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Leadership of highly creative people in highly creative fields: A historiometric study of scientific leaders

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ABSTRACT

In recent years there has been a marked increase in the study of the influence of leadership on creativity, and the effects of this relationship on organizational performance. While a number of explanations have been broached with regard to the positive effects of leadership on creativity, many of these studies propose different, and often contradictory, methods for leaders to achieve these positive effects on creativity within their organizations and work groups. Additionally, little work has been done examining the effects of leadership on highly creative people in fields requiring creativity. The purpose of this study is to examine two existing leadership theories with regard to their viability as models to explain creative performance of eminent scientists. Eminent scientists represent a population of leaders of highly creative individuals in a field that values the production of innovative ideas and products as a marker of performance. Ninety-three excerpts from the biographies of scientists were content coded for leader behaviors and performance criteria. The results of this analysis indicate that a model based on strategic planning and product championing may serve to explain the positive effects of leadership on creativity in a highly creative population.

Introduction

> *Teller approached Oppenheimer for help. Relating the essence of his conversation with Bradbury, he suggested that the former laboratory director use his prestige and influence on his successor. "This has been your laboratory, and its future depends on you," he told Oppenheimer. "I will stay if you tell me that you will use your influence to help me accomplish either of my goals – that is, will you help enlist support for work toward a hydrogen bomb or further development of the atom bomb?" Teller bristled with anger as he recalled Oppenheimer's terse reply: "I neither can nor will do so." – Blumberg*

In the excerpt above a key exchange between Robert Oppenheimer and Edward Teller is related, in which Oppenheimer, as project leader, refuses Teller support for two particular lines of research and thus jeopardizes his working relationship with Teller. Oppenheimer provides a prime example of a leader of a creative effort. Robert Oppenheimer was a noted physicist and the leader of the Los Alamos laboratory, and more specifically was the leader of the Manhattan Project, one of the most historically important creative endeavors in human history. This was clearly creative work, with a novel and ill-defined problem of producing an atomic weapon. The theory behind the weapon was well understood, however the mechanisms through which such a device could be implemented were unknown. Additionally, Oppenheimer's lab is an example of highly creative individuals being asked to work together toward a common goal. The scientists Oppenheimer worked with were among the most well-known and

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well-respected scientists in their respective fields, including Hans Bethe, Felix Bloch, and Edward Teller. Oppenheimer was tasked with directing each of these creative individuals toward the production of a creative product. While only a single example of Oppenheimer's work, the Manhattan Project is illustrative of the general types of tasks scientists engage in, which tend to involve solving complex and ill-defined problems through the production of a model, product, tool, or procedure. In other words, scientists often engage in creative work.

Creativity, the generation of new and innovative ideas, and the translation of these ideas into action (Mumford & Gustafson, 1988), has long been recognized as one of the most fundamentally important ways to identify successful products at the highest levels of science, art, and marketing (Mumford, Scott, Gaddis, & Strange, 2002). Those individuals recognized as having the greatest impact on their field and the world at large are also often recognized as being the most creative in their field (Mumford, Schultz, & Osburn, 2002; Mumford, Scott, et al., 2002). While a number of studies have been conducted in recent years examining creative people, and the factors that make them creative, one area that has been largely neglected is the study of leadership with respect to creativity (Hunter, Thoroughgood, Myer, & Ligon, 2011). Traditionally creativity and creative products have been viewed as the outcome of a lone effort, often thought of as an exceptional effort on the part of the individual and usually conducted in isolation (Jung, 2001). However, a consistent pattern of findings has emerged in which effective leadership is generally found to greatly enhance creativity and creative output (Stenmark, Shipman, & Mumford, 2011). This pattern of findings and increased discussion in the extant literature with regard to the links between leadership and creativity have led to a substantial increase in the number of studies examining leadership and creativity, with many of these studies explaining the effects of leadership on creativity as stemming from unique factors such as motivation and climate (e.g., Heinze, Shapira, Rogers, & Senker, 2009; Hunter, Bedell-Avers, & Mumford, 2007; Tierney & Farmer, 2011).

Although there has been an increase in studies of leadership and creativity in recent years, the samples used have generally been focused on creativity within industry environments and people exhibiting creativity in tasks or jobs that may not fundamentally rely upon creativity. Little work has been done up to this point examining the effects of leadership on creative efforts conducted by those that require creative output as a fundamental aspect of their work; scientists, artists, and marketing people for example. Additionally there is a large body of evidence indicating that highly creative people are relatively unique and operate in fundamentally different ways than the average person when engaging in a creative task (Reisman, 2011). These highly creative people have largely been left out of the existing studies of leadership and creativity, leading to studies focused more on the average person and their expression of creativity. So what happens when leadership influence is applied to highly creative people, what occurs when a highly creative person is the leader in question, and what is the relationship between leadership and creativity for individuals whose entire field is structured around creative output? These are the questions we sought to address in this study. The purpose of this study was to examine the effects of different types of leadership, viewed through the lens of existing models of leadership, on performance in a sample of highly creative individuals. We will first discuss the work done thus far on fields requiring creativity, leadership and its influence on creativity, and the population of highly creative individuals chosen for study here, eminent scientists. We then move on to describe the historiometric method applied here and the results of the analyses stemming from our examination of the scientists' leadership. Finally, we conclude with a discussion of the implications of the study, limitations, and future work that needs to be done in furthering our understanding of leading creative people.

Fields requiring creativity

Organizations, until recent years, have generally had a bias against creativity and innovation, viewing creativity as costly and disruptive to normal operations (Beghetto & Kaufman, 2013). While creativity is indeed disruptive in certain types of work, many organizations are now recognizing the importance of creativity to long-term organizational performance and stability (Wilkins & Holtham, 2012). Many organizations now conduct regular training sessions to improve the creativity of employees and attempt to identify creative individuals as a part of hiring procedures (Florida, 2010). This focus on the importance of creativity to organizations has largely been supported by research showing the effects of creativity on organizational performance (Garcia-Morales, Jimenez-Barrionuevo, & Gutierrez-Gutierrez, 2012; Suh, Bae, Zhao, Kim, & Arnold, 2010). These findings and the general recognition of the importance of creativity by organizations have led to a rapid shift in organizations to put creative talent at a premium and to focus on the development of creative potential (Heinze et al., 2009).

Along with an increase in the perceived value of creativity to organizations, there has also been an increase in the study of creativity within academia, with a focus on understanding the factors that make an individual creative. We have seen creativity studied in a number of ways, with studies focusing on climate (Isaksen & Akkermans, 2011), strategy (Nusbaum & Silvia, 2011), group interactions (Sung & Choi, 2012), structure (Sosa, 2011), and individual differences (Batey, Furnham, & Safiullina, 2010). While creativity has certainly been studied broadly, as with industry there has been limited regard for the context that creativity is taking place within. The majority of studies of creativity have not distinguished between activities or fields where creativity is fundamental to success (e.g., science, art, marketing) and fields where it may have added value in some situations but is not emphasized (e.g., computer science, the military, management) (Mumford, Schultz, et al., 2002; Mumford, Scott, et al., 2002). Those studies that have been conducted, while very informative, have largely occurred outside of the field of psychology and have focused more on the organizational and social context than the underlying processes driving creativity (e.g., Becker, Bergener, Schwehm, & Voigt, 2011; Shalley, Gilson, & Blum, 2009). Studies are needed to examine the psychology behind creativity in the fields where creativity is fundamental to ensure that findings exhibited in other fields generalize, and if not to point out where differences occur.