

Theoretical Psychology at the University of Alberta as Social Science During the Cold War

Michael R. W. Dawson, Cor Baerveldt, Evan Shillabeer, and Vickie Richard
University of Alberta

We examine the University of Alberta's Center for Advanced Study in Theoretical Psychology (1965–1990) in the context of social science conducted during the Cold War. We begin by considering the center with respect to three important properties of social science at this time: an emphasis on interdisciplinarity, a focus on theory, and a preference for quantitative methods. Our analysis suggests that center activities also exhibited these characteristics. They were highly interdisciplinary, they were concerned with the development of psychological theory, and center members were experts in a variety of formal, mathematical, or statistical techniques. We then discuss the center in relation to a subdomain of research known as Cold War social science, which also was interdisciplinary, theoretical and quantitative, but in addition focused on research that contributed to national security against the rise of communism. Center members also believed that their research had social implications, but these were related to a humanistic psychology that served as a positive social force, and diverged from typical Cold War applications. We end by considering the center as an example of a different kind of Cold War science that emerged from a unique set of contextual influences.

Keywords: theoretical psychology, Cold War social science, history of psychology

The Center for Advanced Study in Theoretical Psychology existed at the University of Alberta from 1965 to 1990 (Mos & Kuiken, 1998). Its purpose was to improve psychological theory, to seek out possible unity in the diversity of psychological thought, and to train a new generation of theoretical psychologists. In its day, the center achieved international recognition, hosting over 116 distinguished scholars, including many key figures in the history of psychology (see Table 1). The center also organized several major international conferences (Royce, 1970b, 1973; Royce & Mos, 1979, 1981; Royce & Rozeboom, 1972).

Two of the center's founders and developers of its educational mission were eminent international scholars of historical importance. Joseph R. Royce was one of the best-known psychologists in Canada. He authored over 100 scientific papers and wrote or edited several books. He also belonged to the steering committee that led to the creation of the American Psychological Association's Division 24 on philosophical psychology, became the first editor of Division 24's *Philosophical Psychology Newsletter*, and was the president of Division 24 in 1969 (Mos, 1990; Royce, 1986). Ludwig von Bertalanffy was one of the most important theoretical biologists of the 20th century. He pioneered general systems theory, authored over 200 scientific papers, wrote or edited 17 books, and made

This article was published Online First September 27, 2018.

Michael R. W. Dawson, Cor Baerveldt, Evan Shillabeer, and Vickie Richard, Department of Psychology, University of Alberta.

Correspondence concerning this article should be addressed to Michael R. W. Dawson, Department of Psychology, University of Alberta, Edmonton, Alberta T6G 2P9, Canada. E-mail: mdawson@ualberta.ca

Table 1
The List of Speakers Who Visited the Center for Advanced Study in Theoretical Psychology From 1967 Through 1983

Department	Speaker			
Psychology	Robert P. Abelson	Benson Ginsburg	Joseph Lyons	Jose M. Prieto
	Marion Aftanas	Amedeo Giorgi	R. Duncan Luce	Zenon Pylyshyn
	John R. Anderson	Graham Goddard	John Macnamara	Robert W. Rieber
	Rudolf Arnheim	Carl F. Graumann	Donald G. Mackay	Robert S. Rodger
	David Ausubel	Jeffrey A. Gray	Kristen B. Madsen	Peter Schonemann
	Lewis W. Brandt	Joy P. Guilford	George Mandler	Josef Schubert
	Albert S. Bregman	Graeme S. Halford	Melvin H. Marx	Saul B. Sells
	Donald E. Broadbent	Kenneth Hammond	John J. McArdle	Robert Shaw
	Peter Broadhurst	Norman Henderson	Harold G. McCurdy	Durganand Sinha
	Josef Brozek	Jerry Hirsch	John Mills	Alvin H. Smith
	James Bugental	Willem van Hoorn	Bennett Murdoch	Richard E. Snow
	Donald T. Campbell	John L. Horn	Thomas Natsoulas	Delbert D. Thiessen
	John B. Carroll	James J. Jenkins	David R. Olson	William R. Thompson
	Raymond Cattell	Neal Johnson	Charles E. Osgood	Gordon Trasler
	A. Woodard Ching	Bernard Kaplan	Juan Pascual-Leone	William R. Uttal
	Fergus I. M. Craik	Gregory A. Kimble	Kurt Pawlik	Philip E. Vernon
	Boele de Raad	Walter Kintsch	Michael M. Piechowski	Walter B. Weimer
	David Elkind	Sigmund Koch	Robert Plutchik	
	Hans Eysenck	David Krech	David Polkinghorne	
	James J. Gibson	Robert Leeper	Karl Pribram	
	William P. Alston	Horace Romano Harre	William H. Newton-Smith	Jay F. Rosenberg
	Mario Bunge	Erwin Laszlo	John R. Perry	Michael Scriven
	Jerry Fodor	Joseph Margolis	Willard Quine	Raimo H. Tuomela
Adolf Grunbaum	Arne Naess	Daniel N. Robinson	Mary Anne Warren	
John L. Fuller	James G. Miller	Nikolaas Tinbergen		
John Holland	Seymour Papert	Roger Schank		
James R. Barclay	Arthur Jensen	Henry F. Kaiser		
Philosophy				
Biology				
Computer Science				
Educational Psychology				

This document is copyrighted by the American Psychological Association or one of its allied publishers.
This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

Table 1 (*continued*)

Department	Speaker
Genetics	Hans Kalmus
Linguistics	John A. Mills
American Studies	Floyd Matson
Anatomy	John Z. Young
Cognitive Science	Stevan Harnad
Education	Joseph M. Scandura
English	Steven Marcus
Information Science	Manfred Kochen
Psychiatry	Iago Galdston
Psychobiology	Roger W. Sperry
Religion	John Charles Cooper
Statistics	Herman Wold

Note. The list is organized by the speakers' departmental affiliation. These names were taken from a self-study report (Mos, 1983); this report resides in the University of Alberta Archives (Accession Number 2006-142, Item 32).

critical discoveries in both population biology and cancer detection (Davidson, 1983; Pouvreau, 2009). The process of nominating Bertalanffy for a Nobel Prize was interrupted by his death in 1972.

While well known in its time (Baker, 1988; Mos & Kuiken, 1998), there is little modern awareness of the center's existence, influence, and history. Fortunately, a large amount of archival material concerning center activities has been recovered recently. This material includes dozens of photographs, boxes of documents, and hundreds of hours of thought-to-be-lost audio or audiovisual records of center activities. We are currently studying this material in an effort to place the center in its proper historical context.

The current article uses some of this material to consider the center in the context of the growing literature on what is commonly known as Cold War social science (Cohen-Cole, 2009, 2014; Engerman, 2010; Erickson et al., 2013; Solovey, 2013; Solovey & Cravens, 2012). Case studies (e.g., the papers in Solovey & Cravens, 2012) reveal some distinctive properties of what we will call in this article *prototypical Cold War social science*. These include an emphasis on interdisciplinarity, a focus on theory, a preference for formal or quantified methods, and the intent to apply research results for the common good—which often meant championing or defending American values against the competing values of the Soviet Union during the Cold War (Cohen-Cole, 2014).

One reason for our interest in considering the center in this context is that there is no clear agreement about what constitutes prototypical Cold War social science, and there is some concern about the utility of studying it as a distinct entity (Engerman, 2010, 2012; Solovey, 2012). This is because several of the features noted earlier—interdisciplinarity, focus on theory, quantification—are necessary but not sufficient features of prototypical Cold War social science. As we will see in our investigation of center activities, these properties are also true of other social science research that was being conducted during the Cold War era.

A second reason for placing the center in the Cold War context is that Solovey (2012) promotes the utility of exploring social science research that reacted against the aims of prototypical Cold War social science. We will see that center activities may represent an example of what Solovey calls anti-Cold War social science. Center members promoted alternative views of psychology (Bertalanffy, 1967, 1968c) that they hoped could provide more positive applications than those that emerged from prototypical Cold War social science (Rohde, 2013).

These two reasons suggest that Cold War social science provides an informative perspective from which center activities can be viewed, and also suggest that our understanding of the center within this context may be useful for distinguishing prototypical Cold War social science from other social science conducted during the Cold War era. We explore these issues as follows: We begin by examining how the key properties of interdisciplinarity, an emphasis on theory, and the adoption of quantitative methods properties characterized the center's members, its research and teaching missions, and its many distinguished visitors. We then consider the center in the context of prototypical Cold War social science (Cohen-Cole, 2009, 2014; Engerman, 2009, 2010; Erickson et al., 2013; Isaac, 2012b; Rohde, 2013; Solovey, 2013; Solovey & Cravens, 2012). In addition to being interdisciplinary, theoretical, and quantitative, this research also had applications for defending American democracy against communism (Cohen-Cole, 2014; Engerman, 2009; Rohde, 2013). Later in this article, we argue that center members envisioned that their research would have very different kinds of applications than those of prototypical Cold War social science, and consider various reasons for this difference.

The Center for Advanced Study in Theoretical Psychology was founded at the University of Alberta by psychologist Joseph R. Royce (1921–1989), theoretical biologist Ludwig von Bertalanffy (1901–1972), philosopher Herman Tennesen (1918–2001), and psychiatrist Thaddeus Weckowicz (1919–2000; Mos & Kuiken, 1998). Royce (1975) used Cold War terminology to describe the center: “We are a think tank” (p. 78). Informally,

the goal of the center was to develop a theoretical psychology that would have the same relationship to psychology as theoretical physics has to physics. The center engaged in a variety of activities to foster research in, and education about, theoretical psychology. This article proceeds by placing center activities in the context of other social science research being conducted during the Cold War. We do so by exploring four themes: interdisciplinarity, an emphasis on theory, the adoption of quantitative methods, and the applications of research.

Interdisciplinarity

Social science during the Cold War era was highly interdisciplinary (Cohen-Cole, 2014; Isaac, 2012b). Researchers believed that real-world social problems could only be addressed by adopting different perspectives from a variety of disciplines. Prototypical examples of interdisciplinary research and programs from the Cold War abound. For instance, an interdisciplinary team of social scientists used postwar interviews to study Russian society for the Harvard Project on the Soviet Social System (Engerman, 2012). The American University in Washington, DC, hosted Project Camelot, involving sociologists, political scientists, economists, anthropologists and psychologists in the study of social upheaval in underdeveloped countries (Solovey, 2001). The Cold War era also heralded the development of interdisciplinary graduate training programs in social psychology at Michigan, Harvard, Yale, Cornell, Berkeley, Columbia, Minnesota, Wisconsin, and other leading institutions (Sewell, 1989).

Funding for interdisciplinary social science research also flourished at this time (Cohen-Cole, 2014; Solovey, 2013; Williams & Tyler, 1956). The Ford Foundation established such prominent interdisciplinary programs as the Center for Advanced Study in Behavioral Science at Stanford. Other major interdisciplinary developments during this period include the creation of area studies programs (Szanton, 2004) and the launch of the study of small group processes (Bales, 1950; Hare, Borgatta, & Bales, 1965).

The center too was intensely interdisciplinary from its beginning. The formal request for creating a Theoretical Psychology Center was signed by faculty members who represented the departments of psychology, zoology, philosophy, and psychiatry (Royce, Bertalanffy, Tennesen, & Weckowicz, 1963). By 1967, center membership still included Royce, von Bertalanffy, Tennesen, and Weckowicz, but it had added William Rozeboom (psychology) and Kellogg Wilson (psychology and computing science; Mos, 1983). "Thus while the Center's activities were focused on the foundations of psychology, a strong interdisciplinary emphasis was present from the beginning" (p. 8). For the period from 1976 to 1980, the center fell under the administrative umbrella of the newly formed (and short-lived) Faculty of Interdisciplinary Studies.

The center's interdisciplinarity was largely the result of the backgrounds and experiences of two of its key founders, Royce and Bertalanffy. Both were participants in interdisciplinary settings that were funded by the Ford Foundation. While Royce was a member of the University of Redlands from 1955 to 1960, he had a 5-year appointment as a faculty fellow in the Ford Foundation Interdisciplinary Program of Graduate Studies (Royce, 1975, 1978). His interdisciplinary experiences in this program profoundly influenced his career, and were largely responsible for the content of his book *The Encapsulated Man* (Royce, 1964). Similarly, in 1954, Bertalanffy was one of the first fellows at Stanford University's Center for the Advanced Study in the Behavioral Sciences. It was here that Bertalanffy, economist Kenneth Boulding, mathematician Anatol Rapaport, and neurophysiologist Ralph Gerard famously laid the foundations for a society devoted to the promotion of general systems theory (Hammond, 2003).

The center's interdisciplinarity is further reflected in the faculty that it recruited later, who included William Baker (psycholinguistics), Michael Dawson (cognitive science), Harry Garfinkle (educational foundations), Richard Jung (sociology), Donald Kuiken

(psychology), Aleksander Matejko (sociology), Leo Mos (psychology and linguistics), William Smythe (psychology), Paul Swartz (psychology), and Lorne Yeudall (neuropsychology, Alberta Hospital; Mos, 1983; Mos & Kuiken, 1998).

The interdisciplinarity of the center was evident in the diversity of individual member's educational experiences and research interests. For example, consider Richard Jung, a center member from 1972 to 1984. His undergraduate training included philosophy, political science, and animal husbandry. He received his first doctorate from Charles University in Prague in 1948, where he studied law and economics. Jung obtained a second doctorate from the Department of Social Relations at Harvard in 1962. He spent 3 years as an assistant to the eminent sociologist Talcott Parsons. After graduating from Harvard, Jung held various academic positions including one at Cornell, where he also served as a consultant to Project Camelot (Solovey, 2001). His research interests involved revising and extending Parson's own theories (Jung, 1988), as well as integrating sociological theory with cybernetics and with systems theory (Jung, 2006).

The center's keen interest in interdisciplinary perspectives is highlighted in the scholars whom it hosted. A center self-report study provides the names of the 116 speakers who visited between 1967 and 1983 (Mos, 1983). Table 1 shows that the speakers represented 16 different university departments. Given the center's focus on theoretical psychology, it is not surprising that the majority of these visitors (77 in total) were from psychology. However, even this group of psychologists reflects a tremendous variation of expertise, including psychobiology (e.g., Goddard, Pribram), perception (e.g., Arnheim, Gibson), cognition (e.g., Anderson, Murdoch), development (e.g., Elkind, Olson), social psychology (e.g., de Raad, Tralser), statistics (e.g., Cattell, Vernon), and humanistic psychology (e.g., Giorgi, Polkinghorne).

A final indication of center interdisciplinarity comes from its course offerings. In the early 1960s, Royce and Bertalanffy developed the "Interdisciplinary Seminar in Philosophy and Psychology" (Dawson, Baerveldt, Shillabeer, & Richard, 2018). This course was team-taught by Royce, Bertalanffy, a member of the department of philosophy (first Peter Radcliff, later Richard Bosley), and eventually Weckowicz. The memo proposing the creation of the center cited this course, Bertalanffy's biology course "History and Philosophy of Biology," Tennesen's "Philosophy of Science," and a planned course "The Nature of Man" as examples of the interdisciplinary educational opportunities that could be offered by the center (Royce et al., 1963).

In 1967, the center first offered its flagship course "Seminar in Theoretical Psychology." A detailed analysis of this course reveals its interdisciplinary nature (Dawson et al., 2018). Dawson et al. classified each of the 126 different readings assigned to students in the course using Library of Congress catalog numbers. They used these numbers to assess the different content areas to which students were exposed. This analysis reveals that 16 different content areas—topics distinct enough to be assigned different letters at the start of the catalog number—were used as the source of readings. While about three quarters of these readings were from psychology, the remaining quarter came from diverse topics that included philosophy, biology, sociology, internal medicine, social history, science, and literature.

The interdisciplinarity of the center exhibited one additional interesting characteristic. The center was created in the midst of the cognitive revolution in psychology. This revolution began with psychology's reaction against positivism and operationism (Allport, 1940; Cravens, 2012), which by the late 1950s, had resulted in a prominent cognitive psychology that rejected the philosophical foundations of psychological behaviorism (Boden, 2006; Cohen-Cole, 2014; Dawson, 2013b; Gardner, 1984). However, the center was not completely swept up in this movement, for it did not completely repudiate positivism. A core center member, William Rozeboom, was a sophisticated proponent of logical empiricism and a defender of psychological behaviorism (Mos & Kuiken, 1998).

To have an interdisciplinary program that included positivism at the height of the cognitive revolution is completely consistent with Royce's vision for the center (Royce, 1978). For Royce, group discussions of theoretical issues were the core center activity, and he wanted these sessions to be as productive as possible by addressing issues from a variety of viewpoints: "A multiplicity of perspectives is guaranteed by virtue of the simultaneous participation of half-a-dozen center staff members of very diverse interests and outlooks" (p. 246). Royce's notion of interdisciplinary scholarship had the room—and the need—to include positivism.

Emphasis on Theory

Royce was of the opinion that disciplines like psychology largely dismissed theory in the first half of the 20th century (Royce, 1957b). He believed that positivism and operationism had reduced psychology to mere data collection. The center's self-report (Mos, 1983) quoted a May 29, 1961, memo from Royce to the Academic Planning Committee as follows: "The psychology Zeitgeist in mid-20th century psychology is essentially antitheoretical, primarily because of psychology's concern that it be recognized as 'experimental'" (p. 2).

As part of a reaction against positivism that is discussed in the Adoption of Quantitative Methods section, during the Cold War era, psychology and the other social sciences increasingly adopted theory as the foundation for pure and applied research (Buck, 1985). It was understood that theory not only determined what facts to collect and what facts to ignore, but also helped to make sense of collected data (Parsons, 1938, 1950). Furthermore, there was a growing belief that theory could capture regularities that would permit synthesis across empirical findings, research domains, and academic disciplines.

Parsons' own Department of Social Relations at Harvard represents a prototypical example of trying to use theory to unify the diversity offered by sociology, psychology, and anthropology (Buck, 1985; Isaac, 2012a, 2012b). This department attempted to employ a particular theoretical position, the general theory of action (Parsons, 1948; Parsons & Shils, 1951), to unify the interdisciplinary study of personalities, social systems, and cultural systems.

The rise of theory in social science did not mean that theory itself was free of problems. Parsons repeatedly called for improving sociological theory (Parsons, 1938, 1948, 1950). A similar position emerged in psychology; Sigmund Koch pointedly suggested that it was time to pay less attention to particular psychological theories and to pay more attention to developing the methods of a rigorous theoretical psychology (Koch, 1951).

Royce echoed this view (Royce, 1957b), recognizing that psychology had ignored theory for too long and that new approaches were required to develop theoretical psychology. The research mission of the center called for technical analysis of psychology's theoretical foundations and conceptual structure. The center's primary concern was "with how one goes about constructing viable psychological theory" (Royce, 1978, p. 233). This concern was addressed in a variety of ways. Group efforts included the cooperative delivery of the center's "Seminar in Theoretical Psychology," which spent the first 2 weeks laying out the need for theory and the current state of theoretical psychology, the next 4 weeks surveying basic theoretical issues, and the next 5 weeks considering the theoretical aspects of factor analysis (Dawson et al., 2018). Later, 5 weeks were spent exploring the similarities and differences between philosophy and theoretical psychology, and students were introduced to the works of prototypical theoretical psychologists, in particular Boring, Brunswik, Feigl, and Koch.

Individual efforts included a variety of research projects that reflected center members' personal interests in theory. For example, Royce concentrated on the theoretical status of factors, and on combining factor analytic and experimental methodologies (Royce, 1957a, 1963a, 1963b, 1966). Bertalanffy extended general system theory into psychology, de-

veloping what he called an organismic psychology (Bertalanffy, 1967, 1968c). Rozeboom explored the differences between intervening and mediating variables in psychological theories (Rozeboom, 1956) and made important contributions concerning the theory of induction (Rozeboom, 1966, 2013).

Center members were not only interested in developing theoretical psychology. They also recognized that theory offered the possibility of unifying disparate domains, and that psychology—typically described as being fragmented—was in serious need of such unification (Koch, 1959, 1969; Stam, 2004). The center explored the potential for unification via psychological theory in both group and individual research activities. In 1965, the center held its first International Conference on Theoretical Psychology, whose theme was “Toward the Unification of Psychology” (Royce, 1970b). This conference played a large role in the center’s creation and formal establishment (Royce, 1970a). In terms of individual research, Bertalanffy’s organismic psychology was aimed at providing a framework that identified principles that could unify biology and psychology in accordance with the approach developed in his general system theory (Bertalanffy, 1967, 1968a, 1968c).

Adoption of Quantitative Methods

By the end of World War I, the social sciences began an increasing trend toward scientism by borrowing the methods and philosophical perspectives of the natural sciences (Mirowski, 1989; Ross, 1991). In spite of reacting against positivism during the Cold War, and increasing their emphasis on theory, the social sciences did not reject the natural sciences’ focus on collecting empirical data. Instead, the social sciences aimed to develop theory that was informed by data, and that could also make sense of empirical observations (Isaac, 2012a).

The empiricism of Cold War social science was an important feature as it competed against the natural sciences for a piece of postwar research funding (Solovey, 2013). The success that the social sciences had in obtaining funding was in part due to promoting research in a fashion that minimized the differences between the social and the natural sciences. “The reigning scientific hierarchy meant that if social scientists wanted to gain recognition and funding, they typically had to present themselves as junior citizens seeking to emulate the more mature ‘hard’ sciences” (pp. 94–95). This required the social sciences to adopt and adapt scientific methods that were quantitatively precise and technologically sophisticated (Cravens, 2012; Erickson et al., 2013).

Cold War psychology and other social sciences achieved quantitative precision and technological sophistication by embracing statistical methods, mathematical models, and computer simulation (Atkinson, Bower, & Crothers, 1965; Chernoff & Moses, 1959; Coombs, Dawes, & Tversky, 1970; Cyert, Feigenbaum, & March, 1959; Gigerenzer, 1989; Luce, 1959; Neumann & Morgenstern, 1944; Newell, Shaw, & Simon, 1958; Newell & Simon, 1961; Restle, 1971; Restle & Greeno, 1970). The center mirrored this practice by using rigorous, quantitative methods to explore psychological theory. For example, consider the research programs of two of the center’s founders.

Royce used factor analysis to generate theories of behavior genetics, emotion, and personality. Prior to his graduate studies, Royce served during World War II as a research officer with the Air Force Aviation Psychology Program. This is when Royce was first exposed to factor analysis, which was used to help select individual for particular Air Force roles (Royce, 1975). Royce learned factor analysis under the mentorship of his doctoral supervisor L.L. Thurstone at the University of Chicago. Thurstone is regarded as one of the leading figures in the quantification of psychology that began before World War II (Ross, 1991, p. 433). Royce’s later behavior genetics research attempted to relate factors taken from analyses of behavioral data (and not behaviors themselves) to underlying genotypes (Royce, 1957a). Royce saw factors as “behavioral phenotypes” that captured

behavioral variability. A large expanse of his career (for an overview, see Royce, 1978) was spent exploring this idea using different subjects (dogs, mice, humans) and different behaviors (emotionality, avoidance learning, perception) as dictated by the capabilities of his laboratories.

For Royce, factor analysis was not merely a statistical technique, but was also a powerful tool for theory development: It was “a valid method for generating scientifically useful theoretical constructs” (Royce, 1978, p. 237). Beyond his factor–gene theory, factor analysis played a key role in Royce’s theoretical psychology. He argued that factors could serve as theoretical constructs (Royce, 1963b), and he employed factor analysis as a source of a taxonomy for a general theory of individuality (Powell & Royce, 1981a, 1981b; Royce, 1979; Royce & Powell, 1981).

Bertalanffy also used mathematics to develop theory. His general system theory had its origins in biology of the 1920s. Bertalanffy reacted against both mechanistic and vitalistic biological theories, and proposed in their stead an organismic view that took agents as organized systems. Bertalanffy argued that biology’s main goal was discovering (at multiple levels) the laws governing this organization (Bertalanffy, 1952, 1968a). He introduced the notion of an open system at dynamic equilibrium—a system with constantly changing parts that exhibited stability in the relations between these ever-changing components. He formalized these notions by defining a system as a set of simultaneous differential equations (e.g., Bertalanffy, 1968a, chapter 3). He then discovered that formal operations on these equations revealed similar organizing principles across different domains.

General system theory became a search for isomorphic principles between disciplines; Bertalanffy expected these principles to be revealed via the formal analysis of differential equations, but was open to the possibility that mathematical approaches developed in other fields (“information theory, game decision and net theories, stochastic models, operations research to mention only the most important ones”; Bertalanffy, 1968a, p. 38). Glaringly absent from this list is computer simulation, which Bertalanffy considered as a methodology to use “where no mathematical theory or ways of solution exist” (Bertalanffy, 1968a, p. 20). It is possible that this bias prevented Bertalanffy from using computer simulation techniques that other systems theorists later exploited to great advantage (Arthur, 2015; Holland, 1992, 2012; Kauffman, 1995; Meadows & Wright, 2008).

Bertalanffy’s preference for differential equations over computer simulations might have resulted from his more general concerns about theory. As a student, Bertalanffy rejected positivism in spite of his impressive early exposure to it—he was a student of the Vienna Circle’s Moritz Schlick and Robert Reininger (Pouvreau, 2009). Bertalanffy’s (1968a) “interest in German mysticism, the historical relativism of Spengler and the history of art, and similar unorthodox attitudes precluded his becoming a good positivist” (p. 12).

General system theory represents Bertalanffy’s reaction against positivism and mechanism. Bertalanffy’s long opposition to positivism and mechanism had, by the time he was a member of the center, crystallized into a critique of what he called the robot model of man (Bertalanffy, 1967). According to this robot model, man was a passive responder to the environment, man’s natural state is at rest (i.e., to behave is to reestablish equilibrium), and that ultimate rationale of all behavior is utilitarian (i.e., governed by the principle of reaching a desired goal with minimal cost). Bertalanffy accused psychological behaviorism of holding this robot view. Furthermore, Bertalanffy (e.g., Bertalanffy, 1967, pp. 10–14) leveled this accusation at most other psychological schools of thought, including cognitivism. Cognitive psychology’s analogy between the mind and the digital computer was, to Bertalanffy, simply another example of the robot model.

One reason that Bertalanffy so strongly opposed the robot model of man was his belief that it prevented psychology from providing a proper treatment of human spontaneity, creativity, playfulness and exploratory behavior. “*Science has conquered the universe but*

forgotten or even actively suppressed human nature” (Bertalanffy, 1967, p. 6, his italics). In this respect, Bertalanffy’s position mirrors postwar social science’s reaction against positivism. However, Bertalanffy’s critique of the robot view of man also leads to a fundamental difference between center scholarship and that of prototypical Cold War social science: the goals to which this scholarship could and should be applied.

Military or Political Applications of Research

The three characteristics that have been discussed—interdisciplinarity, emphasis on theory, and adoption of quantitative methods—are all characteristic of social science research conducted in the Cold War era, and all began to develop in the decades that preceded the Cold War. Let us now turn to a fourth property of social science research during this period that is receiving an increasing amount of historical analysis: the military or political applications of social science. We will see that Royce’s interest in humanistic psychology, and Bertalanffy’s reaction against the robot model, made the center sympathetic to research applications that were quite different from those explored by prototypical examples of what is typically called Cold War social science (Solovey, 2013; Solovey & Cravens, 2012).

Cold War social science was conducted during the Cold War, but not all social science conducted during this period is properly characterized as “Cold War social science” (Engerman, 2010; Solovey, 2012). Prototypical examples of this particular subset of social science research all possess the three properties (interdisciplinary, emphasis on theory, quantitative) that have been discussed (Solovey, 2013; Solovey & Cravens, 2012). However, what sets Cold War social science apart from other social science conducted during the Cold War is that it was typically funded or directed by the military, and that its goal was to produce results with political or military applications.

Many examples of prototypical Cold War social science have been discussed in the literature (Cohen-Cole, 2014; Erickson et al., 2013; Rohde, 2013; Solovey & Cravens, 2012), and exhibit an interesting combination of academic and military objectives. For instance, Harvard’s Refugee Interview project interviewed displaced Russian refugees, was seen by its researchers as being able to provide a conceptual model of the Soviet social system (Engerman, 2009, 2012). Its sponsors believed that it would identify vulnerable elements of Soviet society that could be targeted by the military. The Special Operations Research Office (SORO) established at the American University in 1956 (Rohde, 2013). One of its projects was Project Camelot, which had as its scholarly purpose the study of the revolutionary process, particularly in Latin American countries (Cravens, 2012; Horowitz, 1966; Rohde, 2012, 2013; Solovey, 2001). When Project Camelot’s link to the military was exposed, concerns were raised that its actual intent was manipulating foreign revolutions; the resulting strained relations between the United States and Chile led to the abrupt cancellation of the project. The Washington Public Opinion Laboratory conducted Project Revere to study the flow of information and mass communication via dropped leaflets (DeFleur & Larsen, 1958). The military was particularly interested in the scientific study one of its weapons of mass persuasion, the leaflet. “By dropping leaflets over targets, the Air Force hopes to set in motion social processes of persuasion that will direct and affect the behavior of mass populations” (pp. 33–34).

Many of the social scientists involved in Cold War social science did so from the perspective that a government or military equipped with social and cultural information and tools might be able to achieve political goals without requiring armed conflict (Rohde, 2013). The members of the center were also interested in the social implications of their research. However, this interest was aimed in quite different direction than prototypical Cold War social science. The center’s scholarship did not move in a direction aligned with Cold War political or military goals. Instead, the center moved in the *opposite* direction. Two interrelated ideas underscore its rejection of Cold War social science. The first is the

center's long-lasting interest in the theoretical foundations of humanistic psychology. The second is its exploration of the use of symbols as a psychological and cultural means of counteracting social, cultural, and environmental pressures.

These two ideas are strongly represented in Bertalanffy's organismic psychology which he developed during his tenure at the center (Bertalanffy, 1967, 1968c). Bertalanffy, as noted earlier, reacted against the robot view of mind. He believed this view had produced a sick society because it dismissed such positive human characteristics as culture, reasoning, play and creativity. He argued for a new view of man as an active personality system. This system was dynamic (an open system like the others that figured in Bertalanffy's general system theory), and was *not* a passive, deterministic responder to its environment. Engagement with the environment was mediated by the use of symbols. The world that human agents responded to was not directly physical, but was instead "materializations of symbolic activities" (Bertalanffy, 1968b, p. 13). These symbolic activities separated humans from animals and machines, and were counter to the robot view that Bertalanffy so vehemently opposed. Bertalanffy argued that many emerging perspectives in psychology were united by this appeal to symbolization, which he used to characterize the so-called third force in psychology, humanism.

From an academic perspective, Bertalanffy's critique of the robot view and his organismic psychology can both be viewed as continuing his career-long opposition to positivism. From the perspective of applications, Bertalanffy crusaded against a view of humanity that he felt was the root of almost all social ills. The mechanistic psychology that aligned itself with the robot view had become the developer of behavioral engineering and mass persuasion. "This—besides nuclear weapons—is the great discovery of our age: the power of modeling men into automata 'buying' everything from toothpaste and Beatles to presidents, atomic war and self-destruction" (Bertalanffy, 1967, p. 14). For Bertalanffy, psychology had the power of solving societal problems by developing an alternative image of humankind. "More important than academic niceties, psychology today is a *social force* of the first order, molding man's self-image and directing society" (Bertalanffy, 1967, pp. 11–12, his italics). Organismic psychology was designed to provide an alternative, positive, and humanistic model.

Bertalanffy was not the only center member to explore humanistic psychology and symbolization. These two themes are also common in Royce's work. For instance, Royce organized a symposium on psychology and the symbol at the 1962 meeting of the Western Psychological Association (Royce, 1965a). It was through organizing this symposium that Royce first met Bertalanffy, who was one of the participants (Royce, 1981).

Royce became interested in humanistic psychology in the late 1950s (Royce, 1978). He recognized that humanistic psychology offered another approach for achieving understanding of the world, and argued that psychology needed these methods along with those of the natural sciences (Royce, 1964). The need to integrate the humanistic approach into psychology appears in several of his publications (Royce, 1963a, 1964, 1965b). For him, this integration was required "to remain open to all forms of truth which impinge upon the nature of man and his behavior, thereby maintaining the vitality and integrity of psychology as an unbiased discipline of knowledge" (Royce, 1965b, p. 6). Thus, in contrast to Bertalanffy, Royce's interest in humanistic psychology was more academic than activist. However, this interest also reflects Royce's deep concern with the search for meaning, which formed the basis for his lengthy exploration of psychological epistemology (Royce, 1978).

The related themes of humanism and symbolization are also reflected in the center's group activities. For instance, their flagship course "Seminar in Theoretical psychology" spent 4 weeks (Weeks 12 through 15) exploring these topics (Dawson et al., 2018). This included discussing psychology and the symbol, the role of phenomenology and existentialism in psychology, comparing scientific and humanistic psychology, and exploring psychology and drama.

As well, the center hosted several scholars whose talks were strongly related to humanistic concepts (Mos, 1983). These included James Bugenthal, Joseph Margolis, Iago Galdston, Harold McCurdy, John Cooper, Carl Graumann, Amedeo Giorgi, Joseph Lyons, and David Polkinghorne. The center's fourth international conference on theoretical psychology, held in October 1975, focused on the theme "Humanistic Psychology: Concepts and Criticisms." The book that emerged from that conference (Royce & Mos, 1981) presented 14 different contributions including several from the scholars who had visited the center (Giorgi, Graumann, Lyons, Matson, McCurdy). The introduction to this book notes that its chapters provide a critical examination of humanistic psychology's contributions by concentrating on its "conceptual presuppositions and theoretical formulations" (Royce & Mos, 1981, p. xv).

An Alternative Cold War Context

Of course, additional interrelated forces contributed to the differences between center objectives and those of prototypical Cold War social science. The center arose in a very different geopolitical context—the Canadian prairie, under the Social Credit government of Premier Ernest Manning, which was fiscally conservative, which cautiously introduced social reforms, and which used newfound wealth from the discovery of oil in Alberta to modernize the province (Barr, 2008). In this context, the center developed in a climate that offered alternative sources of funding, and in a country that had a different perspective on Cold War politics than did the United States.

One characteristic of prototypical Cold War social science projects is their military funding. For example, the Air Force's Human Resources Research Institute funded Harvard's Refugee Interview project as well as Project Revere; the latter was also funded by the Central Intelligence Agency (DeFleur & Larsen, 1987). SORO was established by the United States Army's Office of the Chief of Psychological Warfare (Rohde, 2013).

In contrast, Royce deliberately worked to create the center as an independent administrative unit at the University of Alberta to eliminate its dependence on external funding (Royce, 1975). "What I was after, I wanted hard money, I wanted University support, which we have. In other words, I didn't want to have the sweat of going back [to external funding agencies] every year" (p. 76). Royce recognized that the university's financial support of the center was not overwhelming, but he appreciated the stability that it provided.

Furthermore, Royce had the good fortune to establish the center during a time in which there increasing support for Canadian postsecondary institutions (Hauserman & Stick, 2005). For instance, Royce was chair of the University of Alberta's Department of Psychology when it was growing its size by about one new faculty member per year (Dawson, 2013a). The growth of Royce's department reflected increasing financial support of postsecondary education in the province of Alberta. The discovery of oil in the province in 1947 led to an economic boom that increased demand for postsecondary education; the oil boom in turn provided resources to meet this demand. Between 1958 and 1968, a period that includes the establishment of the center, provincial funding for postsecondary education increased from \$5 million to \$51 million, and fulltime university enrollment in Alberta rose from 4,600 to 18,600 (Anisef, 1985). Thus, at the same time that social science research in the United States had access to substantial funding from the military (Solovey, 2013), the new center was fortunate enough to have access to a different source of funding, provincial wealth acquired by the discovery of Albertan oil.

While Royce appreciated the stability offered by university funding, the center's ultimate reliance on provincial support later proved to be its downfall. For example, the steady rise in the size of the psychology department at the University of Alberta reversed when severe cuts in provincial funding began in the late 1980s (Dawson, 2013a). Shortly

thereafter, the center was a casualty of these cuts, and was closed in 1991 (Mos & Kuiken, 1998).

Although the center received stable funding from the University, and it relied upon federal funding (from the Canada Council) for postgraduate scholarships and postdoctoral fellowships, the University also expected it to seek some money from outside agencies. In the winter of 1967, Thomas Nelson, the acting head of psychology, sent on behalf of the center about 90 inquiries about funding to a variety of external agencies. None of these was successful in securing money. Center records indicate that only five positive replies were obtained (from the Kresge Foundation, the Milbank Memorial Fund, the New World Foundation, the National Institute of Mental Health, and the Rockefeller Foundation); a “positive response” was generally no more than a suggestion that the center submit a formal application.

Beyond the issue of funding, the center’s Canadian location may also have contributed to its research being different from that of prototypical Cold War social science. As a Western nation, as a member of the North Atlantic Treaty Organization, and as a next door neighbor to the United States, Canada was profoundly affected by the Cold War (Bothwell, 1998). In the 1950s, Canada was involved in the Korean War, and helped construct the Distant Early Warning Line of radar detectors at the 70th parallel. However, in the 1960s, the enthusiasm of the Canadian people for the Cold War greatly diminished, and Canadian foreign policy changed direction, at times diverging dramatically from that of the United States. For example, Canada continued diplomatic relations with Cuba, increased its trade with communist China, and diverted military funding from defense to peacekeeping.

The center arose at a Canadian university during this period, so it is perhaps not surprising that its research interests were more humanistic than military. In addition, this was also a time in which there were growing concerns in the social sciences about the undue influence of military patrons on research directions, as well as about the value of emulating the social sciences (Solovey, 2013). The center’s willingness to explore humanistic psychology may reflect the disciplinary contexts that prevailed at the time that the center was established.

Some of the wartime experiences of certain center members may have also steered them away from military applications, particularly in this Canadian context. Jung was active in Czechoslovakia’s anti-Nazi resistance, for which he was held and tortured in a concentration camp (Šubrt, 2014). Bertalanffy had all of his possessions (including his house, personal papers, and library) destroyed by the SS during the Soviet siege of Vienna; he was also obligated to undergo a procedure of “denazification” before he could emigrate (Pouvreau, 2009).

In addition, several center members were deeply interested in the arts, and were therefore sympathetic to the positive qualities of the arts and humanities. Royce was a playwright; several boxes at the University of Alberta Archives (Accession 86–67, Boxes to 5–78 5–93) contain drafts of his play *You’re Ill, Sam Gill, Take a Pill*. Bertalanffy was published philatelist (Bertalanffy, 1968b). Wilson was widely known throughout Edmonton as a jazz enthusiast with a large collection of records from which he sampled for a weekly program he hosted on a local radio station.

Conclusion: Broader Contexts for Cold War Social Science

The current article has considered the University of Alberta’s Center for Advanced Study in Theoretical Psychology in the context of social science during the Cold War. Important characteristics of the social sciences at this time include an emphasis on interdisciplinarity, a focus on theory, and the adoption of quantitative methods.

Our examination of the center suggests that these properties were also critical to its research and teaching activities. It was highly interdisciplinary, in terms of its members,

its courses, and its distinguished visitors. Its primary focus was concerned with the development and evaluation of psychological theory. Its members were experts in a variety of formal, mathematical, or statistical techniques.

The current article also considered the relation of the center to a particular subset of research during this period, prototypical Cold War social science. This research is also interdisciplinary, theoretical, and quantitative. However, in addition Cold War social science had political or military applications in the conflict between Western democracy and rising communism. In contrast, our examination of the center indicates that it was interested in very different research implications. Some center members, such as Bertalanffy, were involved in developing a humanistic psychology that they hoped could serve as a social force in opposition to the typical aims of Cold War social science.

Our consideration of the center, in the context of both social science during the Cold War and prototypical Cold War social science, raises two interesting issues. One concerns whether it is possible to broaden the notion of “prototypical Cold War social science” by considering an organization like the center as reflecting prototypical Cold War social science of a different kind. The other, related, issue is whether the center arose when and where it did because of a unique set of circumstances. Could it have easily arisen elsewhere had, for instance, Royce not accepted a job offer at the University of Alberta? We conclude this article by considering these two issues in turn.

Along with the growing interest in prototypical Cold War social science, there has been an increasing discussion about how to characterize and study this topic. For instance, the utility of studying a distinct Cold War social science is being debated (Engerman, 2010, 2012; Solovey, 2012). Solovey noted that viewing a topic as exemplifying Cold War social science might conceal as much as it reveals. He raised the possibility that scholars might also explore “anti-Cold War social science as a way of identifying, examining, and comparing scholarly efforts that emerged as an explicit alternative to previous social science work judge problematic because it seemed slanted in favor of American Cold War objectives” (Solovey, 2012, p. 18). Others have argued that historical analyses of Cold War social science require considering multiple contexts, because the Cold War cannot be seen as a unitary phenomenon, and because factors other than the Cold War shaped the social sciences at this time (Isaac, 2007).

Our exploration of the center provides an example of studying an entity that developed in a context that is quite distinct from that which influenced typical case studies of Cold War social science (Cohen-Cole, 2014; Engerman, 2009; Rohde, 2013; Solovey & Cravens, 2012). As we noted earlier, the center arose at a period when military applications of social science were being questioned, in a different country that had Cold War priorities that diverged from those of the United States, and in a political and financial environment that offered freedom to pursue novel research directions. The result was a research and educational mission that exhibited important properties of the social sciences during this era (interdisciplinary, theoretical, and quantitative) but at the same time pursued research implications quite different from Cold War military applications. Further research would be required to defend the claim that the center provides an example of anti-Cold War social science. However, Bertalanffy’s exploration of organismic psychology as a reaction against the robot model of man was clearly motivated by his concerns about Cold War politics and the nuclear arms race (Bertalanffy, 1967, 1968c). His search for an alternative model of man is one possible example of anti-Cold War social science.

The Canadian context in which the center arose might have led to its distinct brand of research during the Cold War. This raises another question: could the center have arisen elsewhere, or was it the product of a unique set of circumstances? One approach to answering this question is to consider the center in relation to other organizations.

Many organizations that are considered to typify Cold War social science existed in a gray area that existed between academia and the military (Rohde, 2013). For instance, consider SORO. On the one hand, it was associated with the American University; when

members of SORO attended scholarly conferences they identified themselves with this university, and some SORO projects like Project Camelot were unclassified. On the other hand, SORO was funded by the military, and the military had considerable input in directing the types of research that social scientists at SORO conducted. The utility of SORO existing in such a gray area was that its university affiliation placed certain limits on military influence; as a result, the research it conducted maintained a certain degree of objectivity and respectability.

Clearly, the center did not develop in this kind of gray area; it arose as an autonomous unit in a traditional Canadian university environment. It is hard to imagine that an entity like the center would have arisen in one of these gray areas south of the Canadian border, because the research interests of center members did not intersect with the military. When the military moved away from supporting gray areas like SORO after rising public opposition to its involvement in social science research, it turned to funding private research entities (Rohde, 2013). The center would be even more of an anomaly had it arisen in this later context.

Other organizations also arose during the Cold War, such as Stanford's Center for Advanced Study in Behavioral Science which was established by Ford Foundation funding in 1954 (Solovey, 2013). This organization brought together some of the leading figures in the behavioral sciences to conduct research in an interdisciplinary setting. Another example is the Harvard Center for Cognitive Studies founded by George Miller and Jerome Bruner in 1960 and funded in part by the Carnegie Foundation (Cohen-Cole, 2014). This too was highly interdisciplinary, and was one of the birthplaces of modern cognitive science. It was likely fostered by Harvard's rich environment for informal interactions between faculty members from different departments (Isaac, 2012b). Isaac calls these informal interactions "the interstitial academy" and documents their importance for establishing other interdisciplinary units at Harvard like the Department of Social Relations.

The center at the University of Alberta was much more similar to the centers at Stanford and Harvard. All were highly interdisciplinary, and were established as independent units in university settings. Royce's center was rooted in the environment that produced these other organizations. The interdisciplinary experiences that the Ford Foundation provided to Royce, who directly linked his interdisciplinary approach to theoretical psychology to his involvement with Ford Foundation activities (Royce, 1978), served as a model for the new unit at the University of Alberta. Similarly, Bertalanffy was one of the original fellows of the Stanford center, and therefore understood and supported Royce's vision. The 4 years of planning and lobbying for the creation of the center were also conducted by a small interstitial academy of researchers from different departments who saw the need and the possibility for formally establishing an interdisciplinary unit.

However, Royce's vision of establishing a center that did not depend on external funding means that it would also not have arisen elsewhere in the late 1960s. External funding was critical to establishing other comparable organizations. In addition, sources of funding that center members were familiar with were no longer available even if Royce had been interested in pursuing them. For instance, the Ford Foundation ended its funding for the behavioral sciences in 1957, as center members found out in a reply that they received from the Foundation to a 1967 funding inquiry.

The center's founding at the University of Alberta might have resulted from a perfect storm of intersecting forces: Royce's vision for theoretical psychology, his ability to marshal the support of a small number of like-minded colleagues, ample provincial funding, and a university willing to listen to and act upon Royce's proposal. Royce himself certainly believed that the center would not have been established elsewhere. Royce (1978, p. 226) wrote that the University of Alberta promised him "unlimited vistas" and noted "the rare and perhaps remarkable fact that this University not only came through with what it had promised, it actually delivered more than was promised." In his 1975

interview with the CPA archivist, Royce marveled that “it wasn’t easy, but they listened, and let’s face it, nobody would listen today” (Royce, 1975, p. 76). The context that surrounded the creation of the center may have been unique, and it produced an organization that presented a unique brand of scholarship during the Cold War. Our hope is that as we learn more about the center from our newly obtained archival materials we will be in a position to understand more about the contexts that produced it.

References

- Allport, G. W. (1940). The psychologist’s frame of reference. *Psychological Bulletin*, 37, 1–28. <http://dx.doi.org/10.1037/h0060064>
- Anisef, P. (1985). *Accessibility to postsecondary education in Canada: A review of the literature*. Ottawa, Ontario, Canada: Education Support Branch, Department of the Secretary of State of Canada.
- Arthur, W. B. (2015). *Complexity and the economy*. Oxford, United Kingdom: Oxford University Press.
- Atkinson, R. C., Bower, G. H., & Crothers, E. J. (1965). *An introduction to mathematical learning theory*. New York, NY: Wiley.
- Baker, W. J. (1988). The current direction of theoretical psychology: An epilogue. In W. J. Baker, L. P. Mos, H. V. Rappard, & H. J. Stam (Eds.), *Recent trends in theoretical psychology: Proceedings of the Second Biannual Conference of the International Society for Theoretical Psychology* (pp. 367–372). New York, NY: Springer-Verlag.
- Bales, R. F. (1950). *Interaction process analysis: A method for the study of small groups*. Cambridge, MA: Addison Wesley Press.
- Barr, J. J. (2008). Ernest Manning. In *The Canadian encyclopedia*. Retrieved from <https://www.thecanadianencyclopedia.ca/en/article/ernest-manning/>
- Bertalanffy, L. v. (1952). *Problems of life: An evaluation of modern biological thought*. London, United Kingdom: Watts.
- Bertalanffy, L. v. (1967). *Robots, men, and minds*. New York, NY: G. Braziller.
- Bertalanffy, L. v. (1968a). *General system theory: Foundations, development, applications*. New York, NY: G. Braziller.
- Bertalanffy, L. v. (1968b). *History of the letter: From early times to 1840*. New York, NY: Braziller.
- Bertalanffy, L. v. (1968c). *Organismic psychology and systems theory*. Worcester, MA: Clark University Press.
- Boden, M. A. (2006). *Mind as machine: A history of cognitive science*. New York, NY: Clarendon Press.
- Bothwell, R. (1998). *The big chill: Canada and the Cold War*. Toronto, Ontario, Canada: Irwin Pub.
- Buck, P. (1985). Adjusting to military life: The social sciences go to war, 1941–1950. In M. R. Smith (Ed.), *Military enterprise and technological change: Perspectives on the American experience*. Cambridge, MA: MIT Press.
- Chernoff, H., & Moses, L. E. (1959). *Elementary decision theory*. New York, NY: Wiley.
- Cohen-Cole, J. (2009). Cold War salons, social science, and the cure for modern society. *Isis*, 100, 219–262. <http://dx.doi.org/10.1086/599554>
- Cohen-Cole, J. N. (2014). *The open mind: Cold War politics and the sciences of human nature*. Chicago, IL: The University of Chicago Press.
- Coombs, C. H., Dawes, R. M., & Tversky, A. (1970). *Mathematical psychology: An elementary introduction*. Englewood Cliffs, NJ: Prentice Hall.
- Cravens, H. (2012). Column right, march! Nationalism, scientific positivism, and the conservative turn of the American social sciences in the Cold War era. In M. Solovey & H. Cravens (Eds.), *Cold War social science: Knowledge production, liberal democracy, and human nature* (pp. 117–135). New York, NY: Palgrave MacMillan.
- Cyert, R. M., Feigenbaum, E. A., & March, J. G. (1959). Models in a behavioral theory of the firm. *Behavioral Science*, 4, 81–95. <http://dx.doi.org/10.1002/bs.3830040202>
- Davidson, M. (1983). *Uncommon sense: The life and thought of Ludwig von Bertalanffy (1901–1972)*. Los Angeles, CA: J. P. Tarcher.
- Dawson, M. R. W. (2013a). A case study in Gantt charts as historiophoty: A century of psychology at the University of Alberta. *History of Psychology*, 16, 145–157. <http://dx.doi.org/10.1037/a0031079>

- Dawson, M. R. W. (2013b). *Mind, body, world: Foundations of cognitive science*. Edmonton, Canada: Athabasca University Press.
- Dawson, M. R. W., Baerveldt, C., Shillabeer, E., & Richard, V. (2018). *Training scientific generalists: Joseph R. Royce, Ludwig von Bertalanffy, and the "Seminar in Theoretical Psychology."* Manuscript submitted for publication.
- DeFleur, M. L., & Larsen, O. N. (1958). *The flow of information*. New York, NY: Harper.
- DeFleur, M. L., & Larsen, O. N. (1987). *The flow of information: An experiment in mass communication*. New Brunswick, NJ: Transaction Books.
- Engerman, D. C. (2009). *Know your enemy: The rise and fall of America's Soviet experts*. Oxford, United Kingdom: Oxford University Press.
- Engerman, D. C. (2010). Social science in the Cold War. *Isis*, *101*, 393–400. <http://dx.doi.org/10.1086/653106>
- Engerman, D. C. (2012). The rise and fall of wartime social science: Harvard's Refugee Interview Project, 1950–1954. In M. Solovey & H. Cravens (Eds.), *Cold War social science: Knowledge production, liberal democracy, and human nature* (pp. 25–43). New York, NY: Palgrave MacMillan.
- Erickson, P., Klein, J. L., Daston, L., Lemov, R. M., Sturm, T., & Gordin, M. D. (2013). *How reason almost lost its mind: The strange career of Cold War rationality*. Chicago, IL: The University of Chicago Press. <http://dx.doi.org/10.7208/chicago/9780226046778.001.0001>
- Gardner, H. (1984). *The mind's new science*. New York, NY: Basic Books.
- Gigerenzer, G. (1989). *The empire of chance: How probability changed science and everyday life*. Cambridge, United Kingdom: Cambridge University Press. <http://dx.doi.org/10.1017/CBO9780511720482>
- Hammond, D. (2003). *The science of synthesis: Exploring the social implications of general systems theory*. Boulder: University Press of Colorado.
- Hare, A. P., Borgatta, E. F., & Bales, R. F. (1965). *Small groups: Studies in social interaction* (Rev. ed.). New York, NY: Knopf.
- Hauserman, C. P., & Stick, S. L. (2005). The history of post-secondary finance in Alberta—An analysis. *Canadian Journal of Educational Administration and Policy*, *42*, 1–25.
- Holland, J. H. (1992). *Adaptation in natural and artificial systems*. Cambridge, MA: MIT Press.
- Holland, J. H. (2012). *Signals and boundaries: Building blocks for complex adaptive systems*. Cambridge, MA: MIT Press.
- Horowitz, I. L. (1966). The life and death of Project Camelot. *American Psychologist*, *21*, 445–454. <http://dx.doi.org/10.1037/h0021152>
- Isaac, J. (2007). The human sciences in Cold War America. *Historical Journal*, *50*, 725–746. <http://dx.doi.org/10.1017/S0018246X07006334>
- Isaac, J. (2012a). Epistemic design: Theory and data in Harvard's Department of Social Relations. In M. Solovey & H. Cravens (Eds.), *Cold War social science: Knowledge production, liberal democracy, and human nature* (pp. 79–95). New York, NY: Palgrave MacMillan.
- Isaac, J. (2012b). *Working knowledge: Making the human sciences from Parsons to Kuhn*. Cambridge, MA: Harvard University Press. <http://dx.doi.org/10.4159/harvard.9780674065222>
- Jung, R. (1988). Systems profile: The structure of social action: In memory of Talcott Parsons. *Systems Research*, *5*, 255–259. <http://dx.doi.org/10.1002/sres.3850050308>
- Jung, R. (2006). Thinking about experience and action. *Kybernetes*, *35*, 347–359. <http://dx.doi.org/10.1108/03684920610653665>
- Kauffman, S. A. (1995). *At home in the universe: The search for laws of self-organization and complexity*. New York, NY: Oxford University Press.
- Koch, S. (1951). Theoretical psychology, 1950: An overview. *Psychological Review*, *58*, 295–301. <http://dx.doi.org/10.1037/h0055768>
- Koch, S. (1959). *Psychology: A study of a science*. New York, NY: McGraw-Hill.
- Koch, S. (1969). Psychology cannot be a coherent science. *Psychology Today*, *3*, 64–68.
- Luce, R. D. (1959). *Individual choice behavior*. New York, NY: Wiley.
- Meadows, D. H., & Wright, D. (2008). *Thinking in systems: A primer*. White River Junction, VT: Chelsea Green Pub.
- Mirowski, P. (1989). *More heat than light: Economics as social physics, physics as nature's economics*. Cambridge, United Kingdom: Cambridge University Press. <http://dx.doi.org/10.1017/CBO9780511559990>

- Mos, L. P. (1983). *Self-report study: Center for Advanced Study in Theoretical Psychology* (142, Accession No. 2006). Edmonton, Canada: University of Alberta Archives.
- Mos, L. P. (1990). Royce, Joseph R. (1921–1989). *American Psychologist*, *45*, 1170. <http://dx.doi.org/10.1037/h0090811>
- Mos, L. M., & Kuiken, D. (1998). Theoretical psychology at the University of Alberta 1965–1998. *History and Philosophy of Psychology Bulletin*, *10*, 3–12.
- Neumann, J., & Morgenstern, O. (1944). *Theory of games and economic behavior* (60th anniversary ed.). Princeton, NJ: Princeton University Press.
- Newell, A., Shaw, J. C., & Simon, H. A. (1958). Elements of a theory of human problem solving. *Psychological Review*, *65*, 151–166. <http://dx.doi.org/10.1037/h0048495>
- Newell, A., & Simon, H. A. (1961). Computer simulation of human thinking. *Science*, *134*, 2011–2017. <http://dx.doi.org/10.1126/science.134.3495.2011>
- Parsons, T. (1938). The role of theory in social research. *American Sociological Review*, *3*, 13–20. <http://dx.doi.org/10.2307/2083507>
- Parsons, T. (1948). The position of sociological theory. *American Sociological Review*, *13*, 156–171. <http://dx.doi.org/10.2307/2087030>
- Parsons, T. (1950). The prospects of sociological theory. *American Sociological Review*, *15*, 3–16. <http://dx.doi.org/10.2307/2086393>
- Parsons, T., & Shils, E. (1951). *Toward a general theory of action*. Cambridge, MA: Harvard University Press. <http://dx.doi.org/10.4159/harvard.9780674863507>
- Pouvreau, D. (2009). *The dialectical tragedy of the concept of wholeness: Ludwig von Bertalanffy's biography revisited*. Litchfield Park, AZ: ISCE Pub.
- Powell, A., & Royce, J. R. (1981a). An overview of a multifactor-system theory of personality and individual differences. I. The factor and system models and the hierarchical factor structure of individuality. *Journal of Personality and Social Psychology*, *41*, 818–829. <http://dx.doi.org/10.1037/0022-3514.41.4.818>
- Powell, A., & Royce, J. R. (1981b). An overview of a multifactor-system theory of personality and individual differences: III. Life span development and the heredity-environment issue. *Journal of Personality and Social Psychology*, *41*, 1161–1173. <http://dx.doi.org/10.1037/0022-3514.41.6.1161>
- Restle, F. (1971). *Mathematical models in psychology: An introduction*. Baltimore, MD: Penguin Books.
- Restle, F., & Greeno, J. G. (1970). *Introduction to mathematical psychology*. Reading, MA: Addison Wesley.
- Rohde, J. (2012). From expert democracy to beltway banditry: How the antiwar movement expanded the military-academic-industrial complex. In M. Solovey & H. Cravens (Eds.), *Cold War social science: Knowledge production, liberal democracy, and human nature* (pp. 137–153). New York, NY: Palgrave MacMillan.
- Rohde, J. (2013). *Armed with expertise: The militarization of American social research during the Cold War*. Ithaca, NY: Cornell University Press. <http://dx.doi.org/10.7591/cornell/9780801449673.001.0001>
- Ross, D. (1991). *The origins of American social science*. Cambridge, United Kingdom: Cambridge University Press.
- Royce, J. R. (1957a). Factor theory and genetics. *Educational and Psychological Measurement*, *17*, 361–376. <http://dx.doi.org/10.1177/001316445701700304>
- Royce, J. R. (1957b). Toward the advancement of theoretical psychology. *Psychological Reports*, *3*, 401–410. <http://dx.doi.org/10.2466/pr0.1957.3.h.401>
- Royce, J. R. (1963a). *Factorial invariance as an approach to interspecies comparisons*. Paper presented at the American Psychological Association Symposium on Interspecies Comparison of Behavior, Philadelphia, Pennsylvania.
- Royce, J. R. (1963b). Factors as theoretical constructs. *American Psychologist*, *18*, 522–528. <http://dx.doi.org/10.1037/h0044493>
- Royce, J. R. (1964). *The encapsulated man: An interdisciplinary essay on the search for meaning*. Princeton, NJ: Van Nostrand.
- Royce, J. R. (1965a). *Psychology and the symbol*. New York, NY: Random House.
- Royce, J. R. (1965b). Psychology at the crossroads between the sciences and the humanities. In J. R. Royce (Ed.), *Psychology and the symbol* (pp. 3–25). New York, NY: Random House.

- Royce, J. R. (1966). Factorial studies in comparative-physiological psychology. In R. B. Cattell (Ed.), *Handbook of multivariate experimental psychology* (p. xxxi). Chicago, IL: Rand McNally.
- Royce, J. R. (1970a). Prologue. In J. R. Royce (Ed.), *Toward unification in psychology* (pp. 1–7). Toronto, Canada: University of Toronto Press.
- Royce, J. R. (1970b). *Toward unification in psychology*. Toronto, Canada: University of Toronto Press.
- Royce, J. R. (1973). *Multivariate analysis and psychological theory*. London, United Kingdom: Academic Press.
- Royce, J. R. (1975). *Transcript of taped interview with Joseph Royce conducted by C. R. Myers, C. P. A. Archivist, 1975–1976* (77, Accession No. 86–87). Edmonton, Canada: University of Alberta Archives.
- Royce, J. R. (1978). The life style of a theory-oriented generalist in a time of empirical specialists. In T. S. Krawiec (Ed.), *The psychologists* (pp. 222–259). New York, NY: Oxford University Press.
- Royce, J. R. (1979). Toward a viable theory of individual differences. *Journal of Personality and Social Psychology*, *37*, 1927–1931. <http://dx.doi.org/10.1037/0022-3514.37.10.1927>
- Royce, J. R. (1981). A personal portrayal of von Bertalanffy, Ludwig (1901–1972): System theorist and interdisciplinary scholar at the University of Alberta. *Journal of the History of the Behavioral Sciences*, *17*, 340–342. [http://dx.doi.org/10.1002/1520-6696\(198107\)17:3<340::AID-JHBS2300170305>3.0.CO;2-K](http://dx.doi.org/10.1002/1520-6696(198107)17:3<340::AID-JHBS2300170305>3.0.CO;2-K)
- Royce, J. E. (1986). Philosophical issues and the founding of Division 24, American Psychological Association. *Journal of the History of the Behavioral Sciences*, *22*, 321–323. [http://dx.doi.org/10.1002/1520-6696\(198610\)22:4<321::AID-JHBS2300220403>3.0.CO;2-9](http://dx.doi.org/10.1002/1520-6696(198610)22:4<321::AID-JHBS2300220403>3.0.CO;2-9)
- Royce, J. R., Bertalanffy, L. v., Tennessen, H., & Weckowicz, T. (1963). *Memo to Vice President (Academic) Herbert Stoker Armstrong requesting the establishment of a Center for Advanced Study in Theoretical Psychology* (1264, Accession No. 86–87). Edmonton, Canada: University of Alberta Archives.
- Royce, J. R., & Mos, L. P. (1979). *Theoretical advances in behavior genetics*. Alphen aan den Rijn, the Netherlands: Sijthoff & Noordhoff.
- Royce, J. R., & Mos, L. P. (1981). *Humanistic psychology: Concepts and criticisms*. New York, NY: Plenum Press. <http://dx.doi.org/10.1007/978-1-4684-1071-6>
- Royce, J. R., & Powell, A. (1981). An overview of a multifactor-system theory of personality and individual differences. 2. System dynamics and person-situation interactions. *Journal of Personality and Social Psychology*, *41*, 1019–1030. <http://dx.doi.org/10.1037/0022-3514.41.5.1019>
- Royce, J. R., & Rozeboom, W. W. (1972). *The psychology of knowing*. New York, NY: Gordon and Breach.
- Rozeboom, W. W. (1956). Mediation variables in scientific theory. *Psychological Review*, *63*, 249–264. <http://dx.doi.org/10.1037/h0043718>
- Rozeboom, W. W. (1966). *Foundations of the theory of prediction*. Homewood, IL: Dorsey Press.
- Rozeboom, W. W. (2013). *Scientific inference: The myth and the reality: Selected papers of William W. Rozenbloom* (E. e. Mac Aogáin, Ed.). Dublin, Ireland: Original Writing.
- Sewell, W. H. (1989). Some reflections on the golden age of interdisciplinary social psychology. *Annual Review of Sociology*, *15*, 1–16. <http://dx.doi.org/10.1146/annurev.so.15.080189.000245>
- Solovey, M. (2001). Project Camelot and the 1960s epistemological revolution: Rethinking the politics-patronage-social science nexus. *Social Studies of Science*, *31*, 171–206. <http://dx.doi.org/10.1177/0306312701031002003>
- Solovey, M. (2012). Cold War social science: Specter, reality, or useful concept? In M. Solovey & H. Cravens (Eds.), *Cold War social science: Knowledge production, liberal democracy, and human nature* (pp. 1–22). New York, NY: Palgrave MacMillan. http://dx.doi.org/10.1057/9781137013224_1
- Solovey, M. (2013). *Shaky foundations: The politics-patronage-social science nexus in Cold War America*. New Brunswick, NJ: Rutgers University Press.
- Solovey, M., & Cravens, H. (2012). *Cold War social science: Knowledge production, liberal democracy, and human nature* (1st ed.). New York, NY: Palgrave Macmillan. <http://dx.doi.org/10.1057/9781137013224>
- Stam, H. J. (2004). Unifying psychology: Epistemological act or disciplinary maneuver? *Journal of Clinical Psychology*, *60*, 1259–1262. <http://dx.doi.org/10.1002/jclp.20069>

- Šubrt, J. (2014). Neobyčejný život a dílo Richarda Junga se uzavřely [The extraordinary life and work of Richard Jung concluded, his works published, professor]. *Sociologicky Casopis—Czech Sociological Review*, *50*, 285–287.
- Szanton, D. L. (2004). *The politics of knowledge: Area studies and the disciplines*. Berkeley, CA: University of California Press.
- Williams, R. J., & Tyler, R. W. (1956). What is behavioral science? *Science*, *124*, 276–277. <http://dx.doi.org/10.1126/science.124.3215.276-a>

Received November 8, 2017

Revision received June 16, 2018

Accepted June 26, 2018 ■

E-Mail Notification of Your Latest Issue Online!

Would you like to know when the next issue of your favorite APA journal will be available online? This service is now available to you. Sign up at <https://my.apa.org/portal/alerts/> and you will be notified by e-mail when issues of interest to you become available!