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The mission of the *Journal of Multidisciplinary Research* is to promote excellence by providing a venue for academics, students, and practitioners to publish current and significant empirical and conceptual research in the arts; humanities; applied, natural, and social sciences; and other areas that tests, extends, or builds theory.

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## Editorial

Dear Colleagues,

The father of quality control, W. Edwards Deming, championed the idea of “improvement is a never ending process.” It is a corporate cultural approach to quality improvement. At the *Journal of Multidisciplinary Research* (JMR), we greatly believe in this approach, and we would like to share the exciting news that we are continually increasing the JMR’s worldwide footprint and impact. It is now included in five more worldwide research indexing sources and organizations: [Microsoft Academic](#) (USA), [Directory of Open Access Resources \(ROAD\)](#) (USA), [ACNP](#) (University of Bologna, Italy), [CIRC](#) (University of Granada, Spain), and [CORE](#) (The Open University, UK).

This Volume 12, Number 1, edition of the JMR features five thought provoking collaborative research papers from around the globe. An article from Yale University introduces an integrated method and tools to diverse problem solving across many different contexts. An article from Ohalo Academic College in Israel discusses politics and management strategies for Israel’s national football team during the early years of statehood. A collaborative study from Florida State University, Troy University, Seoul National University in Korea, and Yonsei University in Korea explores how studies from the field of business have influenced sport management scholarship. A study from Florida Gulf Coast University investigates the relationship between students’ critical thinking performance and interprofessional education, as associated with their learning styles, thinking, and perceptions of the learning experience. Finally, a study from the University of Ottawa demonstrates an advance in Rabbinic genealogy and describes a new technique for the systematic analysis of civil registration records in a typical Polish town during the Nineteenth Century.

In our “Life Forward” section, we feature a captivating and interesting interview with David A. Armstrong, J.D., the 10th president of St. Thomas University and a true change agent. We also feature an interesting student article, analyzing the Boston infrastructure megaproject. In addition, we have a review of the book *From Brooklyn to the Battle of the Bulge* by Bramson.

As we “restart” the year 2020 due to the Coronavirus, I wanted to share a quote by President Ronald Reagan: “Live simply, love generously, care deeply, speak kindly, leave the rest to God.”

Wishing you a happy, healthy, productive, and successful 2020!

Onward,

Hagai Gringarten, Ph.D.

*Publisher & Editor-in-Chief*



“Life”  
2012

Photography by G. Delville

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# **My Standpoint and Work as a University Professor and Pragmatic, Applied Change Agent**

**Susan G. Clark**  
*Yale University*

## Abstract

I teach integration (via interdisciplinarity) in the academy and apply the integrated method to diverse problems across many different contexts. This approach is more encompassing (holistic), fundamental (basic), and functional (relational) than what many others are using. I describe and illustrate the operations of integrated method. I offer problem-solving as a way to bridge between what we know of human nature and society and the “fundamentals” of science and human experiences. This approach and my work can help people build the needed bridge to a better future – human dignity (justice) and environmental sustainability. I address mental (cognitive) processes, ideas, concepts, methods, pragmatism, problem-solving, communication, organization, differentiation, pattern recognition, learning, and other subjects with students – all are matters of form, not substance. Convention, the everyday, ordinary way of self-referential thinking mixed with disciplinary knowledge, and deep personal, existential, and developmental factors can get in the way of teaching and learning integrated problem solving. It is, therefore, a challenge for me to get young students, inexperienced would-be professionals, and new colleagues, some well-established, to recognize and think with the concepts, thoughts, and applications that are central to integrated problem solving. The integrated approach can help us address growing environmental and social problems.

*Keywords:* integrated problem solving, human dignity (justice), values, teaching, education, practical applications, standpoint, sustainable development

## **Introduction**

This article introduces the way I try to teach, communicate, and work, and my experiences and thinking behind these activities. I introduce some of the most important and useful verbal and mental (cognitive) tools of problem-solving. These tools guide systematic thinking for achievements of important goals, both personal and social (e.g., human dignity [justice], democracy, healthy biologically-rich environments). These concepts and methods follow. Typical anonymous feedback from students often comes in like these from three

different students: “I learned more in your classes than I learned in any class I ever took in college or graduate school. For that, I am forever grateful.” “I wanted to send a note to let you know how grateful I am to have had the opportunity to learn from you and with you over the last two years. Your classes will be far and away the most valuable thing that I take away from my time here at FES.” And, “I’ve found the course to be one of the most compelling classes I’ve taken so far in my time at....”

This form of systematic thinking goes by different labels – the “policy sciences,” “integrative or interdisciplinary problem solving,” “the configurative approach,” and the “New Haven School of Jurisprudence,” among them (Lasswell, 1970; Brunner, 1996). Practically employing the integrative skills I use requires the use of these mental and verbal tools on the objects by which problem-solving applied. Describing, explaining, and showing how to use it practically to some people is a little like trying to tell someone about a new language, a different way of thinking and working – sometimes, it is easy, and other times, less so. I draw on the published literature on the policy sciences over the last 100 years to describe my teaching and work (e.g., Lasswell & Kaplan, 1950/2014).

I offer a four-part introduction to the integrative approach below for people who want to learn and skillfully address problems are of concern to them. I draw on the wisdom of Professor Harold D. Lasswell (1971; and others) who said the following:

To some extent, we are all blind, and no doubt will remain so. But there are degrees of impairment, and so far as decision outcomes are concerned, it is the responsibility of the policy scientist to assist in the reduction of impairment. (p. 40)

My work strives to bring about effective decisions supporting human dignity (justice) in healthy environments – in the common interest. This is perhaps the best reason to learn the integrative approach, so we can “reduce impairment” that currently impedes goal attainment. I elaborate on this perspective, method, and experience; give examples; and offer further readings throughout this essay.

### **My Work in the Integrative Sciences**

I am interested in problem-solving. The approach I use comes from millennia of hard won human experience designed to minimize “impairment” in our judgments. The integrative approach to problem-solving more recently comes from many decades of experience, practice, and learning by many people (see Brunner, 2006.) Today, this is available for any of us to learn and use. This great body of experience, concept, and method stands in marked contrast to the everyday or conventional approach and other partial approaches in wide use currently in many of the disciplines, on the job situations, and in many college and university programs, and in everyday use by the public.

### **My Approach**

What is it that I do in my teaching and work that is often helpful (not always though), yet is different from conventional (the everyday, notion of “common sense”) and many single disciplinary approaches? We know firsthand about the everyday because we live in it all the time and we know about how people understand knowledge in most of academia in disciplines. The

answer to the question above is – I use an approach that is more encompassing (holistic), fundamental (basic), and functional (relational) than what many people are using. I use this approach with prospective students, colleagues in the agencies and NGO organizations, and elected officials and friends who face challenges that puzzle them. These people find that my approach opens up new ways of understanding about our environmental and social dilemmas and what to do about the problems we face. The integrative approach takes us, that is ourselves (each of us), as knowing agents into account. It helps us to clarify our standpoint, and at the same time, it helps us map the social context of our work. By context, I mean the social and decision processes really at play. It also offers other guides to effective problem solving, including a rational strategy for problem orientation. In so doing, it helps us understand the challenges we face in both conventional (everyday, disciplinary) and functional (relational) terms and importantly, in practical terms (Lasswell & McDougal, 1992; Brunner, 2010).

Second, the individual and the personal challenge we face, noted Antonio Damasio (2018), the great neuroscientist, is that, “Intending to tell a story about the substance and consequences of human feeling [and thinking], I came to recognize that our ways of thinking about mind and cultures are *out of tune with biological reality*” (emphasis added; p. 6). The integrative approach I use helps us understand and address such “out of tune” problems (e.g., maladaptive, given climate change, biodiversity loss, and growing social problems).

Third, the integrative perspective is highly practical (i.e., problem-oriented, contextual, multi-method, and self-aware). Conventional and disciplinary approaches typically do not attend to these tasks explicitly or systematically. Nevertheless, both convention and the disciplines are deeply institutionalized throughout our society and in the academy – both of which take them to be the best problem-solving approach. In fact, both typically use them as the only way to problem-solve (Kronman, 2007). Yet, that approach often comes up short when in use with complex socio-ecological problems. I have personally and professionally seen many examples of well-meaning conventional and disciplinary (and government and nongovernmental) efforts leading to overlooked blind spots, omissions, and unintended consequences. The integrative approach is our best alternative to convention and the disciplines alone.

Another reason I did this essay is I find that clarifying and re-clarifying my own standpoint (over and over again to myself and communicating it to others in the face of the hegemony of convention and the disciplines, and their often times limited epistemologies) is increasingly important to me as a means of keeping my perspective in our ever-devolving (“de-developing”), complex, and troubling world that we live in currently. As a teacher, I agree with Jean Piaget (1973) who talked about the job of a teacher in such contexts:

It is obvious that the teacher as organizer remains indispensable in order to create the situations and construct the initial devices, which present useful problems to the child [students, adults]. Secondly, he [she] is needed to provide counter-examples that compel reflection and reconsideration of over-hasty [premature] solutions. What is desired is that the teacher cease being a lecturer, satisfied with transmitting ready-made solutions; his [her] role should rather be that of a mentor stimulating initiative and research. (p. 16)

## My Goals

I work for enduring human dignity (justice) in healthy environments. My overriding interest is in building a bridge between the facts of life and human behavior for a better world. I

want to know about the nature of pattern and order in our daily living and social organization over time given the dynamic environment, both human and natural. We must never forget that we are heirs to a great historic movement for human freedom and solidarity that is centuries long. This historic trend derives from the great revolutions (e.g., American, French, English) and the events that set this movement in train.

These basic human demands everywhere are for respect of the individual and the shaping and sharing of all values people seek (i.e., security). Demands range from rudimentary to sophisticated, but all focus on demands for individual freedom from despotism. Despotism takes the form of leaders, institutions, and functions of government and society that are coercive. Today, there is a powerful and growing insistence upon “human rights” as a way to talk about human dignity, as I use it here – about demands for effective participation in all social value processes. Also, there is a growing demand for the wide sharing in all the values upon which even minimal civil liberties depend (Claude, 1977). The human dignity (justice) goal, thinking to support it, and my work and that of a great many others is clear.<sup>1</sup>

It is clear that different peoples at different times and contexts (varying cultural traditions) have used different modes of social organization to make demands for human dignity. History shows there is an overriding insistence across all cultures and locations for the greatest production and widest distribution of all base values (Lasswell & Kaplan, 1950/2014). Calls for a world public order for human dignity, codified in many international and national constitutions, conventions, and agreements, has a long history. The current public order tolerates wide differences in the specific practices by which people seek and enjoy values in terms of common interests.

The present rising common demands for human dignity include demands for fundamental freedom of choice for all individuals regarding participation in all value processes. It includes effective equality of opportunity first in the face of discriminations based on race (skin color), sex, gender, religion, political views, language, and other categories unrelated to capabilities. It includes a social environment that affords a situation and condition for human dignity. It includes distinctive contributions to the common interest. It includes an aggregate pattern of social interactions in which all individuals and groups receive protection from discrimination and coercion from government and in civil society. It includes participation in the shaping and sharing of respect, both individually and in groups. It also includes many other demands, such as demands for respect in all aspects of life. Finally, it includes demands relating to power, enlightenment, well-being, wealth, affection, and rectitude.

In conclusion, human dignity (justice) is a common goal in human affairs. It is in the 1948 United Nations Universal Declaration of Human Rights and many other constitutions, declarations, and conventions worldwide over the centuries. Human dignity arises from respect for the value of the individual, equal treatment under the law, individual freedom, and social

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<sup>1</sup> Clark, S. G., & Mattson, D. J. (2011). Human dignity and diversity training: Clarifying standards and practices. *Mother Pelican: Journal of Sustainable Human Development* 7(2), 1-15. Clark, S. G., Woodruff, K., Price, S., Rodriguez-Olleiro, M. A. M., & Mattson, M. A. M. (2011). A community's struggle to deal with diversity issues: An incident analysis with recommendations. *Mother Pelican: A Journal of Sustainable Human Development*, 7(6), 1-26. Mattson, D. J., & Clark, S. G. (2011). Human dignity in concept and practice. *Policy Sciences* 44, 303-320. McDougal, M. S., Lasswell, H. D., & Chen, L. (1980). *Human rights and world public order: The basic policies of an international law of human dignity*. New Haven, CT: Yale University. Nagan, W. P. 2013. *Contextual-Configurative Jurisprudence: The Law, Science, and Policies of Human Dignity*. Lake Mary, FL: Vandeplass Publishing.

justice. However, applying this principle in practice is problematic in many contexts. For example, using a narrow conventional “diversity” or “inclusion” concept based on a group’s self-identities, external appearance, history, and allocations of power or current level of political agitation can obscure the more comprehensive, basic human dignity construct and be counter-productive to securing justice for all. Given this, I seek to help individuals and communities foster dignity through increased respect, greater freedom of choice, and enhanced mutual deference. Personally, I seek to clarify and secure human dignity in healthy environments in the common interest, as a goal in all of my work – teaching, communication, and applications, as well as in my thinking and writing.

## Problem Solving

It seems obvious to me that we must realistically understand the actual problem at hand before we can begin to think or promote about how to address it. To understand the problem first is about “connecting the dots” – from experience and data, to use an old metaphor. The fact is we need a tried and true method to connect the dots and thus avoid the traps of conventional thinking, political self-interest, and disciplinary narrowness, if we are to minimize our own “impairment.”

It is interesting that thinking about what problem-solving is and how to do it almost immediately takes us backwards to thinking about whom people are, what we value, and much more. That’s how it is with problem-solving. To go forwards, you generally have to go backwards, especially to begin with. This is because when people start to think about anything in any great depth, they usually start halfway up some very shallow, very muddy conceptual polluted creek. The creek is an obscure, overgrown place they have drifted into over the years as a result of making various conventional (assumed, expedient, unexamined) assumptions they have not thought much about.

In thinking about real-world problems – I use the integrative (or policy sciences configurative) approach that is almost a century old (examples below). This approach comes from human experience, mixed inductive/deductive reasoning, and focuses on matters of major importance to us (e.g., human dignity, common interest, adaptability).<sup>2</sup>

Reference to this approach is in footnotes 1 and 2. First, the approach involves using a meta-framework systematically designed to facilitate understanding, experience, and integration. Integration is about “connecting the dots,” seeing the whole picture, so to speak to help us make sound policy, learn, and successfully adapt. The framework offers a view of what to integrate in a practical and comprehensive manner. To be more explicit, what are the “dots”? The framework offers variables and questions to research and understand. The data one finds are the “dots.” I introduce the framework below. My colleagues in diverse fields worldwide use this integrative approach to good effect. Overall, though, I fear few people know of this approach or use it, and, often reject or restrict its use out of hand, without serious inquiry.

Second, the framework asks us to answer five problem-oriented questions in all situations: what are we trying to achieve (goals), what has happened (history), why has it

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<sup>2</sup> Wilkinson, K. M., Clark, S. G., & Burch, W. R. (2007). *Other voices, other ways, better practices: Bridging local and professional environmental knowledge*. Yale School of Forestry & Environmental Studies, Report No. 14:1-58. An intermediate, but also an introductory accounting with methods, questions, and examples is: Clark, S. G. (2002). *The policy process: A practical guide for natural resource professionals*. New Haven, CT: Yale University Press.

happened (explanation), what is likely to happen (futuring), and what should we do if we are unable to achieve our goals (problem definitions, options, pragmatics)? This logical, comprehensive, interactive inquiry offers a practical way to ask and answer questions about problematic situations, no matter the subject or context or perspective on the problem. I use this five-part problem-oriented strategy empirically in all cases to guide my work. In contrast, few people attend to these five tasks iteratively, empirically, or consciously. Most people assume they know the problem right off and do not need to talk about it and thus jump right to promoting some action they see as a solution. Typically, in convention, and even in the disciplines, there is a gross mismatch between the actual problem at hand and what is promoted.

Third, I approach problematic situations by asking what is the relationship among the people involved, what is it that they value in their group, or community, or society (or combination thereof), as they use and affect both raw and cultural resources at hand. This allows me to get data on the social and decision-making value-laden process involved. This is an empirical and data-based approach. It stands in contrast to disciplinary and conventional approaches that typically begin with a technical (content) focus on raw, natural resources (e.g., forest, water, soil, wildlife, air), thus rendering the problem “material” and “technical” (Miller, 2005). Most people seem focused on the physical natural resource in the environment, thus overlooking social and decision processes, value dynamics, and their own standpoint. The approach I use in contrast is genuinely interdisciplinary.

### **Teaching and Communication**

Attending to the goal of human dignity in healthy environments constantly challenges me to teach, communicate, and work effectively. By contrast, I bump into people who seek their special, assumed, or expedient interest using convention or stick to narrow disciplines or some other bounded approach that they take for granted, along with everyday notions of problem solving, action, and responsibility. In turn, these conventional and disciplinary perspectives pose challenges to effective applications of the integrative sciences.

### **My Work**

In my work, I use systematic thinking, an integrated approach directed at the achievements of goals. This requires the use of mental and verbal tools by which the objects of such thinking are achieved, as noted above. In teaching, I explore conventional, everyday notions – the taken for granted (the “Given”) about people, nature, and society, and their limitations that are wide spread in society (Sellers, 1997). As well, I dig into philosophic and existential premises (about our own meaning-making processes, our mind’s way of knowing, and our doing/behavior). I do so in the face of the domination of everyday conventional notions about people, the environment, and problem-solving on which convention and many disciplines rests. I do so in a problem-oriented (realistic, pragmatic), systematic way seeking functional understanding the case at hand (e.g., leadership in the Greater Yellowstone Ecosystem, Clark, 2008). In my teaching, I use the practicum model of education that provides students and colleagues the opportunity to learn about their own standpoint, thinking, and how they go about problem-solving. Often students and colleagues come to see the “errors/limitations” in conventional epistemology (the mind’s way of knowing the world) and in everyday ways of problem-solving. This opens the door to better problem-solving.

In my communication, I try to talk and write in a clear way. As Albert Einstein noted, I try to make things as simple as possible but not overly simple. The integrated approach makes sense to some people right off. For others it takes time. And for still others, it never makes sense. Communication is always a challenge. I try to tailor my communication to the position of knowing the person I am talking to. This is a two-way street. Understanding how things work (and how people think and make meaning) motivates me as I try to help people and make the problem-solving process more effective for them. My writing is one of the ways I go about understanding complex subjects. In the end, I write because I know that what survives is the written, published word.

In my applications, I am always pragmatic (yet principled). I start all projects grounded in the experiences and understanding of my co-workers. And at the same time, I use the framework introduced above to systematically and functionally sort through stories of the problematic situation, details of the case, and also the larger social and environmental context. In doing so, I do not rely on any one disciplinary or conventional perspective. The framework, and being somewhat self-aware of my own standpoint and method, allows me to come to both an everyday and simultaneously higher order, functional understanding of the problematic situation at hand. In turn this permits a realistic problem definition using problem orientation as noted above and this opens up practical options to address the problem at hand. My experience over the decades shows this working approach is often helpful.

Finally, underlying the above is my thinking. I see that behind many of our problems today is misperception and the only practical alternative for that is more comprehensive, realistic thinking. The meta-framework I use is a guide to the needed more systematic and empirical thinking. It offers a way to understand the challenges that we face, explanation for why they exist, and what we might do about them. My work strives to meet the highest practical standards for this kind of thinking in real-world contexts.<sup>3</sup>

This problem-solving strategy (the heuristic) is logically comprehensive as it arguably leaves out nothing in considering the human and environmental situation at hand. This heuristic takes into account both content (biophysical matters of substance) and process (people, relations, values, procedures, and decision-making patterns) of problem solving. This heuristic, really a high order meta-framework, stands in contrast to most conventional (everyday) and even disciplinary approaches. It recognizes and draws on both the disciplines and convention, yet goes far beyond what each permit to be seen and operationalized. It allows a depth and level of integration neither convention and most disciplines permit on their own. In sum, this heuristic is an approach to problem-solving, learning, and on-the-ground work that requires a well-ground method – a meta-framework.

### A Functional Approach

I use this functional approach to my work (Lasswell & McDougal, 1992, pp. 389-397). Human-environment relationships can best be understood using the integrative sciences, much

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<sup>3</sup> Interdisciplinary environmental leadership: Clark, S. G., & Wallace, R. L. (2012). Learning and teaching integrated problem-solving. In D. R. Gallagher (Ed), *Environmental leadership: A reference handbook* (pp. 420-429). Thousand Oaks, CA: Sage Publications. Integration and Interdisciplinarity: Clark, S. G., & Wallace, R. L. (2015). Concepts, frameworks, and education. *Policy Sciences*, 48(2), 233-255. College and university environmental programs as a policy problem (Part 2): Clark, S. G. et al. (2011). Strategies for improvement. *Environmental Management*, 47, 721-626.

more so than any single discipline or combination of them or just convention (McDougal, 1992-93). Whenever we apply the policy sciences to concrete circumstances, specific cases, we must make distinctions between conventional understanding and special meaning for comparative purposes. Conventional meaning often invokes terms such as “political,” “economic,” and “business.” These are not adequate if we want to go beyond conventional word use and examine likenesses and differences in process (relational) interactions – functionally. Confronting the conventional with the functional is one of the major contributions of the integrated approach.

Thinking about functional relationships in problem solving begins with four major themes – people, meaning (values), society, and environment and their relationship. Beyond the individual as discussed above, the other three variables of import in problem solving are the functional values (meaning), society (institutions), and resources (both natural and cultural), as discussed below. Keep in mind individuals have an internal environment, as well as the external one that we often think of when we use the word.

**People seek Meaning through Society using or affecting the Environment**

others	values	institutions	raw resources
self	dignity	organizations	cultural resources

A person using a functional approach explicitly examines connections among the social and decision process involved in the problematic situation at hand. The subject matter of the policy sciences is comprised by the behavior of persons with differing perspectives on action, and organized into groups of varying complexity (Lasswell & Kaplan, 1950, 1). Let me explain briefly. First, the functional approach begins with individuals – *a person*. The other three variables are discussed below in the next section. The individual human being is the basic unit of existence. We each possess interpreted data about human behavior. We use all sorts of data and theory to help us understand the individual and the continuous film record of our own behavior and that of other people. I stress the fact that “data” are not events or objects but always records, descriptions, or memories of events and objects. Always, there is (psychological and philosophic) transformation or recording of the raw event that intervenes between the scientist (and person) and the object of attention and the weight (salience) of an object. We measure our perceptions against the weight of some other object or register on our meaning “meter” (values). The human voice (perception, thinking, self-awareness, expression – words) is transformed into a kind of variable magnetization on the tape of meaning and memory. Moreover, always, and inevitably, we select data because the total universe, past and present, is not subject to our direct observation from any one given observer’s position, thus the need for standpoint clarification for observation and interpretation and comparison of observations with other people.

Second is *meaning* (functionally the values; Lasswell & Kaplan, 1950, pp. 16-28). Although values are multitudinous, they can be classified in terms of eight functional value terms that represent a comprehensive list of underlying human concerns. In no particular order, people seek values: power, respect, affection, enlightenment, skill, well-being, and rectitude. People have these values at their disposal to use in social and management policy processes and also at the same seek more of those values. People use these values as bases (e.g., power, knowledge, skill) to achieve the goals or objectives they seek (e.g., well being, respect, affection). We make meaning by struggling to obtain these and the objects of their acquisition. We enjoy them once we have them. Values and objects sought are orientations toward what is considered desirable or

preferable by individual social actors. Values, in this sense, are criteria for preference or choice (e.g., wealth, respect, well being) or as justifications for actual behavior. Development, individually and socially, refers to decision processes seeking all values in ways and with consequences approximating a good life for the individuals and a public order of human dignity.

The third is *society*. Society, and its culture, functions because of its institutions. Institutions are specialized to each of the eight functional values. Institutions are the patterns that are relatively specialized to the shaping and sharing of a principal category of values. For example, hospitals and health care institutions attend to well-being. Stock markets, Wall Street, and all markets and exchanges attend to wealth. Academia and trade schools attend to enlightenment and skill. Society is complex as everyone knows as there are many kinds of institutions attending to many values, some are specialized. Improving decision making for lasting effects requires changing institutions to best shape and share values consistent with human dignity. Conventional and disciplinary approaches often overlook this fact.

And fourth is *resources*. Resources are the raw natural items we need (e.g., water, minerals, nutrients), cultural structures (e.g., universities, government, associations), and process (e.g., democratic process, deliberation, rationality). All these can be characterized by using indices of each. The diminishing quantity and quality of the raw natural resources of the Earth, and as well cultural resources, carry profound implications for the fulfillment of human rights and other aspirations. In sum, these four factors allow me a research agenda to get data to see connections and relationships among the four classes of variables – people, values, society, and resources.

#### People, Values, Society, and Environment

I go on to elaborate on people, meaning (values), society, and environment in my teaching and research (Table 1). In contrast to convention and most of the disciplines, the integrative approach deals systematically with a focus on humans and contemporary human relationships relative to the external (and also internal) environment (nature), all in a problem-oriented and contextual way.

Table 1

*The Basic Heuristic: **People** Seek **values** through **Society** Using and Affecting Resources – The Human, Social, and Decision-Making Process*

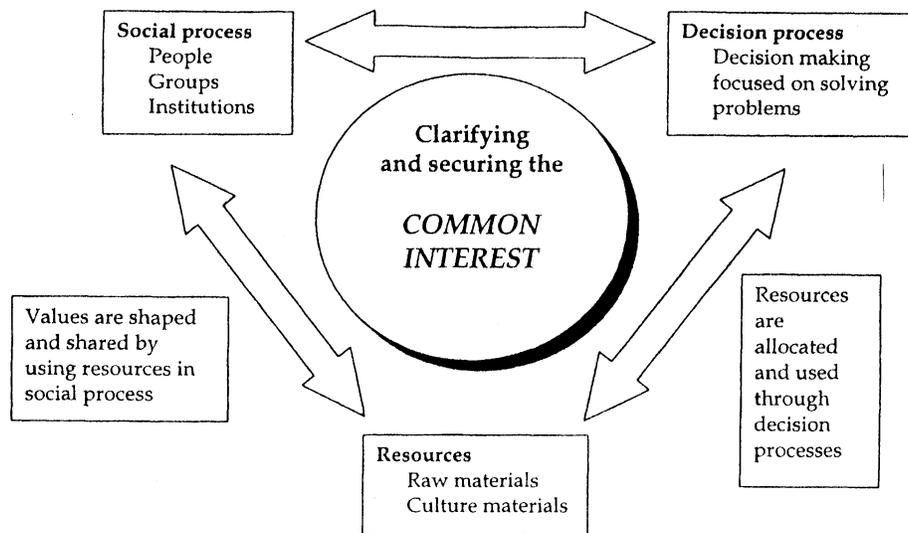
<b>People</b> (individuals)	seek <b>Meaning</b> (values)	through <b>Society</b> (institutions)	using/affecting the <b>Environment</b> (raw and cultural resources)
interacting through culture and personality	power over decisions of importance	power- government, law, political parties	soils, air, water minerals, plants animals, humans
social process	enlightenment – knowledge, information, learning	enlightenment – languages, mass media, scientific establishments	“use patterns” consumption to preservation
decision-making process	wealth – goods and services	wealth – banks, factories, farms	“use patterns” consumption to preservation
	well-being – mental and physical health	well-being – hospitals, recreational facilities	
special and common interests	skill – developing one’s talents along lines of excellence	skill – vocational, professional and art schools	for common or special interests
	affection – warm relations, positive interactions	affection – families, friendship circles	
	respect – being treated as though one matters, deference	respect – social classes and castes	
	rectitude – norms, doing right by others	rectitude – ethical and religious associations	
the meaning of crisis (existentialism) belonging purpose storytelling transcendence growth cultures of meaning	the meaning crisis (existentialism) belonging purpose storytelling transcendence growth cultures of meaning	institutions structure culture and value production and enjoyment	means to ground meaning-making for the individual and culture in specific contexts
human dignity human rights	human dignity human rights	civil public	material civil public

This four-part relationship rests on a postulate – the *Maximization Postulate*, sometimes called the optimization postulate. It states that all living forms are predisposed to complete acts in ways that are perceived to leave the actor better off than if he/she had completed them differently. Our experience shows this to be true. We also know that people misperceive often.

*Interests* (values) are at the heart of all management policy (Figure 1). There are many kinds of interests. The concepts of common and special interests are well known to most people. Interests are patterns of value demands with supporting expectations. *Common interests* are those shared widely in a community and demanded on behalf of the whole community. *Special interests* benefit only part of a community, often at the expense of the common interest. There are three *partial tests of the common interest* – rational, practical, and justified. These can be used in any situation.

Figure 1

*People Seek Values in the Social Process as they use Resources, Ideally in the Common Interest*



Finally, there is the *Principle of Contextuality*. This principle states that all things are interconnected, and the meaning of anything depends on its context. It is not that the whole is more important than the sum of its parts but that one can understand the prosperities of the parts only in the context of the whole. The policy sciences require social process mapping: participants, perspectives, values, situation, strategy, outcomes, and effects.

John Dewey (1932) commented on the common interest:

The great problem concerning ends [goals] is to discriminate between those which are “good” in a near-by and partial view, and those which are enduringly and inclusively good. The former are more obvious; the latter depend on the exercise of reflection and often can be discovered and sustained in thought only by reflection which is patient and thorough.

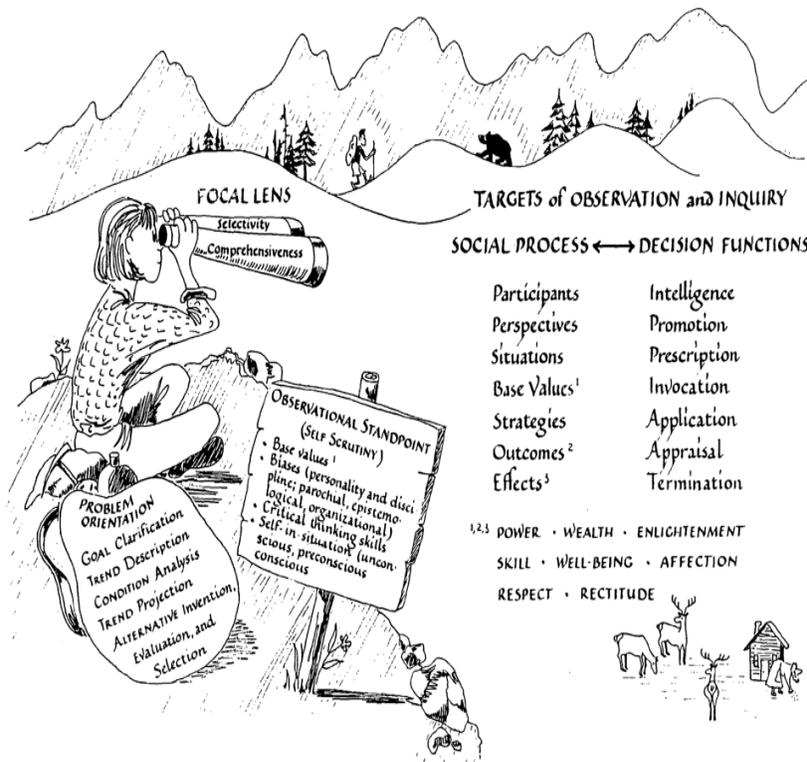
He called for the use of something like the meta-framework of the integrative sciences.

The Meta-Framework – Integrative Concept – Interdisciplinary Method

The policy sciences framework, really a meta-framework that I use includes all the variables, interests, and functional relationships introduced above. Considered to be logically comprehensive, it is a practical concept that can be used to model or “map” any actual management policy process. Just as we need maps to locate ourselves spatially in an ecosystem or in the world, we need a realistic map of the management policy (social) process in which we participate. I and many other people have used this comprehensive, practical meta-framework for decades. The meta-framework directs us to questions about the dynamics inherent in cases. Making connections creatively, efficiently, and systematically requires adequate concepts, procedures useful to any problem, and experience and skill. The meta-framework offers a way to do just that.

To communicate the integrative problem-solving heuristic is not always easy. It can be illustrated as in Figure 2 to describe what is conceived to be the tasks of the pragmatic scientist or change agent. Often this figure or others, and sometimes lists and tables, help the learner grasp the policy sciences. This diagram opens up the possibility of examining the relationship among people, values (meaning), society (institutions), and resources, both natural and cultural. The diagram offers a “what” to examine empirically as a set of relationships that go well beyond what single or multiple disciplines or convention offer (Figure 2).

Figure 2  
*An Illustration Useful to Introduce the Integrative (Policy Sciences) Approach – A Problem-oriented, Contextual, Self-aware, and Multi-method Approach*



Second, I emphasize that the main challenge of using the integrative approach lies in making conventional and functional connections among relevant knowledge scattered across conventional experiences and diverse disciplines. Data is needed on these variables to find connections. In a strict sense, no data about interpersonal and environmental relationships is truly “raw” or “real.” Every record has been somehow subjected to editing and transformation by people’s perceptual, mental, and physical instruments. Yet data are the most reliable source of information, and from data the citizen or scientist must start the understanding process. Data, hopefully reliable data, provide one’s first inspiration and the focus that we must return to over and over again if we are to see deeper below the surface of appearance, convention, and some disciplines. There are many examples of the integrative approach that can help anyone appreciate its content, scope, and range of applications.<sup>4</sup>

In sum, I use a comprehensive, integrative approach and do so systematically, explicitly, and practically. It encourages self-awareness (a clarified standpoint) and a contextual picture more so than most people conventionally come to (Brunner, 2004). There are many published cases in over a dozen countries on six continents (see below). A few examples follow about the integrated approach.

**Learning interdisciplinary problem solving and leadership skills:** Clark, S. G., & Wallace, R. L. (2010). A comparison of four designs. New Haven, CT: Yale School of Forestry & Environmental Studies, Report 14, 171-298.

**Professional Development:** Clark, S. G., Steen-Adams, M., Pfirman, S., & Wallace, R. L. (2011). Professional development of environmental scholars. *Journal of Environmental Studies and Sciences*, 1, 99-113.

**It’s Not Just About Bears:** Clark, D. A., Clark, S. G., Dowsely, M., Foote, L., Jung, T. S., & Lemelin, R. H. (2008). A problem-solving workshop on aboriginal peoples, polar bears, and human dignity. *Arctic*, 63(1), 124-127.

**Environmental Studies:** Proctor, J., Clark, S. G., Smith, K. K., & Wallace, R. L. (2013). A manifesto for theory in environmental studies and sciences. *Journal of Environmental Studies and Science*, 3(3), 331-337.

**Barriers to Interdisciplinarity in Environmental Studies:** Wallace, R. L., & Clark S. G. (2018). A case of alarming trends in faculty and programmatic wellbeing. *Issues in Interdisciplinary Studies*, 35, 221-247.

**Environmental studies and sciences in a time of chaos:** Wallace, R. L., & Clark, S. G. (2018). Problems, contexts, and recommendations, *Journal of Environmental Studies and Sciences*, 8(1), 110-113.

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<sup>4</sup> Clark, S. G. (1992). Practicing natural resource management with a policy orientation. *Environmental Management*, 16, 423-433. Clark, S. G. (1993). Creating and using knowledge for species and ecosystem conservation: Science, organizations, and policy. *Perspectives in Biology and Medicine*, 36, 497-525. Clark, S. G. (1997). Conservation biologists in the policy process: Learning how to be practical and effective. In G. K. Meffe, & C. R. Carroll (Eds), *Principles of conservation biology*, 2nd ed. (pp. 575-597). Sunderland, MA: Sinauer Associates.

As well, the meta-framework is used to organize three programs at Yale's School of Forestry and Environmental Studies: Program in Integrated Strategy for Leadership, Program in Conservation in the American West, and The Yale Large Carnivore Group. Conventional and disciplinary-based problem solvers often overlook many of the variables and functional relationships in our social interactions, including value-laden decision-making processes and their effects. In contrast, these features of human interaction are all central the meta-framework and these three examples.

### **Challenges, Applications, and Resistance**

The principle challenge working against the widespread use of the integrated approach is people (some citizens, professionals, others) who stay within the dominant mindset (the box, echo chamber, boundedness) of convention. Typically, a conventional person relies on the ordinary, everyday, taken for granted ways of understanding human-meaning-society-environmental relationships (see Lasswell & McDougal, 1992, pp. 386-398; Clark, 2002, pp. 123-125). This can mislead people to erroneous conclusions. Using convention precludes understanding the variables and functional interactions illustrated in Figure 2. The conventional perspective is often a huge problem that is in the way of getting to the depth required in actual problem solving, as called for by the integrated approach. Consequently because of convention and other forces and factors, we struggle continuously to upgrade management policy to best approximate common interest goals.

#### **Our Challenge**

Let's look at our overall challenge. In our epic struggle over the centuries to live with dignity in healthy environments, throughout the world across many different societies, we have encountered many challenges. Convention is one; a lack of knowledge and skill is another one. Our overall problems are about the shortfall between our goals (human dignity, healthy environments) and what is actually happening (ignorance, poverty, environmental destruction). Some challenges have been overcome or ameliorated over the decades, yet others are growing and need concerted attention. Yet any realistic diagnosis of the causes of the human and biophysical problems that we currently face takes us to our epistemology (our minds way of knowing) or it should.

When people do not get what they want (i.e., well being, respect, power), it is easy for them to blame somebody for their deprivation viewing themselves as victims. It is easy to blame the "system," in a general way for their problems. The view of the "system" as the problem may be satisfying for some people, but it fundamentally misstates actual causes of problems and how to address them realistically. For example, today some people turn on the "system" and claim that "colonialism, racism, and white power" or similar labels embody the basic problem for shortfalls and deprivations. Yet these labels, symbols, or slogans do not take us to the foundation of the real challenges to human dignity in healthy environments or offer what to do about them pragmatically in an enduring way. The system isn't to blame; it too is part of the same fundamental "epistemological error" that we are making common within convention and some disciplines (as described below). Realistic diagnosis of our environmental and social challenges

is critically important, and the integrated approach and its meta-framework can help, if used skillfully. These current challenges are variously presented in diverse papers by diverse authors.<sup>5</sup>

These publications are very helpful to orient us to our times. These papers, and a great many more, present the “macro” context that we are living within today, which is vital to know about to help us organize our individual and social lives. Further, there are many other accounts of our contextual situation.<sup>6</sup>

What is to be done about the range of challenges originating often from convention and epistemological errors that block our understanding of contextual matters (see Clark, 2019)? The integrative approach is invaluable to help us locate ourselves in the local to the global flow of processes and events (Lasswell & McDougal, 1992). This point was made by Machiavelli, who said in Discourses I, “Men are apt to deceive themselves upon general matters, but not so much when they come to particulars ... The quickest way of opening the eyes of the people is to find the means of making them descend to particulars, seeing that to look at things only in a general way deceives them.” As I see it, we ultimately need to address the epistemological and practical problems at the foundation of the challenges that we face today. The integrated approach might help.

### Sample Applications

Many published applications of the integrative approach exist worldwide in various countries. Here are a very few that I have been involved in across diverse subjects, locations, and situations:

**Nambia** – Muntifering, J., Clark, S. G., et al. (2015). Harnessing values creating value to save rhinos – insights from Namibia. *Oryx*. <http://doi.org/10.1017/S0030605315000769>

**China** – Chen, P., Gao, Y., Lee, A., Cering, L., Shi, K., & Clark, S. G. (2016). Human-carnivore coexistence in Qomolangma (Mt. Everest) Nature Reserve, China: Patterns and compensation. *Biological Conservation*, 197, 18-26.

**United States** – Clark, S. G., & Vernon, M. E. (2017). Elk management and policy in southern Greater Yellowstone: Assessing the constitutive process. *Policy Science*, 49, 1-22.

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<sup>5</sup> Riemen, R. (2018). *To fight against this age: On fascism and humanism*. New York, NY: W. W. Norton. Ripple, W. J., et al. (2017). World scientists' warning to humanity: A second notice. *BioScience*, 67(12), 1026-1028. White, L. (1967). The historical roots of our ecological crisis. *Science*, 155, 1203-1207. World Bank. (2016). *World development indicators 2016*. Washington, DC: World Bank. <http://doi.org/10.1596/978-1-4648-0683-4>. IGO. World Wildlife Living Planet Report. (2016). *Living planet report 2016*. Gland, Switzerland: WWF International. Techurovsky, D. (2019). Mankind at the crossroads: Civilizational shift or self-destruction. *Cadmus*, 3(6), 1-20.

<sup>6</sup> Morris, I. (2010). *Why the west rules—for now: The patterns of history, and what they reveal about the future*. New York, NY: Farrar, Straus, and Giroux. Tarnas, R. (1991). *The passion of the western mind: Understanding the ideas that have shaped our world view*. New York, NY: Ballantine Books. Trompf, G. W. (2011). A brief history of ideas from ancient philosophy. *Environmental Conservation*, 38(2), 113-126.

In fact, some scientists and citizens are partially using the integrative sciences now, often without consciousness of what they are doing. They come to it through considerable experience. Typically, they make no formal connections to the concepts and applications of the integrative sciences as described in this essay and the literature cited. In contrast, a growing number of people do use the integrative approach openly and successfully, and more formally know about it because they were taught it in the classroom or read about it in the literature.

There are many other examples by geographic region, among them:

**World** – Brunner, R. D., & Lynch, A. H. (2009). Adaptive governance: Proposals for climate change science, policy and decision making. In *Adaptation and mitigation strategies for climate change* (pp. 269-284). Tokyo, Japan: Springer.

**United States** – Steelman, T., & DuMond, M. E. (2009). Serving the common interest in U.S. Forest Policy: A case study of the Healthy Forest Restoration Act. *Environmental Management*, 43, 396-410.

**Africa** – Ashcer, W. (1998). Strategies of influence for the conservation of the Sangha River Basin: Insights from the policy science. *Yale F&ES Bulletin*, 102, 259-271.

Eves, H. E., Hardin, R., & Rupp, S., eds. (2009). *Resource use in the Trinational Sangha River region of Equatorial Africa: Histories, knowledge, forms, and institutions*. *Yale F&ES Bulletin*, 102, 8-29.

**Australia** – Mattson, Z. (2018). In the common interest: water policy and reform in Australia's Murray-Darling Basin. Department of Earth, Environmental, and Planetary Sciences at Brown University, Rhode Island.

**Asia** – Gao, Y., & Clark, S. G. (2014). Elephant ivory trade in China: Trends and drivers. *Biological Conservation*, 180, 23-30.

**Europe, Central and South America** – Martin, M., & Clark, S. G. (2018). Adaptive governance and the art of conflict resolution (In Spanish). Book In Press.

**Arctic** – Norchi, C., & Mauewski, P. A. (2017). The arctic: Science, law, and policy. *Ocean and Coastal Law Journal*, 22(2), 97-110.

And there are publications using the integrative approach on large, encompassing subjects too, for example:

**Human Dignity (Justice)** – Lim, T. Y. (2013). Only one world: Challenges & possibilities for sustainable development. Paper won the Society of Policy Scientists 2013 Graduate/Professional Student Paper Prize.

**Marginalization of People** – Brown, S. R. (2006). A match made in heaven: A marginalized methodology for studying the marginalized. *Quality & Quantity*, 40, 361-382.

- Ecology of Science** – Byerly, R., Jr., & Pielke, Jr., R. A. (2006). The changing ecology of United States science. *Science*, 269(5230), 1531-1532.
- Climate Change** – Lynch, A. H., & Brunner, R. D. (2010). Learning from climate variability: Adaptive governance and the Pacific ENSO Applications Center. *Weather & Climate Society*, 2(4), 311-319.
- Lynch, A. H., & Brunner, R. D. (2010, February). And working at the boundary: Facilitating interdisciplinarity in climate change adaptation research. *American Meteorological Society*, 169-179.
- Water Management Policy** – Bischoff-Mattson Z., & Lynch, A.H. (2017). Integrative governance of environmental water in Australia's Murray-Darling Basin: Evolving challenges and emerging pathways. *Environmental Management*, 60(1), 41-56.
- Biodiversity** – Cherney, D. (2011). Securing the free movement of wildlife: Lessons from the American West's longest land mammal migration. *Environmental Law*, 41, 599-617.
- Development** – Reisman, W. M. (2008). Development and nation-building: A framework for policy-oriented inquiry. *Maine Law Review* 60(2), 310-315.
- Science and Social Responsibility** - Brunner, R. D., & Ascher, W. (1992). Science and social responsibility. *Policy Sciences*, 25(3), 295-331.
- Science Politics and Policy** - Pielke, Jr., R. A. (2007). *The honest broker: Making sense of science in policy and politics*. New York, NY: Cambridge University Press.
- Endangered Species** - Cromley, C. M. (2000). The killing of grizzly bear 209: Identifying norms for grizzly bear management. In S. G. Clark, A. R. Willard, & C. M. Cromely (Eds), *Foundations of natural resources and management* (pp. 173-220). New Haven, CT: Yale University Press.
- Planning** – Muth, R., & Bolland, J. M. (1983). Social context: A key to effective problem-solving. *Planning & Changing*, 14(4), 214-225.
- Future Studies** – Ascher, W. (2009). *Bringing in the future: Strategies for farsightedness and sustainability in developing countries*. Chicago, IL: University of Chicago Press.
- Common Resources** – Auer, M. (2006). Contexts, multiple methods, and values in the study of common-pool resources. *Journal of Policy Analysis and Management*, 25(1), 215-227.

**University Education and Experts** – Terway, T.M. (2018). *Sustained in significance with(out) context and ourselves: Expert environmental knowledge and 'social-ecological systems.'* Ph.D. Thesis, Yale University, CT.

**Decision Making** – Auer, M. (2017). Rescuing the decision process. *Policy Sciences*, 50(4), 519-526.

**Wisdom** – Etheredge, L. S. (2005). Wisdom in public policy. In R. J. Sternberg, & J. Jordan (Eds), *A handbook of wisdom: Psychological perspectives* (pp. 297-328). New York, NY: Cambridge University Press.

There are many more articles and books available that use and illustrated benefits of the integrative approach. Despite a vast and growing literature, too few people have heard of the integrative approach or experienced its benefits, given the opportunity to use it.

### Resistance and Barriers

You might ask at this point, why do convention and some of the disciplines dominate our understanding, society, and management policy, instead of the integrative approach? The answer is multifaceted with many structural, cognitive, historical, and personal forces and factors at play. Taken together they can restrict what is possible to think and do in society (Clark, 2019). For some inexperienced students, conventional adults, and hidebound disciplinarians, grasping and using the integrated approach and the meta-framework in practice is hard to impossible. The deep problem here is their own identities and expectations (existential concerns) about knowing, how the world works, and more (e.g., power, control). We all have identities and expectations, and many of us know that they can get in the way of our dealing with real-world problems (including our own thinking about them). Many authors, myself included, have published about the resistance and barriers to the integrative approach.

Concerning college and university programs today, conventional and disciplinary approaches typically dominate pedagogical philosophies and curriculums. These are deeply rooted in the academy and they pose problems and barriers preventing a fair hearing for the integrative approach. Additionally, the integrative approach is not easily communicated or demonstrated to the satisfaction of disciplinary positivists or conventional folks who are committed to their favorite approaches.<sup>7</sup> Other authors have written on these subjects more broadly too.<sup>8</sup>

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<sup>7</sup> Barriers to Interdisciplinarity in Environmental Studies: Wallace, R. L., & Clark, S. G. (2017). A case of alarming trends in faculty and programmatic wellbeing. *Issues in Interdisciplinary Studies*, 35, 221-247. College and university environmental programs as a policy problem (Part 1): Integrating knowledge, education, and action for a better world? Clark, S. G., Rutherford, M. B., Auer, M. R., Cherney, D. N., Wallace, R. L., et al. (2011). *Environmental Management*, 47, 701-715. Integrating science, management, and policy in large-scale conservation: Hohl, A., Clark, S. G., & Picard, C. (2014). Conclusions and recommendations (pp. 185-188). In S. G. Clark, A. Hohl, C. Picard, & E. Thomas (Eds). *Large-scale conservation: Searching for successful approaches*. New York, NY: Springer US.

<sup>8</sup> Bateson, G. (1972). *Steps to an ecology of the mind (A revolutionary approach to man's understanding of himself)*. New York, NY: Chandler Publishing Company. Kronman, A. T. (2007). *Educations end: Why our colleges and universities have given up on the meaning of life*. New Haven, CT:

As I see it, some people are held in place in their perception and thinking by the “Given” – conventional thinking based on certain presuppositions and ideological (doctrinaire) beliefs, and everyday living and disciplinary commitments especially those dictated by positivism. These give people notions about other people, meaning-making, society, and environment often quite different from the integrated approach and view. Hannah Arendt (1994) calls this syndrome – “thoughtless convention” (see Kohn, 2002). It is problematic for reasons that I lay out in a companion essay – “Pathologies of Knowing (Epistemology) and Practice (Pragmatics): How to Recognize and Avoid them” (Clark, 2019).

Some students and professionals actively resist learning the integrated approach. Students typically come to college and university with expectations and demands for convention, a certain structure and linearity (a cookbook to problem-solving) as in ordinary courses. It is a demand that problems are “material, out there,” and a technical approach of some kind is needed to address them. There is a demand to stay in the “box of convention” and existing disciplines, perhaps as a result of their previous “spoon fed” experiences and education and need for a rich social life. Many programs and courses meet and reinforce such student demands. Some students say that my courses lack the linearity they seek and expect and demand.

When asked to anonymously appraise the courses I teach, some students say the following:

I hope the course and conversations in class had been more clear. At times, they were difficult to follow.

Strengths: Widens perspective. Weaknesses: Can be overwhelming.

I would tell a student that lectures seem fairly disorganized, but the content of the course is wonderful.

Expect to spend more time thinking in this class than performing assignments. Do your very best to remain focused for every minute of the three-hour class; Dr. Clark regularly covers important material for the entire duration of the course, and the discussions will be more helpful if you are engaged. Do all the readings ahead of time, especially the readings from the handbook and the course book; you will benefit greatly.

If you want to benefit from this course, you need to be open to new perspectives and ways of problem-solving. Also, participating in course discussions and doing the readings regularly will be key to understanding the material.

This course is an unconventional class at Yale. If you want an opportunity to think more broadly, then take this class. You probably won't use what you learn in this class until you are several years into your career, but it is a class worth taking, It challenges you to think outside conventional thought using the policy sciences framework.

Engage with the material consistently. Take part in class discussions. The policy process is valuable, and it is worth taking a course to engage with it. The policy process explains why science in and of itself is simply not enough to address the world's concerns.

This class is essential to understand the larger picture at FES [Forestry & Environmental Studies] and the world.

Although I do teach a structured and multi-method approach to real-world problem solving, some students are unable to see that fact – conceptually, literally or practically. Some students hold to their original expectations (largely conventional), the expectations they entered the program with. I tell all my students that they should be prepared to work in ill-structured, problematic messy contexts after graduation. Conventional formulas will not work for them in such contexts, neither do single or combinations of disciplines, so be prepared and do not expect convention or bounded disciplines will help them. My teaching, courses, and work are designed to help willing students move beyond their first expectations and conventional notions to address messy, complex, problematic situations, often high highly politicized ones. My courses help students learn to think and work with functional interrelationships in systematic ways and with skill in “mapping” dynamic complex contexts. As such, my teaching and work stand in marked contrast to conventional and most single disciplinary approaches. My approach reflects my real-world experience and experiences of many other people over decades and diverse situations. People committed to rigid conventional expectations for whatever reason are the most resistant to learning the integrative approach. Much has been written on resistance and barriers to the integrated approach.<sup>9</sup>

What makes teaching the integrated approach difficult is that students are typically gripped by convention (accepting unquestioningly the “givens” of everyday life, conventions deeply buried in society and culture, problem solving). As well some students are not experienced enough or at the position of cognitive and moral development to grasp what is being offered by the integrated approach. Consequently, I receive vague complaints that my thinking, communication, and teaching don't seem “right.” I hear some students say, “There is something behind what Clark says, but she never fully says what it is.” Yet many students appreciate there is something there and come to clarity about it. It is obvious that challenges in teaching, working, and in application exist as a result of teaching and applying the integrative approach (policy sciences heuristic). In short, my way of thinking, talking, and working is different from disciplinary knowledge, convention, and positivistic epistemologies.

### **Avoiding Errors in Problem Solving**

All my teaching, communicating, and applied work are targeted at helping students and others become skilled integrative problem solvers (e.g., Clark et al. 2000, 2014). I do this through workshops, using examples, and addressing actual cases. This includes helping them

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<sup>9</sup> Interdisciplinarity for problem framing and solving: Clark, S. G., Palis, F. G., Trompf, G. W., Terway, T., & Wallace, R. L. (2017). Using the policy sciences framework. *Journal of Sustainable Forestry*, 36(5), 516-534. Environmental studies and sciences in a time of chaos: Wallace, R. L., & Clark, S. G. (2017). Problems, contexts, and recommendations, *Journal of Environmental Studies and Sciences*, 2018. The integrity problem in higher education: Clark, S. G., & Wallace, R. L. (2018). Description, consequences, and recommendations. 2018. *Higher Education Review*, 50(2), 126-151.

learn to detect errors in knowing (epistemology) and avoiding those errors in the first place. My work is about helping people understand, map, and negotiate complex problematic contexts, and at the same time being aware of what they show up with in those cases in terms of their own cognition and skills. The meta-framework is an essential tool, a heuristic that is offered to help address such real-world problems and situations. As the record shows, and we know from experience, the integrated approach can be successfully taught, learned, and used to good effect.

### Detecting Errors

We need to find a way to recognize the errors in knowing and practice that we too often make and overcome them (Clark, 2019). The integrative approach I use is a powerful tool to do just that. If it is used with skill, it can minimize human impairment and thinking errors. The integrated approach invites all ways of knowing: pre-positivism, positivism, and post-positivism into the problem-solving process, as appropriate. In all cases, I strive to be rigorously empirical.

One thing we are learning the hard way these days is that a large part of our challenges come out of the nineteenth-century sciences and positivism. Positivism is undoubtedly helpful in a great many instances. In fact, it is usually always helpful to address our current problems, but more than positivism is often needed. Positivism that has dominated science over the last 200+ years, from say the time of Newton to the present, focuses our preoccupation on chains of cause and effect that can be referred to by quantifiable physical forces and impacts. The mathematics available to Newton was preponderantly quantitative; and this fact, combined with the central focus upon physical forces and impacts, led scientists of the last century to measure with remarkable accuracy quantities of distance, time, matter, and energy. This has been hugely beneficial to our material living. That view carries on into today.

The early pioneers of human systems assumed this is also the way to go to understand humans too. Consequently, they began their work (surveys) of behavior by desiring a similar rigorous positivistic base to guide their observations and speculations. Length and mass were not concepts they could use in describing human behavior, social interactions, and policy processes but energy seemed handier. Metabolism obeys energy laws. As a result, metaphors like energy were applied to strong emotions and mass movements. Since then we have come a very long way in understanding and researching human individuals and systems.

Common errors and consequent problems of the conventional and disciplinary approach using positivism are described in papers and books.<sup>10</sup> These publications and many others are little known in some disciplinary arenas and everyday convention and problem solving. This is hugely problematic. Our current science tells us that there are many psychic causalities of our present cultural-environmental dilemma in our present world of rapid, complex social and environmental change. As far as I know, there are only two ways out. First is some conventional religious/philosophic conversion that is widespread and transformative. This “solution” may satisfy some, although there is a real danger of returning to the Dark Ages, totalitarianism, or worse. Second is thinking through our situation and asking as little of faith as possible. This is the more difficult of the two alternatives. The intellectual (thinking) activity – from science to poetry – has a bad reputation in our present generation. We are anti-intellectual these days, too

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<sup>10</sup> Berger, P., & Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. New York, NY: Penguin Books. Rorty, R. (1979). *Philosophy and the mirror of nature*. Princeton, NJ: Princeton University Press. Sellars, W. (2000). *Empiricism and the philosophy of mind*. Cambridge, MA: Harvard University Press.

often it seems. The blame for this falls on the so-called educational system and contemporary electronic culture that appears designed to prevent “students” and others from learning to think while telling them that thinking is what one does when you study or are online. Yet to learn to think – be problem oriented – really is teachable. The low level of what passes for thinking in conventional education and online today in too many American educational, academic communities, and social circles can perhaps only be appreciated by contrast with our great thinkers (e.g., Hannah Arendt, John Dewey, Harold Lasswell) of the last century.

#### Addressing Self and Context in Problem Solving

Key to improved problem solving is a better understanding of ourselves as knowing agents and the contexts in which we live and work.<sup>11</sup> Each of us is deeply acculturated to the conventional “eco-mental cultural system,” which itself is really at base behind many of the problems that we face today – local to global. Why do I say this? Typically, our dominant “eco-mental cultural system” leaves out the depth of self-awareness and contextual methods needed for successful problem-solving. Our many problems arise out of errors in our habits of thought at deep and partly unconscious levels. Anthony Kronman, former dean of the Yale Law School, sees that our problems stems from the dark underside of convention – secular humanism, including the research ideal and political correctness, which he details in his book *Educations End*.

We need to go to basics to turn things around for the better. The central idea I use is that we create the world we perceive, not because there is no reality outside of our heads (whether we believe it or not). We do so because we select and edit the reality we see to conform to our beliefs (values, meaning) about what sort of world we live in, who is responsible, and more. An example is a person who believes that the natural resources of the world are infinite or that if something is good for you then the more of it, the better. Such people will not be able to see their errors, such as ideology, bounded rationality, selective inattention because they will not look for evidence of those traps. We all operate within the “Given” of different beliefs, paradigms, or myths in anthropological and sociology senses.

For a student or anyone to change his/her basic, perception-determining beliefs (paradigms, myths) – what some call “epistemological premises” – he/she must first become aware that reality is not necessarily as he/she believes it to be. This is not an easy or comfortable thing to learn, and most people in history have probably been able to avoid thinking about it. Many people do so today and examples exist all around us all the time. It seems that sometimes the dissonance between reality and false beliefs reaches a point when it becomes impossible to avoid the awareness that the world no longer makes sense. Some people see that we are in such a historic period in human history now. Only then is it possible for the mind to consider a different, even radically different set of ideas and perceptions.

For me, and many others, it is clear that our collective cultural mind has come to the point of crisis. What we do about the crisis can go either way toward learning new possibilities or toward closing down and bringing on even greater danger. There is no guarantee that new ideas, like the integrative approach, will overcome the old ideas – harmful epistemological premises. Neither can we hope, if improvements are found, that the needed social and environmental change will occur or be smooth.

Concerning context, as I see it, we are living in a rapidly changing world, the contours and consequences of which are not fully clear, as yet. However, mounting harmful signs are frightening as we move ever faster toward greater crises (e.g., climate change). There is an ecology of the environment to be sure, and there is also an “ecology of ideas,” including some shallow ideas that have currency and popularity, even dominance in some social circles, presently. Our current eco-thinking has led to theories of control over nature and to theories of power over most things that dominates our society and culture, institutions, and interpersonal relations. I, and many others, see that we are living in a thought system that is making basic errors in control and power, and propagating itself to our detriment. It is a system dominated by thoughtless convention, again to use Hannah Arendt’s term. Many authors have written about this set of circumstances.<sup>12</sup>

Overall, unfortunately at present, the overwhelming structures and culture that many of us are up against (trapped inside of), in fact conditions or causes many of our best minds to give up looking for better ways to address our problems. Once giving up, they return to the established disciplines and work as they can in limited ways.

### Teaching and Applying Problem Solving

In telling students and colleagues what my courses and work are about, I learned that what made this difficult to describe was in fact that I use a functional (focused on value dynamics), comprehensive approach that is significantly different from theirs often (i.e., their established and accepted convention, disciplines, epistemologies). Sometimes I get a student early in the semester asking, “Do you want us to learn what you are telling us?” or “Is it an example, an illustration of something else (sound thinking)?” I say, the latter.

Throughout a typical semester, we (students and myself) explore the many ramifications of our relationships to each other, to the environment, and about problem solving. Inevitably, numerous questions come up about using the integrated framework to look at those relationships. This brings into focus the importance of self-awareness and knowledge of context, among other things. This is because the phenomena of “context” and the intimate phenomenon of meaning (of and for self) define the hard division (and the operations of thinking and working) between the “hard” sciences (positivism and other assumptions about ontological, epistemological matters). This vital issue is difficult for some students and colleagues to grasp. Yet, I continue trying to advance thought and practice in the classroom and in my applied work.

I am gratified when students in anonymous feedback make comments such as these few examples:

This class has had an unprecedented impact on my thought processes, career intentions, and overall approach to many problems and situations.

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<sup>12</sup> Damasio, A. (2018). *The strange order of things: Life, feeling, and the making of cultures*. New York, NY: Random House Publisher. Geary, D. C. (2005). *The origins of mind: Evolution of brain, cognition, and general intelligence*. Washington, DC: American Psychological Association. Harari, Y. N. (2011). *Sapiens: Brief history of mankind*. New York, NY: HarperCollins. Kahneman, D. (2011). *Thinking, fast and slow.*, New York, NY: Farrar, Straus, and Giroux. Kegan, R. (1993). *In over our heads: The mental demands of modern life*. Cambridge, MA: Harvard University Press. Yalom, I. (1980). *Existential psychotherapy*. New York, NY: Basic Books.

Yes, it lived up to my expectations in challenging me to think differently.

I am interested in the social and decision process of biodiversity conservation. In that regard, this course hit the nail on the head with a sledgehammer.

Yes. The 'policy process' map has opened up a whole new world to me in analyzing human decision making and the policy process overall.

The majority of anonymous feedback from students and colleagues is positive. Yet there is some feedback that is highly critical. In brief, overall, what I am told in anonymous reviews is that the integrative approach is helpful, for example:

*Susan has changed my life with this course and one other. She dives deeper than any other professor at FES [Yale School of Forestry & Environmental Studies] and illuminates the raw truth behind social and decision-making processes.*

*I learned a totally different way of approaching what I had historically perceived as purely scientific issues. And, this class will change the way you think about the world.*

*It's a great class if you are interested in being more reflective!*

*Susan is one of the only truly interdisciplinary professors at FES [Yale School of Forestry & Environmental Studies]. She actively works to create bridges between natural and social sciences, having worked extensively in both fields herself.*

*Although many think she only teaches the policy sciences, her courses actually incorporate biology, sociology, ecology, anthropology, and psychology. There is really no one else who better fits the description of bridging disciplines.*

Other constructive feedback includes comments such as these:

*An excellent course... one of the best I have had here at Yale.*

*It should be a required course.*

*I got more out of the class than I expected. It challenged me to change how I think, and moreover to think about how I think.*

*This is truly a professional class in that you learn an interdisciplinary framework and how to apply it to natural resource problems.*

*This course should be a real foundational course for all FES students. It was a fantastic learning experience.*

In the end, for me at least, such feedback makes the effort all worthwhile, at least most of the time.

## Conclusion

I try to teach problem-solving as a way to bridge between what we know of human nature and society and the “fundamentals” of science and human experiences, as understood in the totality of the humanities, social sciences, and everyday living. Millennia of hard won human experience by very observant and exceptionally thoughtful scholars and practitioners assembled this approach. The approach helps us to minimize “impairment” in our judgments and aids our living in practical ways. This vast body of integrated problem solving – concepts and method – stands in marked contrast to the everyday, conventional, and partial approaches in wide use currently in many disciplines, in many college and university programs, and in everyday life by the public and leaders. I have taught, published on, and applied the integrative approach in a wide range of situations from diverse classrooms to field projects across six continents. Many of my integrative colleagues have a similar track record using the integrated approach to that of mine. Students come into our courses with a host of conventional expectations about what knowledge is, what real-world problems are about, and how to address them via convention and the disciplines. A question often arises after about four class meetings: “What is this course all about?” There are various answers that I offer. Sometimes, I use illustrations that bring forth fundamental questions about people (meaning, perception, thinking) and the environment (adaptation, development, sustainability) in concrete circumstances. At the least, the integrative approach opens up worthwhile discussion. Often, it leads to new awareness and skills. For some people, the integrative approach is scientific, systematic, and practical. Many people do in fact come to an understanding and skillful use of the integrated approach in the common interest in their work and lives. To learn the approach takes work and practice, and good luck too.

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Susan G. Clark is the Joseph F. Cullman 3rd Professor (adjunct) of Wildlife Ecology and Policy Sciences, Forestry, & Environmental Studies and fellow in the Institution for Social and Policy Studies, Yale University. She has diverse experience in the NGO community, academia, and in the field. She focuses on professional interdisciplinary education and skill training for leadership, professionalism, and problems solving. Representative activities include koala conservation and management in Australia, a study on improving large carnivore conservation in the Rocky Mountains of the United States and Canada, and an analysis of large-scale management and policy. In 2007, she and colleagues wrote *Other Voices, Other Ways, Better Practices: Bridging Local and Professional Environmental Knowledge* published by FES Yale. She has written about 350 papers and book chapters, over a dozen books, and about 45 popular articles. She has received awards, including the Outstanding Contribution Award from the U.S. Fish and Wildlife Service, a Presidential Award from the Chicago Zoological Society, the Denver Zoological Foundation Conservation Award, and Best Teacher and Mentor from Yale University students.

### Discussion Questions

1. What is integrated problem solving?
2. How is it different from traditional science or conventional approaches to problem solving?
3. What are the operations involved in integrated problem solving?

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“Stalwart”  
2011

Photography by G. Delvaille

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## **Selecting Israel's National Football Teams during the First Decades of Statehood**

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### Abstract

This article discusses the position of the “selector” for Israel’s national football team during the early years of statehood. The individual appointed to this position was responsible for choosing the team players, a task that today belongs to a professional coach. The main idea behind appointing “selectors” related to the notion that football is a national resource and as such should not be placed in the hands of coaches who focus on professional considerations only. During the first two decades of statehood, the role of “selector” underwent changes. These changes reflected national and political trends that digressed from the area of sport. The tasks undertaken by the “selector” in different periods received influence from the tensions between the government and the sports associations regarding government intervention in sport. The article examines the position of “selector” during different periods: the period of the Fifty-Fifty agreement (first half of the 1950s) and the post-Fifty-Fifty period.

*Keywords:* team selector, football national team, politicization of sports, the Fifty-Fifty Agreement

### Introduction

One of the most important tasks of sports coaches is to select players for their teams. Coaches bear exclusive responsibility for choosing players and determining who will play in a given match. Ostensibly, these decisions have their basis in professional considerations alone. In practice, sports and politics are intertwined. National, political, economic, and other interests impact upon, and sometimes overrule, professional considerations. In some cases, such factors may dictate the composition of national teams. The history of sports can teach us much about the role of hidden agendas in selecting representative sports teams. Race, for example, was a factor in choosing the German Olympic team for the 1936 Games in Berlin. Apartheid policy dictated that national teams in South Africa would be exclusively white. Only in 1978 did the South African Football Association embrace equality and permit Blacks and Whites to play together. North Korea and South Korea held talks over a joint delegation to the Beijing Olympic Games in

2008. These talks, which ultimately failed, focused on whether the athletes should be chosen exclusively on the basis of sports prowess or strictly proportional. The examples above illustrate the great importance that countries attribute to representative sports.

Representative sports are even more important to new countries seeking to improve their standing in the international arena. The rulers of countries in Africa that won independence in the late 1950s used sports to build an atmosphere of unity, strengthen loyalty to the leader and transmit a political message. Football, the most popular sport in Africa, was put to use in this way. Kwame Nkrumah, the first prime minister of independent Ghana, saw football as an important tool in the service of national pride. The same was true for the president of Zaire (now the Democratic Republic of the Congo), Mobutu Sese Seko, who tried to harness sports to achieve national goals and spoke about the paramount importance of sports. Like many new countries, Israel in its early years also made promotional use of its national football team. The selection of players was largely influenced by local politics because the national team was viewed as an important PR vehicle. Therefore, during this period, professional considerations in selecting players were sometimes secondary. Those who decided who would play on the national teams were functionaries of competing political-ideological camps. Interests that had no connection to the professional side of sports tainted their decisions.

This article will discuss the tension between political-national constraints and the purely professional aspects of putting together a national team. Studying how Israel's national team was chosen sheds light on the challenges faced by the state in its first decade and the use of sports as a political tool and national resource. To understand the considerations that went into forming the team, we will explore the structure of Israeli sports in the first decade of statehood and the politicization that characterized it, followed by a look at how the IDF was used to bring together feuding camps.

### **The Politicization of Sports in Israel**

Israeli society in the early years of the state was divided between two main social sectors: the workers and the bourgeois. Much has been written on the subject of the sectarianism in Israel. The article framework does not allow for an extension of this issue (Giladi, 1984; Lissak, 2009; Shapira, 1994). Sports institutions were a reflection of the political reality of the time and served as a battleground for ideological conflict between the workers and the bourgeois. The Hapoel and Maccabi sports associations became players in this conflict.

Maccabi was the first sports association established in Palestine in 1912. From the outset, Maccabi portrayed itself as a non-political organization that did not regard sports activities as its only role but rather sought to fulfill national, educational and defense goals (Harif, 2011, pp. 126-127). Accordingly, Maccabi associated itself with the general Zionist stream within the Zionist movement. Such was not the case with the socialist parties, which adopted other values in addition to the Zionist doctrine. In 1926, the disputes between the sectors led to the establishment of a separate sports center for workers – Hapoel (Ish Shalom, 2004).

The establishment of Hapoel was not only the result of conditions in Palestine, but also of political developments in sports worldwide. The Socialist Workers' Sport International SASI (*Sozialistische Arbeiter Sport International*) was founded in Lucerne in 1920 as an alternative to the Olympics, which were branded bourgeois. By 1925, its ranks already numbered 1,300,000 workers (Kaufman, 1995). Sports organizations that joined SASI took upon themselves aggressive and military assignments through pre-military organizations such as the Schutzbund

in Austria and the Plugot Hapoel [Workers Squads] in Palestine serving the workers parties in their countries. While Maccabi sought to integrate sports in Palestine with worldwide sports organizations such as the International Olympic Committee,<sup>13</sup> Hapoel chose to remain loyal to SASI by refraining from forming ties with international sports organizations, with the exception of FIFA, the international football federation. The establishment of this new sports association necessitated a clear definition of the nature of its relations with Maccabi. Hapoel defined the role of sport in an ideal society: “Not just sport for the sake of sport, but also a tool for workers’ health and unity, for correcting defects caused by work, for creating alertness and a good mood and relieving fatigue and exhaustion” (Ben Israel, 2010). In practice, Hapoel athletes strove for achievements just like Maccabi.

During the first decade of the state, sports institutions were an arena of conflict between two opposing political camps. Maccabi and Hapoel had representatives in the sports institutions: the Israel Sports Association, the Israeli Olympic Committee and the executives of the various sports branches. The number of representatives and the executive positions they filled reflected the balance of power between the political camps. In this context, two other associations should be mentioned. They were much smaller but no less infused with ideology: Beitar on the political right and Elitsur aligned with the national religious camp (Furman, 2015; Resnick, 2002; Goldberg, 2015). Their representatives in Israeli sports institutions had little influence and will not be dealt with here.

The political tension between Hapoel and Maccabi moved into the sports stadiums. Football matches often turned into violent confrontations between fans and sometimes players as well (Kaufman, 2006). On many occasions, discord between Hapoel and Maccabi brought sports activity in the country to a standstill. At issue was control over the state's sports institutions, such as the Israeli Sport Association, the Football Association and the Olympic Committee.<sup>14</sup> A simple difference of opinion between bureaucrats from Hapoel and Maccabi was enough to abort league schedules or cause months-long strikes preventing league play.<sup>15</sup> In 1950 the organizations attempted to form a joint football league, but after renewed disputes each organization formed its own league (Kaufman, 2003). The 1952 football season opened extremely late and only after the Football Federation appointed a reconciliation committee to settle the differences between the two disputing factions (Porat & Lerer, 1998). The politicization of Israeli sport sabotaged political and national developments that were of great importance to the State of Israel in its early years, hence necessitating government-level intervention. Since teams representing the country were regarded as a national resource, this intervention included the appointment of officials responsible for selecting the members of the national teams. These officials were in effect the selectors of the national teams. This article will discuss the state's attitude toward sports in the early years and then examine how the role of the selector changed in view of later political developments.

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<sup>13</sup> Henceforth: International Olympic Committee – IOC.

<sup>14</sup> Henceforth: the Israeli Sport Association (ISA), the Israeli Football Association (IFA), and the Olympic Committee of Israel (OCI).

<sup>15</sup> Yehoshua Cahane, Hapoel would be willing to discuss changes in the 'Election Key.' *Maariv*, 20 March 1963, p. 6 [Hebrew].

## **Government Involvement in Sport during Israel's First Decade**

In its early days the State of Israel was preoccupied with existential problems: defense, the economy, social issues and more (Kaufman, 1998). Sporting activity was irregular, and the very limited resources the government did allocate to sports reflected national priorities. Only in 1953 did the Israeli Parliament, the Knesset, hold its first deliberation on “the state of sports in the nation.” Yitzhak Ben-Aharon, one of labor movement leaders, expressed his concerns to the Knesset plenum regarding the backward state of physical education and sports: “This government's attitude toward physical education is from the Middle Ages.” Shalom Zysman, a Member of Knesset for the General Zionists who also served as chairman of Maccabi Israel, outlined the national importance of engaging in sport: “We have neglected and we continue to neglect physical education... How can we defend this country without strengthening the physical condition of our young people?”<sup>16</sup>

Israeli sports also faced serious problems in the international arena. For political reasons, various branches of Israeli sport were technically assigned to different continents: The national football team was assigned to Asia, the basketball team to Europe and the tennis team to America.<sup>17</sup> The professional level of Israeli athletes was low relative to athletes from Western nations. It was proposed that athletes’ trips abroad be subject to government supervision, and there was agreement that if a trip “will not bring goodwill to Israeli sports and the State of Israel,” it should not be approved.<sup>18</sup>

Nevertheless, during the first decade of statehood attitudes toward sport began to change. Athletic excellence generated national prestige (Galili, 2009), and the country’s leaders saw that it was possible to achieve national goals through sport (Kaufman, 2015). The social divide during the first years of statehood prompted Prime Minister and Defense Minister David Ben-Gurion to seek a way of transforming the nation's disparate groups into one cohesive society (Drori, 2000).

The objective was to use sports to consolidate group identity and achieve a level of integration transcending socio-political factions and sectors. Social integration was part of David Ben-Gurion’s melting pot ideology, and he viewed sports in this context (Kaufman, 2015). Sports was an efficient tool for recruiting the masses and putting into practice the concept of the “new Israeli” (Kaufman & Galili, 2009). The mission of Israeli athletes went beyond engaging in sport for sport's sake. Their duty included generating friendly relations and cooperation between veteran Israelis and immigrants, and promoting the national Zionist idea and the State of Israel. Sports was also expected to serve as a means of strengthening ties with Diaspora Jews and of attaining honor and prestige. Sports delegations were charged with representing Israel in the international arena as part of a public relations campaign to gain recognition for the young nation (Harif, 2011). Thus, for example, in the midst of the War of Independence, November 20, 1947 – July 20, 1949, a decision was made to send the Israeli football team to the United States for a series of exhibition games (Carmi, 2019).

The IDF was put in charge of preparing the team without involving the Football Association. At that time the government believed sensitive assignments such as selecting a

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<sup>16</sup> Yitzhak Ben-Aharon, Second Session, 5 August 1953, Nishri Archive at Wingate, Portfolio 5.17/94 [Hebrew].

<sup>17</sup> Israel is on three continents on the sports map, *Maariv*, 18 August 1957, p. 6 [Hebrew].

<sup>18</sup> Argument at the voice of Israel over sports delegations abroad, *Hatsofeh*, 13 December 1954, p. 4 [Hebrew].

national football team should not be placed in “civilian” hands. Hence, prior to the trip to the USA the task of putting together the team—a purely professional function—was given to Lt. Col. Shmuel Soher rather than to coach Egon Pollak (Ben-Porat, 2009).<sup>19</sup> The purpose of the trip was to represent Israel as a nation worthy of independence. The players, all conscripts in the regular army, were expected to arouse identification with the young nation and to boost donations to Israel. Another objective was to inspire warmer relations with the American administration. The press called for choosing only “soldier-players...only those who took an active part in the war, only on them can we depend. The delegation must contain only soldiers.”<sup>20</sup> During September and October 1948, the team played three games against the Americans, losing all three. From the professional point of view, the trip was a failure, but from the political-propaganda perspective, it was a success. Jewish fans thronged to the stadiums, and celebrities from the worlds of politics and entertainment came to watch the Israeli athletes. The local press covered the games enthusiastically (Ben-Porat, 2009).

After statehood, government supervision of Israeli sport was part of a general trend toward forging a national identity. Nevertheless, in light of the political rivalry between Hapoel and Maccabi, working together in pursuit of a common goal was difficult. The decision regarding government intervention in sports derived not only from a desire to employ sports for political and national purposes but also from the understanding that it was not a good idea to leave sports in the hands of political functionaries. The window of opportunity for making peace between the two camps came in 1951 when political and international circumstances brought the parties to the negotiating table.

### **National Selectors during the Fifty-Fifty Period**

In 1951, the heads of Hapoel and Maccabi signed an agreement between themselves on sharing responsibility for the administration of Israeli sports. The agreement, called “Fifty-Fifty,” stated that leadership of the Israeli Sport Association would be on a parity basis, i.e., six officials from Maccabi and six from Hapoel. Israeli national teams in various sports would also be composed in keeping with political criteria and not athletic achievement. This move had repercussions for the professional level of the national teams and gave Israeli sport a negative image (Carmi, 2016). The circumstances surrounding the signing of the Fifty-Fifty agreement were linked to political events in Israel and pressure from the International Olympic Committee (IOC). Much has been written about the political situation in Israel and the international circumstances that led to the signing of the agreement (Weitz, 2001; Ben Porat, 2002; Harif, 2011; Alperovich, 2007; Zimri and Paz, 1959).<sup>21</sup>

The Fifty-Fifty agreement was signed in November 1951 (Abiram, Bnayahu, Gil, & Panon, 1966). The agreement also applied to the Football Association. This duplication resulted in Israeli sport being ridiculed and becoming a laughing stock in Israel and abroad (Gil, 1977).

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<sup>19</sup> The brain trust of our teams, *Maariv*, 15 August 1958, p. 4 [Hebrew].

<sup>20</sup> Y. G., Makeup of team sent to the US based solely on military values, *Al Hamishmar*, 11 August 1948, p. 3 [Hebrew].

<sup>21</sup> Maccabi joined the general Zionists, *Al Hamishmar*, 26 February 1948, p. 1 [Hebrew]; Agreement between the General Zionists and Maccabi, 17 May 1951, Israel State Archives, Private Collections-Shoshana Persitz, Portfolio 0010goq [Hebrew]; G. Yisrael, Government clerk places compilation of the Olympic Committee in the hands of Maccabi only, *Al Hamishmar*, 22 April 1951, p. 1 [Hebrew].

But the loss of prestige paled in comparison with the high price the athletes paid for the cooperation between the two organizations. Israeli national teams from different branches of sport were formed according to a political key and not according to the athletes' achievements (Kaufman, 2003).

During the period of the Fifty-Fifty agreement, the selectors of the national football team were supposed to protect the interests of Hapoel and Maccabi. For the sake of parity, two selectors were chosen, one from each sports association: Y. Rappaport representing Maccabi and Arthur Baer representing Hapoel. Baer, the dominant of the two, was born in Austria and gained experience in football as a player for the prestigious Hakoah Vienna team and as a referee and board member of the Austrian Football Association. Immediately after the Anschluss in 1938, he immigrated to Palestine and became active in Hapoel (Zimri & Paz, 1959). Baer was known as a football expert and, therefore, was appointed as team selector after the state was established. A number of national coaches served under him.<sup>22</sup>

Alois Hess was the first coach of the national team.<sup>23</sup> In the 1920s and 1930s Hess played for Hakoah Vienna. His appointment in 1949 was seen as a professional appointment. The first challenge for the national team was a game against Yugoslavia in the World Cup preliminaries. Hopes skyrocketed when Israel defeated Cyprus 3:1 in a friendly match. Prior to the match against Yugoslavia the question of selecting the team members became an issue. The Football Association demanded that the team be formed according to the political formula. Hess had no choice but to accept this demand. Following Israel's resounding defeat by Yugoslavia (6:0), Hess resigned.<sup>24</sup>

Ladislav Skali, a former player for MTK Budapest, was appointed as the second national coach. Skali led the team to a victory (5:1) and a loss (2:3) in friendly matches against Turkey. In 1952 Skali resigned, claiming that politicians were interfering in forming the team.<sup>25</sup> Moshe "Jerry" Beit haLevi was appointed to replace him. Beit haLevi, a former player on Maccabi Tel Aviv, coached the national team in 1953-1954. During that period the team suffered a series of losses in games against Turkey (2:3), Greece (0:1), Yugoslavia (0:1), Greece again (0:2), Yugoslavia again (0:1) and South Africa (1:2).

The selector Arthur Baer absorbed the brunt of public criticism for the team's losses: "Arthur Baer is nothing more than a slave, a good Jew who knows what football is but fell victim to inappropriate tactics.... He was not the one who put together the team but rather his masters. All he did was obey their instructions and carry them out without objection."<sup>26</sup> Indeed, Baer did not manage to overcome the method dictated by the Fifty-Fifty agreement. His professional abilities were not enough to change the political structure of Israeli sport.

Note that the Fifty-Fifty agreement applied to all branches of sport. Before the Israeli national basketball team participated in the 1954 World Championship Games in Rio de Janeiro, the team's staff conducted a training camp. During the camp, players who did not perform up to the required standard were removed from the roster. To maintain the coalition, Hapoel and

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<sup>22</sup> Moshe Lehrer, The man who initiated and nurtured Hakoah Vienna has turned 80, *Maariv*, 3 April 190, p. 24 [Hebrew].

<sup>23</sup> To be precise, Egon Pollak was the first coach of the IDF team, which was presented as the Israel national team on its trip to the U.S. in 1948.

<sup>24</sup> From Hakoah Vienna to Maccabi to Beitar Tel Aviv, *Herut*, 21 February 1960, p. 3 [Hebrew].

<sup>25</sup> Zvi Kaufman, A land that devours team coaches," *Maariv*, 20 July 1975, p. 27 [Hebrew].

<sup>26</sup> H. Avraham, Evad ki yimloch (Beggar on Horseback), *Herut*, 16 November 1952, p. 3 [Hebrew].

Maccabi bureaucrats began to negotiate. When the selector at that time, Dov Prusak, dismissed players from Hapoel, he made sure to remove an equal number of players from Maccabi.<sup>27</sup>

In the mid-1950s, the political situation in Israel changed. These changes affected relations between Hapoel and Maccabi as well as the role of the selector of the national football team. In August 1955, Ben-Gurion was asked to form the government. The General Zionists lost their status as the second largest party in the Knesset in the elections and hence were not included in Ben-Gurion's coalition. The weakening of the General Zionists also had an impact on Maccabi, its partner in the area of sport.

During the 1950s, Hapoel's strength grew, and it became the largest sports association. One of the main factors in the rise of Hapoel was the accelerated growth of the Histadrut, the nation's largest workers organization, which sponsored Hapoel (Greenberg, 2002). As a result of this growth, Hapoel's operating budget increased eightfold during the period 1955-1962 (Gil, 1977). This budget enabled Hapoel to open many clubs across the country and to train instructors and coaches.<sup>28</sup> Hapoel felt strong enough to take control of the nation's sports institutions and thus become the sole beneficiaries of being in power. The key to gaining control was cancellation of the Fifty-Fifty agreement. Hapoel was waiting for a pretext to change the status quo, and did not have long to wait. At the end of October 1954 Maccabi decided to send a team to a series of games in England, investing a great deal of money in organizing and publicizing the trip.

According to the Fifty-Fifty agreement, Maccabi needed Hapoel's approval for the trip. Hapoel representatives refused to sign, claiming it was liable to disrupt the opening of the football league.<sup>29</sup> Maccabi held its ground and its delegation set out for England. In the first game Maccabi was defeated by Arsenal 4-1. The second game was scheduled against England's top team, the Wolves, which had finished second the previous season. Tens of thousands of spectators came to the stadium to see the game. From the opening whistle it was clear that the game had no sporting value. The final score, 10:0 for the local team, reflected the difference in the teams' level of play.<sup>30</sup>

When the team returned to Israel, they were in for a bitter surprise. In their absence, Hapoel representatives in the Football Association decided to cancel the Fifty-Fifty agreement. When Maccabi understood that Hapoel's control over the Football Association was a done deal, they joined the association.<sup>31</sup> Cancellation of the agreement renewed the rivalry between Hapoel and Maccabi. Revival of the infighting created a need to appoint a national, apolitical selector with decision-making authority who was unrelated to and in no way subject to either of the two sports institutions. The IDF was perceived as a neutral body and above the political fray.

### **The National "Selector" in the Era after Fifty-Fifty**

In its capacity as an arm of the state, David Ben-Gurion felt that the IDF had a special role to play in nation-building. He believed it could be used to surmount political and party

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<sup>27</sup> Two drops of ink, *Al Hamishmar*, 21 September 1954, p. 2 [Hebrew].

<sup>28</sup> See, e.g., Yaacobson and Green to Reuven Dafni, 17 January 1961, about training camp for athletes by personal invitation, Israel State Archives, Roll 3/1375 [Hebrew].

<sup>29</sup> Football association partnership dissolved, *Herut*, 29 October 1954, p. 7 [Hebrew].

<sup>30</sup> See, The great disgrace of Israeli football, *Al Hamishmar*, 31 October 1954, p. 3 [Hebrew].

<sup>31</sup> A. Shamai, Opposites, *Herut*, 30 June 1953, p. 2 [Hebrew].

differences, cut through bureaucracy and mobilize the younger generation for national missions. He saw the army as a valuable tool for creating unity and shaping the cultural image of the country. In the early days of the state, the army filled a role that went beyond defense. During the first decade of the State of Israel, the army became increasingly involved in sports. Senior IDF officers routinely accompanied the country's national sports teams and the selection of athletes was assigned to an army representative, thereby wresting this task from the hands of the politicians.

The ideal candidate for national selector was Lt. Col. Shmuel Soher, who in 1948 had led the team in its series of exhibition games in the United States. After statehood, Soher was one of the founders of the IDF artillery corps, chief adjutant officer and commander of the Haifa district. His appointment as team selector was in keeping with Ben-Gurion's policy regarding the role of the army in unifying disparate elements within the population. The army was a government instrument that could bypass political and party barriers, overcome bureaucratic procedures and enlist the younger generation to embrace tasks facing the young nation (Zameret, 1993; Drory, 2000). Many research studies have examined the social and cultural roles filled by the army in the nation's early years, roles that went beyond the area of defense (Ben Meir, 1995; Lissak, 1971; Ben Eliezer, 1998; Halpern, 1962).

The first challenge Soher faced was against the Soviet national team. In 1956, Israel drew the Soviet Union as its opponent in the Olympic qualifying round. From the Israeli perspective, these two games went far beyond sports. In the early 1950s, Israel's political relations with the Soviet Union reached a low point (Weitz, 2001). In March 1953, the Soviet Union cut off diplomatic relations with Israel, renewing them only a short time before the Olympic qualifying round. The government of Israel saw these games as a golden opportunity to improve relations with the Soviet Union. Hence, the government called on Lt. Col. Shmuel Soher to assume the role of team selector. English coach Jackie Gibbons was appointed to coach the national team but would serve as Soher's deputy in selecting the players. Gibbons had previously played on the English national team and coached leading European teams.<sup>32</sup> Due to the importance of the game against the Soviets, the Israeli government decided the selection of the Israeli team should be determined by an Israeli, rather than by a foreigner. It was claimed that Gibbons' choices would be based solely on professional considerations, while the match against the Soviet Union had national implications as well (Ben Porat, 2003). Israel was defeated 5:0.

In preparation for the rematch against the Soviet team, the government went out of its way to welcome the guests. The Soviet delegation was invited to visits and receptions at *kibbutzim* in an attempt to emphasize the game's political and national significance. Again, the Israeli government decided to take the selection of players out of Gibbons' hands and to make Soher responsible.<sup>33</sup> When Gibbons tried to protest, he was told the decision regarding Soher's appointment came from the political echelons and was not subject to dispute.<sup>34</sup>

The rematch was held at the end of July 1956. A crowd 65,000-strong filled the Ramat Gan Stadium. The match ended in a 2:1 victory for the Soviet team, a result then considered a tremendous success for Israel. Levi Eshkol, treasury minister at the time, explained the improvement in the team's ability thus: "The contact with the soil of the homeland had a positive

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<sup>32</sup> See, for example, A. Bibring, Mr. Gibbons' methods, *Herut*, 24 June 1956, p. 3 [Hebrew].

<sup>33</sup> Lt. Col. Soher appointed team architect, *Davar*, 25 July 1956, p. 5 [Hebrew].

<sup>34</sup> Aharon Lahav, The Arbitrator in the Lahav Affair digressed from his authority, *Davar*, 17 August 1956, p. 7 [Hebrew].

influence on our boys.<sup>35</sup> In preparation for the Asia Games to be held in Hong Kong in September 1956, the Prime Minister determined that Soher would continue as national selector. When Gibbons understood the appointment of a selector had become routine, he threatened to resign just before the team was leaving for the games in Hong Kong. After being called in for talks, Gibbons gave in to the appeals of the Football Association and agreed to coach the team.<sup>36</sup> South Korea took first place in the tournament and Israel came in second. When the team returned to Israel, Gibbons resigned.

Throughout the second half of the 1950s, Soher continued to select the players for the national teams. Three coaches worked under him: Ivan Yazvanchik, Moshe “Jerry” Beit haLevi and Moshe Varon. Yazvanchik, a Yugoslavian, resigned shortly after being appointed. The Association vehemently denied his resignation was the result of pressure over the selection of players.<sup>37</sup> Moshe “Jerry” Beit haLevi returned to coach the team on a one-time basis for a game against the French reserve squad in 1957. In 1958, Moshe Varon was appointed national coach. During his tenure, Israel faced complex political challenges. After the 1956 Sinai Campaign, Muslim countries worked to isolate Israel in the political arena. Turkey, Indonesia, and Sudan refused to compete against Israel in the World Cup Preliminaries. Israel would have automatically advanced to the next stage, but FIFA decided the team had to compete against at least one European team. Israel drew Wales as its rival (Harif, 2011). Israel’s first game against the Welsh team ended in a 0:2 loss, a result considered to be a success. The press praised Soher for his part in this success.<sup>38</sup> The second game, which also ended in a 0:2 defeat for Israel, received relatively little press attention.

In advance of the Asia Games in Tokyo, the political role of Israeli athletes was the subject of much discussion. Israel stepped up its struggle against the Arab boycott after attempts to attend sports competitions in Mediterranean countries failed. Arab countries hosting international sporting events refused to host Israel (Alperovich, 2002). The nation's leaders headed by Ben-Gurion felt that if Israeli athletes competed in the Asia Games, the Asian countries would have to acknowledge Israeli sovereignty, salute Israel and show respect for its flag.<sup>39</sup> Due to the political implications of the Asia Games, the national team was sent to Tokyo. Israel lost to Taiwan in the quarterfinals 0:2. When the team returned, the press accused the players of inadequately representing the nation.

Our players must be educated.... Every athlete who appears on a foreign field in front of a foreign crowd is an ambassador of the state. He must make sure that every step he takes brings honor to his people and his team.<sup>40</sup>

The Football Association decided to suspend all the team players for three months.<sup>41</sup>

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<sup>35</sup> The visit to Israel left us with warm and good memories, *Kol Haam*, 2 August 1956, p. 2 [Hebrew].

<sup>36</sup> The coach of the football team resigned, *Haboker*, 15 August 1956, p. 15 [Hebrew].

<sup>37</sup> A. Al, Coach Gibbons' complaints, *Haboker*, 26 April 1959, p. 3 [Hebrew].

<sup>38</sup> Baruch Shinberg, Wales defeated Israel 2:0, *Davar*, 16 June 1958, p. 1 [Hebrew].

<sup>39</sup> H. Ben David to M. K. Rachel Tzabari, 4 March 1958, Israel State Archives, Roll 3725/5548 [Hebrew]; Harif, *Muscular Zionism*, 372-373.

<sup>40</sup> A. Al, Closing the gates to Israeli footballers for one year—A wise proposal, *Haboker*, 15 June 1958, p. 3 [Hebrew].

<sup>41</sup> Tokyo Commission Ruling, Collection of Nahum Beit haLevi, Portfolio AD5.28 0009, Nishri Archive at Wingate [Hebrew].

While the committee deliberated, Soher resigned as selector. In his place, the Football Association appointed Shlomo Fuchs from Hapoel and Yitzhak Ben Bassat from Maccabi. This double appointment was intended to return joint control to Hapoel and Maccabi and to distance government bureaucrats from involvement in sport. The job of these selectors was to make sure that the number of players on the team provided equal representation for the two organizations.<sup>42</sup>

In ongoing talks from 1957 to 1960, the idea was raised of establishing a government body to oversee sports in Israel instead of the sports associations affiliated with political parties (Harif, 2011). The failures of the national football team expedited this change. In 1959, Israel was invited to a game against Poland. The invitation came as a total surprise in view of Israel's relative isolation in the international sports arena. The team selectors sought a consensus coach acceptable to everyone. A month before the trip to Poland, the Football Association entered into negotiations with the well-known Jewish Hungarian coach, Gyula Mándi. The game aroused great interest in Poland. The 70,000 spectators who filled the stadium in Wrocław witnessed Poland beat Israel by a score of 7:2.<sup>43</sup> This stinging defeat in Poland led to a public uproar and a call for Israeli sports to clean up its act.<sup>44</sup> Criticism focused on the price paid to silence the feuding camps.<sup>45</sup> The over-politicization of Israeli society has also penetrated sports, lamented Walter Eytan, director-general of the Foreign Ministry. The obvious conclusion was to establish an appropriate national authority to supervise the teams.<sup>46</sup>

### **The End of the Role of the Selector**

In the 1960s, the gap between the ideological rhetoric of public figures and everyday life widened. If the discourse during the first decade of the state was all about equality, pioneering and collectivism, by the second decade these became mere slogans (Zameret, 2000; Gutwein, 2012).<sup>47</sup> The direct tie between Zionism and socialism weakened. In contrast, the connection between Zionism and national considerations that had begun during the first decade of independence grew more intense. The waning of the Zionist-socialist ethos led to cracks in the social cohesiveness that had characterized Israeli society during the 1950s (Ben Porat, 2011). These changes had an impact on many aspects of society, including sports (Carmi, 2019).

Israeli sports had begun a shift to the commercial-professional model, otherwise known as semi-professional sport (Ben Porat, 2002). At the same time corruption reared its head in Israeli football. Players received benefits and payments under the table in violation of the regulations of amateur sport (Ben Porat, 2007). Pragmatic considerations replaced lofty notions of peoplehood and statehood. Fearing a loss of control over sport, the press called upon members of Knesset and the government to establish a supreme government body that would be responsible for sporting activity in Israel. These calls increased as the Olympic Games in Rome

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<sup>42</sup>See, Travel Report, Israel Football Team trip to Poland, Israel State Archives, Portfolio 2105/29 [Hebrew].

<sup>43</sup> Asher Goldberg, Defeat at Wrocław, [http://football.org.il/Archive/Articles/Pages/historyverozlav\\_24october12011.aspx](http://football.org.il/Archive/Articles/Pages/historyverozlav_24october12011.aspx) [accessed 19 July 2016].

<sup>44</sup> Aharon Lahav, What is hiding behind the defeat of the Polish team, *Davar*, 26 June 1959, p. 3 [Hebrew].

<sup>45</sup> Who will save the football team, *Herut*, 14 June 1959, p. 3 [Hebrew].

<sup>46</sup> Aharon Lahav, What is hiding behind the defeat of the Polish team, *Davar*, 26 June 1959, p. 3 [Hebrew].

Dany Gutwin, The neo-liberal roots of the Labor Movement, *Hevra* 51 (2012) [Hebrew].<sup>47</sup>

drew near.<sup>48</sup> At the Olympics the Israeli delegation failed miserably. Following these poor achievements, Ben-Gurion ordered the establishment of a sports review committee to examine the state of sports in Israel, to be headed by Ben-Gurion's close associate, Reuven Dafni. The committee's most important recommendation was to set up a government sports authority. At the same time, the committee recommended that army representatives be part of the National Council for Sport, an advisory body that was to serve as an authority governing sports matters in the country. One of the council's jobs was to "determine Israeli sports policy in the international arena while considering political and security matters ... in order to ensure government interests and national prestige."<sup>49</sup>

Col. Shmuel Soher was again called on to serve as the selector of the national team.<sup>50</sup> In October 1963 the English coach George Ainsley was invited to coach the Israeli national football team. When he landed in Israel, he did not imagine that an army officer appointed by the government would interfere with his professional work. When he learned that Soher would choose the makeup of the team, he was furious. Attempts to reconcile between the two failed. The response of one of the heads of the Football Association reflects the approach to sports at the time: "The coach has a lot of nerve. After all, we are the ones paying his salary."<sup>51</sup> Shmuel Soher was adamant on this issue: "We must put a freeze on bringing in foreign coaches ... We must not give over the country's most valuable asset in the area of sport, the national team, to people whose suitability was not examined sufficiently."<sup>52</sup> The press reported on tensions between the "national selector" and the "national coach."<sup>53</sup> In 1965 Soher resigned as selector.

After Soher's resignation, Hapoel and Maccabi officials began cooperating again. In many cases, personal benefit influenced their professional decisions. The affair surrounding the hiring of the Yugoslavian coach, Milovan Ćirić, illustrates the extent of this phenomenon. Ćirić, who in the 1960s was considered one of the world's top coaches, arrived in Israel on February 1, 1965 at the request of the Football Association and the Foreign Ministry to coach the Israel national team. Even though he was an excellent coach and well-liked by his players, in March 1966 he was fired suddenly after a special meeting of the Football Association directorate. Until then, extending a coach's contract was considered a mere technicality, but now it turned into an international scandal. Apparently two members of the directorate, one from Hapoel and one from Maccabi, voted against him, in a plot with the coach's detractors, in exchange for a promise they could accompany the youth team to a football tournament in Manila.

Dumbfounded, Ćirić retreated to his apartment and told the press: "The circus is over. My work in Israel was a short and unpleasant interlude in my career that I hope to forget (...) I encountered people I never thought could be connected to sport." This affair caused Israel a great deal of embarrassment and was discussed in top echelons of the Foreign Ministry. The commission of inquiry established to investigate the affair invalidated the Football Association's vote as collusion and ruled that Ćirić would continue to coach the team.<sup>54</sup> This episode reflected

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<sup>48</sup> Milla Ohel, Keep your promise to propose the establishment of a government sports authority to the Knesset, *Davar*, 27 March 1960, p. 6 [Hebrew].

<sup>49</sup> Conclusions and recommendations of the Prime Minister's Sports Review Committee, Nishri Archive at Wingate, Portfolio 3-538/ 5.41, pp. 4, 13-124 [Hebrew].

<sup>50</sup> Lt. Col. Soher appointed manager of the basketball team, *Davar*, 22 April 1964, p. 6 [Hebrew]. Association leaders on the Ainsley-Soher Affair, *Maariv*, 6 February 1964, p. 6 [Hebrew].<sup>51</sup>

<sup>52</sup> Y. P., The cure for sport—depoliticization, *Maariv*, 15 August 1965, p. 12 [Hebrew].

<sup>53</sup> Zeevi: Carry out the decision, *Maariv*, 27 June 1963, p. 6 [Hebrew].

<sup>54</sup> Asher Goldberg, *Haaretz*, 9 June 2002. <http://www.haaretz.co.il/misc/1.800864> [Hebrew].

the government's loss of control over what was going on in sport. Thus, from the second half of the 1960s, government influence over football in Israel diminished. National team players ceased to serve as ambassadors and were assigned to the team based upon professional criteria. With the shift to the commercial-professional model of sport, the job of “national selector” became irrelevant.

### **Conclusion**

Before the State of Israel was established, Maccabi and Hapoel oversaw the country's sports institutions. After statehood, as part of the attempt to establish sovereignty, government authorities began to intervene in sports matters and even impose government policy on sports organizations. The tug of war between politically affiliated sports clubs and the government was exemplified by the importance attributed to the national football team and the objectives set for it. For the sports clubs, the national team was a ticket to control over sports in Israel. For the government, it was an instrument for promoting national interests, primarily in the international arena. Putting together the team was not a purely professional matter. The selector had other considerations.

In this essay, we have studied the role of the national team selector during the first two decades of statehood. The period was divided into three phases, each marked by political events that impacted on the work of the selectors. In the early 1950s, the nation was in dire need of a cohesive atmosphere and reconciliation. The Fifty-Fifty agreement and the appointment of two “selectors”—one from Hapoel and one from Maccabi—reflected this tendency and showed that the two opposing sides drew closer. Indeed, at that time the job of the “selector” was to see that the team composition was strictly symmetric, consistent with the Fifty-Fifty agreement.

The second phase began when the two associations ceased to cooperate and renewed their feuding, while sport in Israel rose in status. Sport was assigned several tasks in building the nation, among them winning over world public opinion. The propaganda value of the national teams was measured by the impression they made and not necessarily by their professional achievements, which were allocated less attention.

The importance attached to Israel's image can be learned from the guidelines handed out to athletes representing Israel in the Olympic Games. Before the delegation left for Helsinki (1952), the athletes were requested to change their “foreign” names to Hebrew names so “the Olympic delegation would appear as a seamless Hebrew unit.” The inter-ministerial Committee for International Sports Relations gave the athletes a code of conduct instructing them how to represent the state honorably and create a positive image of Israel in the eyes of the world. Those who wrote the guidelines believed that Israeli athletes would be the focus of public interest and thus must behave like ambassadors.

The guidelines covered all circumstances in which the athletes were likely to encounter local residents.<sup>55</sup> It is hard to know if Israel's image was improved in any way by such conduct, but the losses of the national team in the first decade of statehood were hardly a badge of honor. The team's unflattering record—7 victories and 15 defeats in the nation's first decade—was criticized for not bringing honor to the state. One form of government intervention in football was appointing a senior army officer as the “national team selector.” In the early days, the involvement of military officers in civilian institutions was not considered unusual. At Ben-

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<sup>55</sup> To the Israeli athletes going to Helsinki, June 13, 1953, Nishri Archive at Wingate, Container 163, Portfolio 1.19/7, 1 [Hebrew].

Gurion's initiative, IDF officers were appointed to many civilian positions. Ostensibly, the idea was to grant a degree of officialdom to key positions in sports institutions. In practice, it was an attempt to impose the state's authority on the large audience of sports fans and perhaps on potential voters as well.

Lt. Col. Shmuel Soher, who was chosen for the job, had no professional training in football. The logic behind his appointment was that choosing the team members was of national importance and should not be left in the hands of coaches who would focus only on the players' professional attributes. Soher was responsible for ensuring the team was respectable and properly represented the state, but sometimes, to the chagrin of the team coaches, he interfered in professional decisions. This unprofessional management of the team, along with its poor achievements, led to the end of Soher's tenure.

The third phase began early in the second decade of statehood. The sports associations were dissatisfied with government intervention in the sports institutions. When Soher resigned, they appointed two "selectors"—one from Hapoel and one from Maccabi. This double appointment was intended to return control over sports to the politicians. Following a series of professional defeats and poor performance at the Rome Olympic Games, Ben-Gurion decided to establish the Sports Authority to oversee sports in Israel. Soher was again called upon to serve as "selector," but he failed to upgrade the team's level of achievement.

Toward the end of the second decade, Israeli society began to change. As part of broader social trends, sports in Israel became semi-professional, with the professional-commercial model gradually replacing the former ethos of amateurism. Market forces began to exert control over football, while government influence diminished (Ben Porat, 2002). In the mid-1960s the job of "national team selector" was discontinued, and since then, the national coach has been responsible for selecting team members.

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#### Discussion Questions

1. Why did the State of Israel appoint team selectors to the national football team?
2. What led to the cancellation of the appointments of the team selectors?
3. What is the role of sport in shaping the national image?

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“Opening”  
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# **History of the Field of Sport Management: Relationship between the Intellectual Structure of Sport Management and Business Studies**

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## Abstract

This study explores how studies from the field of business have influenced sport management scholarship historically. For this, we identify central themes, theories, paradigms, and methods to investigate how the subfields establish the intellectual structure and how these subfields are related to each other espoused in the *Journal of Sport Management (JSM)*. We employed principal component analysis of 20,839 citations of 664 JSM articles published between 1987 and 2015. The results show that the central themes between 1987 and 2000 are management studies, reflective studies, and quantitative method-related studies. Between 2001 and 2005, new central themes emerged such as marketing, sport tourism, and qualitative method-related studies. While the sport management area developed with the studies of organizational

behavior in sport from a post-positivistic view at the beginning, divergent paradigms such as feminism and social constructivism tended to anchor studies since 2000. Additionally, since 2000, sport marketing studies became more convergent and centralized towards consumer behavior.

*Keywords:* sport management, business studies, bibliometrics, knowledge development, business history

## **Introduction**

“Sport Management” has been one of the fastest growing academic disciplines as the size of the sport industry in North America expands rapidly, estimated to be 71.86 billion dollars in 2018 (Statista, 2018). In the 1980s, scholars from physical education began to realize the need of business-like professionals in the field of athletic administration and managing sport, and this resulted in the emergence of the discipline of sport management (Parkhouse, Ulrich, & Soucie, 1982). Started from about 20 programs in the early 1980s in the U.S., the number of sport management program has grown drastically from roughly 100 programs in the 1990s (Kjeldsen, 1990), 200 programs in the 2000s (Parkhouse & Pitts, 2001), and as of 2018, to a total of 504 institutions (NASSM, 2018a). Due to its interdisciplinary nature, many sport management educators have had discussions about its proper home in academic institutions (Chalip, 2006; Costa, 2005). In response to growing demands from leading sport industry executives that focus on managerial and commercial aspects of sports, the University of Oregon initiated the first endowed sport business program in the Lundquist College of Business at the Warsaw Sports Marketing Centre in 1993 (Warsaw & Swangard, 2004). Since then, more than 200 sport management programs in the U.S. are housed in a school of business (Zaharia, Kaburakis, & Pierce, 2016).

In 1986, when the first professional association of sport management (i.e., *North American Society for Sport Management*, called NASSM) was inaugurated, the NASSM constitution explains the body of knowledge of sport management as “management theory and practice specifically related to sport, exercise, dance, and play as these enterprises are pursued by all sectors of population” (NASSM, 1986, p. 1). While the management and administration aspects were the focus in the beginning of the field, in 2018, the NASSM has expanded the definition of sport management elaborating its body of knowledge as “an essential common body of knowledge in sport management that is cross-disciplinary and related to management, leadership, and organization in sport; behavioral dimensions in sport; ethics in sport management; sport marketing; communication in sport; sport finance; sport economics; sport business in the social context; legal aspects of sport; sport governance; and sport management professional preparation” (NASSM, 2018b).

As many newly emerged disciplines such as entrepreneurship went through, the field of sport management also has experienced a period of broad acceptance as a unique academic discipline (Zeigler, 2007). The question of whether “managing sport” is distinctive has been a critical reflective question continuously to numerous scholars (Chalip, 2006). As Chalip (2006) stated, sport management scholars should recognize distinctive aspects to the management of sport for enhancing the legitimacy of the field. As some scholars considered sport industry as another mere form of business (e.g., Rottenberg, 1956), many contemporary sport management scholars have endeavored to highlight various special features of sport industry that requires a

specialized set of practices for its effective management (e.g., Fort & Winfree, 2009; Smith & Stewart, 2010; Stewart & Smith, 1999). The shared features of sport and other business areas are mostly observed from the commercialization of sporting structures such as value creation branding, product innovation, market expansion, and advertising (Foster, Greyser, & Wash, 2006; Syzmanski & Kuypers, 1999). The unique features of sport include its idiosyncratic structure (Syzmanski, 2009), a belief in the social value of sport (Hess, Nicholson, Stewart, & De Moore, 2008), sharing revenues, irrational passions of fans followed by high levels of product and brand loyalty, vicarious identification, tendency of favoring winning over profit, and a high degree of structural ambiguity having greatly different business models around the world (Hoye & Cuskelly, 2007).

Several studies in sport management have provided insights to these philosophical questions regarding the matter of legitimacy of sport management (e.g., need of theoretical development, need of diversified paradigms, theories, and methods, need of wider range of topics) since 1970s (e.g., Parkhouse & Ulrich, 1979; Newman, 2014; Zeigler, 1987). A majority of these reflective studies have been experience-based narrative reviews or content analyses (e.g., Chadwick, 2009; Chalip, 2006; Chelladurai, 2013; Cunningham, 2013; Doherty, 2013; Fink, 2013; Paton, 1987). While many scholars have suggested how we need to set the directions of the discipline to enhance the legitimacy of the field, there has been no empirical evidence to systematically analyze what we have studied in the field longitudinally. What were the central themes in the 1980s? Are these central themes in the 1980s different from the ones in the 2000s? If so, how? To answer these questions, mapping the intellectual structure of a flagship journal is critical to track and reflect the history of central research themes, theories, methods, and paradigms, which allows us to comprehend better the development of sport management field (Kuo & Lee, 2012). This study explores explicitly the overall landscape of knowledge structure of the publications *Journal of Sport Management* (JSM), one of the oldest and impactful journals, through co-citation analysis.

Bibliometrics is an “empirical, quantitative methodology that can describe the underlying structure of an intellectual field and help identify paradigms within that field” (McMillan & Casey, 2010, p. 209). One of the most dominant bibliometric analytical tools is citation analysis that enables scholars to trace the visible channels connecting scientific products that can represent the formal communication system of the scientific field (De Bellis, 2009). There are two approaches to analyzing citations. First, citation serves as a tool to assess the overall scientific performance of authors, publications, and/or journals by providing the quantified scores of influences of each (e.g., Baumgartner & Peters, 2003; Oppenheim, 1995; Narin, 1976). The analytical tools of this approach are categorized as *evaluative* techniques (Thelwall, 2008). On the other hand, citation can be used to trace the structure of scientific knowledge based on the way scientists use the previous publications by co-citation analysis (e.g., Benckendorff, 2009; Crane, 1988, Ma, 2009). The techniques of this approach are categorized as *relational* techniques. In sport management, a few studies (i.e., Shilbury & Rentschler, 2007; Shilbury, 2011a; 2011b) have contributed to assess the impact of sport management and marketing journals by identifying the most cited sport management journals and non-sport management journals in the sport management journals (Shilbury, 2011b) and develop the rating schemes for evaluating the quality of sport management journals (Shilbury & Rentschler, 2007). In sum, nevertheless, all of these studies have focused on the frequency of citations of certain articles from an evaluative approach.

Employing co-citation analysis, the purpose of this study is to answer two research questions: (1) what are the central themes, theories, paradigms, and topics espoused in JSM between 1987 and 2015; and (2) how have the studies from the business field influenced the sport management scholarship historically?

### **Methods**

Many studies in various academic fields have focused on identifying the components and network of citations to explore the interrelationships of central subjects, theories, methods, and paradigms by exploring the co-citation relationships from a relational approach (Small, 1973). The co-citation analysis “aims at displaying the structural and dynamic aspects of scientific research” (Cobo, Lopez-Herrera, Herrera-Viedman, & Herrera, 2011, p. 1382). Exploring the components of co-citation matrix using principal component analysis can disclose the underlying intellectual structure of the discipline overtime at a macro-level (White & McCain, 1998). The premise of co-citation analysis is that if two documents are cited by another document, it is likely that a certain type of structural connection among them does exist. Heavily co-cited documents tend to unveil the patterns of links between key concepts, theories, methods, or experiments. Thus, exploring the groups of highly co-cited documents can lead to the identification of the socio-cognitive structure of a certain academic field (i.e., sport management in our case), its subfields and the emerging research fronts in it, and its relationships with other fields (de Bellis, 2009). Co-citation represents the inter-document relationships among scholars. Investigating the central groups of this relationship may tell us different stories (e.g., debates on contradicted views, popular methods and paradigms in a certain subarea of the field). Clusters of co-cited documents can represent both the development of previous theories/frameworks and the emergence of new frameworks. As new information, new opportunities arise, new co-cited clusters will be detected. This indicates the emergence of new ideas in the field from the combination and/or recombination of knowledge.

### **Data Collection**

We chose the *Journal of Sport Management* (JSM) to analyze its knowledge structure because JSM is the oldest Sport Management journal, having been initiated in 1987. It is the official publication of the North American Society for Sport Management (NASSM), the first association of sport management to be formed. It is one of the premier journals in the field of sport management (Shilbury & Rentschler, 2007; Shilbury, 2011b). Revisiting the history of the flagship journal using co-citation analysis has been popular across various academic fields because it allows scholars and editorial members to understand the historical development and current position of a particular journal (Üsdiken & Pasadeos, 1995). In retrieving the JSM articles, we included only substantial articles (e.g., research and review articles, Earle F. Zeigler lectures, sport management perspectives) and excluded non-substantial documents such as off the press and sport management digest. The raw data of citations and co-citations were extracted from the Web of Science (WoS) directly using SITKIS software (Schildt, 2002).

A thorough data screening was required as the retrieved raw data from the WoS had many spelling errors. These erroneous entries were corrected by crosschecking the data with the reference lists of original JSM articles manually. If a certain citation was a book or software, we checked if the different editions or versions of the same book or software were cited by other

articles. Overall, a total of 20,839 different publications were cited a total of 31,702 times in 664 JSM articles between 1987 and 2015. For gaining a longitudinal perspective on the changes in intellectual structure as the field progressed, we established five different periods: (a) period 1 from 1987 to 1993, (b) period 2 from 1994 to 2000, (c) period 3 from 2001 to 2005, (d) period 4 from 2006 to 2010, and (e) period 5 from 2011 to 2015. Due to the variation in the number of published articles in each volume, we set the length of each period differently. Table 1 presents the number of JSM articles in each period, the number of cited publications, and the total number of citations in each period and overall.

Table 1  
*Description of Citation Data of the JSM between 1987 and 2015*

Period	Number of JSM Articles	Number of Cited Publications	Total Occurrence
1987-1993 (Period 1)	96	2,015	2,394
1994-2000 (Period 2)	134	3,871	4,867
2001-2005 (Period 3)	90	3,700	4,361
2006-2010 (Period 4)	141	5,797	7,713
2011-2015 (Period 5)	203	9,191	12,367
1987-2015 (All)	664	20,839	31,702

### **Data Analysis**

We conducted principal component analysis (PCA) to provide statistical evidence of the decomposition of the co-citation network. Employing PCA as a clustering procedure is beneficial because of its capability to measure the document similarity that describes the co-citation profiles (McCain, 1990). Each component is explained by the subset of documents loading on it, indicating the substantial contributions to its construction (McCain, 1990; Tang & Tsai, 2016). To carry out this analysis, we converted the co-citation raw matrix into a Pearson's correlation matrix (McCain, 1990) using the R package 'psych' (Revelle, 2016). The main diagonals of the matrices were considered as missing values. First, parallel analysis was employed to determine the number of factors (Horn, 1965) via R package 'paran' (Dinno, 2012).

Based on the results of parallel analysis, we completed PCA with the correlation matrices to identify the clusters within the co-citation networks in each period using R package 'psych' (Revelle, 2016). Varimax rotation was performed to produce a simple structure by allowing independent facts to be loaded under a single factor (McCain, 1990; Ozcinar, 2015; White & Griffith, 1981). Only documents with loadings higher than  $\pm 0.7$  were chosen for interpreting each component as previous bibliometric studies suggested (e.g., McCain, 1990).

Table 2  
*Summary of Principal Components*<sup>56</sup>

Principal Components				
Period	Number	Variance explained (%)	Major Themes	Cited Publications: First Author (Year)
Period 1 (1987-1993) (>2, n=34)	C1	25	Management Studies; Intercollegiate athletic management; Reflective studies	Parkhouse (1982); Kelliher (1956); Monaghan (1985); Jamal (1981); Spencer (1970); Acosta (1985); Zeigler (1987); Hardy (1987); Hatfield (1987); Brassie (1989)
	C2	14	Reflective Studies on career preparation	Zeigler (1974); Mullin (1980); Ulrich (1982); Parkhouse (1979)
	C3	12	Reflective Studies on curriculum designs	Quain (1986); Parkhouse (1987); Hager (1984); Cuneen (1992)
	Total	51		
Period 2 (1994-2000) (>2, n=128)	C1	9	Management (organizational performance; leadership)	Brown (1982); Pfeffer (1977); Glaser (1989); Pettigrew (1987); Liberson (1972); Sashkin (1990)
	C2	9	Management (organizational structure)	MacIntosh (1990); Pugh (1968; 1969); Miller (1986); Slack (1987)
	C3	5	Management (women; diversity)	Kanter (1977); Acosta (1992); Hart (1986); Hasbrook (1990); Holmen (1981); Pastore (1991)
	C4	5	Management (organizational structure; organizational change)	Kikulis (1995); Hinings (1987); MacIntosh (1988); Slack (1985)
	C5	5	Management (leadership)	Hersey (1977); Burns (1978)
	C6	5	Reflective Studies	Chelladurai (1992); Mintzberg (1982); DeSensi, 1994); Boyer (1990); Parkhouse (1982)
	Total	38		
Period 3 (2001-2005) (>2, n=63)	C1	11	Management (institutional change; organizational culture); Qualitative	DiMaggio (1983); Stern (1979); Greenwood (1996); Leblebici (1991); Oliver (1992); Prahalad (1986); Abrahamson (1994); Miles (1994)
	C2	9	Sport Tourism	Getz (1998); Weed (2001); Redmond (1991); Nogawa (1996); Standeven (1999); Green (1998); Higham (1999)

<sup>56</sup> References available upon request.

	C3	9	Consumer (fan) behavior; Quantitative	Cialdini (1976); Wakefield (1995); Branscombe (1991); Nunnally (1978; 1994; 1999; 2002); Wann (1995); Trail (2000)
	C4	7	Reflective Studies	Chelladurai (1992); Pitts (2001); Boucher (1998)
	Total	36		
Period 4 (2006-2010) (>3, n=102)	C1	11	Sponsorship	Meenaghan (2001); Hill (2000); Cobb-Walgren (1995); Madrigal (2001); Speed (2000); Gwinner (1997)
	C2	7	Consumer (fan) behavior	Crompton (1979); Hirt (1992); Trail (2000); Sutton (1997); Robinson (2005); Millon (1990); Stewart (2003)
	C3	7	Consumer (fan) behavior; quantitative	Churchill (1979); Anderson (1988); Browne (1992); Kwon (2003); Gwinner (1999); Hansen (1989)
	C4	5	Management (managing diversity)	Doherty (1999); Tsui (1999); Cunningham (2005); Fink (1999); Cunningham (2004)
	C5	5	Management (gender); feminism; qualitative	Chelladurai (2001); Ely (2000); Shaw (2003); Meyerson (2000); Chalip (2006); Amis (2005)
	C6	5	Management (agency theory; stakeholder theory); Qualitative	Glaser (1965); Eisenhardt (1989); Freeman (1984); Miles (1994); Whitson (1996)
	C7	5	Quantitative	Tabachnick (1983; 1996; 2001); Kline (1998)
	Total	45		
Period 5 (2011-2015) (>4, n=77)	C1	10	Consumer (fan) behavior; quantitative	Nunnally (1999; 2002); Wann (1990); Iwasaki 92004); Hu (1999); Lance (2006); Mael (1992)
	C2	10	(fan) social identity; quantitative	Cohen (2003; 2010); Luhtanen (1992); Robinson (2005); Tajfel (1985); Ashforth (1989)
	C3	8	Quantitative	Tabachnick (1996; 2001; 2006; 2007; 2008; 2012); Fishbein (1975); Browne (1992); Baron (1986); Field (2005); Jordan (2011)
	C4	7	Brand management; consumer (fan) behavior	Fournier (1998); Mahony (2000); Wann (2001); Bauer (2008); Keller (1998)
	Total	35		

## **Result**

### **Period 1 (1987-1993)**

Table 2 presents the summary of the principal components of each period. In this table, only the first author was identified. In the first period, the three components accounting for 51% of the total variance consisted of reflective studies. Component 1, the largest component (explaining 25% of the variance) consisted of two different themes— reflective studies of sport management and management studies. More specifically, studies of Kelliher (1956), Monaghan (1985), and Hatfield (1987) focused on the context of intercollegiate athletics. Component 2 (accounting for 14% of the variance) consisted mostly of reflective studies on career preparation in the field of sport management. Component 3 (accounting for 12% of the total variance) consisted of reflective studies that focused on curriculum development and design in sport management. In this period, there was no study from the outside of the field.

### **Period 2 (1994-2000)**

In the second period, six components accounted for 38% of the total variance. Different from the first period, most components of the second period were related to management studies. Component 1 consisted of leadership, organizational culture, and organizational performance studies, whereas Component 5 included human resource management studies, including leadership studies. It is noted that all studies of these two clusters were from the general management field. Component 2 comprised of organizational structure studies. Two studies about the structure of Canadian sport organizations (MacIntosh, 1990; Slack & Hinings, 1987) had a close relationship with two organizational structure studies from the general management field (Miller & Droge, 1986; Pugh, 1968). Similarly, Component 4 also composed of organizational structure and organizational change studies, but all studies were related to voluntary sport organizations (Hinings & Slack, 1987; Kikulis, Slack, & Hinings, 1995; MacIntosh, 1998; Slack & Hinings, 1987). Co-cited documents of Component 3 were the studies of diversity and women studies in both general organizations (Kanter, 1997) and sport organizations (Acosta, 1992; Hart, Hasbrook, & Mathes, 1986; Hasbrook, Hart, Mathes, & True, 1990; Holmen & Parkhouse, 1981; Pastore, 1991). The sport-oriented studies were conducted in both interscholastic and intercollegiate athletics. These components accounted for 9%, 9%, 5%, 5%, 5%, and 5% of the total variance respectively. Management-related components accounted for 33% of the total variance. Last, Component 6 consists of reflective studies of sport management. Different from the period 1, the identified reflective studies focus on the reflections in research practices.

### **Period 3 (2001-2005)**

In the third period, four components accounted for 36% of the total variance. Component 1 (accounting for 11% of the variance) was related to management studies focusing on institutional change in both sport organizations (DiMaggio & Powell, 1983; Stern, 1979) and general business contexts (Abrahamson, 1994; Greenwood & Hinings, 1996; Leblebici, Salancik, Copay, & King, 1991; Oliver, 1992). Additionally, the cluster includes one study on qualitative methods (Miles, Huberman, & Saldana, 1994). Component 2 consisted of studies of a new topic

- sport tourism accounting for 9% of the variance. Component 3 also covered the new topics – fan behavior in sport along with a work on psychometric theory. This component accounted for 9% of the variance. Accounting for 7% of the variance, Component 4 was comprised of reflective studies of research practices in sport management.

#### **Period 4 (2006-2010)**

During this period, the results showed that seven components explained 45% of the total variance. Component 1 accounting for 11% of the variance was composed of sponsorship studies (Gwinner, 1997; Madrigal, 2001; Meenaghan, 2001; Speed & Thompson, 2000) and brand management studies (Cobb-Walgren, Ruble, & Donthu, 1995; Hill & Green, 2000). Component 2, explaining 7% of the variance, was comprised of studies of fan behavior. Similarly, Component 3 (explaining 7% of the variance) consisted of fan behavior studies (Hansen & Gauthier, 1989; Kwon & Trail, 2003) but also included literature on quantitative methods (Anderson & Gerbing, 1988; Browne & Cudeck, 1992; Churchill, 1979). In particular, all studies related to measure development. Component 4 consisted of studies of diversity management in sport organizations (Cunningham, 2004; Cunningham & Sagas, 2005; Doherty & Chelladurai, 1999; Fink & Pastore, 1999) and in general contexts (Tsui & Gutek, 1999). The studies of Component 5 addressed gender issues and feminism in sport organizations (Amis & Cornwell, 2005; Chelladurai, 2001; Shaw & Hoeber, 2003) and general contexts (Ely & Meyerson, 2000; Meyerson & Kolb, 2000). Component 6 was comprised of management studies about agency theory (Eisenhardt, 1989) and stakeholder theory (Freeman, 1984) along with works on qualitative methods (Glaser & Strauss, 1965; Miles, 1994). Component 7 was comprised of studies on quantitative methods. In sum, sport marketing studies (Component 1, 2, and 3) accounted for 25% of the total variance, whereas management studies accounted for 15% of the total variance during this period.

#### **Period 5 (2011-2015)**

Between 2011 and 2015, three components— Component 1, 2, and 4 (accounting for 10%, 10%, and 7% respectively) covered the marketing area. Component 1 and 2 were comprised of studies of fan behaviors (Iwasaki & Havitz, 2004; Robinson & Trail, 2005; Wann & Branscombe, 1990) in sport events, social identity and consumer behavior in general organizational context (Ashforth & Mael, 1989; Luhtanen & Crocker, 1992; Tajfel & Turner, 1985) and quantitative methods including psychometric theory (Nunnally & Bernstein, 1999; 2002), structural equation modeling (Hu & Racherla, 1999; Lance, Butts, & Michels, 2006), and regression analysis (Cohen & Cohen, 2003; 2010). Notably, in Component 2, fan behavior studies tended to co-cited often with social identity studies in the context of consumer behavior.

Component 4 included studies that focused on brand management and fan behavior. Two brand management studies in general (Fournier, 1998; Keller, 1998) were identified along with the studies of brand management in sport context (Bauer, Stokburger-Sauer, & Exler, 2008) and the effect of social identity on fan behavioral intention studies (Mahony, Madrigal, & Howard, 2000; Wann, Melnick, Russell, & Pease, 2001). Last, component 3 mostly consisted of studies of quantitative methods such as multivariate statistics (Tabachnick & Fidell, 1996; 2001; 2006; 2007; 2008; 2012), structural equation modeling (Browne & Cudeck, 1992), moderating-mediating effects (Baron & Kenny, 1986), and nonresponse effects (Jordan, Walker, Kent, &

Inoue, 2011) accounting for 8% of the total variance. One study about the antecedents of behavioral intentions also identified in this component (Fishbein & Ajzen, 1975).

## **Discussion**

The boundary of the field of sport management has elaborated to be more specific and broader since the inauguration of the JSM in 1987. While many scholars have suggested how sport management scholars need to set the directions of the discipline and JSM to enhance the legitimacy of the field, there has been no empirical evidence that shows how the field and journal have been developed intellectually. To fill this gap, this study analyzed the co-cited documents of the JSM – one of the oldest and most influential journals in our field.

The results show that the central themes of the co-cited documents of the JSM between 1987 and 2000 are management/administration studies and reflective studies. The dominance of management studies is not surprising as the NASSM constitution defined the field as management theory and practice specifically related to sport in 1986. While many scholars recognized the significance of physical education as an academic field at that time, some scholars began to recognize the lack of studies on administration of different types of sport organizations including intercollegiate athletic departments or interscholastic athletic departments in 1980s. Even though these athletic programs are a part of the academic institutions, it needs the distinctive administration strategies that go beyond the education aspect (Parkhouse et al., 1982; Zeigler, 1987).

Embracing this history, in particular, between 1987 and 1993, the management/administration cluster included the studies about job analysis of athletic directors in the context of intercollegiate athletics and general managers in professional sports. Between 1994 and 2000, various subthemes of the management area are dominant. These subthemes include leadership, organizational structure, organizational change, diversity management, and organizational performance. In particular, in this period, whereas the most of organizational structure and organizational change studies were conducted in the context of voluntary sport organizations (non-profit organizations), diversity management studies were conducted in the context of intercollegiate athletics. Since this was the first decade of JSM, many co-cited documents contributed to establish the legitimacy and identity of sport management at the beginning era of the JSM. Before 2000, the JSM articles tend to cite the studies related to job analysis, organizational culture, leadership, institutional theory, and strategic management from the general management field. It is noteworthy that in periods 4 and 5, reflective studies are not part of any of the components.

Between 2001 and 2005 (period 3), new central themes emerged. These new knowledge domains include tourism and marketing (e.g., consumer behavior) in sport. Related to methods, particularly, structural equation modeling studies and the software designed for structural equation modeling (i.e., LISREL) were newly identified. Also, studies of qualitative methods were also identified for the first time. Specifically, fan behavior studies tend to be clustered with studies of quantitative methods, including structural equation modeling.

In period 4 (2006-2010), sport marketing was the dominant knowledge domain. Twenty-five percent out of 45% of the total variance was explained by sport marketing components (e.g., sponsorship, consumer behavior, brand management). In addition, management studies, reflective studies, and publications on quantitative methods were dominant. Publications on qualitative methods formed a component for the first time in this period. It should be noted that

the group of marketing studies was linked with studies of quantitative methods, whereas the group of management studies were related to studies of qualitative methods.

In period 5 (2011-2015), the popularity of fan behavior studies and publications on quantitative methods still were dominant as in period 4. Consumer behavior-related components explained a total of 27% of the total variance. The group of fan behavior studies was linked to the studies of quantitative methods strongly. Thus, Zeigler's (1987) call in the first issue of JSM for more marketing studies has been satisfied.

Overall, the findings show that the two dominant subareas of sport management--sport management and sport marketing—adopting different patterns in their intellectual themes. The knowledge group of sport marketing is based on deductive-oriented reasoning, while the knowledge group of sport management (organizational studies) had shifted from deductive-oriented reasoning to inductive-oriented reasoning since the late 2000s. As sport marketing more based on psychology-based consumer behavior, this pattern became even more patent. The field of sport management developed with the studies of organizational behavior in sport from a post-positivistic view at the beginning. As time went by, divergent paradigms such as feminism tended to anchor studies published in JSM. Since the 2000s, the intellectual structure surrounding sport marketing became more convergent and centralized towards “consumer behavior.”

Ciomaga (2013) argued that sport consumer behavior developed in academic departments of mother disciplines such as business schools or departments of psychology. Yet, we believe that there have been our “own” sport management scholars who endeavored to pursue the development of unique models or conceptual frameworks that can only be applied to the fan behavior, at least in JSM. The works of the Psychological Continuum Model (Funk & James, 2001) has been influential over a decade now in the field of sport marketing. While many concepts, models, and theories appeared and quickly faded away in sport marketing, PCM has thrived and evolved through more than a decade since it was first published in 2001 (Funk & James, 2016).

Kuhn addressed the notion that critical thinking in science assumes a particular view of science, a view in which science advances through unbridled imagination and divergent thinking. Kuhn recognized that such thinking was responsible for some historical scientific progress, but he suggested that convergent thinking was also an important means of such progress. While revolutions, which depend on divergent thinking, are a crucial means for scientific progress, Kuhn proposed that few scientists consciously design revolutionary experiments. Rather, most scientists engage in “normal research,” which is “a highly convergent activity based firmly upon a settled consensus acquired from scientific education and reinforced by subsequent life in the profession” (Kuhn, 1962, p. 163). For the scientific progress in sport management, we need to discuss what is the optimal balance between normal research with convergent thinking and innovative practices with divergent ideas. The results of the co-citation analysis indicate that sport marketing has been more normal research practice focusing on post-positivistic behavior-based studies whereas sport management has been more divergent to tackle the issues in sport organizations from not only from a post-positivistic view but also from feminism or social constructivism.

## Limitations

The present study provides empirically grounded evidence that can be used by all scholars to identify the opportunities and challenges for research contribution in the field according to their expertise (e.g., sport management, sport marketing, sport economics, sport tourism, sport policy). Because these experienced scholars have a wider range of qualitative knowledge and insights, they may contribute reviews at various levels based on the results of this study.

Because the choice of the sample was the articles published by the JSM, the results cannot represent the overall landscape of sport management. Rather, it presents the intellectual landscape of the JSM. Further studies need to be done combining samples from other sport management related journals such as *Sport Management Review* or *European Sport Management Quarterly*. Additionally, the journal-level co-citation network analysis will provide the positions of each sport management journal and non-sport management journal and how each journal is related to each other to create knowledge domains within the discipline of sport management (Köseoglu, Sehitoglu, & Craft, 2015; Shafique, 2013).

This study used each document as the unit of analysis rather than the authors. The scholars in the field of sociology of science argue that there is a direct relationship between the patterns of social interaction among scholars and the structure of knowledge space (e.g., Love & Andrew, 2012; Moody, 2004; Quatman & Chelladurai, 2008). Future studies may employ co-author network analysis of the published JSM articles to take into account the social construction of knowledge. The incorporation of the results of co-citation analysis and co-author analysis may tell us how social relationships of scholars and knowledge domain generation are related in the discipline of sport management, implying a social influence on the knowledge creation process (Shafique, 2013).

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### Discussion Questions

1. What kind of academic fields influence the knowledge structure of Sport Management?
2. What are the factors that influence citing behaviors in the field of Sport Management?

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# **A Methodology for Reconstructing Complex Puzzles in Multiple Dimensions without a Prior Vision of the Whole Image: A Case Study: The Genealogical History of the Entire Jewish Population of the Polish Town of Pinczow in the 18th and 19th Centuries**

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## Abstract

We have developed a new technique for the systematic analysis of civil registration records in a typical Polish town during the period 1810 to 1912. We have applied the technique to the Jewish population of Pinczow, 5,000-strong by 1912. We extracted more than 27,000 birth, marriage, and death records and reconstituted 1900 family histories with the aid of a set of systematic rules, partially computerized, which allows one to make a 1:1 mapping of the subset of pre-1826 records (that did not employ surnames) to the partially overlapping subset of the remaining records, which did use surnames. Mapping requires agreement on the basis of several criteria. Total consistency and lack of ambiguity are hallmarks of the resulting success. The algorithm not only allows one to establish family trees leading as far back as 1700 but also permits one to simultaneously conjecture surnames, where needed, on the basis of those that descendants eventually adopted. This symbiotic process succeeds only because of the application of the algorithm on a massive scale. One can apply the method to any town of similar size, and one can use the results to study sociological behaviour and town history. In the case of Jewish Pinczow, this study also demonstrates an advance in Rabbinic genealogy.

*Keywords:* patronyms, genealogy, 1:1 mapping, history, sociology, puzzles, methodology, Pinczow

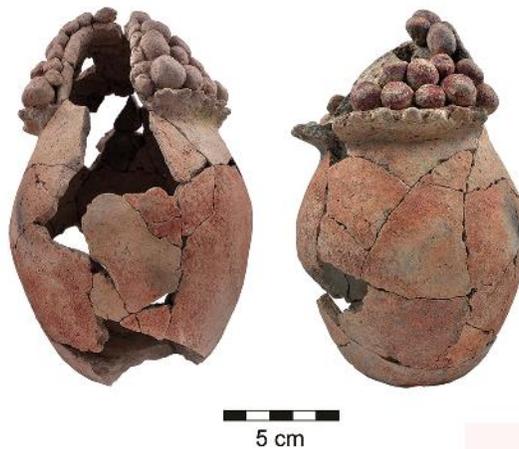
## Introduction

### The Art and Science of Puzzle Solving

The reconstruction of an object consisting of many pieces is a task, often encountered in the field of archaeology. For example, researchers from Israel and Germany recently unearthed a 12-cm tall unusual 7,200-year-old clay vessel at Tel Tsaf in the Jordan Valley and reconstructed it from 25 or so shards (Rosenberg, Garfinkel, & Klimscha, 2017). Its reconstruction led the researchers to conclude that the vessel may be the oldest evidence yet of political and social class structure among the upper class in relation to food storage rituals in the ancient Near East. That a small 3-D puzzle can lead to such far-reaching conclusions is amazing. Reconstructing a 25-piece puzzle like this can be routine because of the experience of the puzzle-solver who knows the context intimately, even if the object is 3 dimensional and even without knowing in advance what it is supposed to look like. In the Tel Tsaf case, the structure was rather complex, and the archaeologists could solve it arduously, but nevertheless relatively routinely compared to the following cases.

Figure 1

*Clay Vessel Unearthed at Tel Tsaf. Photo courtesy of Danny Rosenberg.*



At the other extreme, researchers required a less routine approach for a 2-dimensional puzzle involving only a handful of pieces which are repetitive in nature, but for which the magnitude of the puzzle was initially unknown; and, therefore, they required much more tedious effort, particularly since a variety of possible geometric patterns were involved. The investigations of Barkai, Dvira, and Snyder (2016) resulted in the reconstruction of several multi-coloured tiles used to pave the floors of the Second Temple in Jerusalem. The ancient historian Josephus (1982) described these floors in eloquent and admiring terms. It is important to note that, in order to succeed in solving such a puzzle, one has to know not only exactly how many pieces there are in the puzzle, but also to know which pieces belong to a particular tile, and certainly the overall size of the unit cell<sup>57</sup> – without prior knowledge of the outcome. With the restriction that the puzzle pieces must fit precisely, and must match up to their neighbouring pieces in length and orientation, and must form a square, one would think that one could solve

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<sup>57</sup> A chemical term used to describe the repeating entity in a crystal structure.

such a puzzle by a computer algorithm. However, because of the non-uniqueness of possible patterns, it turns out not to be so feasible or desirable. Instead, the researchers resorted to simple trial-and-error, taking advantage of many years of experience of what *opus sectile* floors looked like throughout the Roman Empire 2,000 years ago (Snyder, Avraham, 2013, p. 178). The only way to know that one has solved the problem correctly is if the result turns out to be beautiful. This was a necessary requirement of the ancient architects. Aesthetics is not something that a computer can easily learn.

Figure 2

*Opus Sectile Pattern Reconstructed from 17 Pieces. Courtesy of “The Temple Mount Sifting Project”*



One may ask, then, are there *any* topological problems that we can solve by computer, or at least objectively. The archetypical topological brainteaser is the ubiquitous jigsaw puzzle. And for this case the answer is – yes, in principle; but no in practice. With the goal broken down into four distinct tasks – (a) classification of the puzzle pieces; (b) construction of the edge topology; (c) construction of the internal topology; and (d) local contour matching, De Bock et al. (2004) succeeded in programming a computer to solve a jigsaw puzzle as large as 300-pieces using known algorithms developed by the same group (DeSmet et al., 2003). Such solutions can easily be held hostage by dust particles (noise) or poor cuttings of jigsaw puzzle pieces (poor intrinsic matches). That fact alone is what makes computer approaches ultimately not useful for our own particular study (see below). In other words, pattern recognition or computer vision is one thing; but flexible computer thinking and appreciation of self-consistency, of context, of beauty or of truth-when-you-see-it is quite another. The authors admit that their study was a subset of a very complex generic digital reconstruction problem. Considering the difficulties that such 2-dimensional problems present, one can imagine what would happen for 3 or more dimensions. Such is the case in genealogy.

Consider extracts of individual birth, marriage and death records of a single town as puzzle pieces. Each of these events could potentially reveal the names of parents, birth years, professions, relationships to witnesses, and town origins etc. We can link these pieces together to create a nuclear family tree. Then using the information gleaned from this tree, one knows whose birth, marriage and death record one must subsequently locate for earlier or for later generations. Each link is a boundary between puzzle pieces. Slowly one builds up a more extensive tree of several generations using a single surname. There are built-in uncertainties if registry clerks were inconsistent in recording ages or if a single person’s profession or surname changed over time or if a parent’s spouse was from a second marriage etc. These would constitute fuzzy edges of the

pieces and at the very least are irritating from the point of view of feeling comfortable with the reconstruction. Notwithstanding this irritant, if one tolerates minor fuzziness, the result is a family tree for a single surname which one can chart in two dimensions. Now, consider any single marriage in this family tree. All of a sudden, we have a new, but imported family whose tree also could be extensive, but which no longer fits on the two-dimensional board. Its family will jut out from the first two dimensions forming a new dimension. This branching is repeated for each marriage. We now have a multidimensional puzzle. Given the fact that, in a given town's population, there are limited numbers of families, eventually the links fold back on each other every time there is a distant cousin marriage. Suddenly, dimensions – even fractal dimensions (Mandelbrot, 1983) – no longer describe the problem at all. It is more properly described as a dense web puzzle. Clearly, the web-like nature of the tree implies that charting the history of a single family, in fact, requires one to make a global family tree for the entire town as a living organism: One family is not strictly isolated from all the others in a single town. Furthermore, a traditional commercial two-dimensional jigsaw puzzle provides the puzzle-solver with an image of the finished product on the box top. Not so for the genealogy of a town. One has no idea of the scope or size of the puzzle until one has actually completed the town's multi-family history. There are not even any regular edges to such a puzzle, as each group extends back to a different point in time<sup>58</sup>. In addition, if one person were to marry a spouse from a different town, the marriage record would not be available to the puzzle-solver who is concentrating on the original town history. The same applies to births and deaths. This feature is analogous to missing jigsaw puzzle pieces. Conversely, one could conceive of the opposite scenario with a newly married couple suddenly immigrating from a distant town, without the puzzle solver necessarily being aware of this. Then one would have an excess of puzzle pieces, and they would not necessarily link up to or add to the original pieces. They belong to a separate puzzle. To complicate matters, in principle it is possible for two different couples having identical names and professions and birth years to give birth to two children having the same names. The uncertain linkages result in ambiguity. In our case, below, spanning a 100-year period, there were about 27,000 events (or puzzle pieces). Clearly, such a jigsaw puzzle can become intractable to solve (certainly by an “unintelligent” computer) because of the sheer magnitude of the possible combination of linkages, were it not for the puzzle-solver's objective and intuitive understanding of the context, and of naming patterns in specific societies etc. Consequently, when studying the genealogical history of a given town or county, one must do it manually, much like the reconstruction of an archaeological artefact. In principle, we can use the same codes that a computer algorithm would use, searching systematically piece by piece for each linkage, using specialized reconstruction rules, elucidated below. These rules have the effect of reducing the complexity of the big-number problem<sup>59</sup>. Thus, our monster problem can indeed be tackled systematically. However, human supervision is a necessary element of the process.

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<sup>58</sup> The solution of a jigsaw puzzle is made more efficient if one starts at the edges. Thus, instead of 4 unknown edge matches there would be only one – the remaining one facing the interior of the puzzle. In the absence of a global edge, one is forced to start the puzzle at random points in the interior.

<sup>59</sup> For example, a 30,000-piece puzzle would require  $30,000 \times 29,999 \times 29,998 \times \dots$  attempted matches. The product is larger than the number 1 followed by 121,000 zeroes – a number which is enough to fill a 100-page book double spaced font size 12; and this does not take into account the infinite number of variable orientations and rotations for each potential match. Happily, we can eliminate most of these options by using context-based logic, which only the human brain can provide.

## **Genealogy as an Academic Field**

Genealogy *per se* is not just a pastime or a matter of vanity. We can address serious issues by tracing ancestral lines. For example, one can predict and, in principle even eradicate genetically inherited medical conditions. Specific genetic mutations affect a person's chances of suffering, from Alzheimers (Jonsson & Stefansson, 2013), from breast cancer (Tulinius et al., 2012), among other conditions and, on the positive side, of acquiring longevity (Gudmundsson et al. 2000). While whole or partial genome analysis might be very useful to determine such genetic properties in single patients after the fact, it follows that by tracing relationships laterally and ancestrally, one can also analyze predispositions to these conditions. Pathological genetic conditions arise sometimes in close-knit communities subject to a lot of inbreeding. But such societies can also serve as test subjects for scientific study. Such is the case of Iceland where approximately 300,000 living members all descend from a small identifiable group which settled the island about 1,100 years ago. What makes this a wonderful test group is that Iceland's population was physically isolated and that, as a result, extensive genealogical records have survived all this time for that unique group, unaffected by wars or massive immigration. Government-supported churches and public institutions have collected these records and ultimately transformed the 11-century old raw data into a computerized genealogical database<sup>60</sup> that was instrumental in the above-mentioned medical advances.

The uninterrupted record-keeping in Iceland made feasible the creation of a single nationwide family tree, containing potentially as many as 1,000,000 distinct people, and spanning 11 centuries. Ashkenazi Jews, too, formed an insular society with considerable inbreeding. However, the practice of reliable record-keeping for Jews has been around for only 300 years at best in Western Europe, and only 200 years in Poland. Less than 5,000 Jews living in the little town of Pinczow, with nearly complete record-keeping for a mere 200 years, does not compare in magnitude to the 300,000 Icelanders with 1,100 years of documentation. Still, given the fact that Icelandic surnames are essentially patronyms, as was the case in Ashkenazi Jewish society until the early 19<sup>th</sup> century, the approach ought to be very similar. It is simply a matter of scale.

JRI-Poland has been constructing its large database (Jewish Records Indexing – Poland, 2019)<sup>61</sup> of birth, marriage and death records of Polish Jews during the last 20 years by scouring the Polish archives. Like the Icelandic case it should be possible, in principle, to create a single family tree of Polish Jews. Unlike the Icelandic cases, though, which made use of an existing 1,100 year old database and only at the end applied it to medical issues, Diamond conversely and ironically pursued the ancestral source of a rare blood disorder (Martino et al., 1997; Diamond, S., 2004), thereby spurring the creation of a previously non-existent database. It has now taken on a life of its own. But it is much harder to use this Polish database since the names are not yet grouped by family. The present study shows exactly how to make the most of the database using the town of Pinczow as an example.

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<sup>60</sup> Stefansson and Kulason at deCODE Genetics, Reykjavik spearheaded the effort to computerize the *Islandingabok*, or *Book of Icelanders* in 1997. They extended the effort by scouring censuses, church records and family archives (Stefansson, 2019). The database includes all living 300,000 Icelanders and all their ancestors stretching as far back as 900 CE, and it encompasses at least 600,000 people, or 95% of Icelanders who have lived during the past 300 years.

<sup>61</sup> The database contains more than five million vital record entries from more than 550 towns. In size, the Jewish database has the potential to surpass that of the Icelandic database.

## **Genealogy of Polish Jews**

Many authors have studied Jewish family history (e.g., Liver et al., 2007; JewishGen, 2015; Amdur, Sack & Mokotoff, 2004). To get a good understanding one requires knowledge of the history of the Jews in Europe. A very large subset of this field deals with Polish Jews (see Wikipedia, 2019) and the 284 basic references therein; Hundert & Bacon (1984); and the bibliographies by Balaban (1930) and by Corrsin (1995)). Pinczow is a good representative town chosen because of the relative completeness of records by Polish standards.

### **(A) The Jews of Pinczow**

Pinczow is a small town in the Kielce province of Poland. According to the Yizkor Book for Pinczow (Shener (1970)) and to Yad Vashem's Pinkas haKehillot series (Wein, 1999), the majority of the town's population was Jewish prior to World War 2. By the mid-19<sup>th</sup> century there were about 3,000 Jews living in Pinczow, and by the end of the 19<sup>th</sup> century their numbers grew to over 5,000. As was typical<sup>62</sup> of most towns in central Poland, Jews engaged in a very large variety of occupations; but Pinczow is remarkable for the relatively large number of scholars and Rabbis who lived there since its beginnings. Much of the history of the Rabbinate is described in the Yizkor Book; and for the years prior to 1614 it was the subject of a study by Simon Dubnow (1894). Information on ordinary families of the town is available mostly in anecdotal form, as for example in the Yizkor book. Nevertheless, it is possible to, in principle, reconstruct the family trees from the civil registry records of Pinczow. The Polish State Archives have preserved birth, marriage and death records for the town almost in their entirety from 1810 to the present time, and they are now publicly accessible up to the year 1912 (Polish State Archives). The present study has extracted and analyzed those vital data *en masse*.

### **(B) The Use of Jewish Surnames**

One aim of the present study is to develop a method for determining the genealogical history of the Jews of a typical Polish town, and to demonstrate the technique for Pinczow over an extended period of time back to ca 1700. In the case of Pinczow this means creating family trees of all families in town who eventually used more than 2,000 distinct surnames. The task is made difficult because Jews tended to resist using surnames until well into the 19<sup>th</sup> century. The Austrian Emperor Joseph II mandated the use of surnames (Joseph II, 1787). (Pinczow was an Austrian possession between 1795 and 1815). Congress Poland, subject to Russian laws, promulgated similar edicts a little later. An excellent description of the processes involved is given by Paull and Briskman (2014, 2016), while we can find the etymology and provenance of

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<sup>62</sup>In the 18<sup>th</sup> century Polish towns had between about 1,000 to 5,000 Jews. The Jews were merchants, small factory owners, innkeepers, agents of farmers and landowners, and scholars. Most of them lived in private towns whose owners were positively pre-disposed to them. See, for example – Hundert (1992) who states that two-thirds of the Jews in 18<sup>th</sup> century Poland lived in towns, and half of the town dwellers were Jewish. He used Opatow as a case study. Another case in point is the town of Zamosc, founded in 1580 by Jan Zamoyski, Chancellor of the Polish Commonwealth. His descendants inherited the town all the way down to 1821. By this time Jews constituted 53% of the population of Zamosc. Pinczow, too, was a private town. The Myszkowski family owned it since 1586 and then sold it to the Wielopolski family who owned it until its annexation by Austria. All of these towns tended to be insular, at first, with families intermarrying with other local Jewish families.

particular surnames in the work of Beider (1996). Civil registry offices were *beginning* to seriously record surnames around 1821, as we have observed empirically for many towns in Congress Poland. Getting used to surnames often stretched out to about 1835. Consequently, the early records (1810 to 1825), in the so-called “patronymic era” stubbornly exemplify a general lack of surnames. Instead, Jews tended to use the traditional X *ben* Y scheme, or the Polish equivalent, e.g., X followed by “Y”owicz. It is therefore very difficult to make good use of these early data. Yet these extra 16 transitional years are crucial to our understanding of the Jewish history of Pinczow: Those early years contain records of the ancestors of much of the later population of Pinczow. Furthermore, any elderly person who died during this period might have been born as early as 1725. Deduction of his or her parents’ names thus would enable us to extend the history of a whole family back to roughly 1700 and make links to other associated families. Accordingly, the secondary aim of this study is to assign surnames (to the people mentioned in these patronymic records) which they themselves never carried but which their descendants eventually adopted. In order to carry out this task for any given family, it turns out, it becomes necessary to conjecture surnames for *all* families, in analogy with the task of solving a large jigsaw puzzle. It is a synergistic procedure. Therefore, the overriding aim of the project is to demonstrate an efficient methodology for conjecturing surnames, *en masse*, which we can apply in the future to other town histories. In addition, it happens that Pinczow was the home of a relatively large number of scholarly families who had ties by blood or by marriage to well-known Rabbinic families all over Congress Poland and beyond. Another aim of the project is, therefore, to analyze these family structures, for the purpose of elaborating the history of historical personalities involved and to resolve various associated historical controversies.

### **(C) Previous Studies**

The extraction of civil registration records of Polish towns is quite popular. Indeed JRI-Poland (2019) devotes itself to making a database of extracts of such Jewish records publicly available. Most family historians are quite capable of charting their own family trees without difficulty using such data. However, in the general absence of surnames, use of the *pre-1826* records becomes intractable, and therefore these records are mostly ignored. Our work differs in that we conjecture surnames for that nebulous era so that those records too can become useful. It happens to be a non-trivial exercise; but we show here how to do it. One recent study published after a mass-extraction project is that of Jankowski (2015) and the International Institute for Jewish Genealogy (2015). This mostly concerned a sociological analysis of marriage and fertility patterns within and without distinct social classes in Piotrkow Trybunalski. However, the author seems to have not conjectured surnames for the very important pre-1826 era. The only other (non-JRI) study which has actually accomplished our mission, as far as we are aware, is the impressive database for Krakow (Hirschberg, 2018), under development for many years, which makes use of conjectured surnames for the period 1798 to 1825. However, nobody has yet published these techniques in academic circles.

**(D) On the Nature of Civil Registry Records of Jews in Congress Poland and the Reliability of such Raw Data for Research**

The records of Jews living in 19<sup>th</sup> century Poland are of three types:

- (1) Prior to 1826 parish offices of many towns in Congress Poland kept records in books wherein there was usually no separation between Jews and non-Jews. Without separate lists and in the absence of the systematic usage of surnames, care is required to identify Jews. Some Polish given names are Biblical in origin and one might erroneously identify them as Jewish. Jewish records, though, can usually (but not always) be recognized by the Hebrew signatures of witnesses at the end of the document, and by the phrase “follower of the Old Testament” after the declarant’s name. Pinczow’s Jewish records are exceptional since, although in the same books as Catholic records, officials listed them in separate sections.
- (2) After 1826 civil registrars kept records of Jews in books which were separate from those of the general Catholic population. The clerks often (but not always) indexed them at the end of each volume or year. One stylistic change after 1826 is the absence of recorded house numbers.
- (3) Starting in mid-1868, after a failed Polish rebellion against Russian rule, clerks wrote the records in the Russian language and in Cyrillic script.

At least in Congress Poland, before 1826 the use of surnames, although apparently required after 1821, was not common. After 1821, Jews began to adopt surnames in keeping with the law, but in some towns the transition period dragged on sometimes for as long as ten years or longer. We note that

- (1) When the transition period lasted a long time, patronyms and surnames were often interchangeable for many years before a surname finally “stuck”. In some cases, families adopted patronyms as official surnames.
- (2) It also often happened that a young male might choose a surname which was entirely different from what his father or his brother(s) chose. Except for references to towns of origin or to professions, or to an honorific acronym, or to intermarriage with a famous Rabbinic family which already carried an ancient surname, there was no obvious reason for the choices of invented surnames. Sometimes sons even chose their mother’s maiden names as their own surnames. On rare occasions, families invented a brand-new surname a few years later to replace the first choice.
- (3) Clerical errors often abounded (spelling, confusion between father and declarant, house number slightly off, etc.)
- (4) People sometimes had double given names. In the records they might appear with one or the other or both, and one has to be prepared for inconsistent usage. For example, sometimes a man might appear with the name Moszek, another time with the name Jakob, and other times with the full name Moszek Jakob. Of course, one has to be sure that the second name is not simply a form of patronymic following the German-language tradition. Hebrew signatures, if available, help to untangle this issue.

- (5) People sometimes used nicknames, and one has to be prepared to recognize them as belonging to the same person. For example, Leyb, Leybusz, Lewek are interchangeable. The Hebrew version adds yet another option. For the same example, Yehuda (or Juda) Leib is also interchangeable with the above. “*Kinnuim*” can also add to the mix. For example, Aryeh is the Hebrew *kinnui* for the Yiddish form, Leib, but some used it as a unique given name.
- (6) Patronyms sometimes reflected the names of the fathers, and sometimes the names of the grandfathers of the subject of the record, depending on how the declarants perceived questioning by the clerk – e.g., was it the patronym of the child or that of the father?
- (7) Although women’s patronyms follow the simple grammatical rule of “owa” = wife of; and “owna” = daughter of, it often happened that a clerk would refer to a particular woman as daughter of “x” at the birth of one child, the daughter of “y” at the birth of her next child, and the daughter of “z” at the birth of yet another child. x, y, and z were sometimes her real father, grandfather or even husband’s father depending on the whim or memory of the person making the declaration to the clerk.
- (8) Widowed heads of households often married more than once. Thus, some children in the family might have one mother, while others would have a different mother. And in some cases, a young orphaned child might never have known his or her real mother, and would get used to identifying the stepmother as the mother.
- (9) Declared ages were rarely accurate, and often drifted further and further from the truth, the older the people became. Inconsistencies as large as 10 years were not uncommon.
- (10) Poor clerical handwriting can lead to errors of interpretation by the modern researcher.

Stroweis (2011) has reviewed many of these sources of error or uncertainty.

### **Methodology for Conjecturing Surnames**

The following is a glossary of the words used in this study:

B,M,D	birth, marriage, and death
Akta	file number
Micro-tree	a family tree for a small group containing father, mother and children, and possibly with siblings and their children, etc, and possibly grandparents – <i>all living in the same house.</i>
Mini-tree	a family tree for an extended group containing several related households not necessarily living in the same house.
Patronym	An apparent surname based on the given name of the subject’s father or, if it is more than one generation old, then based on the given name of the grandfather.

Although we entered all the data into a computerized and searchable database, and although we attempted to standardize variant spellings of names, it was not possible to automate the entire procedure. Human intervention is required because of the need for visual inspection of

charts of micro-trees in order to match with other charts and with those generated for the post-1826 era. In addition, one of our procedural tools is to inspect the names of *couples* (as opposed to those of single people) for additional matching, especially if the families spread to adjacent houses. Prior to this work nobody ever attempted to take advantage of the unique information available in pairs of given names, as far as we are aware. By its nature, however, it prevents a fully automated computerized mapping, especially since the mapping must be done in the context of an extended family group. The following procedure for conjecturing surnames is as objective as one can expect to make it.

Given the multiple sources of confusion described above, we have to be a little (but not too) flexible when conjecturing surnames from large bodies of data containing some variability. We have to develop objective rules. The general principle used in this work is that a family should be assigned a surname only if there is a match between it and a surnamed family on at least three major counts – same house number (if pre-1826 data are compared), same parents, agreement between patronyms and the given names of parents, identical occupations, and very similar years of birth. A surname is assigned, recorded in a prominent colour, say red, and placed in square brackets if there are three or more positive counts. With only two counts and some other partially supporting evidence (e.g. extra information from Hebrew signatures or from witness identity), the square bracket is accompanied by a question mark. For less than two additional counts, it is too risky to assign a surname, unless agreement is supported by evidence from a third generation (later or earlier) or by a Hebrew signature, etc.

In order to successfully link patronymic era records to those of surnamed families it is important to use all of the *post*-1826 B, M, D records in order to chart the family trees of *all* families in town and to search for matches to earlier records. This might seem like overkill if one is only interested in one or two families. However, since we are interested in identifying *all* people in the patronymic era, we are left with no choice. At the very least, this allows us to distinguish between different families with virtually identical name and age characteristics, and thus to reduce the level of ambiguity.

In the following section we describe the steps used in the process, and we illustrate them with the data for particular family groups. We have also arbitrarily chosen the HOROWICZ family to show the net result of all steps.

(a) The first step in the procedure is to create a spreadsheet (in order of Akta #s i.e., in chronological order) giving, in separate columns, the following items: family surnames, followed by given names, parents' names, professions, and house numbers. (Usually the marriage records will not have house numbers, but they will have the names of the towns of origin.) We include all additional data, including the names of witnesses and their relationship to the family, if any, as well as any peculiar information. For the patronymic era we use the clerk's spelling of the surname as recorded in the registry index. In those cases where there is no index we use the "surname" as recorded in the body of the text. As a modification we add columns with standardized surnames and given names in order to facilitate comparisons (either visual or computer-searched). Some of these entries will have true surnames, as opposed to patronyms. These surnamed records form the raw database from which to conjecture surnames in pre-1826 records.

(b) Next, we use post- and pre-1826 records in order to make charts of families *having surnames*, including house #s where possible. (It is very rare to find house numbers in post-1826 records). These are surname charts and could include many groups using that surname whether or not related to each other.

(c) We then re-order the B, D lists from the patronymic era, each in order of house #s. Our example from house # 13 is shown in Figure 3. Clearly, we have been able to conjecture seven surnames based on the principles listed above. Furthermore, even though there were five family groups associated with house # 13 (HOROWICZ, SAFRAN, MIERNIK, WAJS, and EJBUSZYC) we have shown that at least two of them were related by marriage. This was not uncommon in Pinczow, since the brides' parents often supported young married couples in the existing homes for a fixed number of years during which time the grooms, especially from Rabbinical families, advanced their scholarly activities.

(d) Next, for each house # we make micro-trees of each family group using the combined B, D lists, on a single page if possible, in order to facilitate visual inspection, all the while conjecturing surnames for those parents who are sometimes identified by patronyms, and sometimes by surnames, adding those conjectures to the B, D lists (in square brackets). We also take advantage of additional information like Hebrew signatures or declared relationships of witnesses.

(e) We then re-order the B, D lists according to surnames in order to discover if members of any given family (who used surnames) might have moved around from house to house, perhaps to neighboring ones.<sup>63</sup> This re-ordering ties multiple micro-trees together and sometimes identifies more surnames by inspection. Thus, we see that some members of the same HOROWICZ family described above also appeared in house numbers 11, 12, and 14. By inspection and by comparison with the families from house # 13 we can deduce four additional HOROWICZ names and relationships, and we have added them to Figure 3.

(f) In the next stage we use the micro-trees in order to identify *couples* born ca 1780-1810 who might have married in the time period, 1810-1825. We search for them in the M list and, when we find them, we conjecture surnames. Conversely, using surnames found in the M list we can augment the B, D lists. Thus, we find marriage records for our example, shown in Figure 4 below:

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<sup>63</sup> House numbers were not street addresses like those in modern cities, and they were not physically affixed to the buildings. A house number was merely an administrative device and could easily drift in people's minds even if there were no real move. Consecutively numbered houses were not necessarily neighboring houses. The town could have assigned the numbers in chronological order of construction. Consequently, they might even be at two ends of the city. However, if a large family outgrew its quarters, then it might be tempted to purchase or to rent the neighboring house, especially since parents would often support newlyweds while housing the displaced family members nearby. So it makes more sense that similar numbers really meant either the same living complex but numerically confused, or else they were truly neighboring houses. Therefore, it is worthwhile paying particular attention to houses having nearly identical numbers.

Figure 3

Records of Births and Deaths for Occupants of House # 13 in Pinczow in the Patronymic Era (1810-1825)

Year	Type	House #	Akta #	Surname	Patronym	Given Name	Age	Father	Occupation	Mother	Notes
1812	B	13	26	[HOROWICZ]		Herszel		Josek Mortl (30)	plotniarz	Hai Abraamow (22)	
1812	B	13	80	MIERNIK		Hajm Jonas		Haim (50)	przekupniarz	Bayla Szmulow (28)	
1813	B	13	60	WAYS		Josek Berek		Szulim (Maier) (40)	targownik	Anna Leybusiow (26)	
1815	B	13	34	HOROWICZ		Izrael		Josef Dawid (34)	plotniarz	Haia Lewkow (30)	signed: Abraham HOROWICZ (54) duchowny
1816	B	13	1	HOROWICZ		Gittl		Berek (29)	kramarz	Bayla Abramow (24)	
1818	B	13	103	HOROWICZ		Michel Meyer		Josek (32)	bakalarz	Haia Sara Lewkow (28)	
1819	B	13	33	HOROWICZ		Taubele		Abram Mordka (57)	duchowny	Fayga Morkow (30)	
1819	B	13	73	[HOROWICZ]	Jakubowicz	Sara Frumet		Berek (32)	handlarz	Baila Abramow (28)	witnesses: Abram Mordka HOROWICZ and his son Josek
1821	B	13	2	[HOROWICZ]	Jakubowicz	Wolf Majer		(H) Beri Yakov (28)	handlarz	Baila CHOROWICZ (23)	witness: Abraham HOROWICZ (50) duchowny & Josek Dawid HOROWICZ (35) handlarz
1821	B	13	60	HOROWICZ		Hawa Ester		Abraham (55)	duchowny	Faygele Morkow (24)	
1823	B	13	38	HOROWICZ		Izrael Maier		Abraham (62)	duchowny	Fayga Herckow (36)	witnesses: Josek HOROWICZ (38), Boruch HOROWICZ (30)
1824	B	13	37	[SAFRANI]	Hevzykowna	Hinda Sara		(H) Evzyk b Sender (22)		Gittl Abramow (20) HOROWICZ	
1824	B	13	73	[HOROWICZ]	Abrahamowicz	Haim		Abraham HOROWICZ (57)	duchowny	Fayga Morkow (36)	witnesses: Abraham Mordechai HOROWICZ (63), Josek HOROWICZ (38); Abraham was the Chassidic Rebbe of Pinczow; Evzyk later became the Chassidic Rebbe of Komarno.
1824	B	13	136	[LELOWSKI - EJBUSZYC]	Hevzykowicz	Abraham Mendel		Eyzyk Eliasowicz TARNOWSKI (22)	handlarz	Hana Zysl Izraelow (30)	witnesses: (H) Yonatan b Moshe (40) handlarz; Natan b Moshe (45)
1825	B	13	143	[SAFRANI]	Hevzykowicz	Abraham Morka		(H) Evzyk b Sender (23)	wyrobnik	Gittl Abramow (20) HOROWICZ	witnesses: Dawid HOROWICZ (38), Boruch HOROWICZ (32)
1813	D	13	73	HOROWICZ		Malka	3 1/2	Josek	handlarz	Hai	
1814	D	13	34		Dawidowa	Frumet (widow)	68	Berek			
1817	D	13	21	HOROWICZ		Ryfka Rochl	28	Zelman			husband = Abraham (duchowny)
1819	D	13	78	HOROWICZ		Taubele	7 mos	Abraham Mordka	duchowny	Fayga z Morkow	
1823	D	13	73	HOROWICZ		Izrael Majer	2 wks	Abraham (62)	duchowny	Fayge z Morkow	
1825	B	11	95	HOROWICZ		Abraham Morka		Ber (35)	drobny handlarz	Bayla Abramow (27)	
1821	B	12	19	HOROWICZ		Judes Fremet		(H) Yosef David (35)	plotniarz	Haia Sara Lewkow (26)	
1814	B	14	27	[HOROWICZ] ?	Wolfowna	Ryfka Ester		Abraham (41) b (H) Zev [Wolf]	wyrobnik	Gittla Herszelow (36)	
1816	B	14	64	[HOROWICZ]	Abrahamowicz	Jankel Jcyk		Josek (60) b (H) Abraham	duchowny	Haja Sara Leybuszow (30)	
1823	B	14	65	CHOROWICZ		Dawid Izaak & Perl Marya		(H) Berek (38)	handlarz	Bayla Abrahamow (26)	
1823	B	14	96	CHOROWICZ		Perla		(H) Yosef (39)	handlarz	Haia Sara Lewkow (32)	
1825	D	11	2	[HOROWICZ]	Berkowna	Perl Marya	1 1/4	Berek HOROWICZ (30)	drobny handlarz	Bayla z Abrahamow	
1822	D	14	24	[HOROWICZ]	Wolfowiczowna	Ryfka Ester	7 1/2	Abraham Wolfowicz (handlarz)		Gittl z Herszlow	

Figure 4

*Marriage Records with Conjectured Surnames for the HOROWICZ Family*

Year	Akta	Surname	Patronym	Given Name	Father, occupation	Mother	Town, notes
1822	7	[SAFRAN]	Senderowicz	Eyzyk (20)	(H) Sender handlarz	Eyzyk, Kopelow	Chmielnik
	7	[HOROWICZ]	Abrahamowiczowna	Gitla (19)	Abraham HOREWICZ, duchowny	Mortka Dawidow	Pinczow
1818	1	HOROWICZ		Abram Mordka (60) duchowny widower	Wolf, handlarz	Sara Icykow	son = Josek HOROWICZ (37) duchowny; witness Moszek LEDERMAN (38) kupiec
	1	[LEDERMAN]	Berkowa	Frayndl (30) widow	Mordka LEDERMAN, dead handlarz	Klerl Wolfow	widow of Icyk [Ber] WOLBROMSKI from Wolbrom

Abram Mordka HOROWICZ is identified as a clergyman, and he is, in fact, none other than Avraham Mordechai HOROWICZ, the Admor<sup>64</sup> of Pinczow. It is known that he had a son-in-law named Eyzyk SAFRAN, the son of Alexander Sender, the Admor of Chmielnik. Eyzyk himself would later become the Admor of Komarno. Although this marriage (#7) is known from Rabbinic sources without the aid of our technique, marriage # 1 was not previously known. This turns out to be an extremely fruitful exercise in general, as we can see from the relatively large number of conjectured names in the final marriage (M) file. Unrelated to our HOROWICZ example, we illustrate here again, in Figure 5 below, the power of the technique by showing a sample of several consecutive extracted marriage records:

Figure 5

*Sample of Extracted Marriage Records with Conjectured Surnames*

Year	Akta	Surname	Patronym	Given name (age)	Father	Mother	Notes or witnesses
1811	1		Joskewicz	Hajm (24)	Josek	Malka Izraelow	witness: (Hebrew) Yeshaye b Yosef
		[KANTOREK]	Jakubowiczowna	Haja (20)	Jakob (dead)	Baila Haimow	brother = Symcha KANTOREK
1811	2	[SZWICER]	Mozeszow	Izrael Fiszel (22)	Zelig Pinkes	Szewy Moskow	witness: (Hebrew) Zelig b Pinchas
		[KANTOR]	Joskowna	Etl (20)	Joska KANTOR	Jachet Moskow	
1811	3		Josek	Herszel (24)	Josek	Ester Nechow	
		[LANDAU] ?	Josefow	Sara (20)		Hana Joskow	
1811	4	[WOLBROMSKI]	Lewkowicz	Moszek (34)	Lewek WOLBROMSKI	Gittl Moszkow	
		[KATZ-RAPPOPORT] ?	Dawidowicz	Perl (26) widow	[Dawid Ber Abele]		Perl = widow of Moszek; parents dead

<sup>64</sup> Admor is a Hebrew-language acronym for **A**doneinu **M**oreinu **V**e **R**abeinu, i.e., "our master, teacher and Rabbi." This is an honorific title given to the leader of a Chassidic court typically with many followers.

(g) We use the augmented B, D lists to create a master index in an spreadsheet with 4 columns: A) House #; B) Surnames including conjectured ones in square brackets (leaving a blank if there is no real surname); C) First names of couples born between 1780 and 1800 who would be having children during 1810-1825; and D) First names of couples who were parents (born before 1780) of couples who were having children during 1810-1825. We include couples from the M list (who apparently were not having children in Pinczow), at the end of the index, and give lettered symbols to houses in which they were living. (But we double-check to see if these couples appear somewhere on the B, D lists and were somehow missed.) Sometimes this process alone identifies some additional surnames.

(h) We then re-order the main index according to column C (followed by house #) and identify similarly named couples where there is agreement on two more counts (living in the same house, having the same ages and profession, etc.), thereby linking more micro-trees together, and in this way conjecture additional surnames. We add these surnames to all micro-trees involved as well as to the master index and to the house-#-ordered B, D lists and to the M list.

For example, an 1825 marriage record lists the bride, Ryfka (born 1802), as the daughter of Abram Moszkowicz and Haja Lewkowicz. Because it is a marriage record the clerk did not record the house number. Thus, it seems like one would never be able to identify the bride's parents. (The groom was not from Pinczow). However, by visual scanning of the list, re-ordered according to *couples* (in this case the bride's parents), we see only a single other patronymic era couple by the name Abram and Haja (also without surnames) of the appropriate ages. They lived in houses # 257 and 258. We had already independently conjectured their surnames. Abram was a TENENBAUM, while Haja was a CHYMBERSKI. The births of many of the children of Abram and Haja occurred in house # 257. Ryfka was not among them; but that is to be expected, since she was born too early (1802) for any clerk to have recorded her birth. Unfortunately, in house 257 Abram was the Lewkowicz, while Haja was the Moszkowicz. So it appears that the clerk switched the bride's and groom's patronyms while writing the 1825 record. As mentioned in the introduction, these kinds of clerical errors occurred occasionally; so we are not totally surprised. Nevertheless, we can address the lingering doubt by tracking and confirming the identity of the couple in the post-1826 records.

(i) We then re-order the index according to column D (followed by house #) and identify similarly named *elderly couples* agreeing on two more counts (e.g. living in the same house, having the same ages and professions, etc.), thereby linking yet more micro-trees together, and in this way conjecture even more surnames. We add these surnames to the micro-trees and to the master index, and to the house-#-ordered B, D lists, and to the M list.

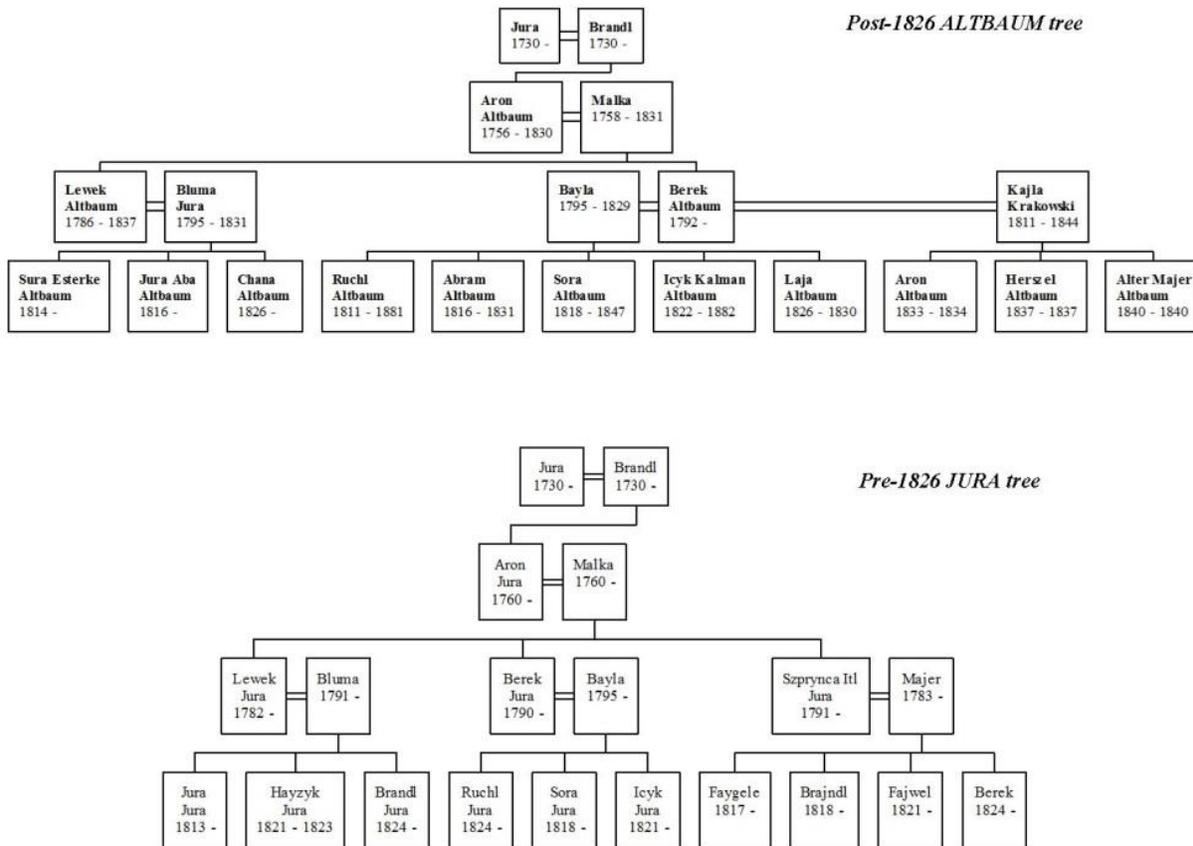
For example, the 1814 marriage record of Laja Cypa (born 1792) reveals her parents to be Juda Lewek and Hana Szmulowna. We search through our list of aged couples and find exactly the same aged couple listed as parents of Brajndl (born 1802) who married in 1823. Thus, we are able to link their respective micro-trees. Now, it turns out that Laja Cypa was living in the same house as Haskel KAM who was a witness to the 1822 death of his paternal uncle, Juda Lewek. Thus, we are able to not only link two micro-trees, but at the same time conjecture a surname for Juda Lewek (KAM), born in 1755.

(j) We then re-order the improved master index according to surnames (this time including conjectures), and we use this to draw extended mini-trees. We also draw separate mini-trees of those groups for which we have not yet assigned surnames.

(k) 1. We now directly map by overlapping the extended mini-trees into the post-1826 trees (which we had charted as a preliminary step) if both sets have surnames. Cross referencing the pre-1826 mini-trees with the post-1826 family trees identifies more individuals, and reveals yet more surnames in the main trees as well as in the mini-trees. As an interesting example we show, in Figure 6, the same family group as revealed by each set of data. Prior to 1826 the entire family was using the surname JURA exclusively. Although it appears that the surname owes its origin to a certain Jura who was born ca 1730, his descendants used Jura as a real surname for many generations thereafter. However, immediately after 1826 two out of a dozen branches of the family suddenly switched the surname to ALTBAUM for no apparent reason. Without our investigation it would probably have never dawned on researchers that ALTBAUM was really a branch of the JURA family.

Figure 6

One Portion of the JURA – ALTBAUM Family of Pinczow from 1730 to 1840



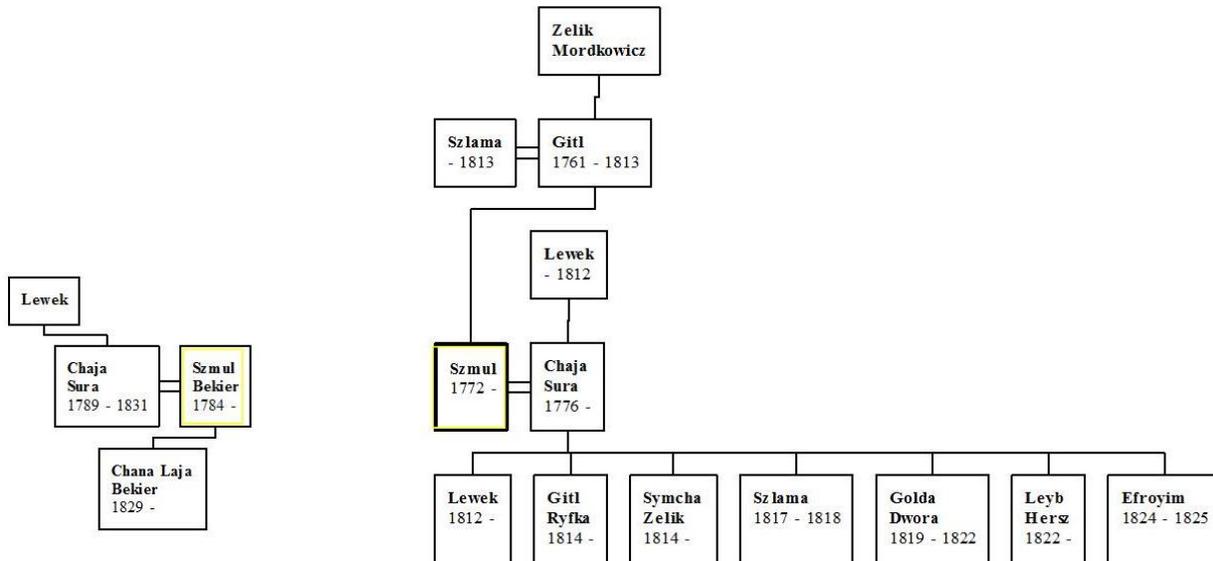
(k) 2. We then compare mini-trees still *without* conjectured surnames to appropriate people on the post-1826 charts, using older couples’ names as a guide for cross-referencing, thus adding more conjectures. Similarly, we find elderly couples on the post-1826 family trees who are unidentified by surname and compare them with elderly couples on the mini-trees who do have surnames, thus adding even more conjectures. As an example, we display the results for one particular BEKIER family in Figure 7. Szmul BEKIER was an “agent” by profession, but he appears to have adopted the surname because his father was a baker by profession. *Bekker* in

Yiddish or German means *baker*.

Considering that ages were often approximate, the existence of a single Szmul / Chaja Sura pair in Pinczow in the relevant time period makes the one-to-one mapping fairly certain, and adds a conjectured surname to the ten pre-1826 events.

Figure 7

Comparison of the Szmul / Chaja Sura Family Group with the BEKIER Family in pre-1826 Pinczow



Post-1826 tree of BEKIER family

Pre-1826 tree of Szmul / Chaja family using patronyms

Mapping of early family trees, such as in the above two cases, onto the family trees of post-1826 records on a large and comprehensive scale, when there is a partial lack of surnames, relies on two principles: a) the matching of given names of *couples* in both sets along with other identifying features; and b) the finding of the births, marriages and deaths in the pre-1826 records of people mentioned in the post-1826 records. Nobody has ever systematically used couples' given names before this study, as far as we are aware. One might think that there is a danger of misidentification if there were to be more than one elderly couple having the exact same set of given names. While this does happen occasionally, it turns out to be rare and, since not every aspect of their family structures can be absolutely identical, it turns out that we never had a conflict, although we could not know this for certain without trying. We matched all relevant post-1826 surnames successfully, and there was no case of more than one patronymic era family "claiming" the same surname. Nor were there any residual pre-1826 families who could not post-facto "adopt" a surname, except for those who moved away from Pinczow, or whose family died out, or who had only daughters using their husbands' surnames, or who decided to turn their patronyms into surnames. Ours is a technique that one simply had to attempt, and fortunately it succeeded. In retrospect, one might think that this success has much to

do with the size of the town, since the limited numbers of given names in the Jewish population would be conducive to repeated use of couples' names, leading to ambiguity.

On the other hand, the larger the city, the greater the number of identifiable and unique house numbers, and this more than compensates for the commonality of given names. Therefore, it turns out, that conjecturing of surnames in the large city of Krakow is remarkably successful also (Hirschberg, 2018).

We illustrate the last stage of the technique, as described in paragraph (k) above, with one last example out of many, many cases in point, chosen to demonstrate that, without our technique, we would not have otherwise noticed the existence of a particular Rabbinic family: At the death of a certain Tewel GOLDFARB (1758-1830) the clerk recorded Tewel as the son of Icyk and Malka. The clerk listed Tewel's surviving wife as Perl. A search of our mini-trees for couples with the *unique* combination of Tewel and Perl reveals the existence of such a couple in the patronymic era, whose surname can now be conjectured. At Perl's death, also in 1830, the clerk listed her as the daughter of Gabryel and Bayla RABINOSTWA, suggesting a Rabbinic origin. Thus, it is not surprising that Tewel and Perl had a daughter, Malka, probably named after her paternal grandmother, who was married to Abram Mendel EJBUSZYC (1798-1823) who was the son of the Rabbi of Pacanow. The latter used the toponym, LELOWSKI-WADISLAWSKI, suggesting a multi-town career. Tewel and Perl also had a son, Saul, living in Chmielnik, but who died in Pinczow in 1823. (He had no surname; but we can now assign it, obviously). Saul married in Chmielnik in 1814 to the daughter of the Rabbi of Chmielnik, Dov Ber (no surname)<sup>65</sup>; but we believe we can determine his identity<sup>66</sup>, as there are only two possible known candidates: Clearly, there is a lot of interesting history that we need to flesh out here.

(l) Ultimately, we re-ordered the improved B, D lists according to chronological order for presentation. In the end, we were able to extend any given family history typically by up to 2 generations by using our mapping and surname-conjecturing techniques.

## **Results**

We illustrate the result of all twelve stages of our method in the chart for our HOROWICZ family, shown in Figure 8, below. This is a fusion of the post-1826 data (generally characterized by actual surnames) and the pre-1826 data augmented by conjectured surnames. We have shown in red those persons and events, whose existence or links we would not have otherwise easily deduced in the absence of our conjecturing process. An additional two generations thus have become accessible stretching back to about 1710 in this case.

There are several interesting facts which our sample analysis reveals:

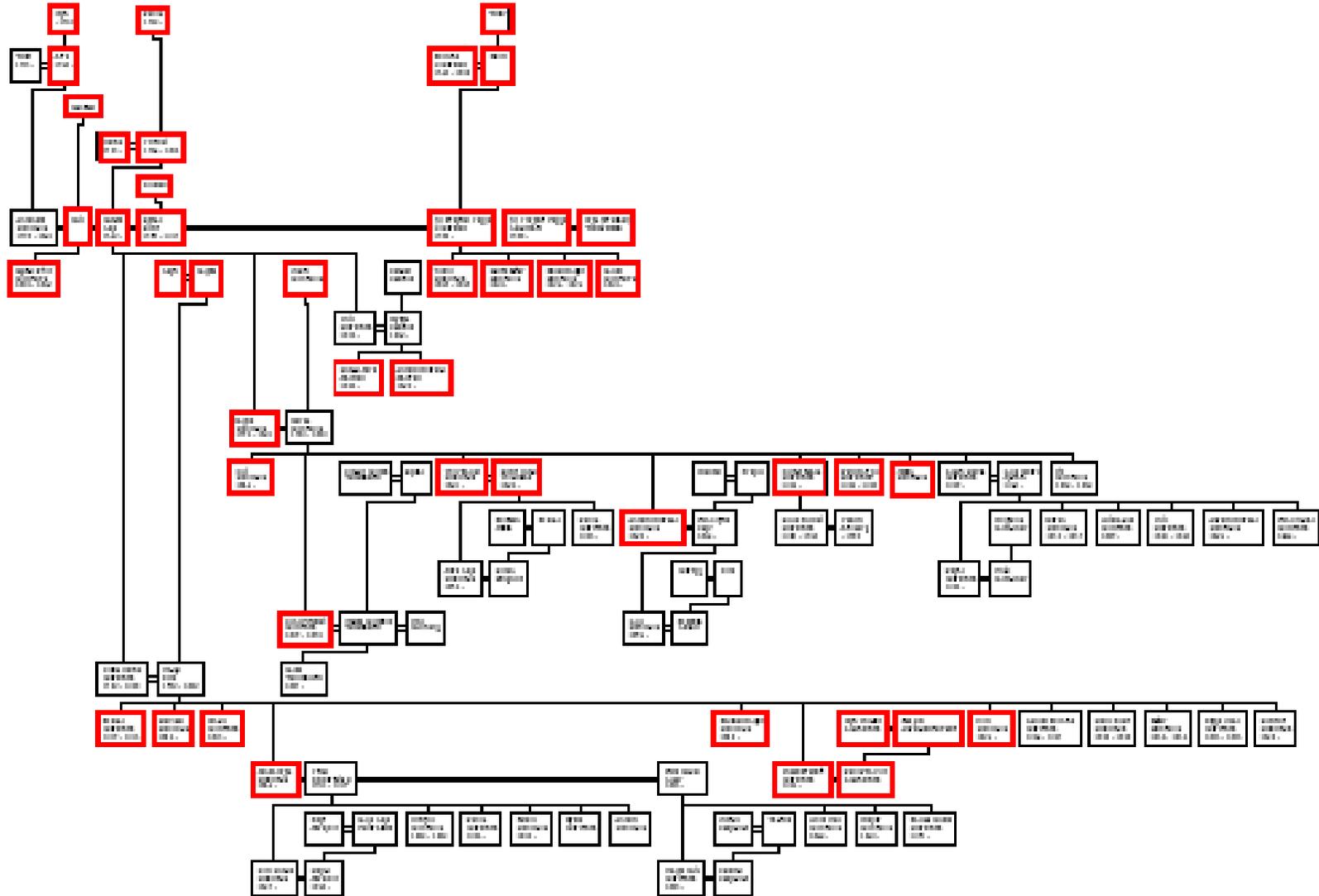
(a) The Admor, Avraham Mordechai HOROWICZ (non-Levite), seems to have married at least four times. His brides were Hinda Laja bat Dawid (died between 1803 and about 1809); Gitl bat Herszel (died between 1814 and 1817); Ryfka Rochl bat Zelman (died 1817); and Fraydl Fayga bat Mordechai LEDERMAN (died after 1824). This is probably the first time that anyone has ever revealed matrimonial details for this well-known Rabbi.

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<sup>65</sup> The 1814 marriage record (Akta # 20) is not available at the Polish State Archives. It is in private hands but made available to the author for scholarly purposes.

<sup>66</sup>Manuscript in the process of preparation.

Figure 8  
Ancestors and Descendants of Avraham Mordechai Horowitz, Ad Pinczow (1758-1824)



(b) Avraham Mordechai HOROWICZ's paternal ancestry is known from Rabbinic sources (Horowitz, 1931).<sup>67</sup> His father was Zev Wolf MARGOLIS, Av Beit Din of Zarnowiec and Wolbrom (Horowitz, 1931; HebrewBooks, 2019). This MARGOLIS family is not Levitical. It stretches back to Menachem Mendel MARGOLIS (ca 1575-1652) of Przemysl and Pinczow and beyond. Avraham's brother and uncles kept the surname MARGOLIS. This raises the question of why Avraham Mordechai adopted the surname HOROWICZ? No one has ever solved this mystery, and perhaps not even posed the query in the first place. Furthermore, it is probably not by chance that one of Avraham Mordechai HOROWICZ's daughters married Berek HOROWICZ (a true Levite, and possibly her cousin. We know that Berek was a Levite because one of his sons, [Jakob] Herszel, signed a record in Hebrew stating as much.) It appears to the present author that Avraham Mordechai may have adopted his mother's maiden name sometime after 1814, prior to which he was content to use the patronym Wolfow (son of Wolf). There is no other logical explanation. The record of his last marriage in 1818 reveals that his mother was Sara, the daughter of Icyk. If Icyk (born ca 1710) was the true Levitical HOROWICZ, then one good candidate for his identity is the famous Rabbi of Hamburg, Yitzchak (HaLevi) HOROWICZ, who was born in 1715. He did indeed have a daughter Sara (though not married to a Wolf MARGOLIS (Rosenstein, 1976)<sup>68</sup>); so, our speculation might be wrong; but it is a good working hypothesis, and it is worth investigating if Sara was married more than once. It is also worth checking if there was more than one contemporary Rabbinic Yitzchak HaLevi HOROWICZ. In any case, the identities of Sara and of Berek ben Yakov HOROWICZ, are worthy of further study.

(c) Avraham Mordechai's first wife, Hinda Laja, was the daughter of Dawid and Frumet. Indeed, Avraham Mordechai's mother-in-law, Frumet, seems to have died in his house # 13. The chances are very high that Dawid and Frumet were from Rabbinical families; and this too is worthy of further investigation. The chances are also high that Avraham Mordechai settled in his wife's hometown in the first place, and that Dawid himself might have resided in Pinczow, perhaps as an early Rabbi, on whose identity we can now easily speculate using the Pinczow data at hand.

(d) Statistics. All in all, the history of this single, fascinating and prominent family is significantly augmented – all because of our analysis of patronymic records. We have dwelled on this particular family for the purpose of illustration; however, we have actually analyzed all 2,901 events recorded during the patronymic era, 1810-1825. Most of them had no surnames originally. However, in the end, we were able to conjecture surnames for 2,432 of them, that is, our overall success rate was 86.6%. Most of our “failures” were for deaths of the elderly who died without spouses or relatives; and, therefore, we were unable to put them into context. The success rates for births and marriages were 90.7% and 90.0% respectively. The remaining events are for families who must have retained patronyms as their permanent surnames.

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<sup>67</sup> Meir Horowicz of Kielce was born in 1868. He was the great-grandson of Avraham Mordechai (see Fig. 8). His work, *Pa'aneach Raza*, states that Avraham Mordechai was supposedly named posthumously after his father, an earlier Avraham Mordechai; and it also states that the daughter who married Ezyk SAFRIN was named Liba. Neither of those two assertions are borne out by the civil registry records analyzed in our study. On the other hand, considering the possible sources of error listed above, Abram Mordka's patronym, i.e. Wolfow, may very well refer to the young orphan's grandfather, who would clearly be the only father-figure he ever knew. Also, we cannot rule out that Avraham Mordechai's daughter's full name could have been Liba Gitl.

<sup>68</sup> Rosenstein, N. (1976) *The unbroken chain* (1<sup>st</sup> ed.) p. 561. NY: Shengold Publ.

Within the set of 24,323 *post*-1826 records there are 1,901 unique family surnames cumulatively by 1912. In addition, within the set of 2,901 *pre*-1826 records we determined 293 patronymic era family surnames. However, 107 of those family names were there to start with and do not appear in the post-1826 database. Those extra families appear to have died out by 1826, or had only daughters who adopted their husbands' surnames, or else moved away prior to 1826. So altogether there were  $1,901 + 107 = 2,008$  uniquely surnamed Jewish families who ever lived in Pinczow by 1912. We also determined that by 1830 (the beginning of the "November revolution" against Czar Nicholas I) there had already been 446 uniquely named families; while by 1825 there were only 293<sup>69</sup>, as stated above. Although not a measure of population *per se*, this nevertheless indicates an explosive growth of a factor of 7 in surnamed families in a period of less than 100 years.

## Discussion and Questions

### Accuracy, Sensitivity Analysis, Redundancy, Reliability, and Self-Consistency

The method described in this study reflects the brute force approach using objective criteria for matching edges of the puzzle pieces. Because the number of criteria is somewhat arbitrary, there are two questions which one can pose: how reliable are the results as they now stand; and what is the effect of more restrictive criteria on the quality or quantity of the conjectures? One can try to estimate such issues by applying one or more of the following scientific approaches<sup>70</sup>:

- (1) Compare the results of the present analysis with those obtained from other sources, such as family archives, cemetery records, and censuses; or
- (2) Repeat the approach and determine the error rate as a function of the percentage of records randomly removed from the database; or
- (3) Repeat the approach, as above in (ii), but modify records randomly in order to induce failure, and thus determine if the error rate is proportional to the number of modifications or if this simply reduces the ability to conjecture at all; or
- (4) Repeat the approach, as above, but vary the number of matching criteria or the magnitude of, e.g., the precision of birth years.

We have addressed these issues, as follows:

- (1) World War II saw the destruction of the Jewish cemetery of Pinczow. The ancient cemetery of Krakow is extant. However, even there, surviving headstones dating to the patronymic era rarely, if ever, mention surnames, anyway. Only in rare cases can

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<sup>69</sup> We have associated 293 family surnames with 2,432 events (out of 2,901) recorded in the time span, 1810 to 1825. If we make a 1:1 correlation between the number of family surnames and the number of events, then we can deduce approximately that there was a total of 349 unique families, 56 of whom had surnames.

<sup>70</sup> The author is grateful to a reviewer of this study for suggesting the proposed strategies.

they reduce uncertainty by adding puzzle pieces, such as priestly or Levitical status. Thus, for example we could, in principle, distinguish between HOROWITZes who were Levitical from those who were not. Unfortunately, we cannot take advantage of this approach for Pinczow.

The 1798 census for Pinczow (Kielce Archives) lists names which were almost 100% patronymic, and it lists only the heads of households. House numbers, presumably the same as those found in the patronymic era parish records, are indeed listed; but ages of the owners are missing. Consequently, the census is not at all helpful in determining the reliability of the present approach. In fact, as the Krakow study shows, where the aim was to conjecture surnames in the censuses, the other way around is actually more fruitful. Second, Rabbinic sources could, in principle, verify the accuracy of the present results. However, it is ironically the opposite which is true (Wunder, 1995). For example, Figure 8, above, shows that the present analysis **extends** what is already known about the HOROWITZ family. Although not applicable to the HOROWITZ case, **rare** family archives can indeed be extremely helpful.<sup>71</sup>

- (2) Removing records from the database, tantamount to removing pieces from a jigsaw puzzle, has one of two possible effects. If the record is from the surname era, then the result depends on the nature of the record. A missing birth record will not affect the conjecturing process for events that occurred one or two generations earlier. A marriage or death record which contains the names of people who lived during the patronymic era, is crucial data. Its absence could simply leave a person or a couple isolated, not allowing us to link them to any of several possible ancestors. We would have an un-placeable puzzle piece. A record missing from the patronymic era is more disastrous.<sup>72</sup> This has the potential effect of isolating an assembled group of many puzzle pieces. However, in no way does the intentional removal of a puzzle piece

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<sup>71</sup> Two case studies illustrate this: 1. The family tradition as well as the headstone in Warsaw of a certain Jochanan FOGEL (a Cohen), son of Yeshaya and Faygl, proclaim that the family came from Pinczow. And yet, there are absolutely no records for FOGEL in Pinczow at any time period, nor are there any relevant KOHEN or KAC records nor even patronymic Szajewicz records to match. However, upon searching for *any* couple – Szaja married to Fajgl – we came across one and only one case in the time period in question using an unexpected surname GOLDSZLAK. The progenitor of the family was a goldsmith, Szaja GOLDSZLAK, married to Fajgl (daughter of Jakob). Their surname started being used during the time of compulsory surname adoption in Pinczow. The son, Jochenen, moved to Warsaw in 1824 for the sake of marriage, whereupon he adopted the new surname FOGEL presumably to commemorate his mother, Faygel. This allowed us retrospectively to increase the size of the puzzle and to conjecture an alias surname of GOLDSZLAK. 2. In the second case, a family of hatmakers, surnamed HALEVY, which immigrated to London in 1846, had the tradition of a Pinczow origin. There were no matching records, though. Nevertheless, the family archives provided enough information, in the form of given names for two critical generations, to allow us, with the aid of patronymic era records and conjectured surnames, to identify it as the ROTH - ROJT family of hatmakers and to amplify an edge of that family's puzzle. There were no ambiguities.

<sup>72</sup> In the above-mentioned ROJT family, without a key patronymic era death record of a certain Bluma (1753-1816) married to a Hersz Lewek, which we conjectured to be a ROTH, we would not be able to tie the heretofore earliest ancestor, the hatmaker Dawid Lejb (born in 1799), to Hersz Lewek (born 1753) son of Moszek (born ca 1725), or to Bluma daughter of Lewek and Rejla who was the daughter of Abraham (born ca 1700).

- (record) reduce the accuracy of the reconstruction. It merely results in placing holes in the puzzle.
- (3) Assuming that we are faithful to the application of our criteria for one-to-one matching, then modifying a patronymic era record in order to introduce errors has the effect of ruining a puzzle piece. We would place it in a wrong location without ever knowing that it is a wrong location, or else if it competed with another puzzle piece for fitting into a particular location it would render two pieces ambiguous, thus ruining two puzzle pieces, or else we would be unable to place the piece at all. There is no unique rule. Each case is different.
- (4) The number three (minimum criteria) for acceptable one-to-one mapping is actually determined by trial and error. Relaxing the criteria has the effect of possibly linking a particular person to a wrong family. At the same time it could prevent us from linking him to the correct family. Two errors would occur, resulting in excessive ambiguity. On the other hand, being more restrictive by expecting matches to all seven variables – professions, house numbers, given names of parents, given names of spouses, patronyms, partial overlap of children`s names, and exact years of birth – is counterproductive and prevents any linkage at all. Occasionally, we are lucky, and all seven criteria are satisfied exactly, and we might even have extra information from a Hebrew signature or from a witness` professed relationship. But in general, we must allow for some flexibility since we know that families moved from time to time, a name could be part of a double name, a patronym could be that of a father or of a grandfather, people often forgot or estimated their age, clerks did not often mention names of relatives etc, aside from clerical errors. Too much rigour results in too many leftover puzzle pieces. Our choice of three is a compromise which resulted, by trial and error, in the minimum amount of ambiguity and the minimum number of excess puzzle pieces. We can reasonably interpret the final 10% missing conjectures as representing puzzle pieces which belong to another puzzle, that is we must search for their extended family in other towns. On the other hand, we can interpret completed puzzles displaying lakes of missing pieces as representing events for people who moved from Pinczow to a different town.

Summarizing the above issues, in this kind of a puzzle (family reconstruction), where there is only a single correct answer, the goal is to avoid ambiguity, and to maximize consistency. We believe that we have achieved this with our procedure.

### **Is this a Big Data Problem?**

One might wish to solve jigsaw puzzles or genealogical puzzles by means of big data techniques (Márquez, 2017). However, we believe that ours is not a big data problem *per se*. Big data involves the continual generation of data which feedback on themselves and which grow at faster than exponential rates, without limit, such as phone-generated, credit-card-generated, or Internet-generated data. Businesses, in general, must collect and analyze their big data because the exercise leads to accurate projections. Of course, some type of business analysis software is required. However, the analysis of such big data results in an overall fuzzy image, with defined

priorities, perhaps revealing patterns (Arora, 2016; Pyne et al., 2016). Certainly, the only thing which can possibly matter is the current average and the trends, but not the detail. Analyzing DaVinci's painting, Mona Lisa, by aggregate techniques, for example, might reveal a level of beauty, but that painting too is not a big data problem because there is a finite, immutable number of molecules in the painting, and because one is interested not only in the overall effect, but also actually in details: we would probably like to know, for example, if a particular feature in the painting is a dimple or a pimple. So too, is our puzzle not really a big data problem. The working definition of "big" is petabyte-size, i.e.  $10^{18}$  or greater. Although large numbers (30,000) of semi-structured puzzle pieces are involved, along with  $10^{121,000}$  possible permutations, we are actually truly interested in the gory details of the "mere" 30,000 data pieces. Big data solution techniques, such as wavelet analysis (Teitelbaum, 2000), even though they may be good for pattern recognition, are therefore of not much use in such a case. Although, in principle, one can solve our problem by computer-aided permutations (Heule & Kullmann, 2017), i.e. by the brute force method, it is not truly feasible here, because a human is required to distinguish between ambiguous permutations, i.e. a human is more capable of filtering out the vast majority of the useless permutations, simply by observation. Realization of a solution sometimes simply involves guessing and verifying. Clearly, the human approach thus is also a brute force method; but by virtue of the filtering, the human's understanding of the context, and his ability to factor the problem into smaller pieces (family groups), the human brain is the better computer in this case.

### **Impact of the Trend toward DNA Testing**

One might ask if DNA testing can aid in reconstructing family histories to the point where we can conjecture additional surnames. The answer is yes, in principle; but, the procedure is limited to the earliest documented record, even though vague relationships can point to earlier times. For precise identification, someone has to know his ancestry far enough back to the pre-patronymic era, while another party (who has hit a dead end in his paper trail research) has to take a DNA test as a fishing expedition. Careful comparison of the two known family histories can identify the common ancestor. At the same time, comparison with the resolved patronyms can identify the as-yet un conjectured surname.<sup>73</sup> For this to become a powerful tool, many people with roots in Pinczow must participate in DNA testing.

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<sup>73</sup> As a case in point, two researchers (one ASPIS, the other RAYZ) with roots in Pinczow dating to at least as far back as 1750, each carried out an autosomal DNA test without being aware of the other's existence. Family Tree Finder Inc. determined that they were 3<sup>rd</sup> to 5<sup>th</sup> cousins with a substantial continuous block of common DNA segments. The same test applied to 2<sup>nd</sup> and 3<sup>rd</sup> cousins of one of the test subjects did not match with the results of a similar test for the second test subject. From this exercise we could eliminate many ancestral lines of the two test subjects as sources of the 3<sup>rd</sup> cousinhood. The single remaining relevant family lines led back, in each case, to two Icyk Ber Nochymowicz's living in Pinczow, each born ca. 1750. We determined one of them to be a RAYZ (by the methods described in this work.) Without a DNA analysis we would not have been able to unambiguously determine that both ancestors were one and the same person. Clearly, we also could conjecture the surname of the matched test subject. This case represents the limit of applicability. In most other cases, the best that DNA testing can accomplish is to give a statistical estimate of cousinhood without being able to identify the names of the most recent common ancestor.

## **Applicability to Other Cases**

Pinczow is not the first Polish town's genealogy where researchers used tactics similar to those described here: The family tree of the Jews of Krakow, under construction for more than 20 years by Dan Hirschberg (2018), is about six times the size of Pinczow's. The present author was one of several original participants in developing the procedures for assigning surnames to Jews of Krakow prior to the general adoption of surnames. The present study describes and expands on that methodology. The success of both projects is proof that the size of the town is not important. One might think that with the limited number of given names and occupations, the risks are much higher for more than one couple to have exactly the same name combinations, ages and occupations, i.e., the risk of ambiguous results would be higher in larger towns. However, it turns out that the larger the town size, the larger the variety of surnames and the larger the number of houses (and thus house numbers) that can act as identifiers, and this latter fact apparently is sufficient to guarantee uniqueness.

## **Conclusions**

We have developed a methodology for the conjecturing of surnames of Jews who were experiencing births, marriages and deaths in Pinczow, but who were not commonly known by their surnames. Although we have used the HOROWICZ family history, and a few others in part, as illustrations of the scope of the project, we have actually applied this technique to *all* of families living in Pinczow from ca 1700 to 1825. The surnames which we deduced are those that their descendants eventually adopted. By combining the patronymic era data (including conjectured surnames) with the post-1826 data, we are now poised to publish the entire genealogical history of the Jews of Pinczow, distributed among 2,008 families, over a 200-year period from ca 1700 to 1912, as a memorial to the decimated Jewish population of Pinczow.

We can apply the methodology shown in this project to other Jewish towns in pre-war Poland. Our success rate of 87% overall is a conservative estimate. The remaining 13% living in Pinczow between 1810 and 1825 consist of either male lines who might have died out (possibly leaving only daughters who adopted their husbands' surnames) or else males who moved to Pinczow in order to marry but settled down elsewhere,<sup>74</sup> or else males who could have simply solidified their then-current patronyms as actual surnames.

It is fairly obvious that the present study has generated a valuable database that now can be used to further our understanding of the culture and sociology of Ashkenazi Jews, at least in Poland. Aside from providing an increased ability to identify family relationships in a "dark" period of archival information, the present study now permits us to examine such issues as the frequency of Rabbinic intermarriages, the frequency of cousin marriages of any degree (whether Rabbinic or not) and uncle-niece marriages (permitted under Jewish law) etc. An examination of such issues requires us to have the entire town history presented in web-like format for easy identification of relationships. We are in the process of constructing this web-tree for Pinczow.

Our methodology also gives hope to researchers in other disciplines that, sometimes, the best method is brute force. It is, in our opinion, doubtful that a computer algorithm, even if properly instructed to follow the straightforward rules presented in this study, and even using soundex and fuzzy techniques, could replicate our success rate. All it could possibly accomplish

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<sup>74</sup> Of course, we may bump into these people in the course of future research of other towns; and so their identities may yet be forthcoming.

is to replace a human eye (able to focus on multiple levels of detail simultaneously) with an overly critical digital processor. It would not surprise us, though, if the present work would spawn such a massive effort in data analytics, worthy of an independent study, with the goal of verifying our assessment.

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#### Discussion Questions

1. Can artificial intelligence be developed to the point where it would be capable of solving a jigsaw puzzle of at least 1,000 pieces without the aid of a picture?
2. Are there any historians currently studying the history of the Jews of Pinczow and who can contribute to the knowledge accumulated in the present study?
3. Have any readers with Pinczow Jewish ancestry undergone a full genome analysis which would be useful in determining to what extent Jews of Pinczow intermarried with each other in that town in the 19th century?
4. Can one develop a computer program which displays the results of our research using a multi-dimensional web application in graphical format?

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## **Critical Thinking Gains via Interprofessional Education Experience with Health Sciences, Business, and Bioengineering Majors**

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### Abstract

Graduates from higher education programs ought to think critically and be disciplinary experts capable of working collaboratively with interprofessional teams to resolve complex workplace issues. This study investigates the relationship between students' critical thinking performance, and interprofessional education (IPE), as associated with their learning styles, thinking styles, and perceptions of the learning experience. The methodological approach consists of a quasi-experimental design with an IPE intervention. We assessed students' critical thinking performance pre and post the IPE intervention, their pre and post IPE perceptions surveys. We evaluated students' learning and thinking style preferences with the Grasha-Riechmann Students' Learning Style Scales and Watson's Thinking Styles Inventory, respectively. Health science, business, and bioengineering majors from three colleges at Florida Gulf Coast University participated in the study. Findings indicate IPE positively contributed to critical thinking performance with variations across disciplines. Business students' participant

learning preferences contributed to their critical thinking performance, independent learning preferences were influential for bioengineering students, and dependent and independent learning preferences played a role for health science students. Students' perceptions of IPE varied among majors. The IPE model is a meaningful approach to resolve problems, nurture critical thinking, and transition students from classroom to professional practice.

*Keywords:* critical thinking, critical thinking performance, interprofessional education, interdisciplinary or multidisciplinary education

## **Introduction**

Critical thinking is a universally valued consequence of higher education among policy makers, educators, and employers (American Association of Colleges & Universities [AAC&U] 1985, then American Association of Colleges [AAC]; Huber & Kuncel, 2015; Quality Assurance Agency [QAA], 2018). Higher education program graduates at minimum ought “to reason well, to recognize when reason and evidence are not enough to discover the legitimacy of intuition, to subject data to the probing analysis of the mind” (AAC, 1985, p. 15). Accreditation and regulatory bodies including the Association to Advance Collegiate Schools of Business (AACSB) and the Accreditation Board for Engineering and Technology (ABET) acknowledge critical thinking underpins the constructs of program outcomes in business, bioengineering, and health sciences. (AACSB, 2013; ABET, 2015; CHEA, 2016; Zorek & Raehl, 2013). The World Health Organization also exemplifies the global emphasis on critical thinking and interprofessional education (IPE) as important components of higher education and practice (World Health Organization [WHO], 2010).

In higher education integration of problem-based learning and simulations are common approaches to foster critical thinking, particularly in health science, business, and bioengineering programs. Also, students participate in didactic education and practices such as service-learning, fieldwork, or internships that link them to real world discipline experiences (St. Hill & Yazici, 2014). Employers, though, address consumer needs and strategic goals concerning quality and cost-effective services that often demand critical thinking through professional and interprofessional collaboration (IPC). IPC often incorporates health sciences, business, and biotechnology to assure safety, quality, and cost-effectiveness in healthcare. Learning, critical thinking, and IPE, therefore, are important in preparing graduates for careers in health science, business, and bioengineering. Evidence-based research connecting health sciences, business, and bioengineering education with critical thinking, learning, and IPE, however, is lacking.

## **Theoretical Framework**

IPE, critical thinking, and learning interconnect through understanding fundamentals, identifying new concepts, subject knowledge, and proficiency gains. Interdisciplinarity engages disciplinary concepts, knowledge, and insights to formulate plausible solutions that apply to research and practice (Interprofessional Education Collaborative, [IPEC] 2016). Learning allows one to absorb and retain new information, foster, and then use new skills to address life circumstances and problems (Kolb, 1985; Palmer & Goetz, 1988; Sarasin, 1999). Learning and thinking styles among learners vary and may affect critical thinking performance. IPE embraces

collaborative learning and problem-solving among students from different disciplines, and, therefore, may invoke and optimize critical thinking.

### **Interprofessional Education (IPE)**

IPE emphasizes integration of knowledge between two or more disciplines in a collaborative manner to enrich practices and deliver client-centred services (Freeth et al., 2007). IPE involves teachers and students from two or more disciplines in teaching and learning (D'amour & Oandasan, 2005). Also, the Office of Disease Prevention and Health Promotion [ODPHP] (2016) and the WHO (2010) espouse evidence-based IPC as the foundation of health promotion, population health improvement, healthcare reform, and cost reduction. IPC between business management, technology and hence engineering, and health sciences are, therefore, essential.

Critical thinking is central to IPE because it fosters exploring what one knows and is learning to logically analyse, synthesize, and evaluate situations (Ausubel, 1968; Gagne, 1965). IPE incorporates didactic content with practical issues and active team-based learning to encourage critical thinking and creative resolution from learners in different disciplines. The integration of technological advances to access teaching and learning content, further supports the need to foster critical thinking, and learning in collaborative teams to meet future business, management, and workforce needs. Notably, disciplines such as health sciences, business, and bioengineering use critical emerging technologies for operations management that impact practice, cost, and quality of healthcare. Drones or unmanned aerial vehicles (UAVs) used to transport biological samples from rural and disaster areas for diagnostic testing and telemedicine exemplify such technologies (Amukele, Sokoll, Pepper, Howard, & Street, 2015; Strzelecki, 2018). Additionally, health services involve a business model that aligns with the innovator's prescription of the solution shop, value-adding process, business and facilitated networks of interconnected groups or experts and generalists with state-of-art knowledge (Johnson, 2010). The solution shop Johnson (2010) describes relates to diagnostic activities in healthcare while the value-adding process pertains to each treatment-related activity. Technological advances require interprofessional collaboration to meet future needs. Hence, IPE with health sciences, business, and bioengineering majors transcends practice, and, therefore, forms a basis for this study.

### **Critical Thinking**

Critical thinking is purposeful thinking, reflective judgements of one's beliefs, and determination to gain insightful decisions (Bailin, Case, Coombs, & Daniels, 1999; Dewey, 1910; Ennis, 1987; Facione, 2000, 2011). Critical thinking occurs within a framework, context, strategy, or process to problem solve and make decisions (Sternberg, 1986). The hierarchical constructs of Bloom's Taxonomy—knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956)—guides the educational approach to critical thinking and aligns with the Biggs and Collis (2014) Structure of Observed Learning Outcomes (SOLO) taxonomy. Complex principles cause learners to draw from past knowledge to transition learned information, and create new ideas which is the essence of critical thinking (Biggs & Collis, 2014).

Cognitive learning theorists advocate that logical information sequencing, practical experiences, and problem solving enhance learning and transferability to realistic situations (Ausubel, 1968; Hill & Scanlan, 1991; Gagne, 1965). Ennis (1987, 1989) described four instructional approaches to integrate critical thinking and subject matter:

- (1) the *general approach* whereby learning objectives address generic skills and viewpoints without specific content;
- (2) the *infusion approach* or deep thoughtful understanding of the subject-specific content;
- (3) the *emersion approach* whereby thought-provoking subject matter engages learners without specifying critical thinking goals; and
- (4) the *mixed approach*, which combines the general approach with either of the other approaches.

Facione (2000) identified six cognitive skills associated with critical thinking: inference, interpretation, evaluation, self-regulation, explanation, and analysis. The six cognitive skills (Facione, 2000) align with the definition, learning outcomes, and evaluation criteria in the AAC&U critical thinking *VALUE* rubric. “Critical thinking is a habit of mind characterized by the comprehensive explanation of issues, ideas, artifacts and events before accepting or formulating an opinion or conclusion” (AAC&U 2009, p. 1). Critical thinking justifies new ideas with reasoned solutions and evaluation of ones’ own actions (Facione, 2011; Halpern, 1998, 2007). Researchers showed significant links between critical thinking and achievement (Facione, 2000, 2011; Ghanizadeh, 2017; Paul & Elder, 2019; Weldy & Turnipseed, 2010). Tan and Vincent (2019) indicate collaborative learning through interprofessional teams with management marketing and computer science serve to prepare students to address technological advances that affected workplace infrastructure and client services. Hence, IPE ought to encourage critical thinking, teaming, and diverse insights that lead to clever solutions.

### **Critical Thinking, Learning, and Thinking Styles**

Educators must foster critical thinking by teaching how to make testing of beliefs, open-mindedness, and reasoned problem solving a habit, so students become more informed and ‘intellectually educated’ (Dewey, 1910). Despite the growing debate concerning clear scientific evidence to support linkages between each learning style and student success (Pashler, McDaniel, Rohrer, & Bjork, 2008), researchers typically address how learners insert new knowledge through cognitive processes in their discipline. Several instruments are available to assess learning styles include the Kolb Learning Style Inventory (LSI), the VARK Inventory (Fleming, 2001), and the Grasha-Riechmann Student Learning Style Scales (GRSLSS) (Riechmann & Grasha, 1974). Several studies show significant correlation between participant learning style and student success based on GRSLSS (Riechmann & Grasha, 1974) and team performance among undergraduates and graduates in the same discipline (Cano-Garcia & Hughes, 2000; Cassidy & Eachus, 2000; Forney, 1994; Gardner & Korth, 1998; Lewis & Hayward, 2003; Marriott & Marriott, 2003; Yazici, 2005). Earlier studies report enhancement of student performance when the learning style and education experience matched (Fleming, 2001; Goorha & Mohan 2009). Further research is necessary to prove a significant link between learning style and student performance (Bacon, 2004; Hawk & Shah, 2007).

## **Why this Study?**

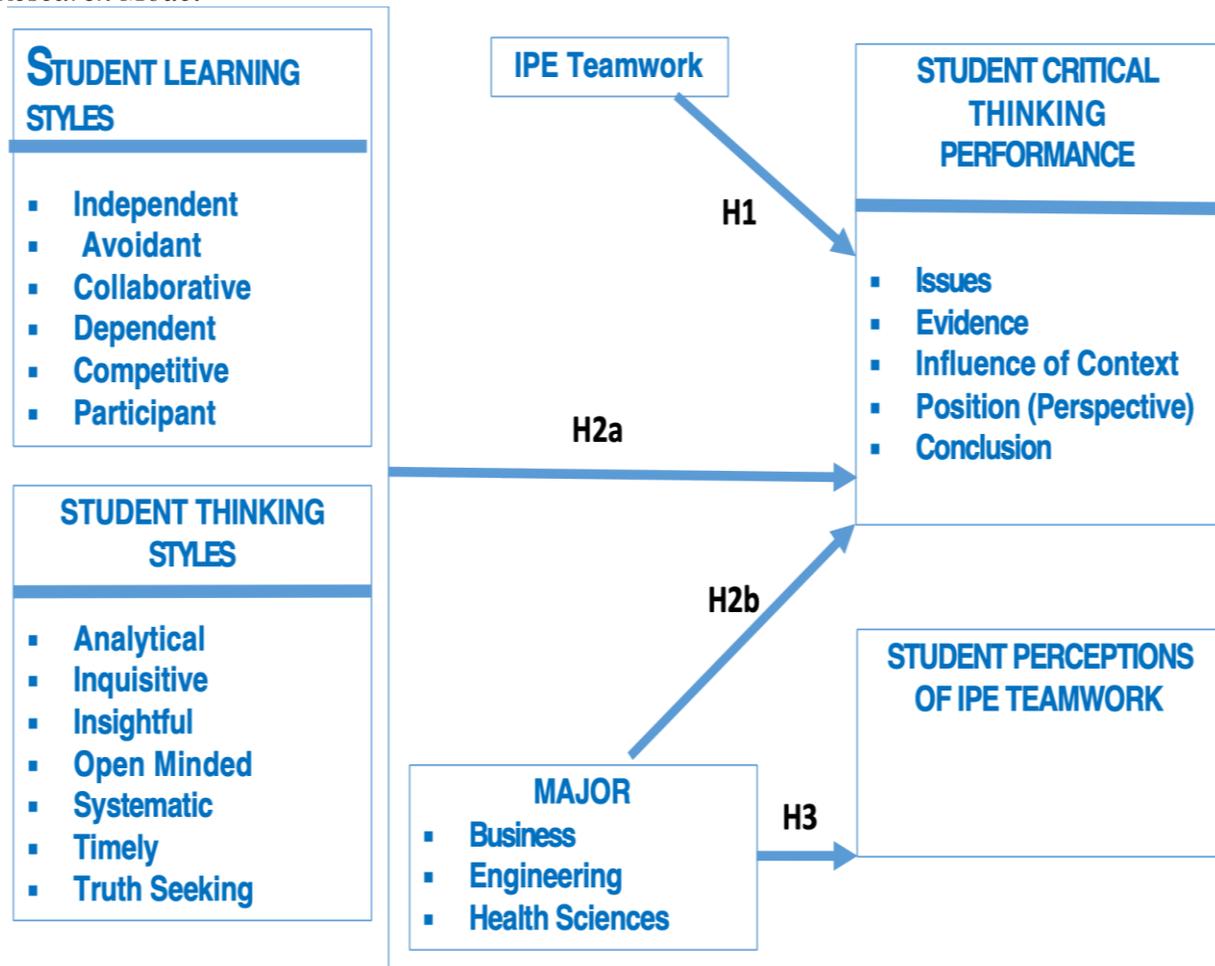
The literature advocates building of knowledge to enhance learning and transferring didactic-to-practice experiences through curriculum sequencing (Ausubel, 1968; St. Hill & Yazici, 2014; Dewey, 1910). Interprofessional teams with management marketing and computer science develop innovative technological advances to improve the workplace infrastructure and client services in healthcare (Amukele et al. 2015; Tan & Vincent, 2019). The latter required an interprofessional mix of health science, business, and bioengineering professionals to work together, think critically, and produce a creative solution. Evidence-based research connecting health sciences, business, and bioengineering education with critical thinking, learning, and IPE, however, is lacking. A gap in the literature also exists concerning fostering critical thinking gains through IPE and possible connections between thinking and learning across disciplines. This study, therefore, aims to investigate the following questions.

- (1) Are students taught in an interprofessional environment better critical thinkers regardless of their discipline?
- (2) Are certain learning and thinking styles more strongly associated with critical thinking performance than others?
- (3) Does the relationship between learning and thinking styles, and critical thinking performance vary among students in different disciplines?
- (4) Do students perceive the interprofessional experience (IPE) as beneficial?

## **Research Model and Hypotheses**

The research model (Figure 1) addresses the role of IPE in different disciplines (majors), along with thinking and learning styles, on critical thinking performance, and student perceptions of IPE teamwork.

Figure 1  
Research Model



Given the above introduction and theoretical framework, significant associations between learning styles, thinking styles and critical thinking skills should occur. Although individual learning preferences and thinking styles may vary, it is likely that IPE will foster collaboration, optimize problem solving, decision-making, and advancement of professional practice within and across disciplines (Freeth et al., 2007). Thus, the hypotheses were:

H1: Interprofessional education experience in the group setting positively contributes to critical thinking performance regardless of major.

H2a: A significant association will occur between learning styles, thinking styles and critical thinking performance.

H2b: Learning or thinking styles differ among health sciences, business, and bioengineering majors.

H3: Students perceive the interprofessional experience as beneficial in terms of: (a) learning and understanding, (b) critical thinking, (c) interprofessional teaming, and (d) professional benefit.

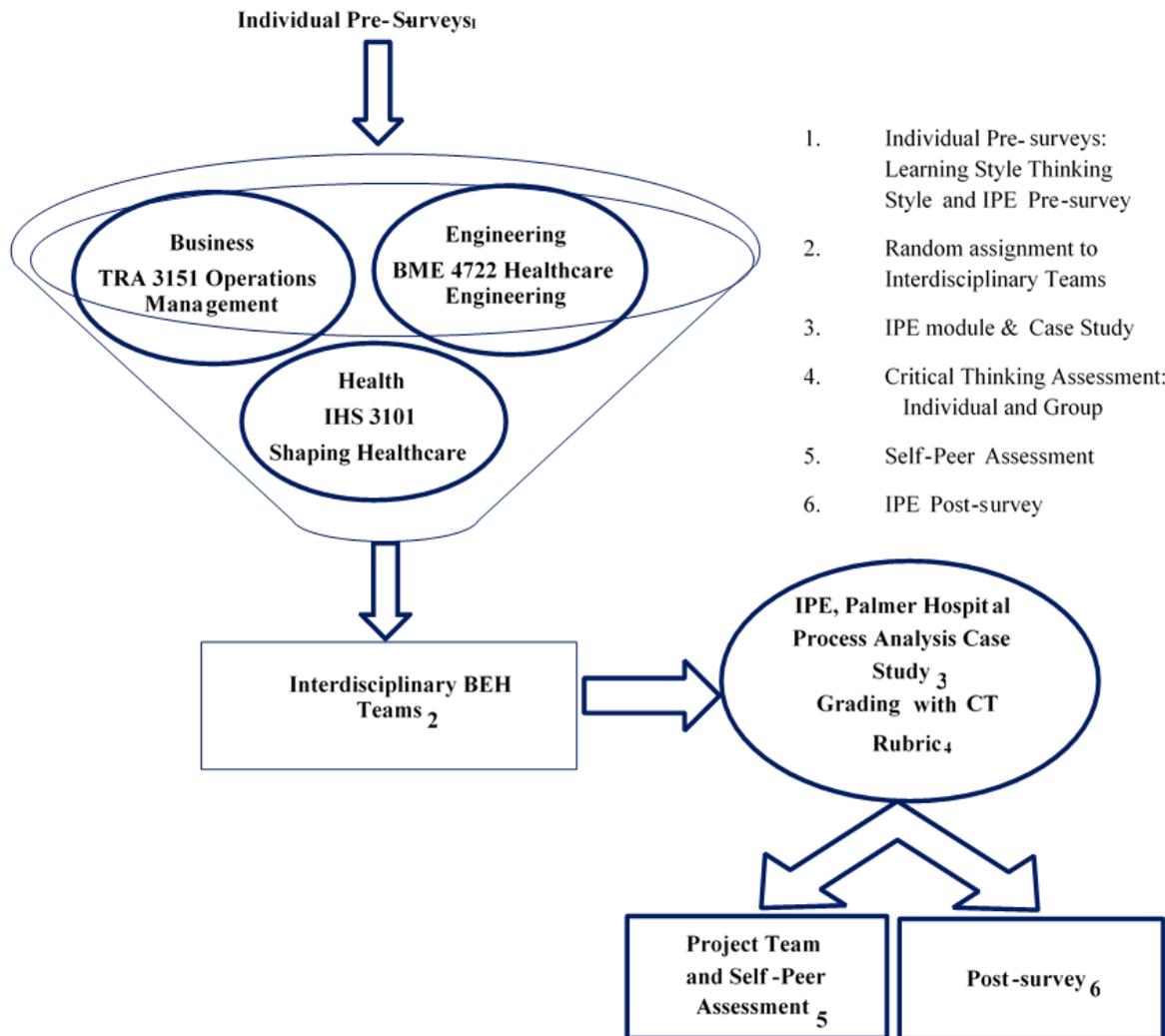
## **Research Methodology**

The sample (n=146) consisted primarily of undergraduate junior and senior students from three majors: health sciences – health services administration and clinical laboratory science enrolled in a healthcare course (n=56), business majors enrolled in an operations management course (n=56), and senior bioengineering majors enrolled in a healthcare engineering course (n=34). These courses were specific to the students' college and major at FGCU. The university's institutional review board approved this study and the researchers adhered to ethical standards and protection of human subjects.

The IPE model method (Figure 2) addresses common learning outcomes in each of three required courses in which subjects enrolled. We applied a quasi-matched pairs design where each student was his or her own control. The intervention was a three-week Process Operations Management IPE module offered online on the university's learning management system (Canvas).

During the first week of classes, instructors informed students of the required IPE module and learning outcomes; its importance in providing common content, knowledge, and skills for their careers; and the culminating group project requirement for assessing their understanding of content, and critical thinking. Students moved through the IPE module in the specific order the content is given on Canvas. First, students completed the IPE pre-survey, read, and reviewed the process management instructor notes, assigned readings, process flow examples, and finally, the process flow. Instructors randomly assigned students' to teams. Each team had a member from bioengineering and a balanced representation from business and health sciences, all of whom needed to learn the same content for their respective course.

Figure 2  
Interprofessional Education Model



### Critical Thinking Measures

In this study, we measured critical thinking performance with the AAC&U (2009) Critical Thinking *VALUE* Rubric framework using 5 criteria: explanation of issues, evidence, influence of content and assumptions, student’s position (perspective, thesis/hypothesis) and conclusion (implication, consequence). Each criterion measure is also based on the AAC&U (2009): 1 is the benchmark or minimum, 2 and 3 are milestones, and 4 is the capstone or highest level. The learning outcomes specific to this module were:

1. Define process analysis and the process management approach.
2. Describe the difference between process and function.
3. Discuss process analysis steps, including documenting and flowcharting.

4. Depict critical thinking through critical analysis and flowcharting of a suggested process improvement approach that provides added value to the case study.
5. Demonstrate the ability to work on an interprofessional team to analyze and develop process improvement.

We instructed students to contribute to, and work in, their team discussion to complete the case study on the flow of maternity patients at the Arnold Palmer Hospital in Orlando, Florida (Heizer & Render 2015, p. 293). Students received the case study with process analysis templates, four tasks (questions), and the rubric (Figure 3). Each task aligned with the critical thinking outcome assessment (grade) criteria on the rubric (Figure 3).

Students completed the current flowchart and identified value-added required aspects to improve the operation management addressed in the case. Each student posted individual findings on the discussion forum before postings from other group members became visible. Group discussions followed and culminated in a team resolution. Individual contributions posted on the forum confirmed participation points and a group-assigned grade. We assessed critical thinking outcomes using the rubric (Figure 3) based on the case study answers posted.

Figure 3  
 Critical Thinking Rubric\* – created using the AAC&U Critical Thinking VALUE Rubric.  
 Retrieved from <https://www.aacu.org/value/rubrics/critical-thinking>

Criterion & Task/Assignment	Critical Thinking Category & Score			
	Capstone 4	Milestones 3		Benchmark 2
<p><b>Explanation of Issues</b>                      Task 1: Draw a process flow chart of the current process described in the case. Use appropriate process symbols for operations, decision points, inspection delays (waits), and transports as described in the course notes/slides).</p> <p><b>Evidence</b> - Selecting and using information to investigate a point of view or conclusion.</p> <p>Task 2: Make a list of all non-value added activities, possible delays, and redundant activity, and inspections.</p>	<p>The current process is clearly identified. The process flow chart is thorough, complete and accurate. Task times are accurate, realistic estimations.</p> <p>Value-added and non-value added tasks are identified with thought and perspective beyond the case details. Information taken from sources were synthesized and interpreted. Appropriate delays, redundancies, inspections, duplications... are appropriately identified as non-value added.</p>	<p>The current process is identified. The process flow chart is complete and mostly accurate. Task times are realistic estimations. Omissions in process do not impede understanding</p> <p>Non-value added tasks are identified; some may be beyond the explicit case statement. Information - own and others' assumptions and several relevant contexts identified when presenting a position. Delays, redundancies, inspections... are appropriately identified as non-value added.</p>	<p>The current process is identified. The process flow chart is complete and mostly accurate. Task times may not be estimated or determined.</p> <p>Non-value added tasks are identified. Information is taken from source(s) with some interpretation/evaluation.</p> <p>Most delays, redundancies, inspections... are appropriately identified as non-value added.</p>	<p>The current process is not fully identified. The process flow chart is lacking in detail/accuracy.</p> <p>Some non-value added tasks are identified. Information is taken from source(s) without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question.</p>
<p><b>Influence of Context &amp; Assumptions</b>                      Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.</p> <p>Task 3: Draw a process flowchart of the improved process.</p>	<p>Appropriately addressed case task with insight and analysis. Improved process flow is realistic and accurate. Responses and process flow reflect appropriate assumptions, case material and analysis appropriate to the students' major.</p>	<p>Appropriately addressed case task. Improved process flow is realistic and accurate. Responses and process flow do not address assumptions but reflect case material and analysis appropriate to the students' major.</p>	<p>Addressed case task. Improved process flow is realistic and accurate. Responses and process flow include case material with minimal analysis.</p>	<p>Minimally addressed case task. Improved process flow was attempted, may not reflect significant improvement. Process flow improvement is minimal.</p>
<p><b>Conclusion and related outcomes (perspective).</b>                      Task 4: Complete the process flowchart, describe the improvements made, state the value-added percent and the time improvements.</p>	<p>Conclusions are and outcomes (added value) are logical, data driven with appropriate emphasis on evidence. Analysis of improvements address data and assumptions. Perspective is considered with respect to overall improvement. Improvements consider priority for implementation, appropriately discuss tradeoff.</p>	<p>Conclusions and outcomes are logical with some tie to evidence. Analysis of improvements include data and assumptions of the process. Perspective is considered with respect to priority for implementation; tradeoffs are appropriately discussed but overall improvements are not addressed.</p>	<p>Conclusions include some tie to evidence. Analysis of improvements include some data and assumptions. Improvements may lack perspective. Minimal discussion of consequences, tradeoff, implications.</p>	<p>Conclusions are stated, without strong supporting evidence. Analysis is focused on data presented only. Improvements lack perspective. Template not completed correctly.</p>

To achieve inter-rater reliability, instructors participated in an IPE training session where each instructor graded the same sample of randomly selected students' submissions on all four tasks using the rubric. Instructors compared grades and, for any graded task with a discrepancy of 1 or more points, the instructors discussed the grade and came to a consensus. Afterward, two instructors graded student/team answers and the third addressed any grading discrepancies to confirm inter-rater reliability.

### **Learning and Thinking Style Measures**

Pre-surveys consisted of the GRSLSS and Watson Thinking Style Survey. We selected the GRSLSS instrument because it was validated and used extensively in many studies with high school, college, and university students to determine students' learning style preferences across six categories that Riechmann and Grasha (1974) defined as: independent, dependent, avoidant, participant, collaborative, and competitive. *Competitive* learners are rewards driven, learning material to outperform their peers. *Collaborative* learners work harmoniously with peers; they believe in learning by sharing ideas and talents. *Participants* are keen to take responsibility for self-learning and relate well with peers. *Avoidant* style learners are not enthusiastic about learning or attending class; their level of responsibility for learning is minimal. *Dependent* learners show little intellectual curiosity, they learn only what they need to know, view teachers and peers as sources of structure and support and look for authority figures. *Independent* learners think for themselves, have confidence in their learning abilities, and are self-directed learners who prefer to learn content they perceive as important. Each learner displays all six categories in preferential levels. Reliability coefficients range from 0.76 to 0.83 (Riechmann & Grasha, 1974, 1982).

Watson and Glaser (1980) measure thinking styles in seven categories: analytical, inquisitive, insightful, open-minded, systematic, timely, and truth-seeking. The *analytical category* defines clear thinking that is orderly and rational whereas curiosity, alertness and interest surrounding the world is characteristic of the *inquisitive category*. The *insightful category* identifies prudent, humble, reflective, and strategic thinking. The *open-minded category* is characteristically intellectually tolerant and fair minded while the *systematic category* characterizes conceptual, process oriented and intuitive thinking. Efficient, reliable, and responsiveness mark the *timely category*, and *truth-seeking* characterizes as independent, tough-minded, and sceptical (Watson & Glaser, 1980).

Watson and Glaser (1980) thinking styles appraisal was based on ninety questions regarding students' approach for thinking with a Likert-type scale where 3: clearly describes me; 2: somewhat describes me, 1: describes me a little; 0: does not describe me. Then, learners' thinking styles generated in ranked order based on learners' responses on the appraisal with the dominant thinking style ranked as one and the lowest ranked as seven.

### **Student Perceptions of IPE**

We designed pre and post questionnaires to determine students' perception of the IPE made available anonymously online in the course management system. We based questionnaire items on defined constructs shown in Table 1. Participants ranked each item using a five-point Likert scale, where 1 = strongly agree and 5 = strongly disagree. The order of the statements in the post-questionnaire was the same as the pre-questionnaire, except the pre-questionnaire was in

future tense, and the post-questionnaire was in past tense. We used Cronbach's alpha to assess reliability. The internal consistency measure was 0.98, suggesting high reliability as students tended to respond in a consistent manner to similar statements. We classified the questionnaire items, based on existing frameworks and research, into the following four constructs:

- (1) Learning and understanding - the extent to which the IPE experience results in knowledge by achieving learning outcomes and making connections between content learned and the student's profession. (Kolb, 1985; Palmer & Goetz, 1988; Sarasin, 1999).
- (2) Critical thinking - the extent to which critical thinking is a habitual exploration and analysis of issues, assumptions, ideas, viewpoints, data, evidence and what is known, to formulate a reasoned logical decision or resolution. (AAC&U 2009; Bailin et al., 1999; Dressel, 1954; Glaser, 1941; Sternberg, 1986).
- (3) Interprofessional teaming - the extent to which students benefit from the IPE, as varied perspectives from IPE team members stimulated deeper understanding of content and students' realization of professional benefits. (Abu-Rish et al., 2012; Ausubel, 1968; St. Hill & Yazici, 2014; Gagne, 1965).
- (4) Professional benefits - the extent to which the IPE prepares students to find a solution considering client benefits, professional and ethical decision making. Professional benefits relate how relevant the IPE was to understanding content from a disciplinary perspective and as an IPE team (St. Hill & Yazici, 2014; Zwarenstein et al. 1999).

### **Statistical Analyses**

Significance level using the R statistical software program (R Core Team, 2019) was at 5% for most inferential procedures. Inferential methods for survey data include permutational multivariate analysis of variance (PERMANOVA) and a permutation-based post-hoc test with a Bonferroni adjustment to the p-value. Critical thinking module data analysis included Fisher's exact test and a permutation F test with Bonferroni-adjusted pairwise Wilcoxon rank sum tests. An analysis of covariance (ANCOVA) followed using SPSS Statistics version 24.

Table 1  
*Classification of Survey Constructs and Questionnaire Items by Category*

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Constructs	Items
Learning & Understanding (LU)	LU 1. The interdisciplinary team project (on management operations in healthcare) enhanced my learning.
	LU 2. The interdisciplinary team project helped me to better understand processes in my profession (major).
	LU 3. The interdisciplinary team project helped me to better understand how my profession (major) contributes to services in the workplace.
	LU 11. By doing the interdisciplinary project I expected to be able to develop an improved process for the customer/patient
	LU 12. The Team project on management operations in healthcare helped me to work in an interdisciplinary team like to the real-world environment.
Critical Thinking (CT)	CT 4. The interdisciplinary team project prepared me to make decisions based on critical thinking. (Critical thinking is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion).
	CT6. The interdisciplinary project helped me to thoroughly analyze my own and other team members' assumptions before submitting a solution.
Interprofessional Teaming (IT)	IT 5. The interdisciplinary project prepared me to work with a team to formulate a solution based on analysis of issues from an interdisciplinary perspective (viewpoints from other relevant professions or majors).
	IT 7. The interdisciplinary team project helped me to better understand how effective teams work.
Professional Benefit	PB 8. The interdisciplinary project helped me to place evidence and perspectives in priority order before deciding.
	PB 9. The interdisciplinary team formulated a decision based on ethical decision making.

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**Results**

**Descriptive Analyses**

Critical thinking performance. We measured critical thinking performance using five criteria based on the AAC&U rubric (see Figure 3). Each criterion was worth two points, for a total of ten points. Individual scores show bioengineering students (M=8) performed better in critical thinking compared to health science (M=6.5,  $p<0.0001$ ) and business majors (M=6.8,  $p=0.0002$ ); however, after the IPE experience, their critical thinking performance deteriorated whereas students in the other majors flourished (see Table 2). Health science majors had their largest gains in explaining their perspective (i.e. position), and the influence of context and assumptions. Business majors benefitted from the IPE experience by improving upon the influence of context and assumptions, in addition to providing better evidence for their analysis. In contrast, bioengineering majors experienced a decrease in every critical thinking category, the worst being evidence.

Table 2  
*Descriptive Statistics for the Mean Change in Performance by Major and Critical Thinking Category, based on Post-pre-IPE Scores*

Critical Thinking Categories	Health Science (n=56)		Business (n=56)		Bioengineering (n=34)		Overall Mean Change by Category (n=146)
	Mean	SD	Mean	SD	Mean	SD	
Explanation of Issues	0.01	0.48	0.01	0.48	-0.37	0.40	-0.08
Evidence	0.12	0.62	0.11	0.54	-0.44	0.44	-0.01
Influence of Context & Assumptions	0.12	0.57	0.10	0.55	-0.17	0.43	0.05
Student's Position	0.20	0.53	0.01	0.63	-0.16	0.39	0.04
Conclusion & Related Outcomes	0.18	0.48	-0.04	0.61	-0.04	0.40	0.04
Overall Mean Change by Major	0.64	2.14	0.19	2.24	-1.18	1.51	0.03

### Learning and Thinking Styles

According to Table 3, students were highly *collaborative* learners, and moderate in *independent, avoidant, dependent, competitive, and participant* learning preferences. Participant learners scored highest while *competitive* and *avoidant* learners scored the lowest.

Table 3  
Mean Scores and Ranks for Learning Style Scales for Participants who completed the GRSLSS Survey

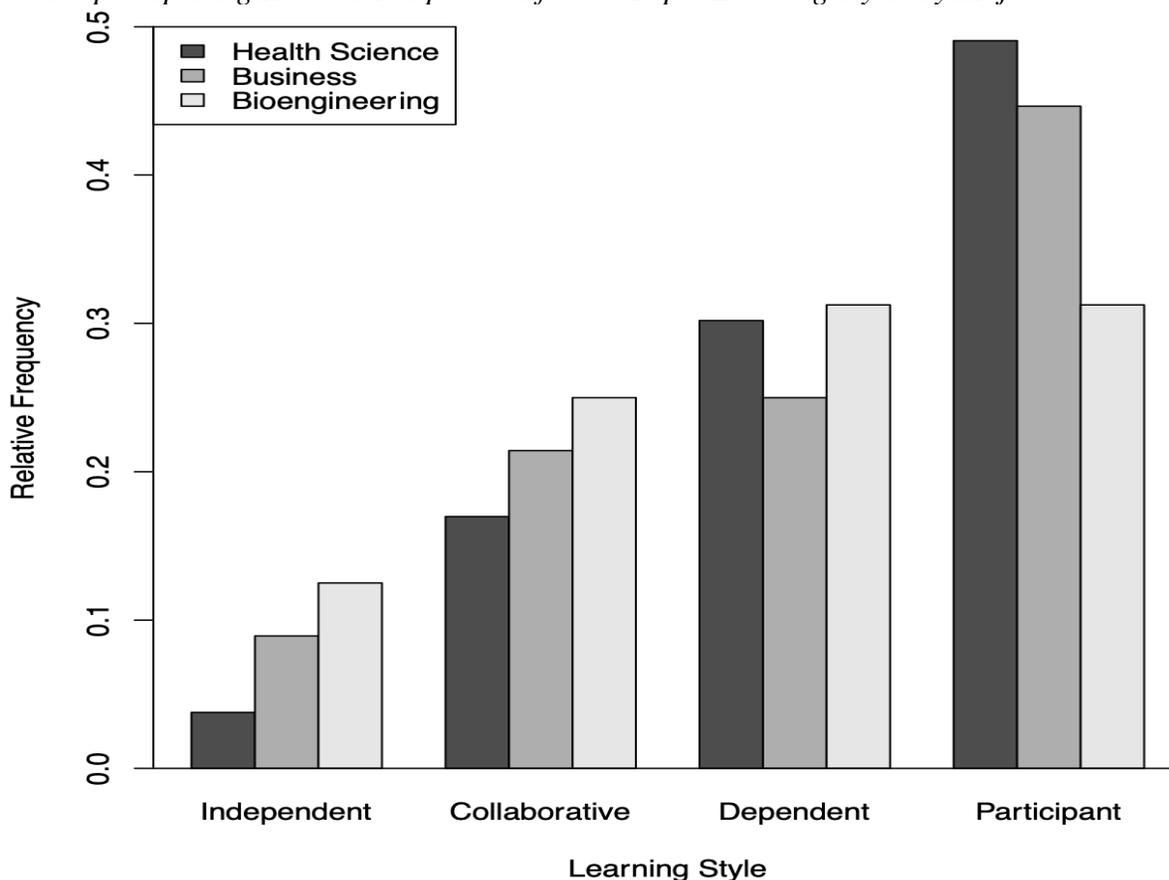
	All Majors (n= 146)		Health Sciences (n= 56)		Business (n= 56)		Bioengineer- ing (n= 34)		GRSLSS Learning Style Scales*	GRSLSS Learning Style Categories*
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Independent	3.52	.47	3.6	1.48	3.41	.43	3.55	.49	2.8-3.8	Moderate
Avoidant	2.41	.57	2.26	.60	2.49	.51	2.48	.52	1.9-3.1	Moderate
Collaborative	3.69	.65	3.71	.64	3.62	.69	3.75	.61	3.5-5.0	High
Dependent	3.89	.46	4.02	.43	3.75	.49	3.92	.46	3.0-4.0	Moderate
Competitive	2.64	.55	2.57	.53	2.64	.57	2.69	.55	1.8-2.8	Moderate
Participant	4.04	.49	4.2	.45	3.96	.51	3.96	.52	3.1-4.1	Moderate

\*From Riechmann and Grasha (1974).

The dominant learning style was the one with the largest rating. Fisher’s exact test did not show any significant relationship between major and primary learning style (p=0.5637). Figure 4 shows the distribution of the most prevalent learning styles by major. It is clear that the distributions are all similar, with an *independent* learning style being the least common and a *participant* learning style being most likely. All majors were weakly *avoidant* and *competitive* learners.

Figure 4

Bar Graph depicting Relative Frequencies for the Top 4 Learning Styles by Major



### Thinking Style Preferences

Based on the Watson Thinking Style Survey, students showed similar preferences across all disciplines. *Timely* ( $M=2.58$ ) and *truth-seeking* ( $M=2.60$ ) were the least preferred thinking styles regardless of discipline, while *analytical* ( $M=4.81$ ) and *open-minded* ( $M=4.86$ ) thinking styles ranked highly among all disciplines.

Closer inspection revealed that the most dominant thinking style among business majors was *analytical* (27%), with *systematic* next (23%) even though, on average, students received a higher *systematic* ranking than *analytical*. Health science majors also appeared to be predominantly *analytical* (38%); however, the second most dominant thinking style was *open-minded* (23%). Bioengineering majors, in contrast, were most likely *open-minded* (31%) or *systematic* (22%). Despite these differences, Fisher's exact test did not reveal any significant association between major and one's dominant thinking style ( $p=0.1978$ ). Hence, there is no support for hypothesis 2b.

### Hypothesis Testing for the Effects of IPE, Learning Styles, Thinking Styles, and Major

The authors observed variations among disciplines through the use of descriptive analysis of pre- and post-IPE critical thinking data. A factorial 3-way analysis of covariance (ANCOVA)

followed to explore how major affected post-IPE performance, thinking style and learning style, after accounting for pre-IPE scores. Nineteen of 147 records (13%) were incomplete with respect to learning and thinking styles. Missing values are based on major, individual scores, and thinking or learning style per k-nearest neighbor classification. We carried out Levene's test, normality checks, and homogeneity of regression slopes; results assured satisfaction of assumptions.

Table 4 depicts the importance of controlling for a student's initial, pre-IPE score. After accounting for individual scores, health science majors with a collaborative learning style improved by an average of  $6.78-6.41=0.37$  points, while business and bioengineering majors experienced a slight decrease in their team score. Business and health science students with a participant learning style also increased, on average, 0.35 points, while bioengineers decreased 0.26 points. Adjustments also exist among dependent and independent learners. Thinking style did not show a significant effect on critical thinking. Thus, the ANCOVA not only showed that the IPE effect on disciplines differs, but the influence of learning style also varies by discipline. Hence, there is enough evidence for partially supporting Hypothesis 1: IPE does not positively affect all disciplines.

Table 4  
*Mean, Standard Deviation, Adjusted Mean, and Standard Error for Each Major by Learning Style*

Learning Style	Major	Mean	SD	Adj. Mean	SE
Collaborative	Business	6.94	1.29	6.87	0.47
	Bioengineering	6.08	1.24	5.97	0.58
	Health Science	6.41	1.44	6.78	0.60
Dependent	Business	6.76	1.02	6.87	0.41
	Bioengineering	7.18	1.18	6.87	0.50
	Health Science	7.77	1.19	7.58	0.45
Independent	Business	5.80	1.43	5.61	0.65
	Bioengineering	7.58	1.55	7.34	0.75
	Health Science	9.00	1.41	9.50	1.00
Participant	Business	7.23	1.62	7.58	0.34
	Bioengineering	7.30	1.60	7.04	0.47
	Health Science	6.87	1.42	7.22	0.41

\*Covariate at the mean individual (pre-IPE) score of 7.0.

The ANCOVA detected a significant 2-way interaction between learning style and major ( $F[6,92]=2.224$ ,  $p=0.048$ ). There were no other significant interactions. Post-hoc analyses on the adjusted means revealed that, among business majors, participant learners ( $M=7.58$ ) performed better than independent learners ( $M=5.61$ ). Furthermore, among independent learners, health science majors ( $M=9.50$ ) did significantly better than business majors. Independent-learning business majors also performed significantly better than collaborative-learning bioengineering majors ( $M=5.97$ ). Adjusted means for team scores are based on the covariate of individual score evaluated at the value of 7.0. Hypotheses 2a and 2b are partially supported: the findings verify a significant relationship between learning style and critical thinking performance and show an interaction between learning style preferences and discipline; however, we could not prove the same for thinking style and discipline.

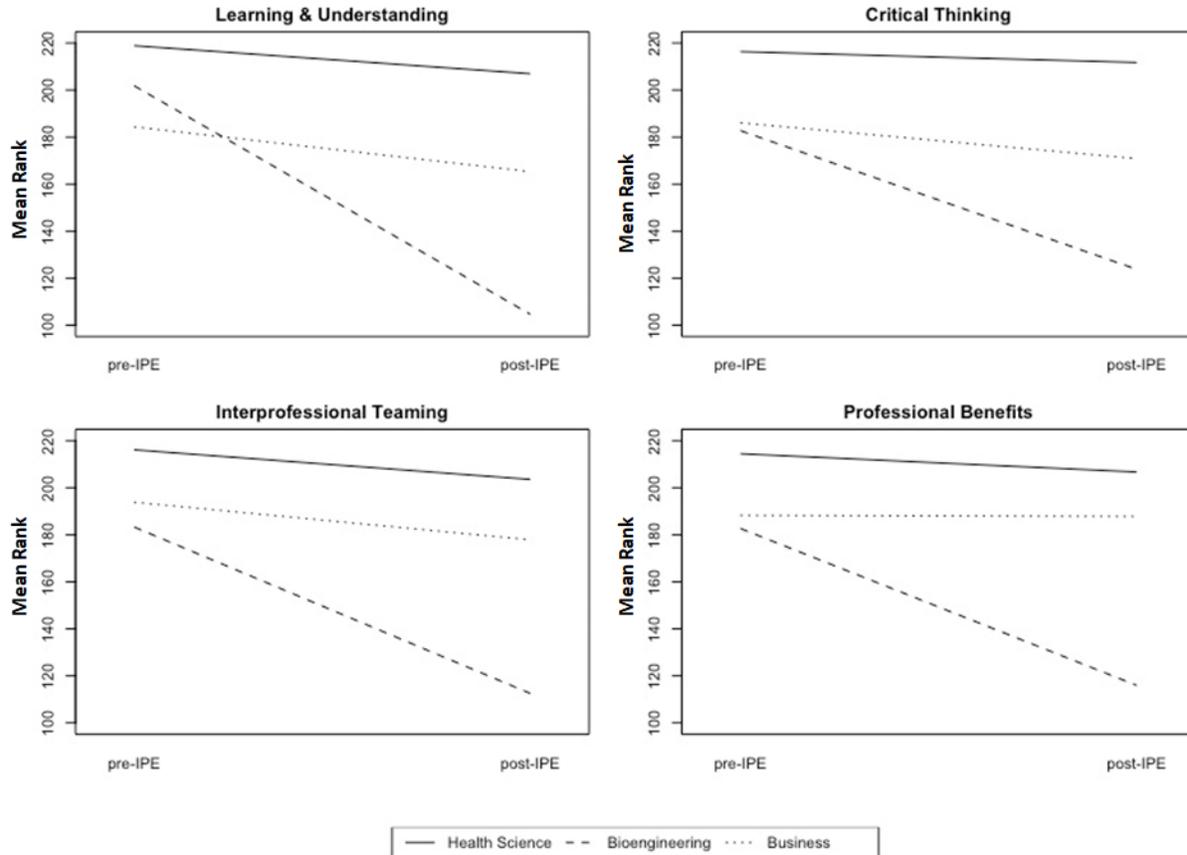
### **Student Perception of IPE**

Pre ( $N=131$ ) and post surveys ( $N=80$ ) for examining students' perception of the IPE experience contain a section consisting of 16 nearly identical statements that students needed to rate on a scale from 1 to 5, where 1 was strongly disagree and 5 was strongly agree. Most statements fit in one of four categories or constructs as described in Table 1. We applied confirmatory factor analysis using lavaan version 0.6-3 (Rosseel, 2012) in R (R Core Team 2019) to test a four-factor model of students' perception based on the constructs. Exploratory data analysis revealed only minor deviations from normality in the eleven statements classified into the four constructs. We used maximum likelihood estimation, with full information maximum likelihood (FIML) for the missing data and standardized latent factors to allow for free estimation of all factor loadings. The model fit was acceptable with a comparative fit index (CFI) of 0.961 and root mean square error of approximation (RMSEA) of 0.118 [90% CI of (0.099, 0.138)]. The full model fit the data significantly better than a single-factor solution ( $\chi^2(6)=28.95$ ,  $p<0.0001$ ) and a four-factor solution that did not allow covariances among the four latent factors ( $\chi^2(6)=1111.50$ ,  $p<0.0001$ ). The indicators all showed significant positive factor loadings, with standardized coefficients ranging from 0.824 to 0.931 (see Appendix 1). There were also significant positive correlations among all four latent factors ( $p<0.0001$ ), indicating that students who showed high ability in one dimension were more likely to also show high ability in the others. The average statement rankings within each construct formed a single value per student.

We performed a permutational multivariate analysis of variance (PERMANOVA) using Adonis version 2.5-5 (Oksanen et al., 2019) in R (R Core Team 2019) to see whether student perception of the constructs is affected by time (pre vs post), major, course grade, or academic year (freshman, sophomore, junior, or senior). There was a significant interaction between time and major ( $F[2,195]=3.85$ ,  $p=0.0128$ ) through a two-way investigation between time and other factors. Figure 5 depicts post-hoc tests that confirmed bioengineering majors rated every construct significantly lower after the IPE module ( $p=0.0315$ ). In addition, after the module, health science majors viewed the experience in a significantly more positive manner across all constructs than bioengineers ( $p=0.0315$ ). Hence, there is partial support for the third hypothesis (H3) since one of the three majors perceived the IPE experience as beneficial.

Figure 5

*Interaction Plots for the Constructs of Learning and Understanding, Critical Thinking, Interprofessional Teaming and Professional Benefits, Comparing Students' Mean Perceptions Before and After the IPE Module*



## Discussion

The research questions and corresponding hypotheses focused on the relationship between critical thinking performance, IPE, and learning and thinking styles.

**Research Question 1 (H1):** Are students taught in an interprofessional environment better critical thinkers regardless of their discipline?

Business and health science majors improved upon their critical thinking performance. Bioengineering majors experienced the opposite effect; their critical thinking performance weakened when working with students from other disciplines (Table 2). Despite the sizeable decrease among bioengineers, three of five critical thinking categories experienced a marginal increase, with a 95% confidence interval for the overall mean change in performance of  $0.03 \pm 0.18$  points (out of 10).

Accounting for an individual's initial performance on the critical thinking assessment, the authors confirmed that health science and business majors did in fact experience a gain in critical

thinking performance through the IPE experience while bioengineers did not. Thus, there is some support for the first hypothesis. One explanation for the negative effect of IPE on bioengineering majors' critical thinking is that the IPE module delivery on a virtual platform that did not suit well for team interaction, particularly by bioengineering majors, who have little to no online coursework. In contrast, health science majors do most of their disciplinary coursework online and had experience working in teams on the virtual platform. Business students did not benefit from IPE as much as health science majors. Sequencing, contiguity of curriculum, and reinforcement through integration is germane to IPE. Moreover, inclusion of a short one-term IPE experience does not assure long-term positive change in critical thinking (Huber & Kuncel, 2016). Nonetheless, IPE is a form of strategic instruction which, per Wang et al. (2015), leads to critical thinking. Major also plays a role, which agrees with or supports Ghazivakili et al.'s (2014) findings that show an association between major, gender, and critical thinking achievement.

**Research Question 2 (H2a):** Are certain learning and thinking styles more strongly associated with critical thinking performance than others?

Learning and thinking styles appear to be influential with respect to critical thinking performance. The ANCOVA revealed a significant interaction between learning style and major such that, among business majors for example, participant learners benefitted more from the IPE experience than independent learners; however, no main effect of nor interaction with thinking style was significant.

**Research Question 3 (H2b):** Does the relationship between learning and thinking styles, and critical thinking performance vary among students in different disciplines?

At first glance, the significant finding makes sense as independent learners 'likely rebel against the experience of having to collaborate with others, while participant learners may relish the opportunity. Nevertheless, the same pattern did not occur among the other majors. In fact, independent health science students greatly benefitted from the IPE activity, significantly outperforming independent business majors. Perhaps one explanation is relevant to the idea that Carpenter and Dickinson (2016) presented, to use IPE to educate and train those who work together to create a better mutual understanding of the contributions and added value gained from each participant. Students majoring in health science are most likely expecting a career where they will socialize with other professionals, while the same may not be true for students pursuing a degree in business. Independent learners in health science know they will work and communicate with others during their career; as such, they may be more willing to embrace potential benefits of an IPE experience. It was therefore not surprising to find a relationship between learning style and major. Furthermore, it was informative to notice in Table 3 that students in all majors were weakly *avoidant* and *competitive* learners yet rated strongly as *participant* or *dependent* learners. This implies that students typically prefer learning from or working with others instead of alone.

In this study, the relationship between thinking style and major was insignificant. This suggests that student interests are not due to thinking styles, but instead factors this study did not consider, for example strength or confidence in foundational subjects such as math or biology. Alternatively, different thinking style inventories, other than Watson and Glaser's Critical

Thinking Appraisal, may further uncover the role of thinking style. Ghanizadeh (2017) used the Critical Thinking Appraisal and found significant contribution of self-monitoring and reflective thinking on critical thinking tasks. The significance of reflective thinking may explain how these skills play a role in critical thinking performance.

**Research Question 4 (H3):** Do students perceive the interprofessional experience (IPE) as beneficial?

Students' perception about the IPE experience varied within and across disciplines. Health science students viewed the experience more positively than bioengineering students. Prior to the IPE module, bioengineering students' ratings suggest they were looking forward to the experience; however, their ratings dropped significantly post-IPE, which aligns with their lower performance after the module. For all constructs, on average, health science students assigned higher ratings after the IPE activity, bioengineering students assigned lower ratings, and business students stayed the same.

### **Conclusion**

Higher education places great value in content knowledge but, until recently, essentially overlooked students' practical interprofessional applications of discipline-specific knowledge. This study appears to be the first to use IPE across the health sciences, business, and bioengineering disciplines, each from a different college in a university. The study provided a 3-week IPE experience and showed results varied by major. Significant differences in pedagogical experiences prior to this study may have affected the results given the online nature of the module. Bioengineering students' team performance was lower than their individual performance, and their perception about IPE was lower than the other majors. Students in the bioengineering program have significantly less interaction in mixed major courses beyond the sophomore year compared to health science and business majors. Critical thinking and interprofessional approaches are important worldwide to educators, graduates, employers, consumers, and other stakeholders, especially in healthcare where issues concerning management, development and implementation of cost-effective practices arise.

It is necessary to continue further studies with larger samples and balanced numbers for each major, and not limited to online delivery. Repeating this study with face-to-face interaction may eliminate the lack of personal interaction among students. A controlled longitudinal study that aims to assess critical thinking development using IPE may be beneficial to curriculum development.

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Appendix – Factor Loadings

<b>Latent Factor Indicator</b>	<b>B</b>	<b>SE</b>	<b>Z</b>	<b>Beta*</b>
LU1	1.024	0.062	16.542	0.881
LU2	1.079	0.063	17.064	0.899
LU3	1.108	0.063	17.523	0.913
LU11	1.068	0.067	16.017	0.864
LU12	1.116	0.067	16.761	0.888
CT4	1.120	0.065	17.287	0.906
CT6	1.134	0.064	17.735	0.921
IT5	1.157	0.068	17.017	0.904
IT7	1.210	0.071	16.981	0.901
PB8	1.128	0.063	17.819	0.931
PB9	1.016	0.069	14.727	0.824

\*All coefficients were significant at  $p < 0.0001$ .

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#### Discussion Questions

1. Do student attributes such as grittiness, personality type, motivation, or mindset change the effectiveness of an IPE experience?
2. Assuming that course materials and instructors are the same, is a significant difference in critical thinking gains expected among students who take an IPE course online as compared to those taking the same IPE course on campus?

#### To Cite this Article

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## **Life Forward**

**David A. Armstrong, J.D.**  
*University President*



### **Background**

David A. Armstrong, J.D., is St. Thomas University's 10th president. Since taking the helm of the university in August 2018, he has spearheaded the launch of a football and marching band program, began construction on the Gus Machado College of Business, and launched both the Institute for Ethical Leadership and the Institute for Interfaith Leadership. Most recently, President Armstrong launched the Center for Pandemic, Disaster, and Quarantine Research, a multi-disciplinary approach to the long-term effects of occurrences like COVID-19 on society as a whole.

Under his leadership, STU has been ranked #1 by U.S. News and World Report in Social Mobility for regional universities in the South, which means it takes students from the lowest financial strata and catapults them to a much higher financial strata in only 10 years. In Fall

2019, STU entered its largest incoming undergraduate class ever. For the academic year 2018-2019, STU raised \$10.7 million, the most amount raised in university's history.

Armstrong comes to St. Thomas University from Thomas More University, a Catholic liberal arts college belonging to the Diocese of Covington, Kentucky, where he was president since 2013. Born and raised in Cleveland, Ohio, President Armstrong holds a Juris Doctor from Cleveland-Marshall College of Law and a Bachelor of Arts in Political Science, with a Minor in Accounting, from Mercyhurst University.

Prior to Thomas More University, he served as Vice President and General Counsel of Notre Dame College in South Euclid, Ohio, where he oversaw divisions of the college that set records in enrollment and fundraising. His background in higher education administration at Notre Dame College, Mercyhurst University in Erie, Pennsylvania, and Thiel College in Greenville, Pennsylvania, includes a span of experience in development, student life, recruitment, higher education law and policy, and athletics.

Armstrong, a nationally recognized speaker on future trends of higher education law and Title IX issues, has dedicated his career to ensuring small, faith-based colleges and universities not only survive but thrive in the new landscape of higher education. His commitment to the transformative power of education has driven the colleges he has worked for to experience remarkable growth in enrollment, corporate partnerships, and collaboration. His vision has guided institutions into the future with comprehensive strategic plans, which emphasize student success, faculty innovation, and increased donor engagement and giving.

In 2018, Armstrong was named as a member of the Orange Bowl Committee. He also serves on the Stetson University College of Law's Center for Excellence in Higher Education Law and Policy Advisory Council, and the National Association of Independent Colleges and Universities Committee on Accountability.

Armstrong is married to Leslie Armstrong, a former special education teacher with 18 years of experience in urban education. He has two children, David Balthazar and Johanna Marie.

### **Interview**

**By Hagai Graingarten, Editor-in-Chief**  
***Journal of Multidisciplinary Research***

#### **1. Life is about stories. Do you have a favorite story you use as an icebreaker?**

When I give a talk on Leadership or Education, I usually share a family story. I talk about my parents—the true heroes in my life—who imparted so many lessons on how to live, learn, and lead correctly. By giving the audience a familiarity with my upbringing, it gives them a closeness and understanding of what comes next.

## **2. What are the top three characteristics that contributed to your success?**

Hard Work. Discipline. Positive Attitude.

Those are the three phrases my college Head Football Coach, Tony DeMeo, always preached. They cover so much ground in life. Very rarely does anyone win the Powerball or Mega Millions. You must earn what you get, and it can only be done by living by those words.

Another way to say those words is Effort, Perseverance, and the Love of People. I love being with people, and I truly love helping people achieve their dreams. Self-Reflection and an Attitude of Gratitude go a long way with me. I look for these traits in anyone I hire or befriend.

## **3. What life-changing events or decisions have guided your career?**

I wanted to be a lawyer since I was 6 years old because I used to read about the lives of our U.S. Presidents, and I wanted to be like them. Many of them were attorneys, so I decided I needed to be one, too. Everything I did in my academic life was to prepare for a career in Law. Then, like it happens in life, I completely changed my life trajectory when my high school Head Football Coach, Regis Scafe, asked me to be a part-time assistant freshmen football coach during my first year of law school. After seeing first-hand how impactful that profession is, I fell in love with coaching and teaching.

My coaches over the years had a tremendous influence on my life and being able to influence others in the same way is life changing. So, after graduating Law School, I decided to throw three legal job offers out the window and went back to my collegiate alma mater to be an unpaid volunteer football coach. I can still hear my Mom screaming at me today. I was supposed to be the first professional in the family. But it has led to a wonderful career in education, which includes being a college Head Football Coach and a university President. Ironically, as I was running away from a career in law, an incident occurred where the President asked me to navigate the college through a compliance issue. The issue became ground zero for the confluence of Title IX and Campus Safety compliance. Next thing you know, I am the national expert on the hottest area of higher education law and policy. Law sucked me back in. That is why it is imperative to get an education and advanced degrees, so when life throws you a curveball, you have the education and acumen to hit it out of the park!

I would be remiss if I did not say this...any success I have had in life are due to learning valuable lessons after failing. I always say you learn more from the bad times than you do from the good times. Being able to Fail Forward is a key attribute that everyone needs to learn. There is a great line in an anonymous saying that has guided me through tough times, "I am the architect of my fate; I will use my failures as the steppingstones to my success." No truer words have been spoken!

## **4. Tell us of any expressions your parents often repeated with you.**

"Education is the Great Equalizer."

I am a first-generation college student. My parents did not have the opportunity to pursue higher education but believed in education and made great sacrifices to provide a Catholic values-based education to their seven children. They understood it was worth the investment to put seven kids through Catholic grade school, four of us through Catholic college, and two of us earned advanced degrees. All the while, they still voted for every public-school levy while my

Dad ran his own tool and die company. My parents could have vacationed around the world for all they invested in our education. It was very tough sometimes as they struggled to feed, house, and clothe seven kids in the 60's and 70's. My parents taught me early on you make sacrifices to educate your children and other peoples' children. The Founders of this country believed the same thing.

## **5. You are considered a turnaround expert of Academia. How did you earn this "title," and what is your approach to turn businesses around?**

Before I walk into a fiscally failing educational situation, I can predict 20 things that are happening at that institution in that very moment. That does not mean anyone is a bad person or that there are not some good efforts and practices happening at those institutions. However, there are certain systematic problems that colleges are perpetuating that are leading to consistent deficits. You cannot survive on deficits. No margin, no mission!

I am fortunate to have learned under some great higher education leaders that taught me how to move colleges and universities to not only survive but thrive. For me, it all starts with a definition of Leadership I learned from Lou Holtz...

- (1) A Leader must have a Vision.
- (2) A Leader must have a Plan to implement that Vision.
- (3) A Leader must lead by Example.
- (4) A Leader must find People with the Shared Vision.
- (5) A Leader must Hold people Accountable to the Plan.

Everything starts and ends with that philosophy. After years of experience, I can succinctly discuss a plan on how to turn around institutions. However, it is much harder to do it. I have worked at 5 universities and been a President at 2 of them. Experts in education have studied turnarounds and surmised it takes seven years to change its trajectory. At the last 3 institutions, I have been fortunate to be on teams that turned around institutions' around in 5 years, 3 years, and now 2 years. From every situation you learn and get better. How you do it, again, is easy to talk about, much harder to do.

The Plan:

- (1) Follow the money...you will find a lot of answers there.
- (2) Generate Revenue...Enrollment is everything!
- (3) Create excitement at the university right away; students want to go somewhere "cool" (that word is definitely from my era).
- (4) Build an excellent team. I learned the hard way. I am a much more effective leader when I get much better people than me to implement the plan.
- (5) Hold everyone accountable to their job and the plan. This is the toughest part that causes the most political backlash. An institution will never thrive with people purposely working against the institution's survival. Sadly, rarely do people self-reflect and realize they are part of the problem, not the solution.
- (6) Create a culture of accountability and sustained excellence. This is especially important in academic offerings. It is at the heart of what we do, meaning it comes from all employees first, not Administration.

- (7) Improvement never ends. People who are waiting for a time to relax and slowdown will not fit.

## **6. What is the biggest misconception about you?**

The biggest misconception about me is that I have no feelings. I am a hard charging, direct, and sometimes in your face personality that some people have a hard time dealing with. But every decision I make, I agonize over how it will affect people. As a result, I do not get much sleep. But when a decision is made, I will do anything and everything to make it work. To some, that may seem callous and uncaring. It is just the opposite; my love of people and their success is why I am so driven to succeed. And sometimes, the caring is breaking ties with people who are not willing to join the plan to success.

There are two things I have learned as a leader.

First, time is everything. I am very direct with people because the most valuable commodity in this life is time! I value my time, and I value your time, just as much. So, I will not waste your time by beating around the bush. I will tell you quickly and directly what needs to be done.

Second, not everyone is going to go with the new plan especially in a turnaround situation. Therefore, it is best to move on quickly from people who are unwilling to follow the plan. That it is better for the organization and even that person. It may be very difficult for those people who are affected to see the benefit right away. However, people who stay in an organization and are unhappy, negative, and unproductive have an adverse effect on themselves and the institution. I am still very good friends with people who I asked to move on from organizations because they eventually realized moving on made their life better. People will be their best selves when invested in the plan of success for their organization. It leads to a more productive situation for everyone.

## **7. What books have you read lately?**

- (1) *Passion for Truth: The Life of John Henry Newman*, by Fr. Jean R. Velez.
- (2) *Wooden*, by Seth Davis.
- (3) *The Small College Imperative: Models for Sustainable Futures*, by Mary B. Marcy.
- (4) *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*, by Daron Acemoglo and James A. Robinson (still reading).

## **8. Imagine your phone rings and it's you from 10 years ago. If you only had a minute to talk, what would you say? (Yes, I know, buy AAPL.)**

Keep doing what you are doing...your dreams can come true!

Always stay in touch with your family and friends!

Make sure you are developing young people to be tough in difficult times and teaching them to have the grit to succeed. Those traits will be needed even more in the future!

## **9. What elevator speech would you give children about success in life?**

Keep God and His Commandments first.  
Honor your parents.  
Learn from everyone and everything.  
Always work hard.  
You will fail but learn from it and get better.  
Find a Way.  
At all times, have an Attitude of Gratitude.  
Find love in your life.

## **10. What is the best advice you've ever received, and who gave it to you?**

Three great pieces of advice from three mentors:

- (1) My wonderful mentor and friend since deceased, William T. Robinson III, Esq., President of the American Bar Association in 2012 and Thomas More University alumnus, told me that our purpose in life should be based on what, I believe, St. Peter will ask us at the gates of Heaven if we are so honored: “How do we make a positive difference in the lives of those we are privileged to serve?”
- (2) When I was making the decision on what college to attend, Jay Carver, Assistant Football Coach at Chanel High School and owner of Bedford Auto Body, a grizzled old, blue collar coach I had in high school, said: “Go where they want you, you will always have a better experience there!” – a brilliant piece of advice that has guided me in this profession and beyond.
- (3) My first year as a college administrator from my college president, Dr. William P. Garvey, who was instrumental in recruiting me to Mercyhurst and giving me an opportunity to work in higher education: “Never put you, your agenda, or anyone else above the institution!”

## **11. What would you like to see as your life's legacy?**

I have been asked this question before, and I know my answer may bring more questions or derision, or both.

I want people to say...“He got things done!”

Now, that covers a lot of ground. My faith, my family, my career, my goals, serving people. It covers a lot of bases. So, many people spend their life like they're watching a movie from afar.

No...we get one chance to be on this miracle marble, so live life and get things done!

To Cite this Interview

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## **Boston's Megaproject: A Leadership Analysis**

**Jonluc Borno**  
*St. Thomas University*

### Abstract

This article analyzes the Big Dig, a Boston infrastructure megaproject that took nearly three decades to complete. Much of the Big Dig's substantial delays and inflated expenses owe their origin to unideal leadership communications from multiple different sources and levels of the project. Where large groups of workers and a substantial budget are concerned, it is vital to be able to merge strong leadership with effective communication. A project such as the Big Dig provides ample opportunities to reflect on what causes various types of issues in a megaproject and how to carry out various forms of leadership moving forward.

*Keywords:* management, infrastructure, leadership, communications, financing

### **Business for Boston**

Consider something as intrinsic to modern society as infrastructure, and the many roads, bridges, and pavements that people drive on every day just to get to work. Before skills or materials, it took high performance team leadership to make all those roads a reality as well as the maintenance that keeps them strong and effective throughout numerous generations. Enter the Central Artery-Tunnel Project, otherwise known as "The Big Dig," which state officials conceived in the 1970s in order to mitigate the copious traffic gridlock across Boston. For Boston's community, another large boon from the Big Dig was cleaner air along with the redevelopment and revitalization of the city's waterfront (Greiman, 2013, p. 45). Furthermore, this historic megaproject stands as an example of what can go wrong and what issues to avoid based on leadership communication as it relates to high performance teamwork (Barrett, 2010, p. 246).

### **Laying the Groundwork and Communicating a Budget**

Before a massive project like the Big Dig can even begin, it is paramount for the various tiers of management to have full transparency on the money and resources available to them. The

Big Dig completely overstepped its boundaries in terms of budget as, by the time of its finishing touches in 2006, it had cost roughly \$12.3 billion more than its originally projected \$2.5 billion (Greiman, 2013, p. 54). Finance hemorrhages like these are one of the first hallmarks of poor communication, in this case between Boston state officials and the workforce in charge of managing the project's expenses. The Big Dig's official cost estimate was \$7.7 billion between 1992 and 1994; however, some federal and state officials would inflate that estimate up to over \$10 billion without notifying any of the project's constituents, and state legislators would re-evaluate that estimate again as \$12 billion according to the *Boston Globe's* coverage of the project (Sennott, et al., 1994).

Vague cost projections carry over into unforeseen obstacles, the kind that are bound to befall long-term construction that displaced 20,000 residents in the vicinity of Boston's central artery (Mass.gov, 2020). In March of 1988, the Big Dig's orchestrators had to deal with an estimated \$80 million addition to their already existing expenses because an off-ramp from the new central artery would cut directly across the Spaulding Rehabilitation Hospital (Sennott, 1994). It is vital to remember that the Big Dig's orchestrators limited the project's viability with their inability to afford resources as well as skilled professionals. Those who lead projects must maintain constant awareness of their budget, make their decisions accordingly, do so while accommodating the needs of other figures involved, and understand that bookkeeping plays a crucial role.

Project report development is one of many integral leadership communication tenets that provides the leader with an opportunity to directly tackle the dire necessity for budget preparation (Barrett, 2010, p. 114). Under ideal leadership communication, the Big Dig's accountants could reserve and set aside portions of the budget in order to handle impromptu issues not limited to the off-ramp oversight. The communicative leader also can enact mitigating measures once he or she understands the root causes of the project's initial problems. As far as the Big Dig is concerned, the leader could enact an owner-controlled insurance program to save money by providing group coverage for contractors, subcontractors, and designers for the project's various structures; naturally, the leader would notify each of those parties in prompt fashion.

### **Firm yet Fair: A Leader Enforces Regulations**

Pure management stands at the heart of the Big Dig's trials and tribulations. Costs will continue to rise on a megaproject whenever the owner or manager is not enforcing the agreed terms of the corresponding contract. It stands to reason that the Big Dig would suffer some unfulfilled contract terms because upwards of 1,500 unanticipated agreements would soon manifest throughout its execution (Greiman, 2010, pp. 330-332). In reference to the previously mentioned owner-controlled insurance program, it can be difficult to change entire components of a megaproject's budget while it is already in progress; that is why it is important to take sections of the project that have yet to begin construction and re-evaluate the initial funding plan correlating to each one. The best option to utilize for these remedial efforts would be to focus on quality assurance through the Big Dig's "Project Procedure 301," specifically its fifth step where contractors use the information they have gathered from surveillance in order to properly notify the lead auditor and commence corrective action (Greiman, 2013, pp. 330-332). This is all instrumental in developing a team charter that would clarify project goals, identify team member

responsibilities, establish ground rules, and reinforce communication protocol (Barrett, 2010, p. 249).

### **Project Management in Leadership: Using an Action Plan**

The Big Dig relied heavily on collaborative integrated project management, which gave it an admiral framework of synergy. Unfortunately, that synergy suffered from integration problems and a lack of organizational structure separated design from construction, thus exacerbating the management process further. To elaborate, the Dig’s orchestrators were erroneously relying on a traditional design-bid-build model (Greiman, 2013, pp. 330-332). The project’s leading team, Bechtel/Parsons Brinckerhoff could have benefitted from utilizing a multi-phased action team plan (Barrett, 2010, p. 254) to open up communications between federal officials, state officials, legislators, designers, contractors and of course, key treasurers involved with the process of projecting expenses. Each new estimate throughout the 1990s period of the Big Dig enacted an abrupt shift in production strategy to prepare for each new set of expenses. The resulting administrative disarray could have been avoided, had the Brinckerhoff team established benchmarking criteria (Barrett, 2010, p. 255) for the many sections-worth of construction that were going to go into the central artery structure from year to year. The following table serves as a portion example.

#### **Brinckerhoff Team Action Plan – (Example)**

High-performance team leadership’s action plan dichotomy calls for a “multiple writers approach” (Barrett, 2010, p. 256) that could have helped the Big Dig’s orchestrators detect the roadblock in their construction that manifested in the form of the Spaulding Rehab Hospital. An increased number of drafters for the Big Dig’s blueprints improves their chances of detecting a structure as large and indispensable as a hospital. Finally, the overruns tied to unfulfilled contract terms could have been avoided with more concentrated management effort put towards adaptive leadership. In accordance to adaptive leadership theory, one needs to maintain disciplined attention on all parameters of a contract while ensuring that the work of their followers is properly distributed to every facet of the contract (Northouse, 2015, pp. 257-294).

Phases	Preliminary Assessment	Construction Blueprint Draft	Cost Estimation & Material Acquisition
Actions	<ul style="list-style-type: none"> <li>• Project all of the economic benefits that will justify the costs/budget that will be allotted to the Big Dig</li> </ul>	<ul style="list-style-type: none"> <li>• Produce a schematic layout of the entire Boston area to find the best tunneling route</li> <li>• Must obstruct normal city functions as little as possible</li> </ul>	<ul style="list-style-type: none"> <li>• Produce and cross-analyze multiple cost estimation spreadsheets.</li> <li>• Start making plans for material expenditures</li> </ul>
Timing	Aug. 15 – Aug. 30	Aug. 31 – Sept. 15	Sept. 16 – Sept. 30

### **Conclusion: How would I have done it?**

If I were the program manager for the Big Dig, I would have first analyzed project trends occurring both before and consistently after the start of the project. I would develop a baseline from research on previous megaprojects such as the 1956 U.S. interstate highway and weigh their projections and developments against those of the central artery tunnel project. I would also alter the post-project protocol so that it cultivates and encourages future change as well as future innovation based on each consecutive phase's results. Once the project has reached completion and all expenses are paid, I would hold a post-mortem meeting involving participants who had the most administrative power, responsibility, and access to statistical information, with increased emphasis on assessing the project expenditures for each one. We would discuss what went right and what went wrong amongst other potential issues, thus forming a consensus in the process on how to refine the construction in progress and better execute future projects.

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### About the Author

Jonluc Borno, M.A. (jborn@stu.edu), is an alumnus of St. Thomas University with a Master's degree in Communications and Digital Media. Mr. Borno is passionate about administrative work and has applied this passion to years of Biscayne College-housed programs including the Rome and Assisi Conference in Italy and the Florence Bayuk Educational Trust Scholarship.

### Discussion Questions

1. In the context of a megaproject like the Big Dig, which would you say is more important, drafting new design plan for basic fieldwork or following established protocol? Explain why, as each choice comes with its own benefits and caveats.
2. How does adaptive leadership provide optimum safety for the many construction-based tasks that go into the Big Dig?
3. Given the enhancements to industrial equipment and technology since the 1970s, how would the Big Dig or a similarly structured megaproject fare in 2020? Would it ultimately be easier and less expensive, or the opposite?

### To Cite this Article

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“Microproject”  
2012

Photography by G. Delvaille

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## Book Review

### Book Details

Bramson, S. (2018). *From Brooklyn to the Battle of the Bulge*. Hallandale, FL: Marc Martin Publishing, 240 pages, paperback, ISBN: 9780979078071.

### Reviewer

Lloyd Mitchell, CPA, CGMA

### Synopsis and Evaluation

From Brooklyn to the Battle of the Bulge...is the story of a real and true American hero, Bernard (Barney) Mayrsohn. Following high school Mr. Mayrsohn left Brooklyn for Cornell University's New York State College of Agriculture and in his sophomore year, on December 7, 1941, the Japanese attacked Pearl Harbor. He immediately volunteered and first was placed in the Army artillery, then transferred to the Army Air Corps, and then, finally, to the infantry. With little training, he and his fellow members of the newly formed 106th Division—the Golden Lion—were sent to England in late November of 1944 and then, in early December of that year to the Siegfried Line near the French and Belgian borders. At that point, they were told they had little to worry about as the German forces, which were facing them, were down to using old men and young boys, and because of that, the area was very lightly defended by the U.S. troops.

The intelligence was incorrect and that Division—the 106th—was in the crosshairs of the onrushing German panzers and the blitzkrieg that would become known as the Battle of the Bulge. After a heroic week of fighting, during which Barney was wounded twice, the Colonel had no choice but to surrender what was left of the Division, two-thirds of the men having been killed or wounded. When the order was given to surrender, the men were told to destroy all of their weapons so they would not fall into enemy hands, and once that was done, bereft of food or fuel, the white flag was raised and the men became *Wehrmacht* (German Army) prisoners.

As soon as the men were captured, the Germans stripped them of their winter gear and it was as they were marching to Stalag 4B, on the German-Polish border, that Barney saved the first of the seven documented lives with which he is credited. The incredible story goes on from there, including his liberation by the Russians on May 1, 1945, his rehabilitation and his eventual return to Cornell, where the stunningly-beautiful Ethel Handelman had waited for him, even though he had been listed as Missing-in-Action (MIA) and was presumed dead.

He and Ethel married and had three children, one of whom, Mark, followed his father and his two uncles and became a Cornellian, he also graduating from the “Ag School” at Cornell and

then continuing to operate the business, which his grandfather started in 1899 when he became the first person to import Cuban produce to the United States.

This book is a source of inspiration and a testimony of perseverance and courage. Through the historical photographs, the reader is able to accompany Barney through his life's journey.

### **In the Author's Own Words**

“Hopefully, our readers have realized and recognized that Barney Mayrsohn is truly, “one of a kind,” a real and true World War II hero and an American original. The mold was broken when Barney came into this world. There is not now, nor will there ever be, another Bernard (“Barney”) Mayrsohn” (Bramson, 2018 , p. 214).

### **Reviewer's Details**

Lloyd Mitchell (lmitchel@stu.edu), CPA, CGMA, serves as Chair of the Gus Machado School of Business at St. Thomas University, in Miami Gardens, Florida. His research interests include investments as well as financial and managerial accounting.

### **To Cite this Review**

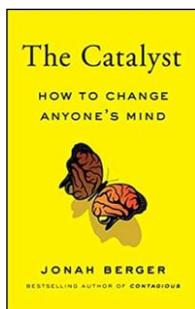
Mitchell, L. (2020, Spring). [Review of the book *From Brooklyn to the Battle of the Bulge*, by S. Bramson]. *Journal of Multidisciplinary Research*, 12(1), 135-136.

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## Editors' Choice Recent Books of Interest – Spring 2020

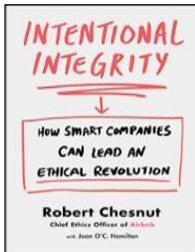
**Hagai Gringarten**  
*St. Thomas University*

1. Berger, J. (2020). *The Catalyst: How to Change Anyone's Mind*. New York, NY: Simon & Schuster, 288 pp., hardcover, \$26.99, ISBN 978-1982108601.



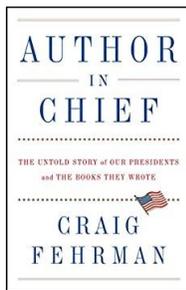
This book is designed for anyone who wants to catalyze change. It provides a powerful way of thinking and a range of techniques that can lead to extraordinary results. Whether you're trying to change one person, transform an organization, or shift the way an entire industry does business, this book will teach you how to become a catalyst.

2. Chesnut, R. (2020). *Intentional Integrity: How Smart Companies*. New York, NY: St. Martin's Press, 320 pp., \$28.99, ISBN 978-1250239709.



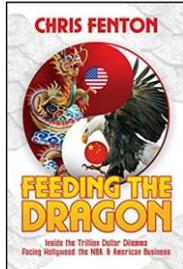
Silicon Valley expert Robert Chesnut shows that companies that do not think seriously about a crucial element of corporate culture – integrity – are destined to fail. He offers a six-step process for leaders to foster and manage a culture of integrity at work. He explains the rationale and legal context for the ethics and practices, and presents scenarios to illuminate the nuances of thinking deeply and objectively about workplace culture.

- Fehrman, C. (2020). *Author in Chief: The Untold Story of Our Presidents and the Books they Wrote*. New York, NY: Avid Reader Press/Simon & Schuster, 448 pp., hardcover, \$30, ISBN 978-1476786391.



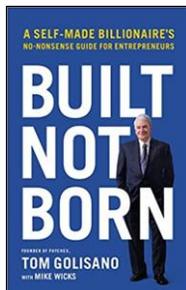
Based on a decade of research and reporting, *Author in Chief* tells the story of America's presidents as authors and offers a delightful new window into the public and private lives of our highest leaders. Fehrman unearths countless insights about the presidents through their literary works.

- Fenton, C. (2020). *Feeding the Dragon: Inside the Trillion Dollar Dilemma Facing Hollywood, the NBA, & American Business*. New York, NY: Post Hill Press, 272 pp., hardcover, \$28, ISBN 978-1642935868.



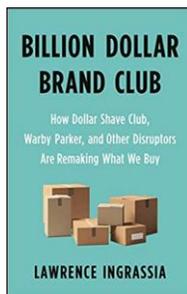
Teeming with urgent insights about unlikely alliances and dangerous misperceptions, *Feeding the Dragon* is a must-read for anyone interested in the future of the U.S.-China relationship and the bottom-line realities of show business and professional sports today. Even better, it's a supremely entertaining ride for anyone who simply loves a great story.

- Golisano, T. (2020). *Built, Not Born: A Self-Made Billionaire's No-Nonsense Guide for Entrepreneurs*. New York, NY: HarperCollins Leadership, 224 pp., hardcover, \$24.99, ISBN 978-1400217557.



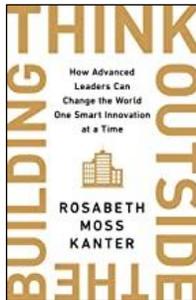
Tom Golisano understands the fears, risks, and challenges small-business owners face every day—he has lived it. He has launched and grown his own highly successful businesses and mentored dozens of entrepreneurs, helping them build their own successful companies.

6. Ingrassia, L. (2020). *Billion Dollar Brand Club: How Dollar Shave Club, Warby Parker, and Other Disruptors are Remaking What We Buy*. New York, NY: Henry Holt and Co, 272 pp., hardcover, \$30, ISBN 1250313065.



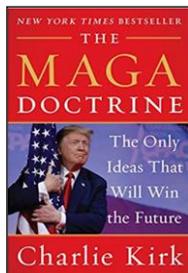
*Billion Dollar Brand Club* reveals the world of the entrepreneurs, venture capitalists, and corporate behemoths battling over this terrain. It's a massive, high-stakes business saga animated by the personalities, flashes of insight, and stories behind the stuff we use every day.

7. Kanter, R. (2020). *Think Outside the Building: How Advanced Leaders Can Change the World One Smart Innovation at a Time*. New York, NY: Public Affairs, 352 pp., hardcover, \$30, ISBN 978-1541742710.



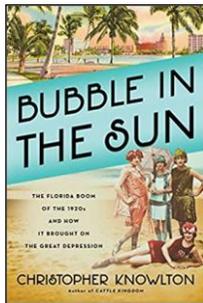
When traditional approaches are inadequate or resisted, advanced leadership skills are essential. In this book, Kanter shows how people everywhere can unleash their creativity and entrepreneurial adroitness to mobilize partners across challenging cultural, social, and political situations and innovate for a brighter future.

8. Kirk, C. (2020). *The MAGA Doctrine: The Only Ideas that will win the Future*. New York, NY: Broadside Books, 256 pp., hardcover, \$28.99, ISBN 978-0062974686.



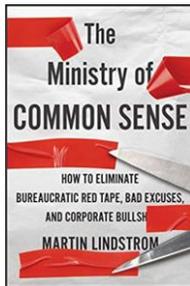
Turning Point USA founder and social media superstar Charlie Kirk explains why a New York real estate magnate found an audience among young conservatives all over the country. Trump and his allies are working to protect all the small things that both parties dismissed: local businesses, families, churches, and the rights of the individual. Kirk explains why it took a reality TV superstar to see past the power-hungry institutions, from the United Nations and Google to Harvard and Viacom, working to crush real America. The Trump Doctrine is all about giving you a say in the future of America and a hand in making it happen.

9. Knowlton, C. (2020). *Bubble in the Sun: The Florida Boom of the 1920s and How It Brought on the Great Depression*. New York, NY: Simon & Schuster, 432 pp., hardcover, \$30, ISBN 978-1982128371.



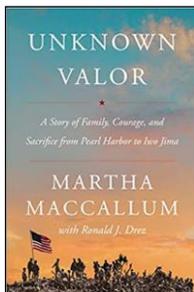
In *Bubble in the Sun*, Christopher Knowlton examines the grand artistic and entrepreneurial visions behind Coral Gables, Boca Raton, Miami Beach, and other storied sites as well as the darker side of the frenzy. For while giant fortunes were being made and lost, and the nightlife raged more raucously than anywhere else, the pure beauty of the Everglades suffered wanton ruination and the workers, mostly Black, who built and maintained the boom, endured grievous abuses.

10. Lindstrom, M. (2021). *The Ministry of Common Sense: How to Eliminate Bureaucratic Red Tape, Bad Excuses, and Corporate BS*. Boston, MA: Houghton Mifflin Harcourt, 256 pp., hardcover, \$28, ISBN 978-0358272564.



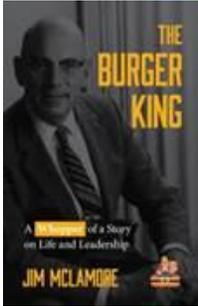
Best-selling author Martin Lindstrom combines numerous real-life examples of corporate common sense gone wrong with his own ingenious plan for restoring logic—and sanity—to the companies and people that need it most. A must-read for today's executives, managers, and office workers, *The Ministry of Common Sense* is funny, entertaining, and immensely practical.

11. MacCallum, M. (2020). *Unknown Valor: A Story of Family, Courage, and Sacrifice from Pearl Harbor to Iwo Jima*. New York, NY: Harper, 336 pp., hardcover, \$27.99, ISBN 978-0062853851.



Martha MacCallum takes us from Pearl Harbor to Iwo Jima through the lives of these men of valor, among them Harry Gray, a member of her own family. In *Unknown Valor*, she weaves their stories—from Boston, Massachusetts, to Gulfport, Mississippi, as told through letters and recollections—into the larger history of what American military leaders rightly saw as an eventual showdown in the Pacific with Japan.

12. McLamore, J. (2020). *The Burger King: A Whopper of a Story on Life and Leadership*. Miami, Florida: Mango, 304 pp., \$19.57, ISBN 978-1642502824.



Co-founder and first CEO of Burger King, Jim McLamore recounts the entrepreneurial journey of an international and successful fast food chain and offers a message to today's aspiring entrepreneurs.

To Cite these Reviews

- Gringarten, H. (2020, Spring). Editors' choice: Recent books of interest – Spring 2020. *Journal of Multidisciplinary Research*, 12(1), 137-141.



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