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CHAPTER

9

Interdisciplinary Research and Creativity

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In most countries in which I have worked, granting agencies and university administrators have encouraged research to be interdisciplinary. Although the motives underlying this preference have never been clearly stated, I had the strong impression that it was based on the assumption that forcing researchers out of their "disciplinary ghettos" would somehow improve the quality of their research and increase the likelihood of innovative outcomes. I assume that this type of assumption also justified the foundation of interdisciplinary meeting places such as the Netherlands Institute for Advanced Studies or the Center for the Advanced Study in Behavioral Sciences. Because many of the chapters in this book will be similarly optimistic about interdisciplinary research, I would like to address the question of whether conducting research in an interdisciplinary setting is likely to stimulate the creativity of the researchers involved in such endeavors.

THE COMPONENTS OF CREATIVITY

Why should interdisciplinary research stimulate creativity? The three-component theory of creative performance developed by Amabile (1983, 1996) could offer a theoretical foundation for such a hypothesis. According to this theory, creativity is a function of *domain-relevant skills, creativity-relevant processes,* and *motivation.* Domain-relevant skills refer to the individual's expertise in his or her area. Thus, the domain-relevant skills of social psychologists would include their ability to think scientifically as well as their knowledge and technical ability in the field of social psychology.

Although a necessary condition for creativity, domain-relevant knowledge is not sufficient to ensure creative outcomes. People can produce good work if they are experts in their area, but they "will be incapable of producing work that will be considered creative if creativity-relevant skills are lacking" (Amabile, 1996, p. 83). Creativity-relevant skills refer to how people approach problems, their capacity to put existing ideas together in new combinations. They include a creative cognitive style characterized by a facility in understanding complexities and an ability to break set during problem solving. Problem solving is more likely to result in creative solutions when an old set of unsuccessful problem-solving skills is abandoned and the search, as a result, moves off in a new direction.

That the ability to abandon routine strategies of problem solving and to restructure problems in novel and unusual ways is an important characteristic of creative scientists has also been emphasized by Simonton (2002). He argued that "to attain scientific greatness ... may require the cognitive capacity to pursue unexpected, even contradictory trains of thought" (p. 140). Simonton even speculated that the decrease in productivity with increasing age observed in some scientists could be partly attributed to "the cognitive tendency for scientists to become increasingly ensnared by the ideas they themselves created. The creativity of their earlier years provides the chains for their later years" (p. 272).

Domain-relevant skills and creativity-relevant skills are the resources the individual needs to produce a creative product. But whether these resources will finally be used creatively depends on the individual's motivation, in particular on whether the individual is intrinsically motivated rather than responding to external pressures. Amabile (1996) defined as "intrinsic any motivation that arises from the individual's positive reaction to qualities of the task itself; this reaction can be experiences as interest, involvement, curiosity, satisfaction, or positive challenge" (p. 115). Extrinsic motivation comprises any motivation that arises from the sources outside the task itself, such as the expectation to be evaluated or that the task has been contracted for reward. Although Amabile (1996) still emphasized that intrinsic motivation is essential for creativity, she has abandoned her earlier hypothesis that extrinsic motivation is always damaging to the creative effort. Amabile (1996) now accepts that certain synergistic extrinsic motivators can increase intrinsic motivation. These synergistic motivators are factors that support one's sense of competence without undermining one's sense of self-determination (see also Deci, Koestner, & Ryan, 1999).

Amabile (1983, 1996) and Simonton (2002) considered creativity-relevant skills as an individual difference variable. It is conceivable, however, that environmental conditions can influence the extent to which individuals who already possess a high level of creative thinking skills will be challenged into applying them during problem solving. From an idealized image of how interdisciplinary research is conducted, one could easily imagine that the discourse among researchers from different disciplines approaching a common

problem might help them to break the mold of their old disciplinary problem-solving strategies and motivate them to develop an innovative approach to tackle the problem. After all, seeing the different way in which a researcher from another discipline addresses a scientific problem might stimulate one to develop a new perspective and abandon the routine approach suggested by one's own discipline. However, in my experience, this idealized image does not reflect the everyday practice of interdisciplinary research.

THE EVERYDAY PRACTICE OF INTERDISCIPLINARY RESEARCH

Because most of my experiences with interdisciplinary research have been in the field of health psychology, I draw my examples from this area. Health psychology is an interdisciplinary field that integrates psychological knowledge relevant to the maintenance of health, the prevention of illness, and the adjustment to illness. It developed during the last half of the last century as a result of the growing recognition that lifestyle factors and psychological stress contribute substantially to morbidity and mortality from the chronic diseases that had replaced infectious diseases as major causes of death in industrialized countries. Social psychology is a major contributor to research in health psychology. In fact, health psychology has become one of the fastest growing areas of applied social psychology.

The conduct of research in health psychology is practically always an interdisciplinary endeavor, beginning with the choice of research questions and continuing with the execution of one's research. Thus, if it were true that interdisciplinary discourse stimulated creativity, health psychology should be one of the most innovative subdisciplines in psychology. Although there is no scientifically tenable test of this hypothesis, having twice reviewed research on social psychology and health during the last two decades (e.g., Stroebe, 2000), I am not convinced that the proportion of innovative research in health psychology is greater than in any other area of psychology.

In my experience, the type of interdisciplinary interaction that characterizes research in health psychology is no more likely to stimulate creativity-relevant processes than any interaction with colleagues from one's own discipline. In my frequent collaborations with medical colleagues, I never felt the need to break my (disciplinary) set or to adopt heuristics for generating new ideas. After all, these colleagues had chosen to collaborate with a social psychologist because they expected that knowledge of social psychological theories and research methods would contribute to a successful solution to the research problem they were confronting. Every member of the interdisciplinary team contributed their domain-relevant expertise to the project, and often there was no need for further meetings or interactions once the project had been set up.

Thus, there was rarely reason to cross the border into other disciplines. On the contrary: It was to avoid crossing the border into other disciplines that one had chosen certain experts in other fields to join the research project. Obviously, this division of labor of interdisciplinary teams, with every member con-

tributing his or her own special knowledge, enables one to address problems that could not have been tackled *within* any of the disciplines involved. But it is probably also the main the reason why the normal practice of interdisciplinary research is unlikely to encourage the search for new problem-solving strategies. (Admittedly, such clear division of labor may be more typical for interdisciplinary collaborations between scientists from very different disciplines than for collaborations between neighboring areas.) A second reason is motivational. Most of my health psychological projects have been funded by outside funds and had to result in a successful dissertation and international publications. This external pressure is not helpful in nurturing the kind of intrinsic motivation that stimulates creative thought.

CAN INTERDISCIPLINARY COLLABORATION STIMULATE CREATIVITY?

I have also experienced interdisciplinary collaborations, which have been exceedingly stimulating. I have been a member of a small interdisciplinary group (Interdisziplinäre Sozialwissenschaftliche Arbeitsgemeinschaft, ISAG) formed with the aim to further the integration between different social sciences. The group consists of seven members, all from disciplines concerned with the study of human behavior: three economists, one sociologist, one philosopher, and three psychologists). The group meets twice a year and has done so for the last 30 years. There has never been any outside funding and there is no external pressure to produce. At each meeting half the members give talks and most of the discussions focus on the similarities and differences in how the different disciplines study human behavior.

Although there have been no joint products involving the whole group, there has been quite a bit of bilateral collaboration (in my case, Frey & Stroebe, 1980, 1981; Stroebe & Frey, 1980, 1982; Stroebe & Meyer, 1982). Furthermore, the group has left a deep impact on how each of us approaches his own discipline. Most often, this influence resulted in group members incorporating theoretical concepts from one of the other disciplines into their own theoretical thinking.

To give two examples, Bruno Frey, a political economist, began integrating the idea that extrinsic motivators can ruin intrinsic motivation into economic theory. Frey (1997) challenged traditional economic theory by arguing that people did not act in expectation of monetary gain alone, and that higher monetary compensation as well as regulations could make people less committed to their work. More recently, Frey and Stutzer (2002) demonstrated how economic and political institutions can affect human well-being and used ratings of life satisfaction and happiness as a measure to assess economic interventions.

In my own work, I have been greatly influenced by Olson's (1965) theory of collective action, and in particular his theoretical analysis of the reasons why the production of public goods increases the temptation to free ride (Stroebe & Frey, 1982). I used these theoretical ideas (of which I became aware at a

meeting of ISAG) to account for motivation losses in group productivity (e.g., Arnscheid, Diehl, & Stroebe, 1987; Stroebe & Frey, 1982). It was this theory, which stimulated my interest in brainstorming as a collective action characterized by substantial productivity loss (e.g., Diehl & Stroebe, 1987). In my research in health psychology, the economic perspective motivated me to pay particular attention to changes in the incentive structure (e.g., price of alcohol and cigarettes; seatbelt laws) as a viable method to reduce health-impairing behavior patterns. I cannot judge whether this interdisciplinary interaction has increased the creativity of my research. However, the exposure to research and theories from other social science disciplines and from philosophy has certainly motivated me to question some of the preconceived notions of my discipline. Furthermore, some of the theories from these neighboring disciplines turned out to be extremely useful for the analysis of social psychological problems.

CONCLUSIONS

There are too many differences between my two examples of interdisciplinary collaboration to allow clear-cut conclusions. These examples do suggest, however, that interdisciplinary collaboration is no panacea for increasing creativity. In the normal course of interdisciplinary research, where the collaboration is often forced on researchers by granting agencies or university administrators, the interaction across disciplines is unlikely to result in a cross-fertilization of ideas.

Obviously, the absence of external pressures is not the only dimension on which my two examples differ. They also differ in the goals that motivated the interdisciplinary collaboration and in the similarity or dissimilarity of the disciplines involved. Thus, interdisciplinary collaboration in health psychology is often motivated by technical reasons. Psychologists collaborate with physicians because physicians have access to patient populations and to medical technology beyond the reach of most psychology departments. Although there are psychologists who are trained in the use of medical techniques, as there are physicians trained in psychology, more often than not in such collaborations each side collects its own data to combine the two data sets later for the analyses that form the basis of joint publications. Each discipline hopes that use of the techniques of the other discipline will help it to validate its own constructs and the ultimate goal of the interdisciplinary collaboration is the production of output which allows such cross-validation. Although collaboration of the latter type can result in a synergetic advance in knowledge, it is unlikely to lead to much interdisciplinary cross-fertilization.

In contrast, the collaboration of our interdisciplinary working group ISAG is motivated by conceptual and theoretical interests. We try to find out how constructs and theories from other social sciences can be integrated with our own theoretical approaches. We are aware of the fact that we (often) study the same social behavior, but focus on different determinants and use different

theoretical approaches. Thus, we are in a question-finding rather than question-answering stage of research. The fact that our disciplines are "related but slightly dissimilar" is another likely reason why our collaboration has stimulated interdisciplinary cross-fertilization. Our curiosity (and the lack of external pressures) motivates us to be open to other approaches, and the similar nature of our disciplines makes it easy to relate to and to assimilate constructs and theories from other disciplines into our own theoretical thinking.

Thus, although the example of ISAG shows that interdisciplinary cross-fertilization is possible, it also suggests that such interdisciplinary stimulation may require unique circumstances: a group of researchers from related disciplines, motivated purely by curiosity, and who exchange ideas without the expectation of tangible rewards. The fact that such groups are likely to be rare probably accounts for the fact that interdisciplinary research is no more creative than any other type of research.

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