



Kellogg Conference on Creativity and Innovation in Organizations Presentation Titles and Abstracts

Steven Smith, Texas A&M University

Title: *Empirical Studies of Creative Cognition in Idea Generation* (with David Gerkens, Jami Shah and Noe-Vargas-Hernandez)

Abstract: The basic cognitive processes, as well as the elemental components of creative idea generation methods in conceptual design, were examined experimentally. The fluency, flexibility, novelty, and practicality of ideas generated in both laboratory and engineering design settings were examined as a function of such factors as task alternation, frame-of-reference shifting, incubation, critical judgment, and biasing examples. The results of these experiments, as well as the concept of alignment in experimental methods is discussed in the chapter.

Eric Santanen, Bucknell University

Title: *Opening the Black Box of Creativity: Casual Effects in Creative Solution Generation*

Abstract: Researchers have sought a better understanding of creativity for more than a century and the resulting investigations have shed a great deal of light on the subject. This chapter examines the creativity literature from a cognitive perspective and then proposes a Cognitive Network Model of creativity (CNM) that explains one possible causal mechanism behind the generation of creative solutions to problems. The model is then evaluated using four person groups engaged in electronic brainstorming. Groups used either free brainstorming or directed brainstorming to generate solutions for one of two ill-structured tasks. In both tasks, people using directed brainstorming produced solutions with higher average creativity ratings and higher concentrations of creative solutions than did groups using free brainstorming. Significant differences were also found among the three varieties of directed brainstorming. The implications of this model are discussed.

Jacob Goldenberg, Hebrew University of Jerusalem

Title: *Structuring Creativity : Creative Templates in Negotiation* (with Dina Nir and Eyal Maoz)

Abstract: Creativity, in the negotiation context, is considered a key ingredient in the creation of value, and in transforming “fixed pie” or even deadlocked situations into integrative, win-win agreements (Fisher, Ury & Patton 1991; Pruitt & Carnevale 1993; Thompson 2001). Furthermore, creatively constructed, integrative solutions are known to yield higher joint benefits than distributive agreements, since they are able to reconcile the parties’ needs and interests (Pruitt 1983a). However, discovering and tapping into the creative potential in any negotiation is a challenge that is easily advocated, but in most organizations, hard to implement.

One promising approach to this problem may be found in recent developments in the creativity literature, demonstrating that creative and insightful problem solving can be achieved through systematic inventive thinking (Goldenberg, Mazursky, & Solomon 1999a; Goldenberg & Mazursky 2002; Maimon & Horowitz 1999). The main thesis advanced in this stream of research, is that certain structures in creative ideation and problem solving processes are identifiable, objectively verifiable, and can be studied, generalized and implemented across various managerial areas. These structures, termed *Creativity Templates*, can serve as facilitative tools in channeling the ideation process, thereby enabling the negotiator to be more productive and focused in generating creative options and proposals.

The template approach to creativity and problem solving has, so far, been successfully applied in new product development processes (Goldenberg, Mazursky, & Solomon 1999b), technological innovations (Goldenberg, Mazursky, & Solomon 1999c) and in advertising (Goldenberg, Mazursky, & Solomon 1999d). The current research is an attempt to bring this innovative technique into the negotiation arena.

Paul B. Paulus, University of Texas-Arlington

Title: *Group Brainstorming and Team Innovation: Some Rules for the Road to Innovation* (with Toshihiko Nakui and Vicky L. Putman)

Abstract: A comparison between the groups literature and the individual creativity literature in the early 1990’s revealed that they were quite consistent. The individual creativity literature emphasized personal characteristics and experiences related to creativity. There was much evidence that eminence and creativity often involve much solitary persistence. Eminently

creative individuals were also renowned for their high level of motivation. They appeared to have a divergent thinking style and generated a high quantity of products (e.g., Simonton, 1988). Studies of groups generally found little basis for creative potential in groups (see Paulus, Brown, & Ortega, 1999 for a review). The most salient literature was that on brainstorming. The consistent finding in that literature was that groups tended to generate fewer ideas and fewer high quality ideas in comparison to individual ideation conditions (Mullen, Johnson, & Salas, 1991). Amabile (1983) had published her influential book on social context factors in creativity and emphasized that certain controlling factors such as evaluation and the use of reward inhibit intrinsic motivation (and thus creativity). However, she also emphasized how modeling and factors that enhanced intrinsic motivation could enhance creativity. Other scholars also highlighted the positive potential for social and group factors in creativity (Nystrom, 1979; Stein, 1982; West 1990), and there was in general an increased interest in teamwork and its potential for enhancing productivity and innovation (see Paulus, 2000, and West, 2003 for a reviews). However, literature surveys yielded few references to group and team creativity or innovation (cf., Paulus, et al., 1999). Recently there has been a significant increase in activity in those areas, leading to a volume summarizing research on group creativity (Paulus & Nijstad, 2003). We will review the diverse perspectives on group creativity that have evolved over that time in the research on groups and teams. First we will compare the contrasting perspectives on group creativity suggested by the research traditions on groups and teams. Then we will examine the factors that influence our perceptions of groups and teams as productive or creative and note that such perceptions may often be incorrect. We will evaluate the relative utility of the group and team paradigms for an examination of the creative potential of groups. Then we will summarize the findings laboratory research on group creativity the related implications for enhancing group creativity. Finally, we will evaluate the applicability of the literature on group creativity to organizations.

Hoon-Seok Choi & Leigh Thompson, Northwestern University

Title: *Membership Change in Groups: Implications for Group Creativity*

Abstract: We begin by defining what we mean by group composition. In so doing, we discuss a particular group composition issue – membership change. Specifically, we discuss four types of membership change and their effects on group functioning. From this we derive two theoretical

views about the consequence of membership change in groups: the disruption perspective and the stimulation perspective. We ultimately argue that membership change stimulates the creative process in groups and enhances group creativity. We then provide a description of our program of research on membership change in groups and its positive impact on creativity.

Michael West, Aston University, U.K.

Title: *Creativity and Innovation Implementation in Work Groups: The Paradoxical Role of Demands* (with Claudia Sacramento and Doris Fay)

Abstract: An organization's ability to innovate – whether to develop new products, implement new technologies, or formulate new strategies – is critical to success in a changing world. In contrast to activities that support execution, activities supporting innovation involve risk, uncertainty and even failure along the way to success. Team members are often reluctant to offer novel contributions for fear of being wrong (Edmondson, 1999), or for fear of slowing team progress and creating frustration (Ford & Sullivan, forthcoming). One of the core challenges of innovation, therefore, is coping with the increased risk of failure that the creative process entails. Past research has identified an interpersonal climate characterized by psychological safety as conducive to interpersonal risk taking and hence to creativity and innovation in teams (Edmondson, 2002; West, 1990), yet we know less about factors that give rise to psychological safety.

This paper extends past work on team learning and innovation by systematically considering the antecedents of psychological safety in innovation teams. The results increase our understanding of what factors enable people to experience a sense of psychological safety at work and thereby also shed light on antecedents of organizational innovation.

Amy Edmondson, Harvard University

Title: *Explaining Psychological Safety in Innovation Teams: Organizational Culture, Team Leadership or Personality?* (with Josephine Mogelof)

Abstract: This chapter distinguishes between creativity and innovation implementation in groups and discusses the paradoxical effects of external demands during the innovation process. It suggests that creativity occurs primarily at the early stages of innovation processes with innovation implementation taking place later. Creativity, it is proposed, is hindered by, whereas

innovation implementation is aided by environmental uncertainty or high levels of demands. The influences of task characteristics, group members' knowledge and skill diversity and integrating group processes upon team innovation are also explored. Diversity of knowledge and skills is a powerful predictor of innovation, but integrating group processes and competencies are needed to ensure diversity enables rather than inhibits innovation.

Bernard A. Nijstad, University of Amsterdam

Title: Four Principles of Group Creativity (with Wolfgang Stroebe and Eric F. Rietzschel)

Abstract: It is important to consider the factors that lead to high levels of creativity when people work collaboratively in a group context, and complement the individual differences approach with an approach that considers the group context in which people work.

In our own work we have focused on idea generating groups (for overviews, see Nijstad, Diehl, & Stroebe, 2003; Stroebe & Diehl, 1994). In this chapter we attempt to go beyond these studies, and propose a framework to understand group creativity more general. The framework is a “combination of contributions” framework, in which the level of creativity of the group is determined by the way the resources of individual group members are combined. We derive four principles of group creativity from this framework. Because we will illustrate these principles with studies of group idea generation, it will be helpful to first describe the basic findings in that field of research.

Deborah Ancona, MIT

Title: *Begging, Borrowing and Building on Ideas from the Outside to Create Pulsed Innovation inside Teams* (With Henrik Bresman)

Abstract: In this chapter we summarize these three stages of research and what each brings to our new understanding of what makes teams innovative. The first stage introduces the core ideas of the importance of team-member diversity, structures to enhance brainstorming and divergent thinking (Sutton & Hargadon, 1996; Nemeth, 1994) and external boundary spanning (Ancona & Caldwell, 1992; Hansen, 1999; Katz, 1982; Tushman, 1977; 1979). The second stage of research introduces the X-team, our current model of an entrepreneurial, adaptive team (Ancona, Bresman, Kaufer, 2002). The X-team combines internal and external perspectives, and considers issues of implementation and the need to change the form of teams across stages of the task.

The third stage of research deepens our knowledge of the X-team. Here we add the concepts of vicarious learning (Bandura, 1977; Bresman, 2003) and temporal design (Ancona & Waller, 2004). A major hypothesis here, which has inspired the title of this chapter, is that innovative teams need to go beyond their boundaries to beg, borrow, and build on ideas, key routines, knowledge about networks, and stories of failure from other teams and individuals that have the experience of completing similar tasks in the past. They then have to apply these lessons in ingenious ways in order to be successful.

Furthermore, firms need to manage this begging, borrowing and building among teams by making it "rhythmic". By "rhythmic" we mean that teams need to manage the timing of their activities so as to "entrain" or move in sync with key cycles of the firm such as the fiscal year or the product development cycle. When multiple teams follow the same temporal rhythm, then the firm can take advantage of increased coordination across teams. When that temporal rhythm is also in sync with external customer and technology cycles innovation and performance can be enhanced even more.

Andrew Hargadon, University of California-Davis

Title: *Bridging Old Worlds and Building New Ones: Towards a Microsociology of Creativity*

Abstract: This chapter argues that creativity remains an elusive construct because, in action, it entails two distinct, concurrent, yet often opposing processes that embed an individual within their particular social context: *bridging* and *building*. On the one hand, creativity requires bridging multiple worlds—recognizing patterns and connections between previously unconnected ideas often across distinct contextual domains (Hargadon, 2002; Weick, 1979). On the other hand, the creative process requires building new patterns of understanding and action within those social groups that serve as arbiters of the creative output (Csikszentmihalyi, 1988). Without the initial recognition of new patterns and possibilities, creativity lacks the defining Aha! Without the subsequent changes in understanding and action across larger communities, the creative inspiration passes unnoticed. To explicate these two processes, this chapter uses the perspective and literature of microsociology, which is concerned with how an individual's social surrounds both constitute and constrain their understandings and actions.

Cameron Ford, University of Central Florida

Title: *Creative Associations and Entrepreneurial Opportunities*

Abstract: Entrepreneurial opportunities are situations in which new products or services can be introduced through the formation of new means, ends, or means-ends relationships.

Consequently, unlike optimizing or satisficing decisions, entrepreneurial decisions require creativity (Ekhardt & Shane, 2003). Unfortunately, relatively little theoretical or empirical work has examined how creativity influences the recognition, creation, or exploitation of opportunities (Shook, Priem & McGee, 2003). I use a Cambellian evolutionary view of creativity and entrepreneurship (Aldrich & Kenworthy, 1998, Campbell, 1960; Ford, 1996; Simonton, 1999; Weick, 1979) as a heuristic to describe how an individual entrepreneur's creative associations can reveal attractive potential future states that motivate search, networking, and team formation processes. I propose that a promising creative association helps an entrepreneur attract network ties and management team members, and that these relationships may result in new associations and refinements that add value to the entrepreneur's original proposal. In this manner, creativity instigates organizing and organizing instigates subsequent creativity in a spiraling (cf. Perry-Smith & Shalley, 2003), cyclical, evolutionary manner (Ford, 1996). When these processes are sustained and coalesce into a new venture capable of enacting a specific domain or market niche, an entrepreneur's initiative may become a successful self-fulfilling prophesy (Weick, 1979) that "creates" an opportunity by instigating changes in market demand or supply characteristics that would not have existed absent the entrepreneur's actions.

Research propositions are offered may serve to guide future research on this emerging area of entrepreneurship research.