal of Social Psychology*, and the *Zeitschrift für Sozialpsychologie*. *European Journal of Social Psychology*, 12, 395–412.
- Fiske, S. T. (1995). Social cognition. In A. Tesser (Ed.), *Advanced social psychology* (pp. 149–193). New York: McGraw Hill.
- Forsyth, D. R. (1999). *Group dynamics* (3rd ed.). Belmont, CA: Wadsworth.
- Galegher, J., Kraut, R. E., & Egidio, C. (1990). *Intellectual teamwork: Social and technological foundations of cooperative work*. Hillsdale, NJ: Erlbaum.
- Graumann, C. F. (1955). 'Social perception'. Die Motivation der Wahrnehmung in neueren amerikanischen Untersuchungen [‘Social perception’. The motivation of perception in new American studies]. *Zeitschrift für Experimentelle und Angewandte Psychologie*, 3, 605–661.
- Hinsz, V. B., Tindale, R. S., & Vollrath, D. A. (1997). The emerging conceptualization of groups as information processors. *Psychological Bulletin*, 121, 43–64.
- Kuhn, T. (1970). *The structure of scientific revolutions* (2nd ed., enlarged version). Chicago, IL: University of Chicago Press.
- Larson, J. R., & Christensen, C. (1993). Groups as problem solving units: Toward a new meaning of social cognition. *British Journal of Social Psychology*, 32, 5–30.
- Levine, J. M., & Moreland, R. L. (1990). Progress in small group research. *Annual Review of Psychology*, 41, 585–634.
- Levine, J. M., & Moreland, R. L. (1995). Group processes. In A. Tesser (Ed.), *Advanced social psychology* (pp. 419–465). New York: McGraw-Hill.
- Levine, J. M., Resnick, L. B., & Higgins, E. T. (1993). Social foundations of cognition. *Annual Review of Psychology*, 44, 585–612.
- McGrath, J. E. (1997). Small group research, that once and future field: An interpretation of the past with an eye to the future. *Group Dynamics: Theory, Research, and Practice*, 1, 7–27.
- Miller, J. G. (1960). Information input overload and psychopathology. *American Journal of Psychiatry*, 116, 695–704.
- Miller, J. G. (1971). Living systems: The group. *Behavioral Science*, 16, 302–398.
- Moreland, R. L. (1996). Lewin’s legacy for small-groups research. *Systems Practice*, 9, 7–26.
- Moreland, R. L., Hogg, M. A., & Hains, S. C. (1994). Back to the future: Social psychological research on groups. *Journal of Experimental Social Psychology*, 30, 527–555.
- Nye, J. L., & Brower, A. M. (Eds.), (1996). *What’s social about social cognition: Research on socially shared cognition in small groups*. Thousand Oaks, CA: Sage.
- Paulus, P. B. (1989). An overview and evaluation of group influence. In P. B. Paulus (Ed.), *Psychology of group influence* (2nd ed.) (pp. 1–12). Hillsdale, NJ: Erlbaum.
- Sanna, L. J., & Parks, C. D. (1997). Group research trends in social and organizational psychology: Whatever happened to intragroup research? *Psychological Science*, 8, 261–267.
- Simpson, J. A., & Wood, W. (1992). Introduction: Where is the group in social psychology? An historical overview. In S. Worchel, W. Wood, & J. A. Simpson (Eds.), *Group process and productivity* (pp. 1–10). Newbury Park, CA: Sage.
- Steiner, I. D. (1974). Whatever happened to the group in social psychology? *Journal of Experimental Social Psychology*, 10, 1467–1478.
- Steiner, I. D. (1983). Whatever happened to the touted revival of the group? In H. Blumberg, A. Hare, V. Kent, & M. Davies (Eds.), *Small groups and social interaction* (Vol. 2, pp. 539–548). New York: Wiley.
- Steiner, I. D. (1986). Paradigms and groups. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 251–289). Orlando, FL: Academic Press.

- Tajfel, H. (1957). Value and the perceptual judgement of magnitude. *Psychological Review*, *64*, 192–204.
- Tindale, R. S., & Anderson, E. M. (1998). Small group research and applied social psychology: An introduction. In R. S. Tindale, F. B. Bryant, Y. Suarez-Balcazar, E. Henderson-King, & J. Myer (Eds.), *Social psychological applications to social issues: Theory and research on small groups* (Vol. 4, pp. 1–8). New York: Plenum Press.
- Von Cranach, M., Ochsenein, G., & Valach, L. (1986). The group as a self-active system: Outline of a theory of group action. *European Journal of Social Psychology*, *16*, 193–229.
- Wegner, D. M. (1995). A computer network model of human transactive memory. *Social Cognition*, *13*, 319–339.
- Humboldt-University in Berlin, Germany. her current research interests are social and cognitive processes in groups, group mental models, transactive memory, communication processes, group work in organizations, perspective taking, and metacognition. Furthermore, she works on the development of methods for the analysis of interaction processes.

WOLFGANG SCHOLL is Professor of Psychology at the Department of Psychology, Humboldt-University in Berlin, Germany. His research interests focus on social interaction and group processes and their role in organizational decision-making and innovation. He is head of a private research unit affiliated with Humboldt-University, which carries out applied research for private and public organizations.

Biographical notes

ELISABETH BRAUNER is Assistant Professor of Social and Organizational Psychology at