Scientists Making a Difference

One Hundred Eminent Behavioral and Brain Scientists Talk about Their Most Important Contributions

Edited by

Robert J. Sternberg

Cornell University

Susan T. Fiske

Princeton University

Donald J. Foss

University of Houston

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Anderson, Craig A.

Even as a child I was interested in aggression. There likely are many reasons, including having an older brother who was much larger, stronger, and smarter; being the smallest boy in my grade level; and hating to lose. I was both frustrated and angry a lot. My favorite TV shows all involved violence, including classic Westerns (e.g., *Maverick, Sugarfoot*) and World War II shows (e.g., *Combat, Rat Patrol*). By the time I was fourteen, though, I knew that being angry and breaking things was neither enjoyable nor productive. In high school I paid close attention to the ongoing Vietnam war and the growing student protest movement. The killings at Kent State University had a major impact on my thinking and my bewilderment about violence. Army Basic Training yielded another major insight; it is trivially easy to learn how to kill another person with an M16 rifle.

At a theoretical level, my most important scientific contribution has been the development of a broad-based interdisciplinary model of human aggression: the General Aggression Model (GAM). Its roots lie in contributions by many scholars going back many years, from scholars whose primary work was in the aggression and violence domain, and from scholars whose primary work was in basic social, cognitive, developmental, personality, and biological psychology. Briefly, GAM illustrates how factors from the current situation (e.g., provocation) interact with personality factors (e.g., attitudes toward and expectations about aggression) and life history (e.g., growing up in a family that hunts animals for recreation) to increase or decrease one's likelihood of behaving aggressively when faced with potential conflict. It views the development of personality as a learning process that is rooted in biological processes but also is strongly influenced by events that a person experiences and observes.

My path from graduate student to aggression scholar was convoluted, and not at all "planful." My early focus was on human inference and decision-making, a focus that required understanding how people think, what heuristics they use, and what kinds of situational variables influence

the inference process. A parallel interest was in attribution processes – that is, how people come to explain events that they experience or observe. I was dissatisfied with current models, but was learning the scientific tools that could test and create better models. I was also interested in personality theory – more specifically, in individual differences in how people explained events to themselves, and how these differences influenced emotional and behavioral variables, such as depression, loneliness, and shyness.

My graduate school and early faculty years yielded a number of contributions in domains that I perceived as highly interrelated, though many others did not see the connection. For example, my interest in basic explanation processes led me to view now-classic human inference and decision-making phenomena such as belief and theory perseverance, attribution and attributional processing, and judgmental heuristics as all being part of the same broader social–cognitive–emotion decision-making system. Thus, with input from numerous colleagues (e.g., Bernard Weiner), we created a model of the explanation process that encompassed attribution theory and current models of judgment and decision-making. It was relevant to understanding phenomena ranging from priming effects on persistence after failure (e.g., hearing some describe a task as being one that requires finding a good strategy leads to more effort and more thoughtful attempts), to interventions for depression, loneliness, and shyness, to the effects of different types of persuasive communications on attitude and behavior change.

This dual-process model describes how quick, automatic types of decisions are made with little or no conscious effort, as well as how slow, thoughtful decisions are made by means of, and are in fact based on, automatic cognitive processes. Indeed, our focus on the importance of the accessibility of causal explanations to belief perseverance and change (and to consequent behaviors) led to experiments by Morgan Slusher that showed that the then-current CDC public service announcements about how HIV is spread failed to persuade people precisely because they didn't evoke the kind of causal explanations that people could understand and incorporate into their world view. Our simple causal-scenario-based persuasive communication significantly changed beliefs about HIV transmission and behaviors toward persons with AIDS, such as willingness to work with people with AIDS.

None of my early work on how people think and make decisions (both automatic and controlled aspects) was specifically done in the context of aggression. Partly this reflected the interests of my graduate school faculty advisors, and partly it reflected aspects of my first faculty position at Rice University (e.g., very small subject pool, no PhD program in Social

Psychology). Nonetheless, my personal interest in aggression persisted, and showed up in my work on temperature effects on violent behavior. Indeed, my first professional publication was on the relation between ambient temperature and civil riots in the United States. This work led to a host of field studies and to some experimental lab studies on temperature effects. As this work progressed, it became clear that a broad theoretical framework was needed to effectively explain numerous (and occasionally paradoxical) findings. That theoretical framework was heavily guided by my prior general model of explanation processes and consequences.

My move to the University of Missouri in 1988 afforded me resources that enabled a greater focus on aggression and violence research. My students and I began conducting experimental studies on the effects of pain, frustration, and temperature (among others). We incorporated individual difference variables in many of these studies. We attempted to delineate the underlying psychological processes by which situational (e.g., pain) and individual difference (trait hostility) variables increased or decreased aggressive behavior. One particularly satisfying line of studies (the last of which was carried out at Iowa State University) involved the "weapons effect." The mere visual presence of a weapon, even a photo of a weapon, increases the likelihood of aggressive behavior, found in both lab and field experiments. Our initial studies tested the hypothesis that this phenomenon was based on priming – i.e., that seeing a weapon increases the accessibility of aggressive thoughts. In later studies, we added an important individual difference variable – hunter status – to further test what was soon to become GAM. If the weapons effect was based on gun images priming aggressive thoughts, there should be different effects for hunters (versus nonhunters) because these two types of people likely have different thoughts and memories associated with guns. Moreover, this effect should differ based on whether the gun image is a hunting or an assault gun. Our experiments confirmed these predictions, supporting not only GAM but also supporting any general social–cognitive-developmental model in which life experiences influence the development of knowledge structures, which in turn influence one's reactions to stimuli.

I was already quite familiar with Albert Bandura's and with Walter Mischel's social learning and social–cognitive theoretical and empirical work, having taken classes from both of them in graduate school and from continuing to follow their work. As I read more in the aggression domain, it dawned on me that many people (e.g., Leonard Berkowitz, Nicki Crick, Kenneth Dodge, Russell Geen, Rowell Huesmann) were fundamentally saying the same things that Bandura and Mischel and other generalists were saying about the development of thought, emotion, and behavior

patterns. Thus, GAM was essentially born in the 1990s, as I tried to create a simple model that summarized the many contributions of many leading theorists, and did so in a common language that would enable aggression scholars from different backgrounds to communicate clearly with each other.

While working on the early versions of GAM, it became clear that any aggression model claiming to be "general" had to successfully incorporate the large media violence research literature. Brad Bushman's early work fit well with this social–cognitive framework. So, my students and I did a few media studies of our own, mainly to see how well GAM fit the media violence literature. Because of my long-time interest in video games as a player (going all the way back to text-based Star Trek games on the Stanford mainframe) and as a parent, my students and I began a series of studies on violent video game effects, a series that continues to the present.

About this time (1999), I moved to Iowa State University. This move was fortuitous in several ways: I had a leading media violence expert as a faculty colleague (Bushman); the subject pool was large enough to allow the large sample sizes needed for media violence research; and there was considerable meta-analytic expertise available. Although unintended, this move led to a longstanding focus on violent video game effects. Indeed, one could argue that my most important empirical contribution has been in developing and promoting high-quality research methods in the video game domain.

Our first major article on video-game violence appeared in 2000. Our first comprehensive meta-analysis of violent video-game effects appeared in 2001 (the most recent in 2010). We found that both short-term exposure in the immediate situation and repeated exposure to violent video games led to increases in aggressive behavior, aggressive thoughts, and aggressive affect; and to decreases in empathy and helpful behavior.

Our first major theoretical GAM article appeared in 2002. The coincidental timing of this paper and our first video game meta-analysis led some scholars to confuse these events to the extent that they claimed that GAM was merely a model of media violence effects. Of course, this wasn't – and still isn't – true. Recently, GAM has guided research by many scholars in a broad range of aggression/violence domains, including intimate partner violence, cyberbullying, outgroup stereotypes and aggression, juvenile delinquency, major personality disorders, and the impact of rapid climate change on aggression and violence.

In the future, I would like to see GAM used to create and test interventions designed to improve the people's lives. For example, GAM's emphasis on the importance of learning experiences in the development

of personality, combined with its delineation of both automatic and controlled decision-making processes, suggests ways in which child-rearing practices might be modified to increase prosocial thinking and feelings. For example, decreasing children's exposure to violent events (both real and in entertainment media), increasing exposure to prosocial events and ways of thinking, and reframing their understanding of aggression all lead to more prosocial, less aggressive children and young adults. Similarly, GAM suggests ways in which already-aggressive people can learn to be less aggressive and more prosocial. Some such interventions might focus on at-risk populations, others on treating violent populations, and still others on broad-based changes in how children are raised and socialized. It also could be used to inform debates about the importance of dealing with rapid global warming, based on its predictions that this will likely increase war and other forms of violence.

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