

University of Richmond

From the SelectedWorks of Scott T. Allison

2017

Heroism Science: Frameworks for an Emerging Field

Olivia Efthimiou
Scott T. Allison



SELECTEDWORKS™

Available at: https://works.bepress.com/scott_allison/45/

Heroism Science: Frameworks for an Emerging Field

**Olivia Efthimiou¹ and
Scott T. Allison²**

Abstract

This article outlines the conceptual framework for a new science focused on heroism using multiple perspectives to generate a science that is explicitly in service to humanity. The role of heroism as a case study for deviant interdisciplinarity, heroism science as storytelling and story revising, and its impacts for research and communities are considered. The primary concern of the deviant agenda of heroism science is the unity of knowledge and the testability of narrative-driven scientific inquiry. In this agenda, science as “episteme” and heroism are unified in their core epistemic function. Heroism science is posited as a prime candidate for promoting science as enabler for improving the world, based on Hefner’s concept of embodied science, and a nonlinear, open, and participatory model of science. Contemporary heroism research trends across the disciplines are mapped in a preliminary taxonomy of peak, emerging, and low subfields of research activity. Heroism science is defined as a nascent multiple disciplinary field which seeks to reconceptualize heroism and its correlates through a close examination of the origins, types, and processes of these interrelated phenomena.

Keywords

interdisciplinarity, embodied science, story, inquiry, two cultures, hero’s journey

Introduction

¹Murdoch University, Perth, Western Australia, Australia

²University of Richmond, Richmond, VA, USA

Corresponding Author:

Olivia Efthimiou, School of Arts, Murdoch University, South Street Campus, Perth, Western Australia 6150, Australia.

Email: oliviaefi@gmail.com

Increased recognition of the crucial role of interdisciplinarity to education and research together with the flurry of research on heroism over the past decade, have resulted in a critical interdisciplinary moment—the birth of heroism science. The purpose of this article is to (a) contextualize the nascent field of heroism science in broader shifts within and outside psychology, and the philosophy of science; (b) consider the role of heroism science as a case study for interdisciplinary research, and a means of developing innovative frameworks for addressing real-world problems; (c) introduce a preliminary taxonomy of emerging research trends in the study of heroism; and (d) offer a working definition of heroism science and its modes of inquiry.

Heroism Science as Deviant Interdisciplinarity

Campbell's (1949) comparative work on hero mythologies marked the first critical interdisciplinary moment in the study of heroism, followed closely by its first major uptake outside the humanities by psychology. In this period, the study of heroism was largely applied to the humanistic psychological fields, such as analytical and transpersonal psychology, alongside popular culture and modern humanities fields more broadly. Chemero (2013, p. 145) observes that “there have been two ways to do psychology” since its inception; a scientific focused culture on the one hand, and a humanistic one on the other. This period also marked the beginning of the use of the hero's journey (Campbell, 1949) as a tool for promoting holistic well-being in everyday settings, counselling, and pedagogy, complementing the rise of innovative fields such as narrative therapy.

After World War II, the humanistic approach to understanding human nature grew out of a dissatisfaction with psychoanalytic and behavioral orientations that portrayed humans as either self-destructive entities or as slaves to environmental forces beyond their control. Maslow (1948) and Rogers (1951), in particular, championed the idea that people are driven to fulfil their greatest potentialities and that these self-actualizations include the heroic ideal of devotion to service to the world. Frankl (1959) emphasized the importance of imbuing the world as a mechanism for enhancing psychological well-being. By the 1990s, positive psychologists were carrying the mantle of scientifically studying and promoting the most life-affirming aspects of humanity (Peterson & Seligman, 2004). The dedicated and consolidated study of heroism within psychology, however, was still curiously neglected.

Franco and Zimbardo's (2006) “The Banality of Heroism” catapulted the study of heroism into the realm of scientific inquiry for the first time in academic history and cemented its observation in everyday contexts. The article signified the entrance of heroism in mainstream and scientific psychology (e.g., cognitive, developmental, clinical, personality), the social sciences and, finally, the sciences. We are now witnessing attempts to deconstruct and illuminate the complexities of the phenomenon via the use of psychological testing and measurement methods and its rigorous scientific observation. These are resulting in the development of various interconnected

but distinct notions of heroism, such as heroic leadership (Allison & Goethals, 2014), everyday heroism (Keczer, File, Orosz, & Zimbardo, 2016), collaborative heroism (Klisanin, 2015, 2017), and embodied heroism (Efthimiou, 2017; Gray, 2010). Recently, this radical shift has gone a step further leaping into the realm of hard science—the scientific initiative The Resilience Project is searching for “genetic heroes,” mapping the genetic structure of individuals who display unusual resilience to debilitating diseases (Friend & Schadt, 2014; Giller, 2014).

The history of the study of heroism reflects the journey across the cultures of knowledge—from the humanities, to the middle culture of psychology, and finally its infancy into the sciences. Campbell (1990, p. 242) anticipated the central role of hero mythology in bridging all the disciplines, noting that “it is the only thing that could unite science and humanity [as it] did in ancient times.” We may thus conceptualize heroism as a naturally occurring interdisciplinary phenomenon, leading into a discussion of heroism as a case study for the value of interdisciplinary research agendas.

The emergence of the field of heroism science, and the vast scope of disciplines that have historically been involved in the enterprise of heroic knowledge, instantly lends the function of heroism and its inherent interdisciplinarity to a questioning of the foundations of intellectual inquiry. Fuller (2012, p. 50) unpacks the notion of a distinct type of interdisciplinary engagement, “deviant interdisciplinarity”:

“Deviant interdisciplinarity” refers to a set of interdisciplinary projects that aim to recover *a lost sense of intellectual unity* [italics added], typically by advancing a heterodox sense of intellectual history that questions the soundness of our normal understanding of how the disciplines have come to be as they are.

Understanding the history of the tensions between the “two cultures” of the sciences and humanities (Snow, 1959), and critiques and resistance toward interdisciplinarity, is set to be instrumental to the research enterprise of heroism science. The ultimate contribution of heroism science as a paradigm of deviant interdisciplinarity is the recovery of the lost sense of unity between myth, story, and science, by challenging the soundness of the assumptions of our intellectual history and disciplinary barriers.

Heroism Science as Storytelling and Story Revising

The deviant interdisciplinary nature of heroism extends to the objectives and practice of “science.” More important, we must consider why a *science* of heroism? Interdisciplinary milestones have been instrumental in advancing the view that “elevating science above other forms of knowledge is untenable on a foundational level” (Cohen, 2001, p. 10). Krohn (2012) argues that integrating humanistic and scientific concerns in a novel form of inquiry is imperative to interdisciplinary research.

This critical reevaluation of the accepted understanding of scientific law bears direct relevance to heroism science—the incorporation of the term *science* may well be contested by disciplines within the field understood to be “nonscientific.” However, this question must provide impetus for a larger underlying issue—the problem does not lie with science per se, but our *preconceptions* of the term. The Merriam-Webster dictionary defines science as “the state of knowing; knowledge as distinguished from ignorance or misunderstanding.” The Ancient (and Modern) Greek translation “episteme” also signifies the pursuit of knowledge, and in its essence *to know*, or the pursuit of rigorous intellectual and experiential inquiry.

Under an interdisciplinary agenda for heroism, the unity of knowledge becomes a central preoccupation. The meaning and function of “science” in “heroism science” is therefore understood as inclusive and all-encompassing of *all* forms and vestiges of knowledge. By the same token, it is envisioned to be a flexible term—it is understandable that a heroism researcher in philosophy, for example, may not wish to or feel comfortable with identifying as a “heroism science researcher.” But if we are to undertake the use of the term *science* in its original meaning, that is, of the pursuit of knowledge, then all heroism researchers are in effect pursuers of heroic knowledge, and in essence, heroism scientists.

Grobstein (2005) proposes story as an avenue for resolving the division between scientific and humanistic inquiry. He highlights the importance of recognizing how many different stories of science exist, as well as their sometimes unfavorable reception. This is exemplified in Grobstein’s (2005) model of “*science as story telling and story revising*.” There is a crucial link between science and heroism in story—the unique roots of heroism in mythology and narrative, and the hero’s journey function as a universal vehicle for storytelling, find an immediate connection with the epistemic roots of science. A core function of hero stories is the *epistemic*; this “refers to the knowledge and wisdom that hero stories impart to us” by revealing “deep truths” and “paradox” (Allison & Goethals, 2014, pp. 170, 171). Kelly (2006, p. 8) states that “[t]he tools for managing paradox are still undeveloped” as he speculates on the future of scientific inquiry—the innate properties of paradox and ambiguity in hero stories, strongly suggest that a science of heroism is in a prime position to serve as a science of paradox, healing the split between the two cultures. It is the return of episteme in her fullest sense.

Grobstein (2005) argues for revisiting the place of science in human culture, with narrative and well-being taking center stage in this emerging epistemology. This story-based scientific method is an open model for the observation and testability of phenomena. It is a flexible process of nonlinear scientific inquiry which encompasses a starting point with a “summary of observations,” the venturing out and collection of “new observations,” and a “return” or resummation based on the new experiences amassed (Grobstein, 2005, p. 6); this aligns well with the Campbell (1949) hero’s journey circular model. This new scientific sensibility is conscious of itself as a dynamic open-ended process and a “deeply social activity” (Grobstein, 2005, p. 10)—one that

employs humility, accountability, and a sense of being embedded in the overarching story of human beings in universal creation and evolution.

A story-driven approach to a science of heroism carries a fundamental preoccupation and engagement with the process of knowledge-making and knowledge acquisition—the epistemic function of story is at the heart of science, as story facilitates learning no matter what its form. Scientific inquiry and hero stories are inexorably joined in their inherent epistemic function, property, and agenda. Both science and the hero’s journey are at their very core broad “form[s] of exploration” (Grobstein, 2005, p. 12). A science of heroism must engage with a critical reassessment of science itself and generate a new mode of knowledge that integrates the humanistic and scientific ideals.

An Embodied Science of Heroism: Heroism as Enabler for Improving the World

What does a science of heroism look like and what are its aims? Heroism science is a prime candidate for promoting “science as enabler for improving the world (SEIW)”; Hefner (2010) maps the contours of a science based on Frances Bacon’s (as cited in Ravetz, 1971, p. 436) concept of a “philanthropic science” in the pursuit of the improvement of the human condition, in contrast to a disembodied, impersonal idea of science, that stands removed from human affairs and other fields of knowledge. In the context of an “embodied science” (Hefner, 2010) of heroism, we may thus speak of *heroism science as enabler for improving the world*—this is a concrete framework for science as storytelling, revising, and ultimately, sharing. The emerging field’s agenda may be outlined across science as enabler for improving the world’s five-part framework:

1. *Building a heroic world.* Heroism science is an inquiry into creative and expansive possibilities for individuals, communities, and the ecosphere. The notion of “constructing” heroes in everyday communities is the foundation of projects such as The Hero Construction Company (Langdon, 2013)—this is the idea of building heroes and heroic communities that care for others, our society, and the ecosphere, in action.
2. *A heroic technoscience.* The emergence of the field can be viewed as a means of arriving at a more evolved symbiotic relationship with “technoscience” (Haraway, 1997). The ultimate function of heroism science as a “critical science” (Hefner, 2010) becomes the advancement of the human species partnered with the mindful and ethical use of technologies. Initiatives such as the Cyberhero League demonstrate how “collaborative heroism” can shape a more ethical and responsible world, and embrace the conscientious use of technologies such as new media for the benefit of humanity (Klisanin, 2015).

3. *Diversity in heroic action and ethics.* Heroism science is grounded in the centrality of “human action and ethics” (Hefner, 2010, p. 251). This agenda must be met with an attitude of tolerance, in recognition of the ambiguity of both heroic and human action, and by implication its ethical nature, in the changing face of 21st-century human societies and new contexts of engagement with the world and each other. Balsamo and Mitcham (2012) highlight the importance of ethical considerations in interdisciplinary research, in particular. As the field moves further into the sciences, interdisciplinary collaborations flourish, and technologies are increasingly used to observe, measure and promote heroism, the necessity for ethical considerations and even policies (as in the case of genomic testing) to be put in place becomes more vital. The ultimate goal of an embodied science of heroism from an ethical perspective must be the promotion of a planetary consciousness, as advocated by Klisanin (2003), always based on a systematic, critical reflection of its intents and impacts.
4. *The transformative possibilities of the embodied heroic consciousness.* Heroism science reveals the transformative possibilities of the “embodied heroic consciousness” (Efthimiou, 2017, p. 148). Campbell (1988) defined a hero as “someone who has given his or her life to something bigger than oneself”—this transformative property reflects the necessary concordance of heroism science with the “big questions” of the meaning of being human and the origins of the universe. The notion of possibility is tied to spirituality (Hefner, 2010); this aligns with the core epistemic function of hero stories in their “transrational” qualities (Allison & Goethals, 2014; Rohr, 2011), as well as the source of hero myths in creation myths and the world’s religious and spiritual traditions. Much of the integrative psychological literature on the hero’s journey spurred forth from Campbell’s (1949) model addresses this dimension and its interrelationship with other facets of human experience. This transformative property of embodied heroism science permits the integration of “nonscientific” disciplines such as philosophy and religion, making their contribution in the context of an integrative framework for heroism imperative, and placing heroism science in a prime position for “recentering religion-and-science” (Hefner, 2010).
5. *Recovering the mythopoeic heroic imagination.* Heroism science is inextricably linked with the recovery of myth—the centrality of myth at the heart of the origins of heroism necessitates revisiting its importance in 21st-century societies, and its interrelationship with science. Heroism science holds the possibility of realizing Paul Ricoeur’s (as cited in Hefner, 2010, p. 262) concept of “retrieving the power of myth” to achieve “a critical and reflective second naiveté.” The retrieval and centralization of the “heroic imagination” (Franco & Zimbardo, 2006, p. 31) in the everyday stands to be integral to this vision. This final clause of heroism science as embodied science

realizes its function as deviant interdisciplinarity, fulfilling its agenda of “advancing a heterodox sense of intellectual history” (Fuller, 2012, p. 50), and providing evidence for myth and science as two distinct yet connected forms of inquiry.

Heroism as a Case Study for Interdisciplinarity

Any venture in heroism science must consider its impacts in a real-world and community context. The need to tackle real-world problems has been a propellant that has resulted in the congregation and fusion of various forms of disciplinary knowledge under the common platform of heroism.

Krohn (2012, p. 32) states that “[w]hatever drives people into highly complex interdisciplinary projects . . . the need for manageable objects and presentable results in their reference community drives them out again.” This is indeed the case with the advent of the empirical observation and scientific era of heroism. The need for tangible results and data is driving the use of various psychological and broader scientific testing methods of heroism—such as prototype analysis (Kinsella, Ritchie, & Igou, 2015b), identification of lay concepts of heroic behavior (Allison & Goethals, 2013; Franco, Blau, & Zimbardo, 2011; Goethals & Allison, 2012; Kinsella, Ritchie, & Igou, 2015a), and genome sequencing of resilient biochemistries of “genetic heroes” (Friend & Schadt, 2014)—for the first time in the history of its study, confining researchers momentarily back into disciplinary silos.

But the implication of certain other factors drives such research a step further:

If . . . public and political concerns are strong enough to exert a more permanent pressure, the difficult process of discovering and shaping the components of a complex problem can continue and generate a complex field of interactive interdisciplinary research. The problem, thereby, turns into a case. (Krohn, 2012, p. 32)

Pressing issues such as school bullying, gang violence, workplace discrimination, bystanderism, and debilitating diseases, and the political concerns that accompany these at the policy level, have seen the cry for their resolution morph into the promise of heroism as a powerful tool for fostering community resilience and awareness. Over the past decade, a strong sense of “curiosity” and “social responsibility” toward these real-world cases (Krohn, 2012, p. 32) has fuelled growing collaborations between psychologists, other scholars, and heroism promoters and educators. The complex problem of heroism has generated the complex interdisciplinary field of heroism science, thereby becoming a *case*.

Table 1 provides a preliminary taxonomy of peak, emerging, and underexplored disciplinary avenues of research in heroism science. As interdisciplinarity marks “new modes of knowledge production” (Weingart, 2012, p. 11), so do these broad disciplinary groupings demonstrate the

interdisciplinary case of heroism as generator of novel spaces of knowledge production—burgeoning, materializing, or latent. This table is by no means exhaustive; it serves as a starting point for mapping research trends of the breadth of work presently being undertaken on heroism and its correlates across the cultures of knowledge and identifying gaps.

The taxonomy indicates that work across the sciences is the most underdeveloped; nonetheless, the important progress made in these areas in only a short span of time and its impact must be noted, with ripples felt by other researchers taking up the mantle of the bold and intricate study of this phenomenon. Peak areas of activity are located in the humanities, social sciences, and psychology, with psychological research clearly having picked up momentum over the past decade; however, there is still scope for improvement with a number of key areas remaining underexplored. A more rigorous survey of the bodies of literature in both contemporary and other periods of research could result in the generation of multiple subfields within heroism science. As researchers from various disciplines turn their attention to a greater number of real-world cases and discover the utility of heroism as an interdisciplinary tool, the gravitas of heroism science as a case for interdisciplinarity is likely to be amplified. The property of heroism as a

Table 1. Contemporary Heroism Science Research Across the Three Knowledge Cultures.

	Peak activity	Emerging activity	Low or nil activity
Humanities and social sciences	Popular culture, cultural studies, philosophy, mythology, creative arts, literature, film	Education, pedagogy, digital humanities, new media, human rights, political science, embodiment theories, history, consciousness studies, transformative studies, religion, international security and counterterrorism	Indigenous studies, sustainability, heritage, environment, integral studies, law, sociology, cross-cultural studies, international relations, East/West comparative studies, Asian studies, communication studies, semiotics
Psychology	Social psychology, positive psychology, humanistic psychology, leadership psychology, transpersonal psychology, analytical psychology, personality psychology, community psychology, narrative therapy	Developmental psychology, clinical psychology, evolutionary psychology, organizational psychology, embodied cognition, abnormal psychology, experimental psychology	Ecological psychology, critical psychology, cross-cultural psychology, health psychology, political psychology
Sciences	Nil	Biological sciences, neuroscience, embodied cognition, global health genomics	Epigenetics, archaeology, anthropology, astronomy, mathematics, physics, information technology, cybernetics, artificial intelligence, radical embodied cognitive science, chemistry, chaos theory, systems theory

Note. It is acknowledged that some of the above fields (e.g., integral studies, embodied cognition, transformative studies, radical embodied cognitive science) are inherently interdisciplinary and do not neatly fit into a single culture of knowledge, but are grouped for the purposes of this table.

naturally occurring interdisciplinary phenomenon indicates that heroism science research stands to be relevant to any real-world problem, be it enduring or emerging.

As the field is still in its nascent phase the degree of interactivity between these emerging heroic epistemologies is largely underdeveloped. The enduring barriers that exist between the knowledge cultures means interaction *within*, rather than *between*, disciplines is much more commonplace. However, these various branches and attempts at resolving seemingly isolated cases are all intrinsically unified under the common driver of advancing a heroic or improved mode of the human condition. As Krohn (2012, p. 33) states, “[a]ny research field or research project that addresses real-world problems is considered to be essentially interdisciplinary.” Heroism, by its very nature, is rooted in a preoccupation with the human condition and its possibilities. In essence, any researcher working to untangle the concept of heroism or its correlates under the rubric of a particular discipline, can automatically said to be operating under the interdisciplinary umbrella of heroism science—under this framework, the disciplines of psychology, genomics, philosophy, and so forth, are “interdisciplines, or disciplines with interdisciplinary features” (Krohn, 2012, p. 33) in their acceptance of the case of heroism in all its complexity.

Preliminary Working Definition

A preliminary working definition of heroism science must address the interdisciplinary and real-world function of heroism research. Choi and Pak (2006) and Klein (2012) distinguish three forms of interdisciplinarity: “multidisciplinary,” “transdisciplinary,” and “interdisciplinary” research. Choi and Pak (2006, p. 351) conclude that “[t]he more general term ‘multiple disciplinary’ is suggested for when the nature of involvement of multiple disciplines is unknown or unspecified.”¹ These three branches may be addressed in relation to the degree of radicalism and innovation in transcending boundaries between disciplines—from lowest to highest would be multidisciplinary, interdisciplinarity, and finally transdisciplinarity. Individual enterprises within the field of heroism science may comprise either of the three, and the use of the more general term multiple disciplinary leaves the aim and scope of research activity inclusive of any and all methods aimed at shedding light on heroism, broadly defined.

In light of the above, heroism science can be defined as a nascent multiple disciplinary field which seeks to reconceptualize heroism and its correlates (the hero’s journey, heroic leadership, heroic imagination, everyday heroism, resilience, courage, altruism, etc.) through a close examination of the origins, types, and processes of these interrelated phenomena. With the use of a mix of

traditional and cutting-edge epistemological and methodological frameworks, and their application in a wide variety of settings (e.g., pedagogy, crisis management, health care, counselling, workforce, community development, popular media, online activism, human rights, digital humanities), heroism science is part of a broader movement which aims to foster holistic well-being, promote heroic awareness and action, civic responsibility and engagement, and build resilient individuals and communities in the face of increasingly complex social landscapes.

Heroism science seeks to understand heroes, heroism, and heroic behavior. Heroism science distinguishes between the *subject* of inquiry and the *process* of inquiry:

Subject of Inquiry. Heroism science seeks to understand:

- The origins (formation, causes, and antecedents) of heroism.
- The nature of heroism.
- The different types, categories and expressions of heroism, and their impact on individuals and society.
- The functions and consequences of heroism.
- The variety of processes associated with heroism, including biological, social, cultural, psychological, and spiritual.
- Heroism as a dynamic phenomenon.

Process of Inquiry. Heroism science draws on all methods of inquiry in the sciences, social sciences, psychology, and the humanities. Illuminating the full range of phenomena associated with heroism science requires *multidisciplinarity*, *interdisciplinarity*, and *transdisciplinarity*, as defined by Choi and Pak (2006, p. 351). Specifically, heroism scientists may employ:

- A multidisciplinary approach, which “draws on knowledge from different disciplines but stays within their boundaries.”
- An interdisciplinary approach, which “analyses, synthesizes, and harmonizes links between disciplines into a coordinated and coherent whole.”
- A transdisciplinary approach, which “integrates the natural, social and health sciences in a humanities context, and transcends their traditional boundaries.”

Epilogue

The advent of heroism science is a product of broader research shifts toward greater interdisciplinarity, marking a potentially critical moment in the history

of science. Heroism science becomes a baseline for building a heroic world and an inquiry into creative and expansive possibilities for individuals, communities, and the ecosphere. This inquiry should be accompanied by an active reframing of research practices and the foundations on which our intellectual training rests. We acknowledge that not all researchers will be willing to transgress disciplinary boundaries as radically as transdisciplinarity allows, for example, with the degree of transgression varying according to the needs of projects engaging with heroism, researchers' disciplinary training and attitudes to interdisciplinarity, and institutional or funding constraints. Nonetheless, all three forms of interdisciplinarity have their place in research and will suit individuals and teams to varying degrees across institutions, even within single projects as they evolve. The use of the term *science* will also likely be problematic to some extent. A gradual shift in preconceptions over time, and the practice of heroism as a critical, philanthropic, and inclusive science stands to reshape research and community opinions. If we can develop a science that honors the legacies of individual disciplinary heritages in the humanities, social sciences, psychology and sciences, yet draws on their combined epistemological and methodological strengths to generate new areas of strength, heroism science is well poised to transform individuals and communities alike, and surface the heroic—or the best of human nature.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

This research has been supported through an Australian Government Research Training Program Scholarship.

Note

The term *interdisciplinary* in this article is understood as being synonymous with Choi and Pak's (2006) open term "multiple disciplinary" as all-encompassing of the three types of research, or Klein's (2012) threefold taxonomy of interdisciplinarity (interdisciplinarity, multidisciplinary, and transdisciplinarity) in "The Oxford Handbook of Interdisciplinarity."

References

- Allison, S. T., & Goethals, G. R. (2013). *Heroic leadership: An influence taxonomy of 100 exceptional individuals*. New York, NY: Routledge.
- Allison, S. T., & Goethals, G. R. (2014). "Now he belongs to the ages": The heroic leadership dynamic and deep narratives of greatness. In G. R. Goethals, S. T. Allison, R. M. Kramer, & D. M. Messick (Eds.), *Conceptions of leadership*:

- Enduring ideas and emerging insights* (pp. 167-183). New York, NY: Palgrave Macmillan.
- Allison, S. T., & Goethals, G. R. (2017). The hero's transformation. In S. T. Allison, G. R. Goethals, & R. M. Kramer (Eds.), *Handbook of heroism and heroic leadership*. New York: Routledge.
- Allison, S. T., Goethals, G. R., & Kramer, R. M. (2017). Setting the scene: The rise and coalescence of heroism science. In S. T. Allison, G. R. Goethals, & R. M. Kramer (Eds.), *Handbook of heroism and heroic leadership*. New York: Routledge.
- Allison, S. T., Goethals, G. R., & Kramer, R. M. (Eds.) (2017). *Handbook of heroism and heroic leadership*. New York: Routledge.
- Balsamo, A., & Mitcham, C. (2012). Interdisciplinarity in ethics and the ethics of interdisciplinarity. In R. Frodeman, J. T. Klein, & C. Mitcham (Eds.), *The Oxford handbook of interdisciplinarity* (pp. 259-272). Oxford, NY: Oxford University Press.
- Campbell, J. (1949). *The hero with a thousand faces*. Princeton, NJ: Princeton University Press.
- Campbell, J. (1988). *The power of myth: Joseph Campbell with Bill Moyers*. New York, NY: Apostrophe S.
- Campbell, J. (1990). *The hero's journey: Joseph Campbell on his life and work*. Novato, CA: New World Library.
- Chemero, A. (2013). Radical embodied cognitive science. *Review of General Psychology, 17*, 145-150. doi:10.1037/a0032923
- Choi, B. C., & Pak, A. W. (2006). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. Definitions, objectives, and evidence of effectiveness. *Clinical & Investigative Medicine, 29*, 351-364.
- Cohen, B. R. (2001). Science and humanities: Across two cultures and into science studies. *Endeavour, 25*, 8-12.
- Davis, J. L., Burnette, J. L., Allison, S. T., & Stone, H. (2011). Against the odds: Academic underdogs benefit from incremental theories. *Social Psychology of Education, 14*, 331-346. doi: 10.1007/s11218-010-9147-6
- Efthimiou, O. (2017). The hero organism: Advancing the embodiment of heroism thesis in the 21st century. In S. T. Allison, G. R. Goethals, & R. M. Kramer (Eds.), *Handbook of heroism and heroic leadership* (pp. 139-162). New York, NY: Routledge.
- Franco, Z. E., Blau, K., & Zimbardo, P. G. (2011). Heroism: A conceptual analysis and differentiation between heroic action and altruism. *Review of General Psychology, 15*, 99-113. doi:10.1037/a0022672
- Franco, Z. E., & Zimbardo, P. G. (2006). The banality of heroism. *Greater Good, 3*(2), 30-35.
- Frankl, V. (1959). *Man's search for meaning*. New York, NY: Simon & Schuster.
- Friend, S. H., & Schadt, E. E. (2014). Clues from the resilient. *Science, 244*, 970-972. doi:10.1126/science.1255648
- Fuller, S. (2012, May 30). Deviant interdisciplinarity. In R. Frodeman, J. T. Klein, & C. Mitcham (Eds.), *The Oxford handbook of interdisciplinarity* (pp. 50-64). Oxford, England: Oxford University Press.

- Giller, G. (2014, May 30). "Genetic heroes" may be key to treating debilitating diseases. *Scientific American*. Retrieved from <http://www.scientificamerican.com/article/genetic-heroes-may-be-key-to-treating-debilitating-diseases/>
- Goethals, G. R., & Allison, S. T. (2012). Making heroes: The construction of courage, competence, and virtue. In J. M. Olson & M. P. Zanna (Eds.), *Advances in experimental social psychology* (Vol. 46, pp. 183-235). San Diego, CA: Elsevier.
- Gray, K. (2010). Moral transformation good and evil turn the weak into the mighty. *Social Psychological and Personality Science*, *1*, 253-258.
- Grobstein, P. (2005). Revisiting science in culture: Science as story telling and story revising. *Journal of Research Practice*, *1*(1), M1. Retrieved from <http://jrp.icaap.org/index.php/jrp/article/view/9/18>
- Haraway, D. (1997). *Modest_Witness@Second Millenium. FemaleMan_Meets_OncoMouse: Feminism and Technoscience*. New York, NY: Routledge.
- Hefner, P. (2010). Embodied science: Recentering religion-and-science. *Zygon*, *45*, 251-263.
- Keezer, Z., File, B., Orosz, G., & Zimbardo, P. G. (2016). Social representations of hero and everyday hero: A network study from representative samples. *PLoS ONE*, *11*(8), 1-17. doi:10.1371/journal.pone.0159354
- Kelly, K. (2006, April 6). Speculations on the future of science. *Edge: The Third Culture*. Retrieved from https://www.edge.org/conversation/kevin_kelly-speculations-on-the-future-of-science
- Kinsella, E. L., Ritchie, T. D., & Igou, E. R. (2015a). Lay perspectives on the social and psychological functions of heroes. *Frontiers in Psychology*, *6*, 1-12. doi:10.3389/fpsyg.2015.00130
- Kinsella, E. L., Ritchie, T. D., & Igou, E. R. (2015b). Zeroing in on heroes: A prototype analysis of hero features. *Journal of Personality and Social Psychology*, *108*, 114-127. doi:10.1037/a0038463
- Klein, J. T. (2012). A taxonomy of interdisciplinarity. In R. Frodeman, J. T. Klein, & C. Mitcham (Eds.), *The Oxford handbook of interdisciplinarity* (pp. 15-30). Oxford, England: Oxford University Press.
- Klisanin, D. (2003). *Designing media with intent: Evolutionary guidance media for the creation of planetary consciousness* (Doctoral dissertation). Saybrook Graduate School and Research Centre, Oakland, CA.
- Klisanin, D. (2015). Collaborative heroism: Exploring the impact of social media initiatives. *Media Psychology Review*, *9*(2), 1-17.
- Klisanin, D. (2017). Heroism in the networked society. In S. T. Allison, G. R. Goethals, & R. M. Kramer (Eds.), *Handbook of heroism and heroic leadership* (pp. 283-299). New York, NY: Routledge.
- Krohn, W. (2012). Interdisciplinary cases and disciplinary knowledge. In R. Frodeman, J. T. Klein, & C. Mitcham (Eds.), *The Oxford handbook of interdisciplinarity* (pp. 31-49). Oxford, England: Oxford University Press.
- Langdon, M. (2013, May 1). How to be a hero by Matt Langdon at TEDxMarinette [Video file]. Retrieved from <https://www.youtube.com/watch?v=IE0jGWVMjJw>
- Maslow, A. H. (1948). Higher and lower needs. *Journal of Psychology*, *25*, 433-436. doi:10.1080/00223980.1948.9917386

- Peterson, C., & Seligman, M. E. P. (2004). *Character strengths and virtues: A handbook and classification*. Washington, DC: American Psychological Association.
- Ravetz, J. R. (1971). *Scientific knowledge and its social problems*. New York, NY: Oxford University Press.
- Rogers, C. (1951). *Client-centered therapy: Its current practice, implications and theory*. London, England: Constable.
- Rohr, R. (2011). *Falling upward: A spirituality for the two halves of life*. Richmond, VA: Union Theological Seminary.
- Snow, C. P. (1959). *The two cultures and the scientific revolution*. Cambridge, England: Cambridge University Press.
- Weingart, P. (2012). A short history of knowledge formations. In R. Frodeman, J. T. Klein, & C. Mitcham (Eds.), *The Oxford handbook of interdisciplinarity* (pp. 3-14). Oxford, England: Oxford University Press.

Author Biographies



Olivia Efthimiou is a transdisciplinary researcher based in the School of Arts, Murdoch University, Australia and an associate researcher at the Australian National Academy of Screen and Sound. Her current research focuses on transdisciplinarity, heroic leadership, embodiment, the philosophy of science, well-being, innovative methods, and sustainable futures.



Scott T. Allison is a professor of psychology at the University of Richmond, Virginia. He has authored numerous books on heroism and leadership, including *Heroes* in 2011; *Conceptions of Leadership* in 2014; *Frontiers in Spiritual Leadership* in 2016; *Handbook of Heroism and Heroic Leadership* in 2017; and *Heroic Humility* in 2017. His work has been featured in media outlets such as National Public Radio, *USA Today*, *The New York Times*, *Los Angeles Times*, *Slate Magazine*, MSNBC, CBS, *Psychology Today*, and *The Christian Science Monitor*.

His “Heroes” blog has attracted over a half million visitors.