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Contact

Professor Hagai Gringarten, Editor-in-Chief
Journal of Multidisciplinary Research
c/o O'Mailia Hall, 16401 N.W. 37th Avenue, Miami Gardens, Florida 33054
Telephone +1 (305) 628-6635 E-mail: hgringarten@stu.edu

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Mission Statement

The mission of the *Journal of Multidisciplinary Research* is to promote excellence in leadership practice 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 leadership theory.

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Editorial

Happy holidays, and a warm welcome to the fall edition of the *Journal of Multidisciplinary Research* (JMR).

A recent review and recommendation by the Harvard library stated the *Journal of Multidisciplinary Research* "crosses so many disciplines, it's hard to categorize it, but that may be a strength of this particular journal, and of multi-disciplinary studies overall."

As we focus on moving the journal forward, and ensuring our commitment to academic and professional excellence, we feature true multidisciplinary research from around the world. This edition features thought-provoking articles from the Technion-Israel Institute of Technology and the Massachusetts Institute of Technology, Columbia University, the University of London, Florida State University, and the University of Teramo in Italy. This issue of the *Journal of Multidisciplinary Research* (Volume 4, Number 3) also contains a student article in the "Student Corner," three book reviews, and a "Life Forward" section featuring an interview with Patricia Lynch. Named as one of the "most powerful women in New York," Patricia is a true trailblazer in a business dominated by men.

As 2012 comes to a close and we continue to innovate and evolve as a research journal, we are proud of our achievements and excited of things to come. We created a new user-friendly JMR Website, redesigned the print journal, and signed licensing agreements with news services and world leaders in e-research and educational publishing.

Thomas Lodge said "Men, in teaching others, learn themselves." By bringing you a truly global multidisciplinary research, I hope we facilitate discussions, advance knowledge, and continue to learn.

Onward,

Hagai Gringarten
Editor-in-Chief

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A Suggested Taxonomy of Genealogy as a Multidisciplinary Academic Research Field

Arnon Herskovitz
Teachers College, Columbia University

Abstract

Genealogy has been practiced by people all over the world for many years, and in recent years, its leveraging to the academic level has been suggested. Mostly, discussions about the academization of genealogy were focused on teaching in the field, rather than on promoting it as a legitimate research field. This article suggests taxonomy for genealogy as an academic multidisciplinary research field. The taxonomy consists of six components: people, families, communities, representations, data, and bird's-eye view. This taxonomy demonstrates how genealogy is related to many other existing disciplines, highlights its unique points of view, and hence, promotes it as a separate field of study. The discussion goes further and recommends a way of actually building this new academic community in a bottom-up fashion, gathering currently affiliated scholars from other disciplines who will together work for constructing the new field.

Keywords

genealogy, taxonomy, academic discipline

Introduction

Genealogy has been in the minds of people for many generations, dating back hundreds and thousands of years, when it played a major role in the formation of many cultures. Detailed and rich genealogies are documented in numerous canonical texts, like the *Holy Bible*, the *New Testament*, Hesiod's *Theogony* (which describes the genealogies of the ancient Greek gods), or Sima Qian's *Shiji* (Records of the Grand Historian, in which the author describes the genealogies of the emperors and kings of China). Genealogy as a field of practitioners (genealogists) has been growing tremendously over the last few decades.

In the late 1970s, it was Alex Haley's bestseller *Roots* (1976) that inspired many African-Americans to trace their own family history back to their ancestors' country of origin, and

encouraged many Americans to investigate their own lineages. A survey published in 1995 suggests that more than 40% of adult Americans were at least "somewhat interested in genealogy" (Fulkerson, 1995). Five years later, this number had grown to 60% (Gallop-Goodman, 2000), and after another five years, 73% of Americans were interested in discovering their family history (MyFamily.com, 2005). Countries from which people emigrated have attracted genealogists and descendants of those emigrants, as in the case of Ireland (Nash, 2002). Along with the growth of the Internet and its adoption by millions around the world, genealogy has experienced a boost in interest over the last couple of decades due to increased access to remarkable amounts of data and resources, and new opportunities for connectedness between genealogists (Veale, 2009). This growth also led to the production of a number of TV genealogy shows – the most prominent example being the BBC production, *Who do You think You are?* (2004), and its numerous spin-offs, which were very popular and led to even more interest in the field of genealogy.

Being a self-taught practice, associated with only a few self-accredited organizations in the field, genealogy is not yet in the spotlight of the academic arena. However, in recent years, there has been an ever growing interest in studying the various aspects of genealogy using the tools of academic research, whether it be immigrant registration under History (Alroey, 2011); the study of visualization of family trees, through the lens of Computer Science (e.g., Bezerianos, Dragicevic, Fekete, Bae, & Watson, 2010; Kim, Card, & Heer, 2010; Tuttle, Nonato, & Silva, 2010); or the implications of genealogy on tourism, in light of Management studies (e.g., McCain & Ray, 2003). Until now, only the "other" disciplines discussed such topics, mainly because genealogy in itself has not yet developed into an academic field of study. This article presents Genealogy as a multidisciplinary academic research field and suggests a taxonomy for this domain.

Re-defining Genealogy as a Multidisciplinary Academic Research Field

At its most basic, the term "genealogy" traditionally refers to both the "history of the descent of families" and "the pedigree of a particular family or person" (Findlater, 1882, p. 200). This definition (which can be found in updated dictionaries as well) still holds the building stones of most of the studies carried out by amateur and professional genealogists today—namely, persons, families, and pedigrees—however, today's genealogy is de-facto much broader than that. First, the term "family" in today's modern societies is very different from how it was understood a hundred years ago or so. Second, "pedigree" is only one of the basic entities studied by genealogists today (others include, for example, ancestral lines, or complex network-like family relationships). Third, today many genealogical studies focus on migratory patterns or the history of communities, rather than on individuals or families. More important, this definition is not sufficient for understanding what genealogy as an academic research field involves.

Dozens of studies discuss the question of various fields being academic disciplines, but only few include suggested measures for this examination. One list of conditions for a field of study to be considered a discipline has been constructed by the American Council of Graduate Schools (CGS). Minton (1983) quotes this list when assessing whether Statistics is indeed an academic discipline. Another list is found in Krishnan (2009), while discussing what are academic disciplines. Merging these two lists, a framework is set for assessing whether genealogy

is an academic discipline. According to this merged list, academic disciplines should have the following: particular objects of research; unique research methods; a significant market demand; professionals working essentially in the field; specific terminologies or technical language; a theory, concepts, and a body of literature; professional journals regularly publishing new advances in the subject; and institutional manifestations. A detailed account of these components for genealogy is given in Hershkovitz (2011); in short, Hershkovitz suggests that genealogy has the potential to become an academic discipline, as it has a huge market demand, professionals working in the field, many journal articles that appear regularly in various venues, special jargon, specific objects of research, and some unique methodologies. However, genealogy still lacks a comprehensive and organized body of knowledge as well as an institutional manifestation; and it seems the former is a pre-requisite to the latter.

However, academic genealogy is not merely an independent discipline, but rather a research field that juxtaposes many disciplines, like history, geography, literature, computer science, information science, linguistics, etc. Hence, it is a true multidisciplinary field (Klein, 1991; Miller, 1982). Therefore, we hereby suggest a systematic way of organizing the field of academic genealogy, treating it as a truly multidisciplinary domain. The main purpose of this taxonomy is to highlight the multifaceted research directions of genealogy; previously, genealogy was mentioned as part of the Humanities (Lamdan, 2011), the Exact Sciences (Wagner & Klauzińska, 2006), and the Social Sciences (Jones, 2007) as well as being related to no fewer than 45 research disciplines (Jones, 2007). Although most of the building blocks of the following taxonomy are indeed an integral part of well-established academic disciplines (e.g., History, Anthropology, Sociology, Computer Science, Biology, and many more), each of them has a unique point of view when discussed under the umbrella-topic of genealogy. All together, they synergistically create a new integrative field of research.

The Taxonomy

The suggested taxonomy for multidisciplinary academic studies of genealogy is built of six components. Each of the first five components is a research unit. These units – namely, people, families, communities, representations, and data – refer to the core building blocks of traditional genealogy studies; while presenting them, we demonstrate how academic research in the field of genealogy is related to in-practice genealogy, but enriching it with new points of view to benefit the field. The sixth component, bird's-eye view, suggests an extension of genealogy beyond the traditional scope of its daily practice, hence, highlighting the potential contribution of such research to the field, academically. All together, the taxonomy suggests reciprocal relationships between the practiced field and its academic level.

People

People are the basic entities behind any genealogical research in practice, as it is the chronology of individuals that motivates any historical inquiry. Any genealogical account is comprised of individuals and is based on a collection of facts, documents, and various materials about them. People within any genealogical study have descriptors of different types, like names, dates, places, occupations, or relationship to others. Their historical narrative might is partly

objective (e.g., the parts that rely on vital records) and partly subjective (e.g., the parts that rely on testimonials), and is usually based upon diverse evidence. However, the study of an individual is almost never the sole purpose of genealogical research, but rather it is about the simple or complex relationships of others to that individual.

Families

By definition, genealogy discusses people in the context of familial relationships, as such, families are a crucial research component in this field. Within genealogy, one almost never researches historical narratives of individuals without considering the families to which they belonged. That said, the term “family” is much less narrow in genealogy than it is in its usual social contexts. An exact definition of the term "family" is something to debate on, hence, we will use it here by the very intuitive and simple meaning of "a group of people who are related to each other" (Family, 2012). This definition might well apply to families from the 16th century, as well as new families from the 21st century, or it might also fit other structures of families that families often research, such as groups of individuals who all were descendants of the same person or from the same couple.

Genealogies of families bring together information on individuals across different times and locations, and yet all of these people are connected through an often illusive idea of “family.” Lists of descendants are present from as early as biblical times, often with the common ancestor being of importance historically, culturally, or religiously. For example, the book of descendants of Thomas Olcott (died 1645, aged about 45 years old), one of the first settlers of Hartford, Connecticut, appeared in 1845, holding more than 700 descendants, not counting their spouses; more than 7 generations (Goodwin, 1845). Another example is the book *The Unbroken Chain*, which traces more than 25,000 descendants of the very famous Jewish Rabbi, Meir Katzenelnbogen (1482-1564/5), more than 16 generations and across numerous countries (Rosenstein, 1990). *The Ancestry of Abraham Lincoln* (Lea & Hutchinson, 1909) demonstrates a different form of a genealogical narrative of “family”; this publication examines the ancestral families of the 16th President of the United States (1809-1865), including many sub-branches of these ancestral families; these sub-branches are all connected to Abraham Lincoln, but not necessarily to each other. There are more generalized interpretations of the term “family,” like the “Royal Family,” which brings together many sub-branches of different families to unite them in various ways to form royal lineages (e.g., Weir, 2009).

But a “family” is not merely a set of individuals. On one hand, it is an entity that has taken a fundamental role in the formation of societies; on the other hand, cultural and political norms heavily affected communities all along the history. As such, the study of families in the context of genealogy might deepen our understanding of daily life traditions as well as external factors affecting these customs. For example, in his work for exploring the formation of the English middle class in the 17th-18th centuries, Earle (1989) discusses three main topics: economy and society, business life, and family and social life. In the last one, Earle examines topics like marriage customs, household structure, and even diet and dress. Another example is Anderson’s (1971) study of 19th century Lancashire’s family structure. In such studies, genealogical sources are a necessity; for example, vital records that supply the researcher with the means of calculating demographic statistics. However, upon completion, such extractions also are helpful for future

genealogical constructions, as they may suggest paths for in-practice research. For example, knowing the average age at marriage of women and men for finding relevant records, and understanding customs related to appearance might help in extracting information from photos. Of course, there are big differences between families from different locations and times, as this entity is constantly changing (e.g., Popenoe, 1988), and these differences often relate to another essential genealogical entity—community.

Communities

In 1887, Ferdinand Tönnies published his inaugural work, *Gemeinschaft und Gesellschaft* (society and community), in which he sketched the main differences between communities and societies. By doing that, the concept of community refers to much more solid a construct than just a sub-group of a society, or a set of individuals sharing local resources. A community a la Tönnies (1887) is a grouping based on feelings of togetherness and on mutual links; the goal of the community is to maintain these feelings and links, and the community members are the means for this goal. This definition helps understand that communities are components that are as important to genealogy as families, as one affects the other. For example, studying other families from the same community to which a given family belonged might enrich our knowledge about that family. On the other hand, telling the story of a certain family within a community might shed light on the community as a whole. The characteristics of a particular community – which might be small (e.g., a Jewish community of a little "Shtetl" in 19th-century Eastern Europe) or huge (e.g., African Americans) – usually determine the genealogical resources relevant for the research of all of the families and individuals. Therefore, it is no wonder that many genealogy organizations have emerged based on communal belonging. One example would be Italian genealogy groups, which focus on the study of descendants of current and historical "Italy" wherever they are. Another example would be Jewish genealogical societies, which focus on researching any individuals, families, or communities of Jewish descent.

Through sociological lenses, communities might have "memory," more precisely collective memory (Halbwachs, 1950), that is, the shared information individuals within a given group share. Individuals within a group can create (or re-create), sustain, transform, and pass-on their collective memory. A range of disciplines, including psychology, historical geography, linguistics, and communication studies can study topics related to collective memory (cf., Middleton & Edwards, 1990). This collective memory relates strongly to genealogy, not only as it might enrich knowledge on communities to which one's relatives belonged (with, e.g., folklore stories, traditions, and recipes) but also as it might promote community-related "pure" genealogical research. An example of the latter is the study of how the collective memory of the Holocaust plays an important role in "second generation" Jewish Holocaust survivors' decision to trace their roots (Stein, 2009). In other cases, genealogy is a tool for preserving or modifying the collective memory of a given group (Anderson, 1971; Čiubrinskas, 2009b).

But even when narrowing down to the more practical definition of community as a group of people living in a given geographically-limited area, communities are of interest to genealogy from at least two important points of view: resources and migration. Resources may largely vary not only between different countries but also between different locations in the same country, often at the community level. A fire in a town's archive might destroy all of this town's historical

documents, but might do no harm to the neighboring town. A particular small community might decide to keep lists of household members as a local initiative. Such examples are, of course, countless. This is why compilations of inventories at the community-level are of huge importance to genealogists (e.g., Eichholz, 2004). Merging resources at the community level might help in enriching other resources for the same community: Wagener (2008) demonstrated how tombstones from an old Jewish cemetery in Eastern Europe – traditionally holding only little information about the deceased or having missing information due to poor conditions – are fully identified using other resources for that community, such as vital records, burial records, necrology lists from memory books, and business directories. Another example from a different domain demonstrates the usefulness of resources at the community level: A study of genealogical resources for the Old Order Amish community in Lancaster, Pennsylvania, spanning over 160 years, revealed interesting relationships between parity and life span (McArdle et al., 2006).

Migration patterns of communities are also of great importance for practical genealogy research, as understanding such patterns might provide hints for research directions when tracing "lost" family branches. Examples are numerous, so we will mention only two: Most of the Urfalim – Jews originally from Urfa, Turkey – had left Urfa in 1896 and settled in Ottoman Syria, and later in Jerusalem and Tiberias, Isreal; Lithuanians immigrated to the USA as early as in the pre-Civil War days, settling in Texas (Čiubrinskas, 2009a). More high-level patterns of immigration and of community belonging arise from genetic studies, suggesting linkages between groups of people over a span of thousands of years; using such techniques, scholars gather new knowledge about different ethnic groups, like the Jewish population (e.g., Hammer et al., 2000; Ostrer, 2001), or the Indian caste populations (e.g., Bamshad et al., 2001; Kivisild et al., 2003). Overall, genetic studies open new horizons for genealogy practitioners, both at the individual and community level (cf., Johnston & Thomas, 2003; King & Jobling, 2009; Shriver & Kittles, 2004).

The "community" entity is related to available resources and migratory patterns as well as to name(s), history, demographic statistics, local culture, and other characteristics that make it a unique building block of genealogy.

Representations

The skeleton behind many genealogy studies is the family tree, which connects individuals to all kinds of family structures. Often, family trees connect families from the same community together, hence allowing the examination of inter-community relationships. Although immediately associated with a graphical representation, the family tree is not necessarily a visual representation of the relationship within a certain population, but rather the set of all such existing relationships (e.g., many genealogists will talk about their "family tree," without referring to a specific visual representation of it). Hereby, we will refer to these two meanings interchangeably. In the same manner, the "family" in the family tree might is a generalization of the term "family" (see Families). Practically, there are a few common graphical forms for presenting data from a family tree; each refers to a different part of the actual family database: (a) Descendant tree, which includes all of the descendants (usually with their spouses) of an individual or a couple; (b) Ancestor tree, which includes all of the ancestors of an individual; (c) Hourglass tree, combining both descendant- and ancestor tree for an individual or

a couple; (d) All-in-one tree, which represents the whole set of individuals relating to a particular individual. The presentation of all of these is or is not limited by number of generations.

However, graphical objects are not the only means for representing portions of the family tree. Reports are also popular for that purpose; besides a descendant report or ancestor report, which have obvious corresponding graphical representations, there are also other types, e.g., family group sheets (holding information about a single family, i.e., parents and their children), timelines (presenting chronologically-ordered events for an individual or a sub-set of the family tree), relationship reports (detailing the exact relationship between two individuals), and narrative reports (offering as much information as possible about individuals). We group all of these representations of a family tree, or subsets of it, under the "representation" umbrella as well as other potential ways of representing bits and pieces of the information one gathers during a genealogy research (for example, maps which represent genealogy data).

Representations might play a crucial role in one's genealogical research, as using them is a common method for one to communicate and reflect upon research with oneself or with others. As such, representations should be easy to handle and might also offer some insights to the researcher. Family trees, for example, most commonly share two-dimensional hierarchical structures; however, in recent years, some studies suggested other methods, either keeping the concepts of the traditional tree-like diagrams (Tuttle, Nonato, & Silva, 2010; Wesson, Plessis, & Oosthuizen, 2004), or changing them considerably to highlight timelines (Honey, 2001; Kim, Card, & Heer, 2010) or relationships between individuals and families (Bezerianos, Dragicevic, Fekete, Bae, & Watson, 2010). It is computer scientists who usually study problems regarding genealogical data visualization as such problems relate to other problems in data bases and data structure.

Besides their visualization, family trees are an important research unit. One of the best examples of this is the fact that analysis of a repository of family trees might result in finding matches between trees (that is, people, or sub-branches, that appear in multiple trees). Similarly, analysis of a repository of family trees and a repository of historical records might result in matches between individuals in both repositories. The largest commercial genealogy Websites, such as Ancestry.com, Geni.com, and MyHeritage.com already implement algorithms for automatically finding such matching. More than that, similar techniques might be of help for humanitarian organizations for locating "lost" people (cf., Rojas, 2011). Such technologies often use not only pure genealogical data about individuals or families but also descriptive data from the tree structure. Furthermore, merging trees, upon finding a match, is a process that usually involves changing sub-structures of the tree and not just modifying individuals' data. Therefore, in the heart of merging trees lies the tree itself, hence it is a feasible research unit.

Another research topic with regard to representations of the family tree—mainly in the form of reports—is numbering systems for genealogy. There are various numbering systems, a few of which are the "gold standards" of the field of practice (Curran, Crane, & Wray, 1999). The two most common methods for numbering descendant reports are the Register System and the National Genealogical Society (NGS) Quarterly System. In 1870, the New England Historic Genealogical Society developed the Register system, which uses both Arabic numerals (1, 2, 3, 4) and Roman numerals (i, ii, iii, iv), and follows these rules: The main individual (the one the descendants of whom are reported) takes the number 1; each person's children take Roman numerals in the order of birth (if known), starting from i; "children" who later appear in the

report as married or having descendants take additional numbers in Arabic numerals (continuing from 2 upwards across the report), which serve as pointers to their entry; the report details the descendants by generations. In 1912, the National Geographic Society (NGS) published the Quarterly system, which differs from the Register System in that each individual takes a number, regardless of whether the line of that individual is continuing; individuals who do have a separate entry later in the report are further indicated by a plus sign (+) in front of their number. In both systems, spouses do not get numbers, as only direct descendants do. Other numbering systems for descendant reports might implicitly mention the full lineage of an individual (e.g., Henry or d'Aboville systems). Ancestor reports have, of course, other numbering systems, the most common is Ahnentafel, according to which the main person takes the number 1, and then each person's father takes the double of the person's number, and each person's mother takes the double of the person's number plus one. Recently, McDonald (2011) developed a new ancestral numbering system, named the Ancestral Lines Pairing System, which suggests a clever embedding of other pieces of information, including component lines, generations, and collateral families, in the identifying numbers.

As family trees have much to do with the mathematical notion of graphs, it is possible to research the former using algorithms and techniques from the field of Graph Theory, usually under either Mathematics or Computer Science (Lewis, 1992; Rapp & Jones, 2012). However, important to recall, a family tree is not necessarily a "tree" as appears in Graph Theory because of possible inter-family marriages.

Data

What differentiates genealogy from other disciplines is the types of data genealogists and family historians use for establishing genealogical facts or hypotheses, and, moreover, the extremely wide range of potential data they use. These include historical records, old and new fiction and non-fiction books, photos, online databases, artifacts, ephemera, personal communications, and much more. Any piece of information about individuals, families, communities, and such must have originated from some piece of evidence and, frequently, from more than one source.

The life cycle for using a source of information in genealogical research usually includes the following high-level stages: locating, evaluating, and citing.

Locating. This is the process of finding the needed source to answer a specific research question. Detailing this process in a more fine-tuned level might demonstrate its complexity. First, the researcher might ask herself or himself a question like: "Where can I find the exact birth date of my maternal grandmother?" Then, the researcher should gather all the relevant information she or he has for answering that question. For example, based on existing documents, the grandmother was born in Galati, Romania, probably between 1890-1915, immigrated as a single to the US, was married and naturalized in Hartford, Connecticut, and died in New York, New York. After analyzing the existing information, the research can then try to locate the birth date by looking for the grandmother's birth certificate, naturalization records, passport, death certificate, gravestone, etc.; searching relevant online databases (e.g., family trees uploaded by other researchers that might have information about that grandmother); interviewing the grandmother's family members, or friends, or both; or in any other way. This

stage ends when the researcher feels that she or he has gathered enough information for answering the research question.

Evaluating. After collecting the data, the researcher should evaluate it. The evaluation is three-fold, as the researcher is given a *source* that provides *information* from which she or he can derive the *evidence* they need to answer the research question. For each of these components, different methods of evaluation might be required. For example, the source may be original or a derivation, the information might be primary or secondary, and the evidence might be either direct or indirect (Mills, 1999).

Citing. After coming to a conclusion, the researcher should explicitly state what they have learned from the evaluation process and properly cite the source(s) for that conclusion. Of course, there is more than one way of citing sources in genealogy (Croom, 2009; Lackey, 1986; Mills, 2009), and one should choose the proper method to use, based on personal preferences or on requirements made by the venue in which the work is to be published.

Sources and resources – the providers of genealogical data – might be the focus of many studies with regards to the above three stages in the life cycle. Traditionally, many studies have focused on the very existence or usefulness of a given resource for genealogical research; however, in a broader sense, other aspects are also crucial with regards to genealogical data. For example, a method for adding bidirectional links between evidence and conclusions was suggested to improve the way sources are being used and re-used (Wilson, 2002). Another example is SmartMatch and Record Matching, technologies developed and being offered by MyHeritage.com; the former intelligently finds similarities between users' family trees (i.e., locates matching sub-branches), and the latter automatically finds matches of one's family tree profiles in a large set of historical records. The automatization of the first stage of using sources basically redefines that very stage, making the role of the user in locating data more passive and letting data be "pushed" to the genealogist. Scientific explorations might set boundaries to the potential usefulness of such technology in enriching one's family tree (e.g., Rojas, 2011). Metadata can enrich online genealogical data, which in turn will affect all stages of using online genealogical resources (Taylor, 2012), although previous research has demonstrated that even without metadata, locating and separation of genealogical records is possible using ontology-based extraction and vector space modeling (Walker & Embley, 2004).

Taking a different angle, the study of genealogical data may improve data quality. For example, Stroweis (2011) demonstrates a methodology for detecting and correcting family names in repositories of genealogical records using Soundex and phonetic name-coding to overcome errors (either in the source or during its digitization). In another case, Wagner (2008) has shown how one resource (tombstone records) can be enriched by merging it with another resource (e.g., metrical data, burial records, and business directories). Similarly, Agarwala et al. (1999; 2001) have demonstrated how merging two resources – two large genealogy books documenting North American Anabaptist communities – might reveal parent-child relationships that do not exist in either of the books and dramatically increase information about inbreeding. Tulinius (2011) shows how the construction of a complete database of Icelanders (born after 1854) has dramatically promoted many genetic studies.

Connecting data, and more generally, accessing data, is also closely related to the way data is represented, stored, and shared digitally. GEDCOM (GEnealogical Data COMmunication) has become the standard for exchanging genealogical data (GEDCOM X is a

newer version of that protocol, see http://www.gedcomx.org); stepping into the promising world of the semantic Web, historical and genealogical schemas are suggested as new standards to markup such data (cf., http://historical-data.org).

Bird's-eye View

Practicing genealogy involves part or all of the aforementioned research units; however, there are other issues involved in the very practicing of genealogy which should be considered an integral part of genealogy as an academic research field. That is, issues like ethical dilemmas and legal concerns while practicing genealogy (e.g., Human Genetic Commission, 2000; Kallmann; Tutton, 2004; Wilkinson, 2010); methods for teaching or learning about genealogy practices (e.g., Sheppard, 1977; Veale, 2006); or handling the genealogy research (e.g., Duff & Johnson, 2003; Lucas, 2009; Yakel, 2004) are all feasible research topics for a scholar studying the field of genealogy. Of course, such issues might also be relevant to other disciplines (for the examples given above: Law, Education, and Information Science, respectively); however, genealogy sure has some unique points of view that make these topics, as well as potentially many others, an integral part of the current suggested taxonomy. In practice, a research group about "Genealogy Education," for example, might work under the (yet imaginary) Department of Genealogy or under the Faculty of Education (or both). Although not well-defined, we might say that any research question that refers to genealogy as a whole might be categorized under this section of the taxonomy (e.g., Greenberg, 1982; McCain & Ray, 2003; Tyler, 2008). Sure enough, it is not possible to list all the domains to which genealogy is related. However, as the claimant should get some satisfaction, we will shortly present a central building block of potential bird's-eye view types of research on genealogy, namely, the genealogist.

As genealogy has been an active field for hundreds of years, and as it has developed dramatically over the last few decades, mainly in response to technological advancements, it is of interest to many people. They are the ones who, often on a daily basis, deal with people, families, communities, representation, and data. They are the ones who ponder on their family history, or who help others learn more about their ancestors. They are the ones who help each other when they hit brick-walls; the ones who are often engaged in life-long learning in this field. Hence, genealogists might be studied from a wide range of angles. First and foremost, the question arises: why are people interested in their family history? This is a fundamental research question the (alleged) answers to which might help scholars to better understand the inner-structure of the genealogy community, and may lead to help more people research their own genealogy in a way suitable for them. In recent years, studies of this question have surfaced with regards to issues related to oneself, families, cultural groups and societies, and even to human nature (Basu, 2004; Bishop, 2005; Erben, 1991; Hackstaff, 2010; Kramer, 2011; Nash, 2005), hence its importance on many different levels and from many points of view. Another fascinating question, initiated by the fact that many genealogists are involved in meetings or discussions, be it formally or informally, face-to-face or virtual, is: What is the role of the community in genealogy research? This question also has many implications, and might enhance collaboration to ease one's own efforts, as well as promote collaborative genealogy research (that is already being performed by many communities world-wide). Some studies already took this direction, highlighting patterns of sharing, asking, and helping that help to establish the role of a community of genealogists

(Fulton, 2009; Veale, 2004; Willever-Farr, Zach, & Forte, 2012; Yakel, 2004). Still, there is much to explore on genealogists, as well as on many other bird's-eye view topics related to genealogy.

Conclusions and Discussion

Since the beginning of the 21st century, millions of people around the globe have practiced genealogy, either as a hobby, a serious leisure activity, or a vocation. Technological development and the relative ease of access to historical records on the Internet enabled this emergence of genealogy, and TV shows and magazines tail-winded it. Therefore, more people continue to join the circle of genealogists. Along with the major popularity of genealogy among laymen, many academic studies that relate to genealogy conducted in recent years; however, these are scattered across many disciplines. This article suggests ways to leverage genealogy as a multidisciplinary academic research field, and specifically presents a taxonomy for this new field. This taxonomy demonstrates the relationships between genealogy and other fields on one hand, but describes its uniqueness on the other hand. The taxonomy is built upon the very structure of the genealogy research and defines six main topics for research. There are, of course, rich webs of relationships between these components; however, they serve, as we demonstrated in this article, as independent building blocks. The six elements are people, families, communities, representations, data, and bird's-eye view.

As science and scientific research progress, new multidisciplinary research fields continue to appear, such as Urban Morphology (Moudon, 1997), the Philosophy of Chemistry (Scerri, 2000), Network Science (Fang et al., 2007), and many more. These integrative research fields highlight the reciprocal relationships between existing fields and a new domain. Our taxonomy demonstrates that genealogy, as an academic research field, presents a similar structure. For example, researching how certain communities pass down family customs from generation to generation may assist both genealogists (e.g., by developing a method of making connections between individuals and families using knowledge about customs) and sociologists; studying visual representations of complex family trees might assist both genealogists and computer-scientists (e.g., by reflecting on other similarly-structured databases); exploring statistics about professions based on census data might assist genealogists (e.g., in understanding the place their own ancestors took within the community) and historians. Clearly, examples are numerous (also see Brown, 2008).

Academic institutes do not yet manifest genealogy as a research field per se. Although almost any academic institution's library has a dedicated genealogy division, only a few have genealogy as one of their academic branches. While looking for US academic programs that focus on genealogy, we were barely able to find a handful; however, the main focus of these centers and programs involves educational or practical applications, and they are not actively involved in academic research in genealogy. As the nature of the suggested academic genealogy is multidisciplinary, it is only natural that the best practice of building this field is using a bottom-up method, that is, starting by facilitating communication between current faculty members who are interested in bringing genealogy to the fore of their research interests (whether they are currently actively involved with a genealogy research or not) from her or his own perspective. This way, a new academic community will have a non-null starting point; the community members,

motivated by their common interest, will initiate discussions about the new field's requirements, such as definitions, core knowledge, standards, and major research questions. While doing this, they will also have to discuss some community-related issues, like structural organization, means of communication, etc. Eventually, when the community evolves, teaching in the field might be possible, based on the knowledge gathered by its members; and eventually – when the infrastructure is ready – recognition by academic institutions is more plausible. This proposed process takes an opposite direction than a few scholars suggested before, that is, to start with university-level for-credit courses (Jones, 2007; Mills, 2003).

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About the Author

Arnon Hershkovitz, Ph.D. (arnon.hershkovitz@gmail.com), is a Post-doctoral Research Associate in Teachers College, Columbia University (New York, N.Y.), focusing his research on Educational Data Mining (EDM). He holds a Ph.D. in Science Education (Tel Aviv University), an M.A. in Applied Mathematics, and a B.A. in Mathematics and Computer Science (both from the Technion-Israel Institute of Technology). For more than 13 years, he has been involved in genealogy research and in the genealogy community world-wide.

Discussion Questions

1. Are you convinced genealogy is indeed multidisciplinary so it cannot reside under one current discipline? Why or why not?

2. Can you think of innovative genealogy-related studies that might take place under "unusual" disciplines like Literature, Economics, Arts, Physics, Political Science, etc.? Where would these be located in the suggested taxonomy?

3. Can you think of an academic genealogy research that will promote your own family history research? Where it would be located in the suggested taxonomy?

4. What other multidisciplinary domains might be academically leveraged? Base your answer on the list of conditions an academic discipline should follow (under "Re-defining Genealogy as a Multidisciplinary Academic Research Field"): market demand, professionals working in the field, journal articles published, special jargon, specific objects of research, unique methodologies, comprehensive and organized body of knowledge, or institutional manifestation.

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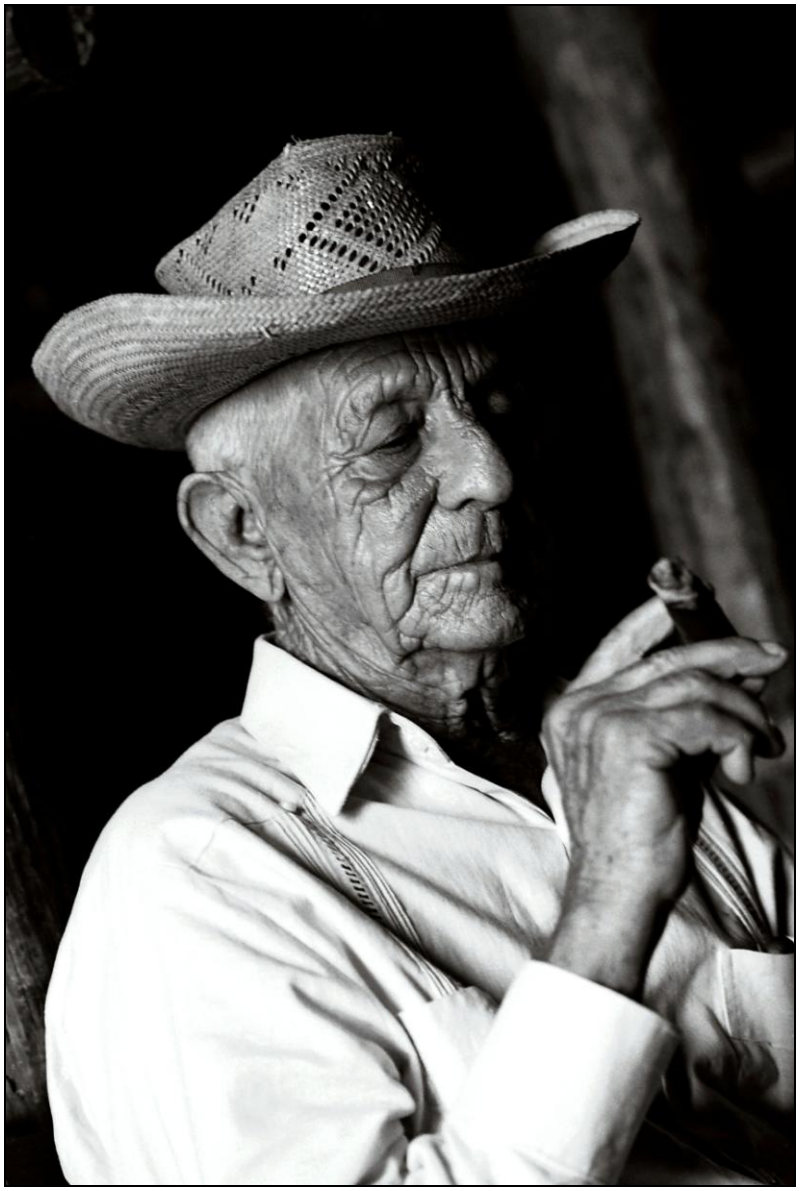

"Diálogo III"

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Extending the Human Spatiotemporal Comfort Zone with CAVERN – Computer-based Augmented Virtual Environment for Realizing Nature

Dov Dori
Technion-Israel Institute of Technology and
Massachusetts Institute of Technology

Abstract

An intelligent multimedia device dubbed CAVERN – Computer-based Augmented Virtual Environment for Realizing Nature – is proposed as a quantum leap in molecular biology research. CAVERN is a system that leverages state-of-the-art technologies that include CAVE, supercomputing, electron microscopy, conceptual modeling, and biological text mining. After discussing the acute problems biological research is facing, the chapter introduces the new notion of the human spatiotemporal comfort zone, and a fourth multimedia learning assumption: the limited spatiotemporal comfort zone. Within this zone, people can use their senses to follow and understand complex systems currently accessible only through indirect observations. CAVERN translates nano-level processes into scenarios of human-size interacting molecules. A brief enumeration of the potential benefits of CAVERN in biology, health, and education is followed by a conceptual blueprint of CAVERN expressed via an Object-Process Methodology model. Finally, challenges and open problems in the way to achieving an operational CAVERN are presented.

Keywords

CAVERN, spatiotemporal comfort zone, Object-Process Methodology, supercomputing

Introduction

Science can be thought of as the process of reverse engineering nature. In recent years, we have witnessed an unprecedented increase in the number, variety, and complexity of information resources available to researchers, particularly in life sciences. We are in a pivotal moment in the

study of life sciences, which is shifting from the study of single molecular processes to complete cellular pathways and the entire cell (Kitano, 2002).

The vast amount of data available also provides new opportunities; because searchable results are readily available (in databases such as Medline and PubMed), the data itself can confirm or refute conjectures, as many "future" predictions already have been tested through related experiments that were carried out for other reasons, and which "only" need to be revealed in the new context. Despite advances in the technologies available for sifting through data to retrieve new insights, the problem of how to fit the billions of known facts into a meaningful whole still remains unsolved.

Visualization and conceptual modeling are key ingredients in a possible solution for this problem. We need a holistic framework, an evolving conceptual model of the cell life system that can facilitate deep understanding through computer-graphics-based visualization. Current and future known facts and findings will be embedded into such a framework to foster insights on this incredibly complex cell life system. Armed with an adequate conceptual modeling language and methodology, biologists will be able to visualize, study, simulate, and analyze models of biological systems. The model will enable the mapping of knowledge gaps, closing them through the design and execution of wet laboratory experiments.

Conceptual modeling enables the process of making system-level sense of the vast number of pieces of information. The enormous number and variety of interactions among substances and processes in the cell primarily poses the qualitative problem of figuring out "what" and "how," which precedes the quantitative one.

A deep understanding of the processes within a biological system requires delving into each process and phenomenon, as most biological researchers have been doing. Comprehending how the system functions as a whole requires the integration of knowledge from the bottom up. A complementary, conceptual modeling approach to top-down modeling takes the cell life function as the system's main process and decomposes it into ever simpler processes down to the molecular level.

The Cognitive Assumptions

Humans assimilate data and information and convert it into meaningful knowledge and understanding of systems using words and pictures simultaneously. During eons of human evolution, the human brain was trained to capture and analyze images, in order for humans to escape predators and capture food. In contrast, the processing of spoken words, let alone text, is a product of a relatively recent period in the history of humankind (Dori, 2008). As human brains are hard-wired to process imagery, graphics appeal to the brain more immediately than words. However, words can express ideas and assertions far too complex or impossible to express graphically (try graphing this sentence to get a feeling for the validity of this claim). So while a picture is worth a thousand words, as the saying goes, there are cases in which a word, or a sentence, is worth a thousand pictures. A problem with the richness of natural languages is the potential ambiguity that arises from their use. This certainly does not imply that pictures cannot be ambiguous as well, but graphic ambiguity can be greatly reduced, or even eliminated, by assigning formal semantics to pictorial symbols of things and relations among them.

Vastly enlarged moving images of the molecular dynamics of a highly complex system, such as the living cell, will improve dramatically our understanding of living processes. When corresponding words and pictures are presented closely together, learners can better retain an understanding of corresponding words and pictures, simultaneously, in their working memory, enabling the integration of visual and verbal models. Mayer and Moreno (2003) proposed a theory of multimedia learning based on the following three, main research-supported cognitive assumptions:

(1) Dual-channel – humans possess separate systems for processing visual and verbal representations.
(2) Limited capacity – the amount of processing that can take place within each information processing channel is extremely limited.
(3) Active processing – meaningful learning occurs during active cognitive processing, paying attention to words and pictures, mentally organizing, and integrating them into coherent representations.

However, there is a major factor in addition to Mayer's three cognitive assumptions that needs to be accounted for when designing a research and study environment for investigating nature: the limited human spatiotemporal comfort zone.

The Human Spatiotemporal Comfort Zone: Plus or Minus Four Orders of Magnitude

Humans are used to thinking about the world via their senses, especially stereoscopic vision, which enables them to see objects—things that exist—with sizes that are neither too great nor too minuscule, so the human mind can grasp it. We cannot mentally digest astronomical concepts (e.g., the space and time it takes light to travel among galaxies). Similarly, on the other extreme end of the distance and time scale, we cannot really fathom tiny micrometer and nanometre-scale biological objects, nor can we imagine microsecond or nanosecond-scale processes.

Processes—things that happen to objects and transform them—are analogous to objects in this regard, except that instead of *size*, which is a dimension applicable to objects, when processes are considered, the dimension to be considered is *time*. A process is a concept constructed in the human mind as a result of comparing the state of an object (or an entire system, which is a complex object) before, during, and after it underwent change. Hence, the main feature of a process is the time it takes to happen—the interval of time that lapses between the beginning of the process in question and the end of that process.

Just as humans cannot grasp objects beyond their capacity to understand based on common sense or life experience, they cannot follow processes that are too short or too long. Based on this observation on human limitations, we define the human spatiotemporal comfort zone as follows.

> The "human spatiotemporal comfort zone" is the interval of space and time between the minimal and maximal values that humans can comfortably imagine by drawing on their intuition and lived experiences.

Trying to quantify the human spatiotemporal comfort zone in terms of space and time units, we note that humans can quite conveniently conceive of objects measuring from the width of a hair (tenths of millimetres) to the distance to a nearby country (thousands of kilometres). Since humans are of the order, or magnitude, of one meter in length, translating this observation to orders of magnitude, we assert that the spatial (size-related) human comfort zone is between four orders of magnitudes smaller than humans and about four orders of magnitudes smaller than that, i.e., between 10^{-4} and 10^{6} meters.

A similar argument works for the dimension of time, when processes are considered. Humans can conveniently conceive of processes such as a runner overcoming her competitor by a few tenths of a second to processes lasting a lifetime and measured in decades. If we consider an hour as the basic human time unit, analogous to meter for size, we easily can verify that the limits of the human temporal comfort zone are between 10^{-4} and 10^{6} hours.

Summarizing the above observations we get the following expression.

$$O(10^{-4}\ \{\text{meter, hour}\}) < \textbf{\textit{Human Spatiotemporal Comfort Zone}} < O(10^{6}\ \{\text{meter, hour}\})$$

Interestingly, countable numbers, which is a third concept related to conceivable orders of magnitude of space and time, also are related to four orders of magnitude. While we now speak easily about millions and billions of items (people, dollars…), in early times, humans could conveniently think of a number of items (instances of a class), and especially people and coins, in up to four orders of magnitude, i.e., tens of thousands. To support this observation, we note the largest number for which there is a special word in Biblical Hebrew is ten thousands, 10^{4}, pronounced *revava.*

Based on the observation and definition of the human spatiotemporal comfort zone, a fourth multimedia learning assumption is the following.

(4) Limited Spatiotemporal Comfort Zone – understanding the dynamics of objects interacting via processes in complex systems can occur within plus or minus four orders of magnitude of objects' basic size unit, meter, and process basic time unit, an hour.

Generalizing Miller's Magic Number: Summary of Human Cognitive Limitations

Bounding the spatiotemporal comfort zone within four orders of magnitude can be considered as a generalization of "The Magical Number Seven, Plus or Minus Two" suggested by Miller (1956), where the limiting factor is the number 7—the number of items a person can remember and handle concurrently—is analogous to the space of one meter and time of one hour. Miller's case is the basis of Meyer's Limited Capacity multimedia learning assumption. There, the factor that limits human cognition is the number of concurrent items, with a linear tolerance of "plus or minus two." Analogously, in the case of the Limited Spatiotemporal Comfort Zone, the limiting factors are space and time, both with a logarithmic (orders of magnitude) tolerance of plus or minus 4. This is summarized in Table 1.

Table 1
The Human Cognitive Limitations, their Nominal Values, Tolerances, and Bounds

Cognitive Limitation	Limiting Dimension	Nominal Value	Tolerance	Lower & Upper Bounds
Miller's Magic Number	Concurrent # of item	7	+ or – 2 items	5, 9
Space Comfort Zone	Space (size)	1 meter	+ or – 4 orders of magnitudes	10^{-4}m, 10^{4}m
Time Comfort Zone	Time (duration)	1 hour	+ or – 4 orders of magnitudes	10^{-4}h, 10^{4}m

One can perhaps reason rationally about objects and processes beyond one's spatiotemporal comfort zone, but it is not possible to intuitively imagine them, as the objects outside the spatial comfort zone cannot be noticed by the naked eye, nor can processes outside the temporal zone be contemplated based on daily experiences.

Coping with the Human Cognitive Limitations

The human cognitive limitations were the tacit motivation behind the inventions of the microscope by the Janssen brothers in 1590 and the telescope by Lippershey in 1608, both in Holland. Huge strides have since been made in developing these devices, with the advent of electronic microscopy on the smaller side and the Hubble telescope at the other extreme. In terms of coping with the temporal human cognitive limitation, devices that take pictures at a high rate and show them at a much slower rate have enabled research on very rapid processes, such as how the cheetah runs, how a bullet penetrates glass, or how the splashing of a milk drop evolves. Doing the same thing in reverse has enabled humans to see how flowers bloom and how they behave during the day and night, how trees grow, how clouds form and disappear, and more.

To fully understand cell-level molecular biology processes, a combination of translating both space and time from their actual minuscule sizes to the human spatiotemporal comfort zone is needed. However, this is just one facet of the problem. Many such interactions already have been discovered and understood without resorting to the drastic multimedia means suggested here, but we are very far from a complete understanding of the cell system as a whole and how each known fact and interaction fits into this puzzle. This is where conceptual modeling comes to play a critical role in making multimedia an intelligent research system.

Integrating Conceptual Modeling Renders Multimedia Intelligent

A structured, intuitive yet formal modeling methodology is needed to support researchers in specifying pieces of knowledge at the atomic and molecular levels on the one hand, and abstracting them by looking at the "big picture"—the holistic view of a unified, finely-tuned, orchestrated system—on the other hand. To this end, the conceptual modeling paradigm underlying the modeling framework must be based on a compact set of the most primitive and

generic elements. This makes it versatile enough to be applicable to a host of domains and simple enough to express the most complex systems in any one of those domains.

A sufficiently expressive model can serve as a basis for a simulated visualization that facilitates its comprehension. The model creator and user can reference the model to reason about the system under study, query and predict its behavior, and effectively communicate it to molecular biology research peers, drug developers, and other stakeholders. Visualization, therefore, must come from two complementary sources and be presented in two compatible modes. One type of visualization originates from inspecting the cell in action—the inspection-driven mode—while the other type of visualization is created by rendering the cell activity from a conceptual model of the cell system—the model-driven mode. As new findings from the inspection-driven mode are discovered, they are used to update the conceptual model. This way, the conceptual model and the visualization derived from it continuously evolve and grow, providing ever deeper levels of knowledge and understanding of the system's function, structure, and behavior. Incorporating the conceptual modeling element into the multimedia ensemble for complex system visualization adds intelligence to the system, qualifying it to serve as a basis for system-level research.

Translating the system in action into the human spatiotemporal comfort zone and combining inspection-driven with model-driven visualization are the two principles underlying the next generation of CAVERN—Computer-based Augmented Virtual Environment for Realizing Nature—the instrument for doing next generation research in Systems Biology, for which principles and blueprint are presented in the article.

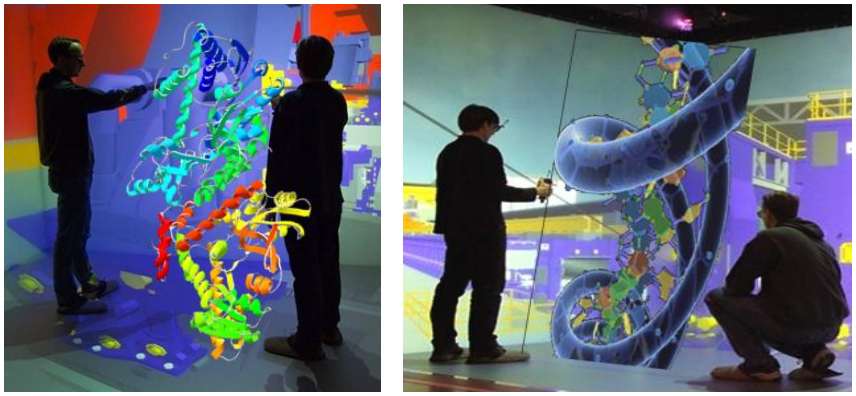


Figure 1. Illustrative CAVERN scenarios.

CAVERN – Computer-based Augmented Virtual Environment for Realizing Nature

CAVERN creates totally immersive living cell environments, opening up a host of exciting new possibilities in biological research that potentially can introduce a dramatic change in the ways this type of research is conducted. For example, adding to the conceptual model new findings discovered by watching rendered 3D scenes, researchers can close knowledge gaps that existed in the model, make new predictions about the behavior of the system under different

conditions, and infer or conjecture about novel relationships among different system components. Figure 1[1] shows two CAVERN scenario examples.

OPM-based conceptual modeling, which has long been used for designing and communicating complex human-made systems, is beginning to play an increasingly important role in facilitating human comprehension of complex biological systems. OPM provides for faithfully and intuitively modeling biological processes and substances that undergo these processes or enable them in a single, bimodal graphic and textual model. The processes, which occur at varying spatiotemporal scales, are modeled at increasingly refined levels of complexity, enabling one to inspect the system at any desired level of detail while not losing sight of the overall view of the functioning system across compartment boundaries and abstraction levels.

Complementing this OPM-based conceptual modeling component, the multimedia modules of CAVERN provide for two presentation modes: the inspection-driven mode and the model-driven mode. In the inspection-driven mode, nano-size molecular interactions, inspected and recorded by the Scene Inspection & Capture Module, are rendered by a supercomputer in the Control Module into dynamic, human-size 3D scenes that can be replayed at various paces, resolutions, and viewpoints in a CAVE™ (Cave Automatic Virtual Environment)—a closed cubic theatre room with 6 walls, including floor and ceiling, embedded inside a larger room, which is the main part of the 3D Presentation Module. In the model-driven mode, human-size 3D scenes are synthesized from the knowledge gleaned from the OPM conceptual model of the living cell and are presented in the same manner in the CAVE.

As proof of concept to the conceptual modeling facet of the CAVERN approach, the paper "Conceptual modeling in Systems Biology fosters empirical findings: The mRNA lifecycle" (Dori & Choder, 2007) describes how, using an OPM-based conceptual model, a knowledge gap in the mRNA lifecycle cell subsystem was identified, leading to a new biological discovery. To fill in the identified knowledge gap, wet lab experiments were designed and conducted, establishing a new finding, namely, that the translation termination factor eRF3 is found in processing bodies (P-bodies) in the cytoplasm after a starvation period. Following this success, work of leveraging an OPM-based conceptual modeling approach for expressing biological findings in an evolving OPM model, identifying knowledge gaps, and experimenting to fill them in is underway.

An Illustrative CAVERN Scenario

Imagine yourself as a molecular biology researcher interested in the interaction between the eukaryotic mRNA lifecycle cellular subsystem and the glycolysis, which supplies energy to all life processes. You are the person on the left hand side of Figure 1 (left). You and your colleague, Judith, walk gently in a CAVE, the main physical part of CAVERN, with a supercomputer-driven set of 48 powerful projectors, which, in near real-time, render cellular life processes of a yeast cell at the nano-level, magnified to centimetre and decimetre scale, and colored for clear, sharp 3-D viewing. This 3-D immersive movie was computed and recorded just seconds ago and is now being played in controlled slow motion. Equipped with tiny, almost invisible 3-D vision antenna glasses, you are both immersed in the cell environment, moving freely inside it and inspecting specific life processes of interest to your current research—the mRNA lifecycle and its

[1] The CAVE images are based on the figures of the CAVE in RWTH Aachen.

interaction with the energy-supplying glycolysis subsystem. The data that drives the live cell life scene is fused from data obtained by a combination of (1) a cell microarray with 85 million (96^4) microscopic wells, each containing about five biologically-marked yeast cells; and (2) a scanning electron microscope, which inspects a single identically-marked cell for comparison and reference. A remote supercomputer, to which the raw data is sent, handles the billions of calculations and the massive statistical analyses involved in computing the representative single cell based on a biologically-marked reference coordinate system in each cell and the representative trajectories of the marked molecules of interest of the approximately 400 million living cells in the wells. For "sanity check" of the outcomes, this super-computed spatiotemporal cell movie is compared with the model obtained from the electron microscope. Once confirmed, it is saved and transmitted for slower rate projection in the CAVE™ via the new Ultra High Bandwidth Network (UHBN) transmitting at a rate of 10 TB/sec, which has been developed recently by researchers funded by the U.S. NSF Future Internet Architectures (FIA) program (Cooney, 2010).

Wherever you move your head, you may be able to see life activities at the molecular and organelle levels. Thanks to specific pre-applied biological markers, life processes you currently are not interested in are filtered out of your visual field in order to avoid distraction and enable you to focus on current, specific research. As the scenario on the left hand side of Figure 1 shows, you and Judith already have been observing how the DNA double helix gradually unfolds inside the nucleus and transcription of mRNA takes place with the help of transcription factors. You have seen the activity of the yeast RNA Polymerase II (pol II), a large multi-subunit complex that consists of 12 subunits (Rpb1–12) and is responsible for the synthesis of all eukaryotic mRNAs. Still inside the nucleus, you follow how the RNA is being processed: It is capped, undergoes Adenylation, and then is spliced.

Having noticed a complex enzyme of interest in the metabolic pathway, you stretch your right hand and grab it. In your left hand, you then get hold of a protein you think might interact with the enzyme and examine whether the two can fit together in 3-D. Through real-time computations performed by the supercomputer and transmitted over the UHBN, combined with haptic technologies, you can feel the elasticity of the "molecules" as you try to put them together at various conformations. Your hands are being pulled and slightly twisted as you manipulate the two molecules next to each other, based on the distribution of their electrical charges. At some point, the two molecules stick together and become one complex, just as you expected. Taking note of this, you exercise some force, separate the two molecules, and let them take their course, at which point they snap back to where their real nanoscale counterpart molecules are supposed to be in the cell according to the recording. During this time, energy, in the form of ATP molecules, is being supplied to enable these intra-nuclear processes. These molecules, you suddenly realize, come from a set of mitochondria found in a domain of the cytoplasm adjacent to the nucleus.

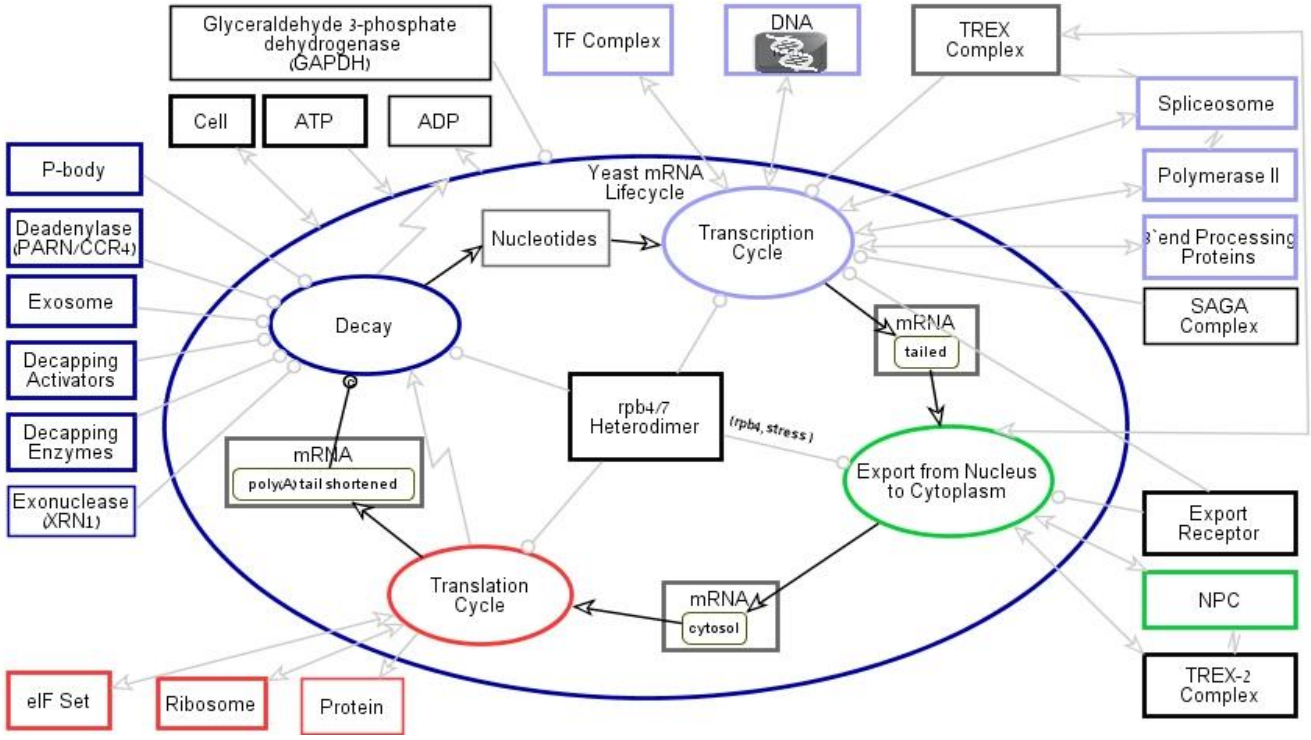
Can the CAVERN Scenario be Dismissed as Science Fiction?

One might indeed be tempted to dismiss the imaginary CAVERN scenario unfolded above as mere speculated science fiction. However, this would be a hastily made conclusion, as the core technologies and building blocks required to support the CAVERN system and make it a reality

are already in place. These include: (1) Object-Process Methodology (OPM)-based conceptual modeling, (2) CAVE™, (3) Supercomputer, (4) Cell Microarray, (5) Electron Microscopy, and (6) Biological Text Mining. The major problem in realizing CAVERN boils down to a systems engineering problem of integrating and interfacing these currently stand-alone systems into a grand system-of-systems that would exhibit the desired emergent behavior of translating nano-level processes and their conceptual model into human size, 3-D scenarios.

The disruptive combination of existing and developing technologies integrated into CAVERN will have an impact on science, education, and health. From the science viewpoint, CAVERN will enable a quantum leap in basic molecular biology research, speeding up researchers' ability to conduct experiments and make breakthrough discoveries.

Figure 2. A level-2 OPM model of the Yeast mRNA lifecycle process in-zoomed, showing the circularity of transcription, export, translation, and decay subprocesses along with the involved molecules based on C^3. Note that these subprocesses have inner cycles of their own.



Health-wise, applications to molecular biology, cell, tissue, and organism research are bound to accelerate dramatically humankind's comprehension of normal and malignant life processes. Using the model for query and predictions, humans will be able to make wider and faster strides towards curing diseases, prolonging life, improving agricultural crops, and increasing humans' well-being, welfare, life expectancy, and ultimately happiness. Not less importantly, CAVERN is expected to serve a major educational purpose. In the science education arena, students at all levels will be exposed to, and quickly grasp, the structure and operation of biological systems. CAVERN shall exhibit the emergent behavior of speed-controllable immersive 3D rendering of cell life processes at the molecular and organelle levels in ways never

experienced before, enabling researchers and students to see, grasp, and experience cell life processes in the most tangible fashion conceivable.

A CAVERN Architectural Blueprint

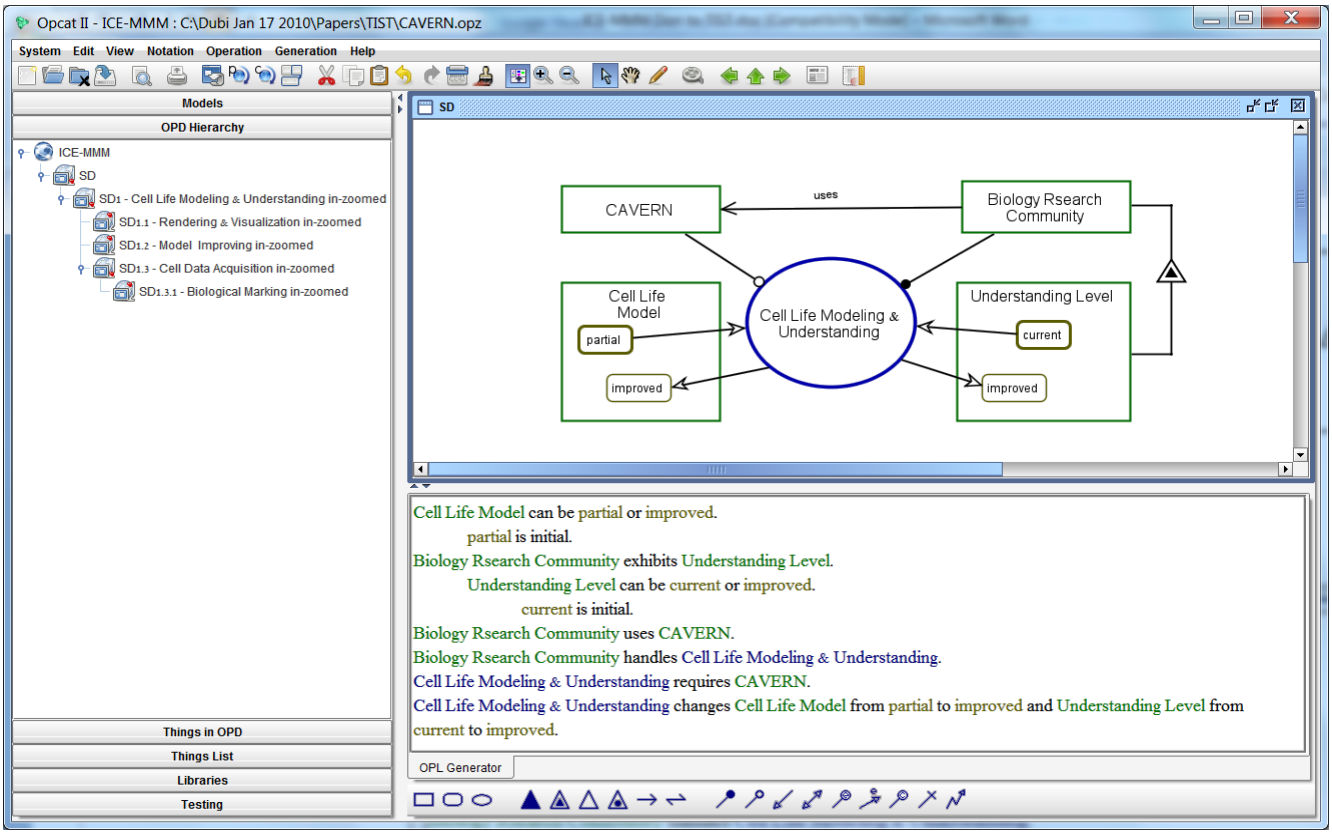
The living cell is a prime example of a highly complex system, in which the two main system aspects—structure and behavior—are highly intertwined and hard to separate. Likewise, CAVERN is a complex artificial system-to-be. Object-Process Methodology, OPM (Dori, 2002), proposed as the cornerstone of CAVERN's conceptual modeling component, is a holistic approach to the study and development of both natural and human-made complex systems. OPM serves as the basis for the design of CAVERN as well as for modeling the living cell within CAVERN. Recognized as one of INCOSE's six model-based systems engineering methodologies (Estephan, 2008), OPM is currently undergoing a process of adoption by ISO as an International Standard (ISO, 2012).

OPM in a Nutshell Explained while Exposing CAVERN Architecture

Based on formal mathematical foundations of graph grammars, OPM caters to human intuition via graphics and natural language text. Requiring that a single model represents structure and behavior, OPM is founded upon two elementary building blocks—stateful objects and processes. Objects are the (physical or informatical) components that comprise the system. Processes transform objects by creating them, consuming them, or changing their states. The concurrent representation of structure and behavior in the same diagram type is balanced, creating synergy whereby each aspect helps understanding the other.

The elements of OPM are three entities and two types of links. Entities are stateful objects, processes, and states. An object is a thing that exists, possibly in some state, while a process is a thing that happens to an object and transforms it. Examples of biological objects are protein, cell, and organism. Examples of biological processes are cleavage, mitosis, and apoptosis. Examples of artificial objects are CAVERN, model, and electron microscope, and examples of artificial processes are 3D rendering, modeling, and magnifying. OPM entities are connected via links, which can be structural or procedural.

Figure 3. OPCAT GUI showing the top-level view of CAVERN systems and the Cell Life Modeling & Understanding it enables. Left: OPD tree; top: OPD; bottom: OPL.



Structural links express a relation between pairs of entities of the same persistence, i.e., between two objects or between two processes. The four fundamental structural relations are aggregation-participation (whole-part), generalization-specialization (inheritance), exhibition-characterization (attributes and operations), and classification-instantiation (class and its members). Procedural links, which connect an object or its state to a process, can be transforming links (generation, consumption, or effect) or enabling links (agent or instrument), as explained below.

Two semantically equivalent modalities, graphic and textual, describe each OPM model. Figure 3 presents the top-level view of the CAVERN architecture via the graphic user interface of OPCAT (Dori et al. 2010), a software environment for OPM-based system modeling. Taught in academia (e.g., the Massachusetts Institute of Technology) and applied in industry (e.g., National Aeronautics and Space Administration), OPCAT is used to model both CAVERN and the mRNA lifecycle (Dori & Choder 2007; Somekh, Choder, & Dori, 2012) combined with glycolysis as a case in point (see Figure 2 as an example of one diagram of this model). The top-right pane of Figure 3 shows an Object-Process Diagram (OPD), OPM's graphic modality. The bottom pane shows the textual modality—the corresponding Object-Process Language (OPL) paragraph, the auto-generated OPD counterpart. OPL is a subset of English that domain experts (e.g., biologists) readily understand. Each element in an OPD has a graphical symbol. An object is a box and a process—an ellipse.

The System Diagram Presents CAVERN's Function as the Main System's Process

The major function of CAVERN is **Cell Modeling &** Understanding (Arial font signifies OPM model elements). Following the *function-as-a-seed* OPM principle, this function is depicted as the only *process* at the top- (zero) level OPD, called the *System Diagram* (SD). The three major *objects* in SD are **Biology Research Community**, **CAVERN System**, and **Cell Life Model**. The *OPD syntax* specifies correct and consistent ways by which entities (objects, object states, and processes) can be connected via structural and procedural links, such that each legal entity-link-entity combination bears specific, unambiguous semantics. Thus, the object **CAVERN System** is *instrument*—a non-human enabler—of **Cell Life Modeling & Understanding**, the instrument (procedural) link between them, denoted by a white lollipop. Likewise, **Biology Research Community** is *agent*, a human enabler of this process (the black lollipop). **Cell Life Model** is a stateful object, which **Cell Modeling & Understanding** changes from its input state **partial** to its output state, **improved**. **Biology Research Community** exhibits (is characterized by) **Understanding Level**, which is initially at the input state **current**. After **Cell Life Modeling & Understanding** occurs, it is at the output state **improved**. There is an input-output links pair, comprised of an input link from the input state of **Understanding Level** to the central process **Cell Life Modeling & Understanding** and an output link from that process back to the corresponding output state improved. Another input-output links pair is comprised of an input link from the input state **partial** of **Cell Life Model** to the same **Cell Modeling & Understanding** central process, and an output link from that process back to the corresponding output state improved. These two link pairs have the semantics of the automatically-generated OPL sentence at the bottom of the OPL pane in Figure 3:

> **Cell Modeling & Understanding** changes **Understanding Level** from **current** to **improved** and **Cell Life Model** from **partial** to **improved**.

According to the modality principle of the cognitive theory of multimodal learning (Mayer & Moreno, 2003), the graphic/textual representation of the OPM model increases the human dual channel processing capability (Dori, 2008). Indeed, it has been our experience that human understanding of the OPM model is enhanced by concurrently consulting both the graphical and the textual representations, facilitating detection and correction of modeling errors as soon as they are created.

Complexity Management via Details Refinement

The complexity of systems is managed in OPM models by abstraction-refinement mechanisms, notably out- and in-zooming, as well as unfolding and folding, which hierarchically expose or hide details of objects and processes. This way, the top-level diagram (SD) is gradually expanded into a set of increasingly elaborate OPDs. The left pane in Figure 3 shows the hierarchy of OPDs of the **CAVERN System**. In the next-level OPD shown in Figure 4, **Cell Life Modeling & Understanding** is zoomed into, showing four subprocesses: **Scene Inspecting**

& Capturing, **3D Rendering & Visualization**, **Conceptual Modeling & Knowledge Mining**, and **Model Improving**.

The execution order of subprocesses within an in-zoomed process is from the top down. In parallel, the object **CAVERN System** is unfolded to expose its parts: **Conceptual Modeling & Knowledge Mining Module**, **Scene Inspection & Capture Module**, **3D Presentation Module**, and **Computing & Control Module**. Each part participates in one or more subprocesses.

CAVERN System exhibits (has the attribute) **Operating Mode**, which can be **model-driven** or **data-driven**. When **Operating Mode** is **model-driven**, **Knowledge Mining & Conceptual Modeling** takes place, using the **Conceptual Modeling & Knowledge Mining Module** as instrument and **Research Team**, which is part of **Biology Research Community**, as agent. This is expressed by the *condition link* from the **model-driven** state of **Operating Mode** to **Knowledge Mining & Conceptual Modeling**. This process creates **Cell Life Model** at its initial **partial** state. Similarly, **Cell Data Acquisition** occurs if **Operating Mode** is **data-driven**. **Cell Data Acquisition**, handled by the agent **Laboratory Team** (another part of **Biology Research Community**), consumes **Cells Sample**, and affects (creates or changes the state of) **Spatio-temporal Cell Data**. The latter object and **3D Presentation Module** are instruments for the next process, **Rendering & Visualization**, handled by **Research Team**. This process is expected to yield **New Finding**. **New Finding** is input to **Model Improving**, where **Research Team** uses **Knowledge Mining & Conceptual Modeling** for changing **Cell Life Model** from **partial** to **improved**.

Figure 4. Cell Life Modeling & Understanding in-zoomed.

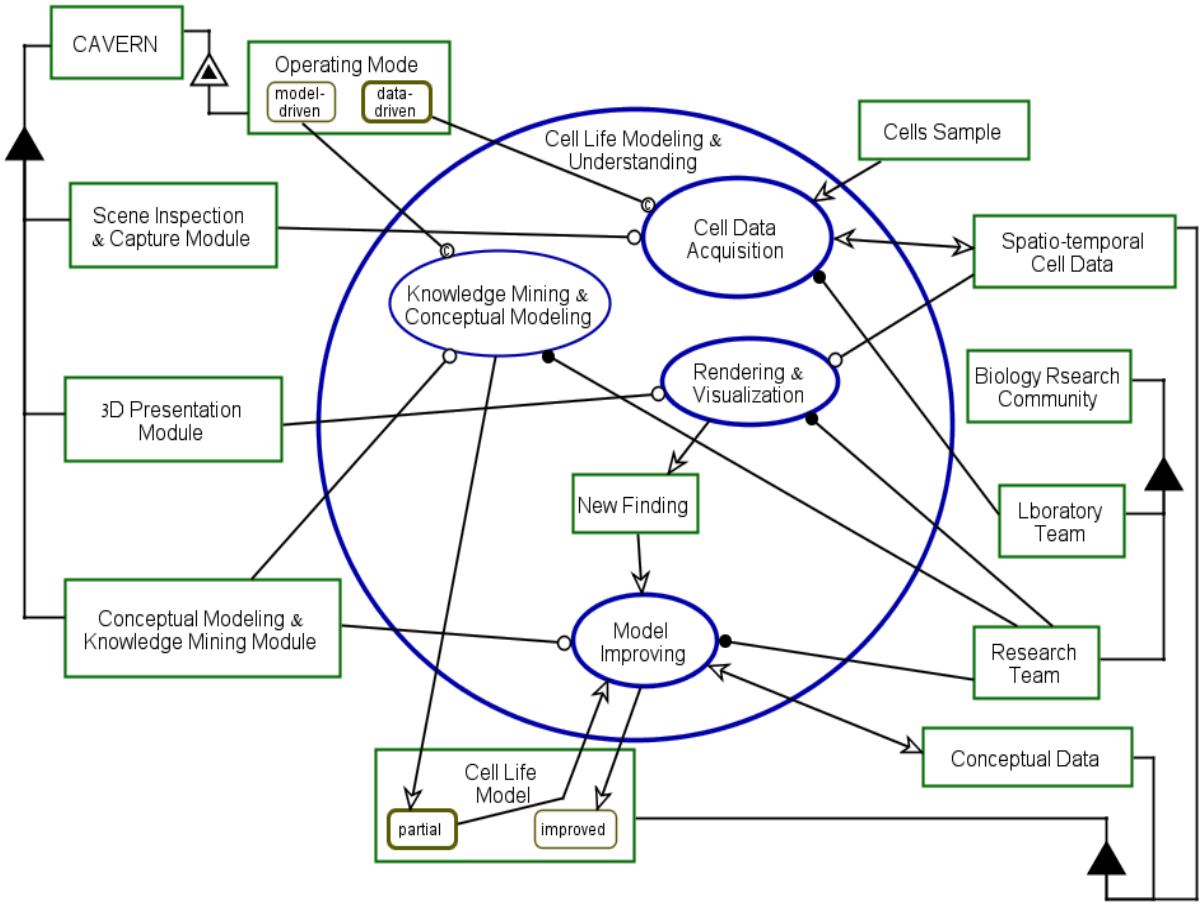
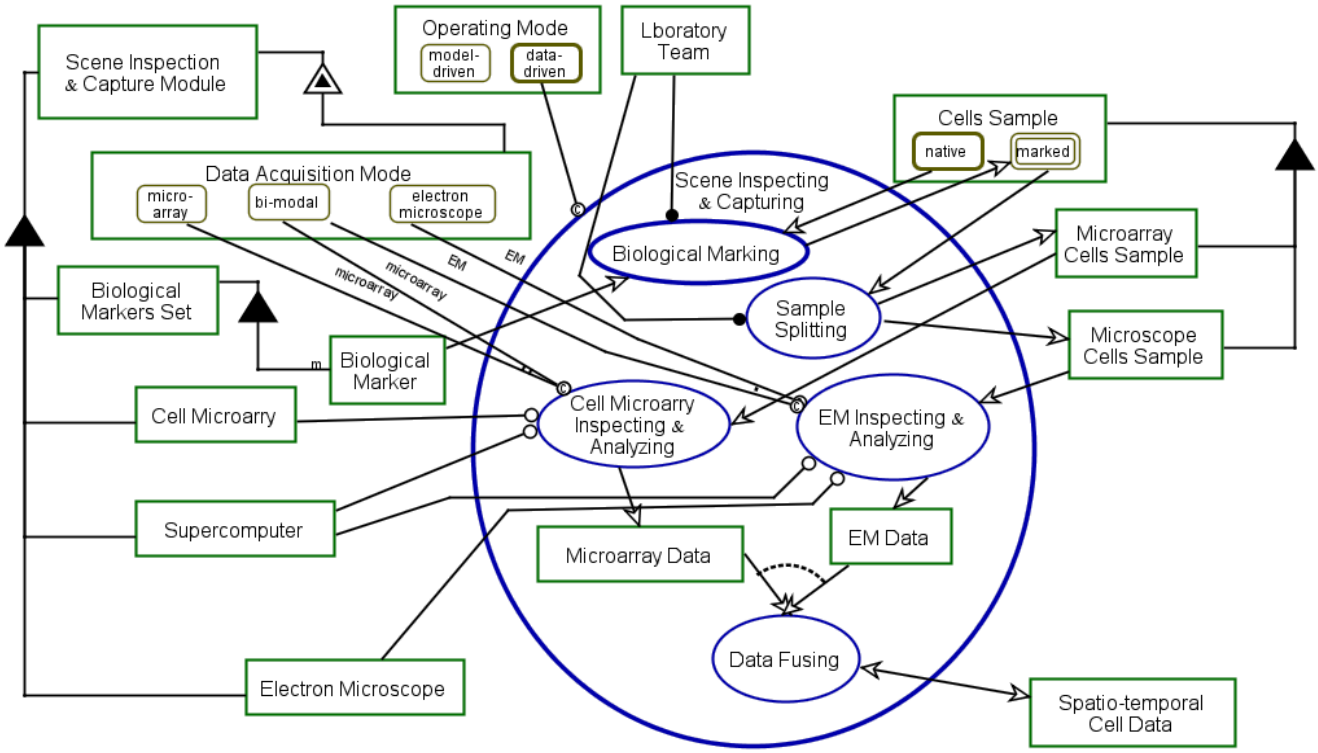
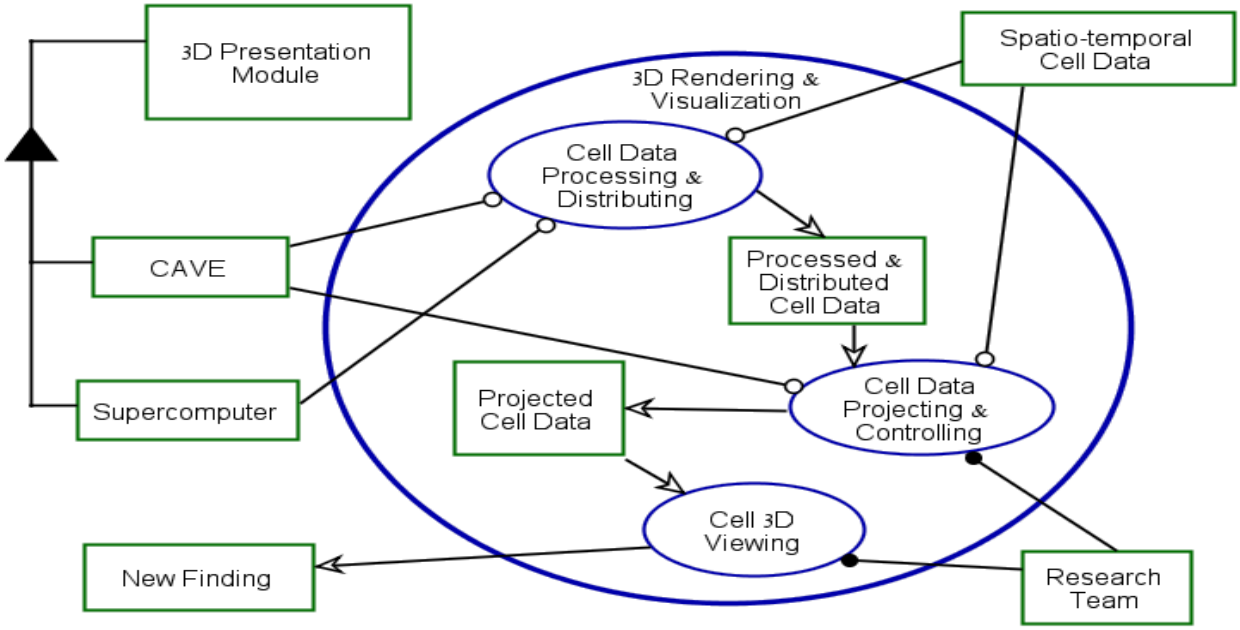


Figure 5. Scene Inspecting & Capturing in-zoomed.



Scene Inspecting & Capturing, included within **Cell Life Modeling & Understanding** in Figure 4, is zoomed into in Figure 5. It starts with **Biological Marking**, where **Laboratory Team** uses **Biological Markers**. The **marked Cells Sample** undergoes **Sample Splitting**, yielding one sample for **Cell Microarray Inspecting &** Analyzing and another for electron microscope analysis, **EM Inspecting & Analyzing**. Depending on the **Data Acquisition Mode** of the **Spatio-temporal Cell Data Acquisition Module**, either one or both analyses are performed. **Data Fusing** then fuses **Microarray Data** with **EM** Data to create or alter **Spatio-temporal Cell Data**.

Figure 6. 3D Rendering & Visualization in-zoomed.



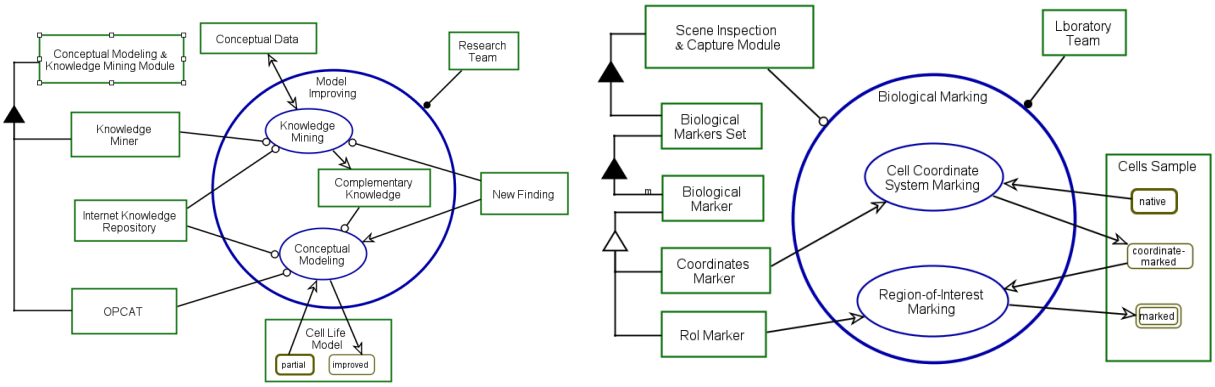
In Figure 6, **3D Rendering & Visualization** is in-zoomed, while the **3D Presentation Module** is unfolded, showing **CAVE** and **Supercomputer** as its parts. Both are instruments to **Cell Data Processing & Distributing**, which processes the **Spatio-temporal Cell Data** and yields **Processed & Distributed Cell Data**. This object, in turn, is input to **Cell Data Projecting & Controlling**, which the **Research Team** controls, and which **CAVE** enables. The **Projected Cell Data** is input to **Cell 3D Viewing** by the **Research Team**, yielding the desired visualization that the **Research Team** views as a human-size reflection in near-real time or in slow-motion replay of what takes place inside the cell, possibly leading to the emergence of **New Finding**, an actual desired output of the entire CAVERN system.

New Finding is used by the **Research Team** for **Model Improving**, which is in-zoomed in Figure 8. Specifically, **New Finding** and **Knowledge Miner**, a part of the **Knowledge Mining & Conceptual Modeling Module**, are instruments to **Knowledge Mining**, which also uses **Internet Knowledge Repository** and yields **Complementary Knowledge**, which complements **New Finding**. Together, they enable **Conceptual Modeling**, for which **OPCAT** and **Internet Knowledge Repository** are instruments. Finally, **Conceptual Modeling** changes **Cell Life Model** from **partial** to **improved**, in accord to what is expressed at a more abstract level in Figure 4, and even more abstractly, in Figure 3.

Figure 7. Left: a "chip" cellular microarray; right: rod-shaped bacillus.

Using a cellular microarray (Chen et al., 2005), shown in Figure 7, the supercomputer processes the detected cellular activity data it receives from the **Scene Inspection & Capture Module**. Cellular microarrays currently allow for multiplexed interrogation of living cells on the surface of a solid support, spotted with varying materials (antibodies, proteins, lipids...), which can interact with the cells, leading to their capture on specific spots. Combinations of different materials can be spotted in a given area, allowing the triggering of a cellular response, change in phenotype, or detection of a specific secreted factor. Statistical algorithms, developed within the Computation & Control Module of CAVERN will be applied to compute spatiotemporal interactions of interest in one representative cell (see Figure 8 left) that will be computed from data obtained from millions of cells, which had been biologically marked as explained by the OPD in Figure 8 (right).

Figure 8. Model Improving (left) and Biological Marking (right) in-zoomed.



The **New Finding** is input to the **Model Improving** process, shown in Figure 8. Within **Model Improving**, **New Finding** is instrument to **Knowledge Mining**, which is aimed at checking whether a similar or related finding exists anywhere in the literature or databases. The potentially found **Complementary Knowledge** and the **New Finding** are used to update the **Cell Life Model** via the **Conceptual Modeling** process, changing it from **partial** to **improved**.

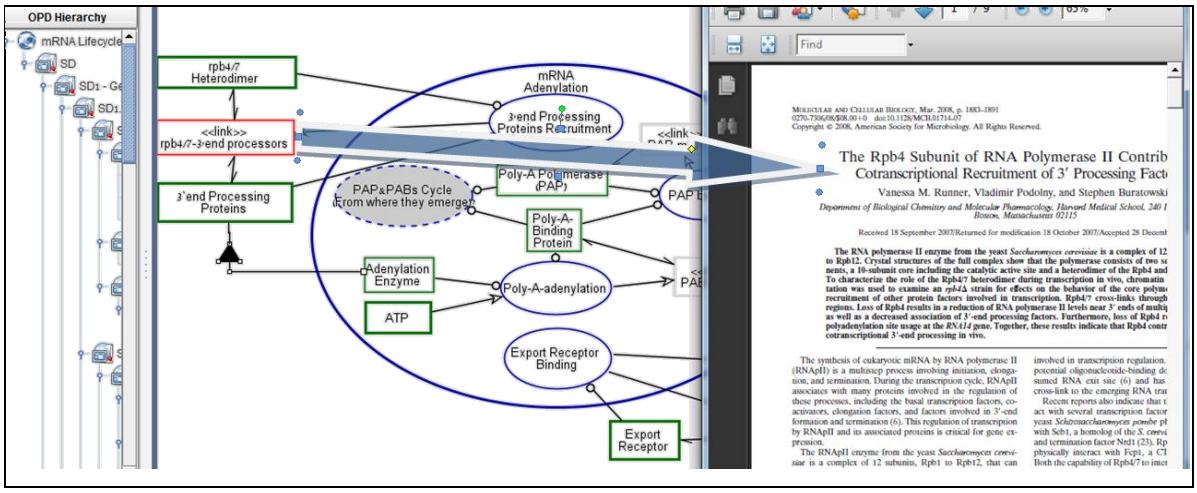
Diving yet deeper into the fourth level of detail, **Biological Marking** from Figure 5 is zoomed into in the OPD in Figure 8, showing its two subprocesses, **Cell Coordinate System Marking** and **Region-of-Interest Marking**. The objective of the first subprocess is to enable the establishment of a 3D Cartesian, cylindrical, or polar coordinate system, depending on the cell shape. For example, since bacillus (see left of Figure 7) is shaped as a rod, it will be marked

for a cylindrical coordinate system. Good potential candidates for marking the origin of a coordinate system are specific proteins in the nucleolus, a non-membrane bound structure within the nucleus, where rRNA is transcribed and assembled. A customary way of marking is through fluorescent tagging fluorophores and fluorescent recovery after photobleaching (FRAP). A fluorophore, such as fluorescein isothiocyanate (FITC), coumarin, cyanine (Rietdorf, 2005), and newer, more effective ones (Lakowicz, 2006), is a functional group in a molecule that absorbs energy of a specific wavelength and reemits energy at a specific different wavelength. The database of fluorescent dyes and applications (Database of Fluorescent Dyes, 2010) enables directed search of thousands of fluorophores. The amount and wavelength of emitted energy depend on the fluorophore and its environment. Photobleaching, the photochemical destruction of a fluorophore, can be exploited to study the motion of molecules, their diffusion, or both, for example via FRAP. FRAP is an optical technique capable of examining single cells that has been useful in studies of cell membrane diffusion and protein binding.

Biological Knowledge Mining

The OPM architecture model of CAVERN calls for constructing a conceptual model of the cell which exploits synergy between 3D visualization, using the CAVE, and knowledge creation or discovery through biological text mining. Figure 9 and Figure 10 are two examples of OPCAT-enabled URL hyperlinks documenting the references from the OPM model to the PDF passage or Web page sentence on which any specific modeled fact is based. Based on the work conducted as part of ISO standardization of OPM (ISO, 2012), CAVERN will be able to automatically or semi-automatically construct such links as well as biological OPM model snippets. After being verified by experts, these will be universally accessible for biologists to browse, reuse, and improve. Each model snippet will be paired with semantically organized URL pointers to documents, including scientific papers and multimedia files, such as CAVERN clips, which researchers can replay in their CAVERNs, creating an evolving web of biological knowledge.

Figure 9. Example of a URL link from the OPM model to a PDF document on which the model is based.

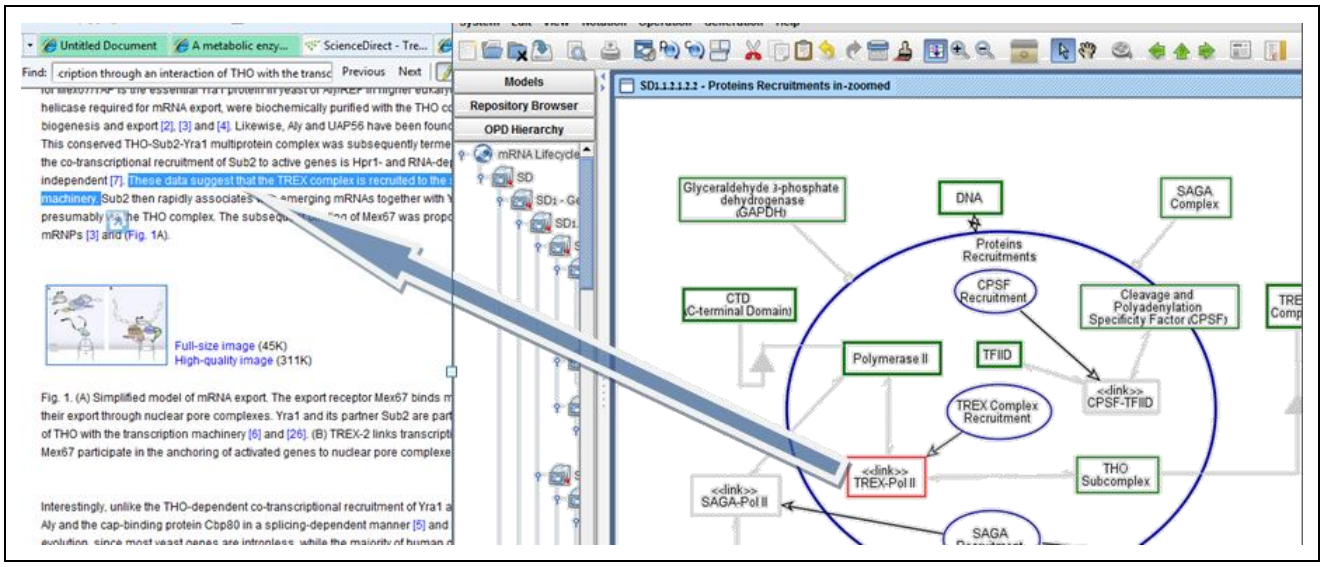


Challenges and Open Problems

CAVERN is an ambitious complex research project with potentially highly valuable gains in science, health, and education, explained above. Its detailed OPM architecture, of which only part was elaborated upon, suggests that in spite of its highly innovative nature, it definitely is feasible. Like most high-gain disruptive technology developments, there are open questions that require integration, developing new technologies, techniques, interfaces, and algorithms in several cross-disciplinary domains. Below are the main open questions:

- How do we best mark cells for establishing their coordinate system? Preliminary directions for answers are provided in this article.
- How will the tracing of marked molecules of interest in the microarray and in the electron microscope be done?
- Is it possible to put one cell in each well of the microarray by dilution? If not, how do we track several cells in each well?
- How to compute the representative cell from cell microarray data?
- How to combine representative cell data with data from direct observations from the electron microscope?
- Should we use Transmission Electron Microscopy (TEM), which provides 2D images, or Scanning Electron Microscopy (SEM), which provides 3D images?
- How to mark coordinates on the cell for reference points? What sites and markers should be used?
- How to detect that two molecules are combined? How to detect that two combined molecules separate?

Figure 10. Example of a URL link from the OPM model to a website documenting the modeled fact.



Summary

This article has laid out the vision, principles, and architecture blueprint of CAVERN – a Computer-based Augmented Virtual Environment for Realizing Nature. CAVERN is a disruptive intelligent multimedia system-of-systems that opens the door for a completely new type of molecular biology research by translating nano-scale size and time dimensions that characterize molecular level processes in the cell into the human cognitive comfort zone. When operational CAVERN will enable researchers to design, execute, and monitor experiments, they will be able to see the results in near real time in the most direct way conceivable, and update the OPM-based conceptual model with new findings from their own experiments as well as from new literature.

The major technological building blocks of CAVERN are mature, but algorithms, interfaces, and standards need to be developed to make the CAVERN vision a reality for the benefit of humankind. This will require significant intellectual and monetary resources, but the potential gains of an operational CAVERN definitely outweigh the efforts and investments needed to materialize it.

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About the Author

Dov Dori (dori@ie.technion.ac.il) is Information and Systems Engineering Professor and Head of the Enterprise System Modeling Laboratory at the Faculty of Industrial Engineering and Management, Technion-Israel Institute of Technology, and Visiting Professor at the Engineering Systems Division, Massachusetts Institute of Technology, where he lectures on a regular basis. His research interests include conceptual modeling of complex systems, systems architecture and design, software and systems engineering, and systems biology. Professor Dori invented and developed Object-Process Methodology (OPM), the emerging 19450 ISO Standard. He has authored or edited five books, and more than 250 journal and conference publications and book chapters. He is Fellow of INCOSE – International Council on Systems Engineering, Fellow of IAPR – International Association for Pattern Recognition, and Senior Member of IEEE and ACM.

Discussion Questions

1. What are the main impediments to full implementation of the CAVERN vision presented in this chapter? Are they mainly technological, managerial, or related to integration and systems engineering?

2. What potential value to scientists and students lies in the CAVERN system, once implemented?

3. Assuming the CAVERN vision is implemented, how would you classify and rate this development in the evolution from the optical microscope to the electron microsphere to further visualization devices?

4. What are the similarities and differences between the former inventions and this one?

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Tobacco-Smoke Litigation in Italy: Could the Marketing of Tobacco be a "Dangerous Activity"?

Roberto Carleo
University of Teramo, Italy

Abstract

This article analyzes recent developments of tobacco-smoke litigation in Italy. Italian courts are split on the issue of tobacco producers' liability, but recent precedents of lower courts and of the Italian Supreme Court seem to signal a shift toward court-imposed strict product liability for smoke damages. Upon review of the reasons given by the Italian courts, the article concludes that Italian law on this issue may become a conflicting deviation from trends of courts in Europe and worldwide. Court-imposed strict liability conflicts with the legality of production and sale of tobacco by statutory permission, thus the recent judicial developments leave open the question whether the issue of tobacco-smoke liability should be left to the courts or rather be the subject of an exercise in social policies, in a transnational comparative context.

Keywords

tobacco-smoke, lung cancer, consumer protection, cigarette consumption, product liability, government regulation, class actions

Introduction[2]

The issue of liability for damages from tobacco smoke, in particular from active smoking, has gained the attention of Italian Courts in the last three years. The first claim for damages brought by the relatives of a smoker who died of lung cancer dates back to 1997. Since that time, the issue of tobacco smoke has been the subject of growing debate by scholars and conflicting decisions by the Italian Courts. *British American Tobacco Bat Italia S.p.a. v. Amministrazione Autonoma dei Monopoli di Stato* (hereafter "*Bat Italia*"), a recent controversial decision of the

[2] Editors' Note: We make an exception to our requirement of APA style, and the citations and references in article remain in the style of Italian legal citations.

Italian Supreme Court,[3] held that the marketing of tobacco is a "dangerous activity" that creates strict liability under Article 2050 of the Italian Civil Code.

Article 2050 supplies a historic and comparative review of that decision and of the different theories argued, under Italian law, in support or negation of smoke damages. It is interspersed with analyses and opinions personal to the author of this article (the "author"). After an analysis of *Bat Italia* and of the comments that followed, this manuscript concludes that Italian law could either open new ways of tobacco-smoke litigation or become isolated in the International Community if Italian courts embrace strict liability as a cause of action for tobacco-smoke related claims.

A Background: Tobacco-Smoke Actions in Italy

The first case of tobacco-smoke litigation in Italy dates back to 1997 when the Tribunal of Rome denied a causal connection between smoking and the insurgence of cancer.[4] The Rome court was unable to find scientific evidence of the biological mechanisms that cause cancer among many possible concurring causes. Since then, the path that led to *Bat Italia* was paved with controversial issues: types of causes of action; contributory negligence of smokers in the causation of damage; impact of advertising; and influence of warnings on self-determination of the smokers.[5] Italian courts and scholars have been divided between two opposing trends. The first trend is in favor of admitting, albeit with many limitations and important distinctions, the responsibility of those who produce or sell tobacco.[6] The other trend is oriented to exclude such liability.[7]

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[3] Court of Cassation, Section III, 17 December 2009, n. 26516, *Resp. civ.*, 2010, 5, p. 334 ss. For comments on this decision, see F. R. Fantetti, *Resp. civ.*, 2010, 5, p. 339 ss; D. Covucci, *Attività pericolosa e responsabilità oggettiva del produttore di sigarette*, *Nuova giur. civ. comm.*, 2010, I, p. 667 ss.; Foro It., 2010, 3, p. 870 ss., A. Palmieri, *Produzione di sigarette e responsabilità per danni al fumatore: l'avanzata irrefrenabile dell'art. 2050 c.c. (anche in assenza di potenziali beneficiari dell'attività pericolosa), Foro It.*, 2010, 3, p. 880 ss.; V. D'Antonio, *Il danno da fumo e l'art. 2050*, *Danno e Responsabilità*, 2010, 6, p. 575 ss.; ss., G. Ponzanelli, *La produzione di sigarette è attività pericolosa*, *Corr. giur.*, 2010, 4, p. 488; , P. G. Monateri, *Se il fumatore è consapevole del rischio può esser escluso il risarcimento*, *Guida al diritto*, 8, 20 february 2010, p. 67 ss. See also the following comments: V. Carbone, *L'attività di commercializzazione di tabacco da fumo integra un'attività pericolosa a norma dell'art. 2050 c.c.*, in *Corr. Giur.*, 2010, 2, p. 164 ss.; P. G. Monateri, *La Cassazione i danni da fumo: evitare un ennesimo "isolamento italiano"*, *Danno e resp.*, 2011, 1, p. 57 ss.

[4] Trib. Roma, 04 April 1997, *Danno e resp.*, 1997, p. 750 ss. For a comment on this decision, see F. Cafaggi, *Immunità per i produttori di sigarette: barriere culturali e pregiudizi di una giurisprudenza debole*, and G. Visintini, *Le nuove aree di applicazione della responsabilità*, 2003, Milano, pp. 309-310.

[5] Some courts found that tobacco manufacturers might be responsible for deceiving advertising of "light" cigarettes but that smokers have the burden of proving a causal connection between the deceiving advertising and the damage. See Court of Cassation, United Sections, 15 January 2009, n. 794; Cass. Sez. III, 13 February 2007, n. 3086, in *Foro it.*, 2007, 11, p. 3144 ss.; Cass., sez. III, 04 July 2007, n. 15131, *Danno e resp.*, 2008, 5, p. 515 ss. With comments of V. D'Antonio, *La Cassazione e il danno da fumo attivo:alla ricerca di un orientamento che non c'è*, and di Cass. Sez. III, 30 April 2009, n. 10120.

[6] App. Roma, 07 March 2005, n. 1015, *Corr. giur.,* 2005, 5, 668 ss., with comment of P. G. Monateri; *I danni da fumo: classico e gotico nella responsabilità civile*; Danno e resp., 2005, 6, 641 ss., with comment of V. D'Antonio, *La risarcibilità del danno da fumo tra "consuetudine" giurisprudenziale e nuove prospettive: il caso Stalteri ridisegna la materia*, p. 648 ss.; also reported *Danno e resp.*, 6, 2005,

Those who deny responsibility for manufacturing or marketing tobacco argue that these activities are legitimate, not being affected by any specific prohibition,[8] and cannot be considered the cause of any prejudice suffered by smokers. The argument goes that, at the state of medical science at the time the argument was made, it could not be said with absolute certainty that there is a chain of causation between consumption of cigarettes and the onset of specific disease. A number of contributing factors and external factors may intervene in the insurgence of the disease.[9]

An additional argument was that smokers, when consuming tobacco, are fully aware of the harmful effects produced by smoke and accept the risk with full knowledge that[10] their behavior could be a concurring cause of damage. Article 41 of the Italian Criminal Code excludes or at least reduces the amount of damages recoverable under Article 1227 of the Civil Code if the victim's behavior is a concurring cause of the victim's injury.[11]

The argument in support of responsibility of the manufacturer or distributor of tobacco products is twofold. First, until legislative action of 1990,[12] which made compulsory to place on cigarettes packages specific warnings of smoke consequences, the consumer was not informed about the real health risks of tobacco use.[13] Second, the state of addiction that nicotine produces excludes that the smoker, although informed, is able to decide whether to assume the risk of damage to health or to quit smoking.[14]

The holding of the Rome courts on the issue of causal link between tobacco smoke and cancer disease rested on the assumption that the current state of scientific medical knowledge suggests that smoking is the cause, if not certain, at least sufficiently likely, of several diseases.[15]

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note of G. Giacchero, *Asimmetrie informative e danni da fumo attivo*,. 655 ss.; *Nuova giur. civ. comm.*, 2005, I, p. 326, note of G. Alpa, *Responsabilità civile. Prodotti da tabacco. Produzione e messa in commercio*; *Giust. civ.*, 2006, I, p. 1304, comment of F. Paladini, *Responsabilità civile e danni da fumo "attivo"*; *Resp. civ. prev.*, 2005, p. 476, note of E. Lucchini Guastalla, *La responsabilità del produttore per i danni da fumo attivo.*

[7] For broad coverage of the issue, with particular reference to tobacco litigation in the USA, see C. M. Cascione, *La responsabilità per danni da fumo*, *Danno e resp.*, 10, 2010, p. 870 e ss. and P. G. Monateri, *La Cassazione e i danni da fumo: evitare un ennesimo "isolamento italiano," cit. supra*, pp. 61-63.

[8] Trib. Brescia Sez. II, 10 August 2005, *Danno e resp.*, 2005, 12, p. 1210 e ss., finding also acceptance of risk. However, permissive legislation may conflict with Art. 32 of the Italian Constitution, which states the overriding principle of "right to health."

[9] Trib. Roma, 04 April 1997; Trib. Napoli, 15 December 2004, finding that cancer is the consequence of many possible concurring factors, therefore, that tobacco smoke does not satisfy the "necessary condition" requisite for causation under Italian tort law.

[10] Trib. Brescia, *supra*, fn. 5.

[11] Trib. Napoli, 15 December 2004, n. 12729, *Danno e resp.*, 2005, p. 645 e ss. See also P.G. Monateri, *I danni da fumo: classico e gotico nella responsabilità civile*, *supra*, p. 668 e ss.

[12] Art. 46 Law, 29 December 1990, n. 428, repealed by Art. 11 D. Lgs 24 June 2003, n. 184 and amended by Art. 6 of the same D. Lgs.

[13] App. Roma, *supra,* fn. 4. The Australian High Court has affirmed the constitutionality of Australian regulations requiring "graphic health warnings"; see "Australia is First Country to Require Plain, Logo-Free Cigarette Package," *Bloomberg News,* 15 August 2012, p. 1.

[14] See G. BALDINI, *Il danno da Fumo*, *supra,* p. 211 ss.

[15] App. Roma, *supra,* fn. 4. See also Trib. Roma, 05 December 2007, n. 23877; about the causal link in criminal law, see also Cass. Pen., Sez. Unite, 10 July 2002, n. 30328.

The Bat Italia Decision

The *Bat Italia* decision of the Italian Supreme Court of December 2009 must be seen in the above context. *Bat Italia* held that the purpose of production and distribution of tobacco is the consumption of tobacco products, which have an implicit, potentially harmful effects resulting from normal use of the product.[16] The court found that the activity of tobacco manufacturers is, therefore, a "dangerous activity" that produces strict liability under Article 2050 of the Civil Code.

Article 2050 of the Civil Code provides that the manufacturer or distributor of tobacco products has the burden to prove having taken all reasonable steps to prevent causation of damage at each phase of its industrial activities as a whole. The *Bat Italia* Court held that those who have control of a dangerous instrumentality also respond for the damages caused by the instrumentality. Liability is premised on the mere lack of adequate protective measures to avoid the damages, which are an ordinary consequence of the dangerous instrumentality. The *Bat Italia* Court rejected the argument that prevention of damage is also a duty of the consumer, thus that smoke damage does not fall within the scope of Article 2050 of the Civil Code.

Bat Italia's finding that tobacco products are objectively dangerous clearly favors the victims, freeing them from the burden of proving both danger and causation so what remains to be tried is only the amount of damage suffered.

The Remaining Uncertainties

The choice of an objective standard of liability has very important practical consequences.[17] The manufacturer of tobacco products bears the risk of negative consequences resulting from its activities, aimed at marketing goods that have the tendency (not just the potential) to be harmful (that is more than dangerous), creating an effective blend between the needs of repression and repair on one hand and prevention on the other.

However, the *Bat Italia* decision leaves questions unanswered.

Even those who agree with the judgment have expressed concern over its apparent "ideological" content. *Bat Italia* takes a position with respect to a social problem that the courts, on previous occasions, had declined to address. Beyond criticism, the novelty of the *Bat Italia* decision can be found in extending the attribute of dangerousness from the activity of production, which by itself is not dangerous, to the product of the activity, which has its own detrimental potential for the consumer.[18]

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[16] As confirmed by numerous Rules and Regulations that contain expressed designation of tobacco as a poisonous and harmful product, therefore, dangerous by its own nature.

[17] The Court, through a cost-benefit analysis, gives Article 2050 of the Civil Code an interpretation in terms of strict liability. See A. Palmieri, *Produzione di sigarette e responsabilità per danni del fumatore: l'avanzata irrefrenabile dell'art. 2050 c.c. (anche in assenza di potenziali beneficiari dell'attività pericolosa), cit.*, p. 881, noting that the Supreme Court, running against precedents followed in the recent decades, established the current jurisprudential concept now prevailing, and confirmed by Cass. 04 May 2004, n. 8457, *Foro It.*, I, 2378, with a note by A. Sorrentino, *Responsabilità derivante da attività pericolosa e somministrazione di energia elettrica,* La *Resp. Civile*, 2005, p. 618.

[18] See, on germane issues of production and distribution of gas tanks, Cass. 30 August 2004, n. 17693; Cass. 04 June 1998, n. 5484; Cass. 19 January 1995, n. 567. See also (connecting with the

From the fact that tobacco products contain within them, by their very nature and their biochemical composition, an intrinsic tendency to cause harm to health[19] follows the result that their manufacturer will be liable for damages even though it complied with all formal requirements of the legislation governing the industry.[20]

The author submits, however, that his argument bears a hidden contradiction.

On one side, it is true that an industrial activity does not become illegal simply because it is dangerous. In fact, tobacco production and distribution is subject to Government regulations and tobacco manufacturers comply with the same. On the other, it may be difficult to argue that the activities of production and marketing of cigarettes is in itself lawful, for the following reasons:

(1) At the present state of the art, it is not possible to produce and market cigarettes that are "safe," meaning without even the possibility of damage to health;[21]

(2) Article 103 of the Consumer Code qualifies "tobacco" as a product not only "dangerous" but also "unsafe" under the following standards:

(a) "safe" means a product that "under normal or reasonably foreseeable circumstances does not present any risk or only the minimum risks compatible with the product's use, considered as acceptable and consistent with a high level of health protection and safety of persons";[22]

(b) "dangerous" means "any product that does not meet the definition of safe product referred to in subparagraph a";[23]

(3) The abuse or misuse of the tobacco product is not relevant to responsibility but only to the amount of damages;

(4) there being no appropriate measures to prevent the potential danger of the product, the only preventive measure is the non-use;

(5) the rules on product liability are not applicable in this case, because cigarettes cannot be regarded as a defective product pursuant to Article 117 of the Consumer Code because there may be "products dangerous but not defective" and "totally harmless products becoming very dangerous when defective."

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tobacco smoke issue) Cass. 19 July 2008, n. 2006, with comment of A. Maietta, *Scoppio di bombola a gas: esercizio di attività pericolosa o danni da prodotto difettoso?*, *Danno e resp.*, 6, 2009, p. 655; A. L. Bitetto, *Pericolosità del prodotto e obblighi di «precauzione» del distributore*, in *Foro it.*, 2009, I, p. 1163;. V. Trovato, *Esercizio di attività pericolosa ed efficacia causale esclusiva*, in *Danno e Resp.*, 2010, 10, p. 927.

[19] App. Roma, 07 March 2005, n. 1015, *Corr. giur.*, *cit.*, p. 668 ss.

[20] F. Cafaggi, *Immunità per i produttori di sigarette*, *cit.*, p. 76.

[21] See *Bat Italia*, above.

[22] Art. 103, lett. b), Cod. Cons.

[23] Art. 103, lett. b), Cod. Cons.

A problem with *Bat Italia* is that the Court, having distinguished activity-product that is "dangerous" from products that are "defective,"[24] failed to coordinate the domestic rule that it announced with the principles of the European Community relating to these issues of liability. In fact, the Bat Italian Court failed to realize that the tobacco product is not only "harmful" (as defined by the court) but also "unsafe" for the purposes of Government regulation.

This is a conflict between the legality of putting into the stream of commerce a product which, under normal or reasonably foreseeable circumstances, is "unsafe" (according to Article 103 of the Consumer Code) and the legal force of the Regulations that allow production and marketing of tobacco products.

The Difficulty of Simplifying a Complex Problem Objectively

The contrasting decisions of Italian courts in the saga of tobacco-smoke litigation underscore a need to strike a balance between the responsibility of the manufacturer, who must bear the risk for having released a product without safety requirements required by the law, and the choice of the smoker, who cannot be considered unaware of the harmfulness of the product.

The most recent judgments, in fact, turn the focus on the issue of causation.

In April 2011, the Rome Tribunal issued an order denying class certification in the first attempt of class action against cigarette producers.[25] Although the denial was based mostly on lack of commonality, the Rome court also addressed the issue of causation, finding that

> "the act of the smoker (consumption of cigarettes) is in and by itself a direct and exclusive cause of the event (the damage by smoke). The behavior of the damaged consumer cuts the chain of causation and is a factor intervening between damaging consequences and the production and distribution of cigarettes, which is no longer the immediate and direct cause of the damage, as required by law."[26]

The Court of Appeal upheld the order of the Rome court, reconfirming that the general rule on concurrent fault of the tort victims (Article 1227 of the Civil Code) applies also to the cases of strict liability for dangerous activity under Article 2050 of the Civil Code.[27] However, Article 1227 states a principle of comparative negligence, not of contributory negligence, bearing only on the amount of the damages and strictly not on causation.

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[24] On the distinction between "product liability" and "dangerous activity," see M. Franzoni, *Fatti illeciti*. Artt*. 2043-2059*, *Commentario del Codice Civile Scialoja-Branca*, a cura di F. Galgano, *sub art. 2050*, Bologna-Roma, 1993, p. 538.

[25] Trib. Roma, XIII sez., 01 April 2011.

[26] *Id*.

[27] Art. 1227 Civ. Cod., loosely translated, reads as follows: "If the negligence of the plaintiff contributed causing the damage, compensation is reduced according to the gravity of the plaintiff's negligence and the magnitude of the consequences that resulted. Compensation is not due for any damage that the creditor could have avoided by using ordinary diligence."

Conclusion

The contrasting trends of Italian jurisprudence seem united by a common goal: to find rational legal grounds for allocation of responsibility in a perspective of pure private enforcement, balancing protection of consumers with freedom of exercise of a Government-approved activity. However, the courts are still struggling with the problem of how to shift the blame on one of the two subjects. The answers given are plagued by antithetical criteria of judgment moved by opposing ideologies.

In the light of the above, it seems appropriate to reflect on the role of courts for the solution of the problems. In a comparative context, Italian scholars looking at the American experience of tobacco litigation perceive the role of the American courts as fading, the focus there being on the different issue of deceptive advertising.[28]

It is the author's opinion that the use of civil liability litigation is not the best solution to solve the problems of tobacco-smoke related damages. A general consensus seems to exist, that judicial intervention on compensation of victims is not the solution, as the tobacco consumer may be unable to resist and not just be unaware of the risk.

The *Bat Italia* litigation may compound the conundrum and steer Italian law to a path of isolation from the legal trends in the European Union and the United States. In fact, it seems unlikely that the *Bat Italia* principle may find followers in Europe or overseas, in which case Italian law would become an unlikely leader in an innovative direction.

The author believes that only an exercise in social policies may help finding a solution and only in a comparative context.

About the Author

Roberto Carleo (r.carleo@legaletributario.net) was born in Napoli in 1968. After completing *cum laude* his law degree at the University of Rome Law School (*La Sapienza*), he earned his doctorate degree (Ph.D.) at the University of Naples (*Università di Napoli Federico II*) in Rights of Companies in Crisis (*Diritto delle imprese in crisi*). He held a position as Assistant Professor in Private Law at the University of Teramo Law School and shortly thereafter, he became Associate Professor and is now a full tenured Professor in Private law (s.s.d. IUS/01). He currently holds the position of Director of the School of Specialization in Legal Professions at the University of Teramo in addition to teaching a course entitled Institutions of Private Law (*Istituzioni di diritto privato 1*). He is a member of the Scientific Research Committee at the University of Teramo and a member of the Board of Professors of the Doctorate program in European Private Law (*Il diritto privato europeo dei rapporti patrimoniali, civili e commerciali*) at the University of Verona. He teaches Family Law in the LUISS University of Rome, where he also taught European Private Law. He is the author of three books: *Le Vicende Soggettive della Clausola Compromissoria, Prelazione Legale e Interesse dei Creditori,* and *L'esecuzione Anticipata del Contratto.*

[28] V. D'Antonio, *Il danno da fumo e l'art. 2050 c.c.: "Scusate il ritardo,"* in *Danno e resp.*, 2010, 6, p. 569 e ss: "perhaps it is appropriate to ask whether, in Italy as it also happened in the United States, the task of the courts on the issue of smoke damage is running out, having reached the result of identifying a problem that involves interests too complex (and important) to be resolved with the use of legal actions in tort, which are not adequate to supply a solution."

In addition, he is the author of many other essays on arbitration, civil liability, lease, rights of consumers, interpretation of the will, bank foundations, outsourcing, family law, and sector codes.

Discussion Questions

1. Could cigarette producers be held strictly liable on "product-liability" grounds?

2. If tobacco-smoke damages are actionable in product-liability, should Government refuse to issue licenses to tobacco companies?

3. Are tobacco-smoke issues better addressed by advertising regulations rather than by product-liability legal actions?

4. Should tobacco-smoke issues be left to courts of law or to regulation by statutes?

5. How is tobacco-smoke regulated in Europe?

6. Could Italian courts finding cigarette producers liable in product-liability set a precedent for other European nations to follow?

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What is Corporate Diplomacy? And, Why does it Matter?

Alberto Asquer
School of Oriental and African Studies, University of London

Abstract

This study aims to analyze the concept of corporate diplomacy, that is, the behavior of organizational actors aimed at implementing favorable conditions for carrying out corporate activities. By following a cognitive-linguistic approach, the analysis outlines the meaning of corporate diplomacy along various dimensions, and in relation to other "bordering" concepts, such as diplomacy, economic or commercial diplomacy, negotiation, and public relations. The result of the analysis supports a better definition of corporate diplomacy, and offers interesting cues for acknowledging why this activity is an important function that firms should address, especially when they engage in intense relationships with governments, other businesses, and non-profits.

Keywords

corporate diplomacy, negotiation, public relations

Introduction

Although the term "corporate diplomacy" occasionally is employed in both the scholarly and professional literatures, the concept of corporate diplomacy has never received much consideration within organizational analysis or professional managerial discourses. The term "corporate diplomacy" sometimes is used by public authorities and other bodies (e.g., chambers of commerce abroad) and, occasionally, by businesses and non-profits that typically use the terms "public relations," "corporate social responsibility," and "collaborative networking" to refer to the kind of activities generally related to establishing and maintaining cordial and cooperative relationships. The term also rarely is discussed in scholarly works in the fields of political economy, organization studies, or business strategy. Some exceptions include Steger (2003), who discusses the role of corporate diplomacy within the context of the relationships between the firm and its environment; Strange (2000), who considers the role played by corporate diplomacy in

the international political economy, especially within the relationships between firms, and firms and governments; and, finally, Ordeix-Rigo and Duarte (2009), who examine how corporate diplomacy contributes to enhancing the legitimacy and influence of firms within a given social system. On the whole, however, we are left with the sense that corporate diplomacy in general never gained much attention as a subject of study, and did not attract much attention to define its meaning and traits.

The lack of an established body of scholarly literature on corporate diplomacy does not imply, however, that firms do not carry out activities that are relevant for the management of diplomatic relationships between themselves and other entities. Empirical evidence presents various situations where corporate actors establish cordial and cooperative relationships with other firms and public authorities (both national and foreign), especially to attain advantages, both economic and other advantages. Some scholarly works have addressed issues on the dynamics of negotiation between firms, especially in relation to the role played by information asymmetries and other factors in the development of cooperative or conflictual relationships (e.g., Srivastava & Chakravarti, 2009; Thaler, 1988; Samuelson & Bazerman, 1984). However, do these works contribute to capturing the essence of corporate diplomacy? If not, what is corporate diplomacy, and what are its main traits and functions within the management of business firms?

This study presents a conceptual analysis of corporate diplomacy. The analytic method is based on a cognitive-linguist approach developed by George Lakoff (1987; Barzelay, 1997) of the University of California, Berkeley. According to this approach, the analysis of the meaning of abstract terms and expressions should be conducted by identifying idealized cognitive models that characterize the concept under examination as a whole. Moreover, the definition of abstract terms and expressions such as "corporate diplomacy" should be distinguished from similar concepts by contrasting and comparing the concept under consideration to similar ones score on multiple dimensions. Moreover, the conceptual definition of a term does not necessarily correspond to a dictionary definition, provided meaning is constructed through the identification of similarities and differences between the concept under consideration and related concepts. When applied to the concept of corporate diplomacy, this approach allows us to distinguish between the meaning of the term and other, "bordering" concepts, such as diplomacy, economic diplomacy, commercial diplomacy, and terms commonly understood as referring to closely related activities, such as negotiation or public relations.

The aim of this study is to provide a more accurate definition of corporate diplomacy than the one generally presented within the extant scholarly literature and professional management circles. The rationale for this study is that the term corporate diplomacy is too vague without a precise understanding of those activities that contribute to corporate diplomacy, the objectives of these activities, and what constitutes effective performance of corporate diplomacy activities. In other words, if corporate diplomacy is not adequately defined, this term may be thought to include too broad a range of organizational behavior activities intended to result in favorable conditions for the accomplishment of organizational goals. Accordingly, the meaning of the term may be obfuscated and cannot provide a useful conceptual tool for the analysis of organizational behavior or a description of managerial efforts.

Corporate Diplomacy: A Framework for Analysis

As a preliminary and working definition, corporate diplomacy can be understood as a range of activities aiming at generating favorable conditions for carrying out a firm's activities and accomplishing organizational goals. Corporate diplomacy, in this sense, includes activities such as influencing economic and social actors in order to create and exploit business opportunities, to collaborate with public authorities and regulators that affect commercial and investment processes, and to prevent possible conflicts with external stakeholders and minimize related political risk, and attract the favor of the media and opinion leaders to safeguard corporate image and reputation (Saner et al., 2000; Ghemawat, 2010). According to Steger (2003), corporate diplomacy is

> an attempt to manage systematically and professionally the business environment in such a way as to ensure that 'business is done smoothly' - basically with an unquestioned 'licence to operate' and an interaction that leads to mutual adaptation between corporations and society (in a sense of co-evolution). (pp. 6-7)

For Ordeix-Rigo and Duarte (2009), corporate diplomacy is "a valid way for organizations to extend their social power and influence and thus achieve their status of institutions within society" (p. 557) especially for the operation of trans-national corporations.

Corporate diplomacy can be performed within diverse relationships. Strange (2000), for example, distinguishes between corporate diplomacy between firms and national governments, and corporate diplomacy between different firms. In the first case, corporate diplomacy relates to the ways firms (particularly multi-national and trans-national corporations, and other economic actors within internationalization processes) pursue their objectives, taking into account the industrial and commercial policies of governments, both at home and in foreign markets. In the second case, corporate diplomacy relates to the behavior of firms with respect to other firms, especially within the context of partnerships, strategic alliances, and joint ventures. Depending on the circumstances, firms adopt different styles of behavior. On certain occasions, for example, firms try to stimulate public authorities and national regulators in order to provide more favorable rules and regulations. On other occasions, they try to persuade other firms to collaborate in joint projects that can result in mutual benefits.

Following the cognitive-linguist approach (Lakoff, 1987), the definition of corporate diplomacy is developed here along five dimensions, namely what role actors play, the organizational (or inter-organizational) context where they operate, the objectives of activities, the desired performance of these activities, and the kind of activities performed. These dimensions are selected according to a functional logic related to who carries out corporate diplomacy (actors), where (organizational context), why (objectives), how well (desired performance), and how (activities). Moreover, the meaning of corporate diplomacy is defined in relation to the meaning of bordering concepts, such as diplomacy, economic diplomacy, commercial diplomacy, negotiation, and public relations. The summary of the analysis is shown in Table 1.

Table 1
Comparative Analysis of Corporate Diplomacy and Other Bordering Concepts

Field of activity	Organisational venues	Desired performance	Objectives of the activity	Mode of operation	Role of actor(s)
Diplomacy	Inter-governmental	The pursue of peaceful means for conducting business between states	To build and sustain positive and constructive relations between states	Advising, organising, negotiating, information gathering and analysis, rules compliance, ambiguity handling	Facilitators
Economic/commercial diplomacy	Inter-governmental or firm-government	The pursue of economic gains and advantages for countries	To promote exports, attract inward foreign investments, and stimulate other economic activities	Advising, networking, negotiating, gathering information and analysing it, and conflict handling	Professional 'salesmanship'
Corporate diplomacy	Firm-government or inter-firm	The pursue of economic gains and advantages for business companies	To establish favourable conditions for business companies' activities	Creating and seizing business opportunities, safeguarding image and reputation of business companies, affecting rule-making, conflict prevention	Entrepreneurial broker
Negotiation	Firm-government or inter-firm	The pursue of a more advantageous situation than the status quo	To improve own position in the negotiation table	Affecting perceptions, redefining the object of negotiation, linking different negotiation tables	Persuader

Public relations	Inter-firm or inter-personal	The pursue of the interests of the organisation or of the public	To actively reap opportunities or react to threats	Communicating, cooperating, issue management, gathering information, defining responsibilities, embrace change, anticipate trends.	Strategic relationship managers

Bordering Concepts of Corporate Diplomacy

The first step in defining the meaning of the concept of corporate diplomacy is to look at the features commonly attached to the term diplomacy. Diplomacy is a field of human political activity that relates, broadly, to the process of communicating, negotiating, and sharing information between nation states (Lee & Hudson, 2004). According to a narrower definition, diplomacy also can be understood as the application of intelligence and tact to the conduct of official relationships between governments of independent states, or the conduct of business between countries through peaceful means (Stow, 1917, quoted in Gore-Booth, 1979). Diplomacy is a complex and variegated activity that includes all actions carried out by political actors and representatives of countries that typically operate through embassies, consulates, ministries of foreign affairs, or international organizations, and that provide advice to decision-makers on national policies, organize forms and methods for establishing relationships, solving problems, negotiating, gathering and analyzing information, managing ambiguous situations with prudence and tact, and observing stringent codes of conduct (including international treaties as well as etiquette). The organizational context wherein these activities are typically carried out is the one of inter-governmental relations. Activities are generally are oriented toward managing the relationships between countries in a peaceful way, rather than with recourse to physical struggle, and to establishing and maintaining positive and constructive relationships between countries over time (Saner et al., 2000). The ultimate objective of diplomacy often is conceived as that of maintaining order between countries, especially in relation to the presumed state of anarchy that would otherwise characterize international relations (Lee & Hudson, 2004). Diplomatic activity, moreover, typically is conducted by actors that ideally possess specific personal traits and education, such as "truth, accuracy, calm, patience, good temper, modesty, loyalty, intelligence, knowledge, discernment, prudence, hospitality, charm, industry, courage and tact" (fulfilling this list of features constitutes the so-called Nicolson test, named after the British diplomat Sir Harold Nicolson) (Saner et al., 2000, p. 84).

Within the field of diplomacy, some disciplines and professional circles acknowledge the existence of more specialized areas of activity, such as economic diplomacy and commercial diplomacy. The meaning of these terms sometimes overlaps, although it is possible to attribute a somewhat broader connotation to the former (in the sense it involves diplomatic activities related to economic relationships between countries) than the latter (which may relate more precisely to commercial, i.e., trade, relationships, rather than industrial ones). Generally,

economic or commercial diplomacy is understood as a particular branch of diplomacy keyed to obtaining economic advantages for countries (Rana, 2002; Lloyd, 2003; Coolseat, 2004; Yeung, 2004; Visser & Ruel, 2012) in terms of higher growth rates, creation of jobs, and increase of tax revenues (Kotable & Czinkota, 1992). The objectives of economic or commercial diplomacy typically carried out in such venues as bilateral, regional, or multilateral negotiations, often are achieved through actions that include providing advice to national economic actors, assisting business firms in the penetration of foreign markets, negotiating favorable rules and regulations for international trade and foreign investments, carrying out foreign market intelligence, and preventing or mitigating conflicts between economic actors from different countries (Naray, 2008; Carron de la Carrière, 1998; Hibbert, 1990). Actors of economic or commercial diplomacy (typically members of diplomatic offices abroad) often develop specific salesmanship skills, including the capacity to persuade others about the merits of economic and commercial operations and policies.

Within the field of management, negotiation is an area of activity that conceptually relates closely to corporate diplomacy. Negotiation is, in effect, a fundamental function of managerial behavior, in both internal (e.g., among subordinates and senior staff) and external relationships (e.g., among clients, suppliers, investors, and shareholders). Various studies on the structure and dynamics of negotiation highlight how skilled negotiators behave when trying to attain satisfactory performance (that is, striking a deal that leads to an improved state of affairs with respect to the status quo), including tactics such as altering the views of counterparts on the terms of the negotiation, redefining the object of negotiation, and establishing linkages between different negotiation tables (Lax, 1987; Raiffa et al., 2002). Negotiators typically possess certain specific traits, such as listening skills, the ability to analyze complex situations and manage conflict, and the capacity to persuade.

Another area within the field of management that closely relates to corporate diplomacy is public relations. Although defined in various ways, public relations generally are understood as those activities intended to support an action, a cause, a movement, or an institution (Bernays, 1947). More broadly, public relations generally is understood as a managerial function that helps establish and maintain open channels of communication, understanding, acceptance, and cooperation between an organization and the public, with the aim to solve problems and issues that may arise with other organizations, gather and provide information on public opinion, define and highlight how the organization contributes to serve the public interest, and tackle current pressures on changing and emerging trends (Harlow, 1977). Public relations are carried out through various activities intended to protect the interests of the firm and the public. These activities may be either proactive or reactive with respect to the opportunities and threats arising from the environment. Also, they may be focused on substantial issues or on fictitious ones brought to public attention as a way to accomplish covert objectives. Public relations managers generally play the role of strategic relation managers, which includes performing the part of persuaders, advocates, educators, councilors, and intermediaries, depending on circumstances (Hutton, 1999; Tadajewski, 2009).

The Traits of Corporate Diplomacy

Corporate diplomacy presents well-defined traits with respect to the bordering concepts described above. The organizational context wherein corporate diplomacy takes place is that of the relationship between firms and public authorities (i.e., governments), or between firms (i.e., inter-firm), rather than between governments (i.e., inter-governmental), as in economic and commercial diplomacy. The desired performance of corporate diplomacy, moreover, is that of attaining economic advantages for the firms involved (especially, for the firm where the corporate diplomats operate). A broader connotation of the term diplomacy typically is related to actions intended to attain economic advantages for countries on the whole (although, these actions also may target the specific interests of particular firms or industries). Other concepts, like those of negotiation and public relations, relate to a more narrow meaning than the one presented here for corporate diplomacy, insofar as these refer to specific negotiation settings, or situations where the firm copes with public opinion (Macnamara, 2012).

Corporate diplomacy also is distinguished from other bordering concepts in more practical terms. Corporate diplomacy is circumscribed within an area of activities that relate to creating and seizing business opportunities, safeguarding the image and reputation of the firm, affecting the making of rules, and preventing conflicts. In part, these activities seem to overlap with those that also characterize the other concepts. For instance, activities associated with diplomacy, economic diplomacy, or commercial diplomacy may be intended to affect the formation of rules (such as those regarding custom duties or foreign investments), or to prevent potential conflicts. Also, negotiation activities may be intended to create and seize business opportunities, and public relations activities may aim to safeguard the image and reputation of the firm. Corporate diplomacy, however, combines these activities in a selective and peculiar way, insofar as they play a functional role to create more favorable conditions for carrying out the company's activities. Instead, diplomacy, economic diplomacy, and commercial diplomacy generally are intended to improve relationships between countries (with the effect of promoting exports, attracting investments, and stimulating economic activity). Within negotiation, activities are intended specifically to improve bargaining positions and increase the possibility to strike an advantageous deal. Within public relations, activities are focused on tackling a particular issue arising from opportunities or threats from the environment, using either a proactive or reactive stance.

Corporate diplomacy also presents specific features with respect to the role played by actors. The role of diplomats (and of other actors of the diplomatic corp) can be characterized as that of facilitators who help establish and maintain relationships over time. Actors that perform activities of economic or commercial diplomacy may be conceived as professionals of salesmanship that aim to attain economic advantages for countries as wholes. The role of negotiators mainly is related to that of persuaders that aim to affect the perceptions and beliefs of counterparts. Instead, the role of operators of public relations is characterized broadly as that of strategic relationship managers who attend to the quality of communications between firms and public opinion. With respect to these roles, the corporate diplomat can be characterized as an entrepreneurial broker because, on the one hand, she or he performs a function of mediation between parties that potentially can gain from collaboration, and, on the other, the diplomat performs an entrepreneurial function by searching, discovering, conceiving, and implementing favorable conditions for the conduct of corporate activities (Ruel & Visser, 2012).

Finally, corporate diplomacy can be discussed in relation to the neighboring concept of business diplomacy. Although the two terms may be considered synonymous, business diplomacy generally refers to activities conducted between economic actors that are not necessarily corporations or that do not pursue the interest of any specific company. Business diplomacy, in this sense, may be performed by entrepreneurs and businesspersons as individuals who seek to attain personal economic benefits, rather than to pursue organizational objectives. Business diplomacy, moreover, also may be performed by organizations (such as chambers of commerce abroad) that intend to create favorable conditions for the conduct of business activities for the sake of a community of firms, rather than a specific company. Accordingly, business diplomacy may be conceived either as a particular form of corporate diplomacy, or as a type of business procurer not necessarily conducted within the corporate context.

Conclusions

This study offers an analysis of the concept of corporate diplomacy intended to overcome current weaknesses in the use of this expression within both the academic literature and professional circles. The analysis suggests corporate diplomacy can be defined more precisely than it is regarded in the extant literature and press. By following a cognitive-linguist approach, the analysis outlined the meaning of corporate diplomacy in relation to bordering concepts, such as diplomacy, economic diplomacy, commercial diplomacy, negotiation, and public relations. By qualifying the meaning of corporate diplomacy, the result of this study helps prevent the risk that this expression is applied in a vague sense, with the effect of losing any relevance and usefulness as a category of analysis and component of the discourse on management practices.

The analysis shows corporate diplomacy plays a different function than the one of economic or commercial diplomacy (which typically does not relate to specific firms), negotiation (which is generally circumscribed within specific bargaining settings), and public relations (which often addresses public opinion in general, rather than specific business circumstances). There is little evidence, however, that companies acknowledge the peculiar role of corporate diplomacy, or that they devote resources and effort to improving the effectiveness of their corporate diplomats. Although, as previously mentioned, corporate diplomacy is not discussed widely in academic or professional circles, it is, nevertheless, important for firms that engage with public authorities or other (both national and foreign) companies. In part, this lack of attention may be related to the fact that activities that may be appropriately conceived as instances of corporate diplomacy often are framed within other bordering concepts. The explicit recognition of the concept and function of corporate diplomacy can lead to a better understanding of the actions performed, why they are performed, and what role they play for the attainment of a firm's objectives.

Last, the analysis highlights that corporate diplomacy is carried out through various, complex activities. Effective corporate diplomats need to master a wide range of skills and capabilities that may overlap with those commonly possessed by diplomats, negotiators, and public relations managers. In part, these skills and competences, including gathering and analyzing information, providing advice, and establishing and maintaining relationships with institutions and other firms, may relate to some innate personal features. In part, however, they may be acquired through targeted training programs akin to those typically provided for

diplomats and professional negotiators. It seems pivotal, therefore, that firms select the most appropriate talents in order to fill organizational positions that require the extensive management of relationships with outside entities, that they provide them with appropriate training to develop their analytic and social skills, and that they furnish them with appropriate resources and tools.

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About the Author

Alberto Asquer, Ph.D. (aa144@soas.ac.uk), is a lecturer of Public Policy and Management at the School of Oriental and African Studies, University of London. He teaches in courses about public policy and management, regulation and regulatory reform, and privatization and public-private partnerships. His research works have been published in the *International Public Management Journal; Governance, Competition, and Regulation in Network Industries; Utilities Policy; and Water Policy.* He was lecturer at the University of Cagliari, Italy; visiting fellow at the Robert Schuman Centre for Advanced Studies at the European University Institute (Florence); and visiting researcher at CESIfo (Munich), the Higher School of Economics (Moscow), and the Mirbis International Higher Business School (Moscow).

Discussion Questions

1. What are the functions performed by corporate diplomacy? How do they differ from other similar inter-organizational activities?

2. Why should corporate diplomacy be regarded as an important function for companies in nowadays' business and regulatory environment?

3. What are the traits that corporate diplomats should possess or acquire?

4. How would you research the issue of whether corporate diplomacy affects companies' performance?

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Revisiting Sport Brand Personality: Scale Development and Validation

Young Do Kim
Florida State University

Marshall Magnusen
Baylor University

Yukyoum Kim
Florida State University

Abstract

Comprehensive brand personality conceptualizations may not be applicable to a single category goods or service brand personality because such approaches are too broad and overstated. Furthermore, different brand categories need to be specified and conceptualized according to their own distinctive features. With those observations in mind, as well as the absence of a valid and reliable sport brand personality measurement tool, the purpose of this study was to create a sport brand personality scale centered on sports apparel and footwear. Using Korean sport consumers, six sport brand personality factors were identified: Competence, Creativity, Ruggedness, Excitement, Sincerity, and Energy. A valid and reliable sport-centric brand personality scale also was developed. The instrument includes a total of 18 items, with each of the six brand personality factors consisting of 3 items. Included in the discussion section is an explanation of the research implications, managerial applications, and limitations of the developed brand personality scale.

Keywords

sport brand personality, personality traits, creativity, footwear, sports apparel, sport consumers

Introduction

Sport organizations throughout the world have given greater priority to brand management strategies, investing hundreds of millions if not billions of dollars on such activities. The European soccer club Manchester United, for example, enjoys the most lucrative jersey sponsorship deal in soccer history. The deal with Chevrolet (a U.S. automaker) is worth more than US$559 million over 7 years (Cutler, 2012). Additionally, Nike, the sport apparel and footwear giant, spent more than two billion dollars on the marketing and promotion of its products in 2010. To put that in perspective, Under Armour, a rival to Nike, generated more than a billion dollars in revenue that same year (a first for the company in its 15 year history), and yet its total revenue was still less than half of what Nike spent on promoting its brand alone (Burke, 2011).

Along with sport teams and firms, sport scholars also have embraced brand management strategies, devoting increasing amounts of attention toward understanding how to build strong, favorable, and distinctive brands in order to positively affect sport consumer attitudes and patronage behaviors (e.g., Bauer, Stokburger-Sauer, & Exler, 2008; Gladden & Funk, 2002; Ross, 2006). In particular, an area of branding research that has both piqued the interest of and proven challenging for sport scholars to comprehend sufficiently is brand personality. A key reason brand personality research has proven challenging for sport researchers is that, despite several research attempts, a reliable measure of brand personality has yet to be produced. Braunstein and Ross (2010), for example, developed an adapted sport brand personality scale (BPS) that was met with mixed success as only two of the six dimensions were found to be reliable (i.e., good estimates in both Cronbach's alpha and average variance explained).

Therefore, the primary objective of this study is to improve upon past research efforts and develop a scale that can be used to measure brand personality in the context of sport products (i.e., sport apparel and footwear). In doing so, this study not only creates a brand personality measurement tool but also highlights the benefits and inherent limitations of a general scale development approach to sport brand personality research. Preceding the research method and results sections of this study is a brief review of the relevant brand personality literatures as well as a more detailed explanation of how this study makes an important contribution to sport marketing research and practice.

Literature Review

The brand personality concept tends to be depicted as a key measure for understanding consumer perceptions of and attitudes toward brands, in addition to serving as a communication guideline for brand strategists to reference when engaging consumers (Aaker, 1996). More specifically, in her seminal work on brand personality, Aaker (1997) held the concept to reflect the associations of human characteristics with a specific brand. Plummer (2000) likewise defined brand personality as "the characterization aspects of the brand" (p. 81). However, Azoulay and Kapferer (2003) viewed such approaches as too broad and vague. As a result, they defined brand personality as "the set of human personality traits that are both applicable to and relevant for brands" (Azoulay & Kapferer, 2003, p. 151). Of the various definitions found in the extant literature, Azoulay and Kapferer's revised conceptualization appears to provide a clearer and

more precise explanation of brand personality, and it, therefore, represents the version employed in this study.

Although by no means as extensive as the body of research established in the business literatures, several relevant approaches to examining brand personality research have emerged in the sport marketing literature. Forming the foundation for the first approach is the work of Aaker (1997). She developed the concept of brand personality and then, looking to the personality research of Goldberg (1992), developed a five dimensional scale for assessing the construct that subsequently has been used and adapted across a multitude of cultures and situations (Aaker, 1997; Aaker, Benet-Martinez, & Garolera, 2001; Beldona & Wysong, 2007; Bosnjak, Bochmann, & Hufschmidt, 2007; Supphellen & Grønhaug, 2003). By extension, one approach undertaken by sport marketing scholars has been the application of Aaker's brand personality scale to a sport context (Cho, 2004; Rosenberger & Donahay, 2008; Ross, 2008; Smith, Graetz, & Westerbeek, 2006). However, despite repeated attempts, sport scholars who have undertaken this approach to sport brand personality have yet to demonstrate sufficiently that Aaker's original scale is fully applicable to sports teams.

Next, a growing number of studies (Austin, Siguaw, & Mattila, 2003; Azoulay & Kapferer, 2003; Bosnjak et al., 2007; Gladden & Funk, 2002; Parent & Séguin, 2008; Ross, 2008; Smith et al., 2006) lend support to the notion that general brand personality conceptualizations, such as Aaker's brand personality framework, may not be automatically applicable to sports. The reason this may be the case is that only three sport brands were selected as representative examples of sport brands (ESPN station, Nike athletic shoes, and Reebok athletic shoes) in Aaker's study (1997). Therein, she developed four brand groups, and each group consisted of nine brands. Three of the groups had one sport brand; however, one of the four groups did not have a sport brand. Moreover, when she confirmed the brand personality dimensions she generated, no sport brand was selected and matched to a confirmatory sample of brands. Consequently, sport scholars have sought to develop and individualize the brand personality "concept on their own turf" (Braunstein & Ross, 2010, p. 8).

Of note, Braunstein and Ross (2010) made an effort to develop the BPS, which consisted of 6 brand personality factors and 41 items. Even though this attempt was met with mixed success, their adapted scale nevertheless reflected a much needed divergence from the more frequently employed approach of applying Aaker's (1997) scale to sport brands. Therefore, given potential problems with using Aaker's scale, as well as the absence of a reliable and valid sport-specific brand personality scale, the development of a usable scale to evaluate the unique personalities of sport brands has great research and practical value for the study and execution of branding activities in sport marketing.

Accordingly, one main contribution of the present study is the development of a sport brand personality scale specific to sport goods. This aspect of the study holds two-fold significance to the sport marketing literature. First, though Aaker's (1997) seminal work represents a prominent cornerstone of brand personality research, it has come under increasing scrutiny in recent years. At the core of these criticisms are issues of scale validity and applicability to various contexts and products (Austin et al., 2003; Azoulay & Kapferer, 2003; d'Astous & Lévesque, 2003), a point that several sport-based studies also have observed (e.g., Heere, 2010; Ross, 2008; Smith et al., 2006). This study, therefore, is advantageous to sport scholars because it

does not attempt to fit Aaker's scale to a sport context. It seeks, instead, to develop a unique sport brand personality scale.

Second, and in tandem with the first point, sport management scholars have paid minimal attention to the development of distinctive sport brand personality scales. One contemporary exception is Braunstein and Ross (2010); they focused on professional sport teams and developed the BPS. However, when discussing their newly adapted scale, they noted "the reliability and validity of the BPS scale, in its current state, do not provide a sufficiently sound instrument" (Braunstein & Ross, 2010, p. 13). Although the approach of this study does not address all of the limitations of the extant sport branding literature, the creation of a valid and reliable sport-based brand personality scale represents a significant and positive advancement.

Method

Overview

In the present study, the development of a brand personality scale centered on apparel and footwear as represented by the well-known sport companies Nike and Adidas in 2010 (Korean Management Association Consulting) (see Table 1). The rationale for the apparel and footwear was grounded in the following information. The Korean sport industry is classified into three areas: (a) sport facility, (b) sport product, and (c) sport service. The sport product category consists of five subcategories: sport equipment, sport apparel and shoes, sport food and drink, wholesale and retail trade, and online trade. In 2009, the market size of the apparel and sport footwear subcategory was approximately $1.2 billion US dollars (34% of the total sport product market); this was the largest of the five subcategories (Ministry of Culture, Sports, and Tourism, 2009), which is the reason the researchers conducting this study selected it as the focal product category.

Table 1
Selection of Sports Brands (Apparel and Footwear)

Items	Products	1st Priority	2nd Priority	3rd Priority
Customer Satisfaction Index (KCSI)	Footwear	Nike	Adidas	Pro-specs
Brand Power (K-BPI)	Apparel	Nike	Adidas	Puma
	Footwear	Nike	Puma	Adidas
Design Power (K-DPI)	Apparel	Nike	Adidas	Reebok
	Footwear	Nike	Adidas	Reebok
Finally Chosen Brands	All	Nike	Adidas	

Participants

The target population for this study was University students attending colleges and universities located in the Seoul and Gyeonggi Provinces in Korea. Out of 500 questionnaires, 55 survey questionnaires contained incomplete responses. This resulted in 445 (a response rate of 89.4%) questionnaires being suitable for data analysis. The respondents consisted of 303 male (67.8%) and 144 female (32.2%). Approximately, 59.5% of the respondents were between 20 and 25 years old, 27.5% were in the 25 or higher age range, and 13% were between 18 and 20 years old.

Measures

The researchers conducted two separate surveys as part of a two-stage process to develop a sport brand-specific personality measurement tool. Similar to the research of Ross, James, and Vargas (2006), the first stage was the generation of items stage; it included a free-thought listings questionnaire. A convenience sample of 200 students who were enrolled in sport, recreation management, and physical education courses at a large university in Seoul, Korea, completed the free-thought listing questionnaires. This resulted in a total of 107 sport brand personality traits.

The second stage was "the purification stage." In this stage, sport brand apparel and footwear consumers completed the questionnaire consisting of 107 sport brand personality traits. The second stage of the survey involved developing the final arrangement of sport brand personality traits. To improve the appropriateness of the identified sport brand personality traits, a total of 38 teaching assistants, research assistants, and instructors who were majoring in sport management participated in the survey. They responded to the questionnaire items on a 7-point Likert-type scale ranging from 1 (very inappropriate) to 7 (very appropriate). Next, an expert panel of scholars, including four sport marketing professors and one brand management researcher, selected only sport brand personality traits averaging 5.0 or higher. The panel, using the criteria of 5.0 or higher, selected 47 sport brand traits for inclusion in the final sport brand-centric personality questionnaire.

Data Analysis

During the data analysis process, questionnaires deemed to be redundant, insufficient, and/or conceptually unreliable were excluded and only the remaining questionnaires were restructured. To start, an exploratory factor analysis (EFA) was conducted using predictive analytics software and solutions (PASW) statistics 18.0. This was done in order to identify and consolidate potential underlying factors of the sport brand-centric personality scale (Tabachnick & Fidell, 2007). Principal axis factoring with varimax rotation was used in order to reduce the number variables in a model to the smallest number as possible. The varimax method is also focused on the interpretation of factors while at the same time maintaining their independence from one another.

In order to determine an appropriate number of factors, three criteria were used: (a) The Kaiser criterion (eigenvalue are greater than 1; Kaiser, 1970), (b) scree test (Catell, 1966), and (c) interpretable criteria (loading with excess .45 is fair; Comrey & Lee, 1992). Additionally, in

order to verify the extent to which items consistently reflect a single construct, an internal consistency reliability analysis was conducted using Cronbach's α. This was done to indicate the degree to which the items are interrelated (Johnson & Christensen, 2008). For purposes of the present study, the cutoff criterion was set at .70 (Nunnally, 1978).

After this step, a confirmatory factor analysis (CFA) was conducted to evaluate the measurement model representing "how measured variables reflect certain latent variables" (Thompson, 2010, p.110) using Mplus 6.0 software (Muthén & Muthén, 2008). According to Hu and Bentler (1999), in order to evaluate the overall fit of a model, several goodness of fit indices also need to be estimated: (a) chi-square (statistically non-significance is favorable), (b) the comparative fit index (greater than .90 or .95 demonstrates "reasonable" fit), (c) the root mean square error of approximation (equal to or less than .05 corresponds to a "good" fit), (d) the standardized root mean square residual (smaller than .08 is "favorable" fit), and (e) the Tucker-Lewis index (greater than .90 or .95 demonstrates "reasonable" fit).

Results

Exploratory Factor Analysis

Three criteria (i.e., eigenvalue, scree test, and factor loading) were assessed with the 47 sport personality traits generated from the two separate item generation processes. The analysis revealed that six factors were initially structured based on eigenvalues greater than 1. This six-factor model was also supported by the scree plot test. Among the six factors, 19 items were eliminated based on factors loadings lower than .45. The first factor was Competence; it consisted of 10 items. The second and third factors were Creativity and Ruggedness; they consisted of 7 items. The fourth factor was Excitement, which consisted of 4 items. The fifth factor was Sincerity, and it included 3 items. The sixth and final factor was Energy; it consisted of 6 items.

Cronbach's α for each factor was as follows: .876 (Competence), .849 (Creativity), .844 (Ruggedness), .843 (Excitement), .863 (Sincerity), and .818 (Energy). All these values were greater than .70, which was the criterion established by Nunnally (1978). The EFA results indicate that Korean sport consumers recognized the six-factor model with 37-items of sport brand personality (see Table 2).

Table 2
Results of Sport Brand Personality Factors

Factors	Details	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Cronbach's α
Competence	Competent	.768	.008	.100	.055	.151	.174	.876
	Specialized	.734	.016	.080	.043	.017	.097	
	Able	.705	.135	.141	.143	.109	.182	
	Leadership	.648	.025	.211	.145	.067	.175	
	Advanced	.599	.290	.146	.168	.180	-.132	
	Technical	.599	.138	.118	.048	.104	.028	
	edge	.570	.095	.143	.195	.229	.043	
	Confident	.556	.244	.156	.228	.156	-.191	
	Modern	.549	.149	.186	.047	.067	-.155	
	Global	.526	.224	.075	.196	.154	.030	
	Success-oriented							
Creativity	Original	.223	.772	-.005	.050	.075	.006	.849
	Unique	.107	.733	.045	.128	.004	.058	
	Creative	.260	.716	-.047	.173	.155	.068	
	Imaginative	.251	.664	-.030	.231	.237	.149	
	Fresh	.123	.595	.098	.291	.108	.206	
	Open-minded	.001	.528	.294	.158	.129	.071	
	Adventurous	-.040	.501	.248	.078	.259	.013	
Ruggedness	Strong	.141	.089	.757	-.108	.029	.009	.844
	Tough	.101	.041	.735	-.106	.037	.032	
	Brave	.145	.068	.714	.131	.015	.219	
	Healthy	.295	-.046	.623	-.064	.064	.138	
	Devoted	.093	.131	.614	.303	.118	.210	
	Enthusiastic	.210	.171	.558	.246	.249	.049	
	Eager	.154	.135	.539	.283	.205	.150	
Excitement	Witty	.169	.167	.019	.792	.067	.091	.843
	Fun	.120	.162	.069	.756	-.011	.061	
	Exciting	.194	.216	.043	.718	.075	.007	
	Pleased	.237	.116	.119	.661	.170	.022	
Energy	Lively	.111	.030	.082	.205	.788	-.022	.818
	Cheerful	.065	.017	.024	.209	.749	.072	
	Vigorous	.129	.162	.083	.229	.703	.059	
	Quick	.207	.172	.047	-.053	.625	-.108	
	Dynamic	.198	.213	.149	-.183	.595	-.209	
	Active	.240	.102	.058	-.049	.573	-.205	
Sincerity	Sincere	.164	.133	.256	.132	-.138	.691	.863
	Diligent	.155	.230	.237	.117	-.107	.675	
	Hardworking	.240	.196	.282	.101	-.120	.660	
Eigenvalue		12.402	3.685	2.759	2.447	1.969	1.750	
% of Variance		26.387	7.840	5.870	5.207	4.190	3.723	
cumulative %		26.387	34.227	40.097	45.304	49.495	53.218	

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .896
Bartlett's Sphericity Test = 10997.481, df = 1081, sig = .001

Confirmatory Factor Analysis

As a follow up to the EFA, a CFA was conducted to evaluate whether the proposed model of 6-factors with 37-items adequately measured sport brand personality. Prior to conducting the CFA, the multivariate normality assumption was examined using LISREL Version 8.8. Since the normality assumption was not met ($p < .05$), Satorra-Bentler (1994) scaling correction method was utilized to address violation of the normality assumption. Based on the result of the CFA, however, the proposed measurement model through EFA did not fit the data well. Goodness of fit indices indicated that chi-square was significant ($\chi^2 = 2238.19$, $p < .001$), which suggests the model was not favorable. Both the CFI and TLI were not greater than .90 or .95 (CFI=.794, TLI=.776), which also indicated a poor fit (Hu & Bentler, 1999). Further, the RMSEA (RMSEA =.078 >.05) value revealed an unreasonable fit (Hu & Bentler, 1999). Lastly, a favorable SRMR is less than .08 (Hu & Bentler, 1999). In the present study, the reported value was .068 (SRMR = 0.68 < .080). Only this fit index suggests a good model fit to the data (Hu & Bentler, 1999).

Overall, the results of the CFA for the 6-factor model with 37-items revealed that except for the SRMR, other global fit indices were not acceptable. Based on this evidence, the model, with particular reference to the items, needed to be readjusted. Several items were therefore eliminated based on the factor loadings, model modification indices, theoretical considerations (i.e., excessively high correlation between two items and low factor loadings). This process resulted in the removal of 19 items and the creation of a 6-factor instrument with 18-items. The revised instrument consisted of the following factors and item totals: Competence (3 items), Creative (3 items), Ruggedness (3 items), Excitement (3 items), Energy (3 items), and Sincerity (3 items). Once again, before conducting the CFA, the multivariate normality assumption was analyzed. In this case, the normality of this model was still violated ($p < .05$). Thus, the Satorra-Bentler collection was also used in this model, and a CFA was conducted to evaluate if the re-proposed model of 6-factors with 18-items appropriately measured sport brand personality.

From the CFA results it is evident the revised measurement model was a good fit for data once the low factor loading items and highly correlated items were removed. By and large, the goodness of fit indices also provided values supportive of this observation. Chi-square was significant ($\chi^2 = 181.92$, $p < .001$), which implies the model was not favorable. However, the Chi-square statistic is both functionally and statistically affected by a large sample sizes. As a result, the variety of goodness of fit indices was carefully examined.

Both the CFI and TLI were greater than .90 or .95 (CFI=.983; TLI=.979), which indicates a good fit (Hu & Bentler, 1999). The RMSEA was less than .05 (RMSEA =.034 <.05); this indicates reasonable fit (Hu & Bentler, 1999). The SRMR value also indicated a good model fit (SRMR = .034 < .08) according to Hu and Bentler' (1999) criteria (SRMR < .080 or .010).

Table 3
Mean (M), Standard Deviation (SD), and Correlation Matrix

Traits	M	SD	Comp	Lead	Able	Creat	Iamg	Origi	Brave	Eager	Enthu	Fun	Witty	Excit	Delig	Hard	Sin	Cheer	Live	Vigor
Comp	3.75	.924	1.000																	
Lead	3.48	.915	.530	1.000																
Able	3.51	.930	.606	.660	1.000															
Creat	3.28	1.05	.225	.242	.301	1.000														
Imag	3.14	1.02	.235	.269	.374	.724	1.000													
Origi	3.26	1.01	.196	.179	.249	.639	.620	1.000												
Brave	3.25	.868	.195	.283	.279	.212	.274	.185	1.000											
Eager	3.51	.849	.217	.321	.307	.227	.277	.188	.634	1.000										
Enthu	3.43	.877	.275	.295	.285	.235	.324	.232	.555	.571	1.000									
Fun	2.96	.967	.197	.246	.256	.301	.286	.227	.274	.285	.203	1.000								
Witty	2.85	.925	.184	.261	.330	.348	.381	.252	.265	.241	.276	.732	1.000							
Excit	3.10	.900	.239	.212	.250	.317	.384	.301	.275	.235	.309	.532	.622	1.000						
Delig	3.02	.941	.221	.215	.244	.196	.217	.120	.265	.204	.186	.176	.200	.157	1.000					
Hard	3.31	.959	.259	.268	.283	.153	.186	.125	.325	.317	.268	.165	.177	.125	.647	1.000				
Sin	3.16	.896	.203	.240	.220	.119	.149	.101	.290	.278	.199	.176	.157	.111	.631	.754	1.000			
Cheer	3.47	.836	.158	.131	.169	.170	.266	.092	.155	.203	.256	.109	.184	.145	.046	-.012	.008	1.000		
Live	3.68	.830	.218	.184	.197	.201	.245	.150	.183	.199	.257	.118	.204	.211	-.008	-.003	-.021	.629	1.000	
Vigor	3.60	.864	.232	.171	.229	.270	.314	.234	.215	.257	.284	.162	.243	.248	.008	.069	.055	.545	.676	1.000

Note. Comp = Competence, Lead = Leadership, Creat = Creative, Imag = Imaginative, Origi = Original, Enthu = Enthusiastic, Excit = Exciting, Delig = Delight, Hard = Hardworking, Sin = Sincere, Cheer = Cheerful, Live = Lively, Vigor = Vigorous

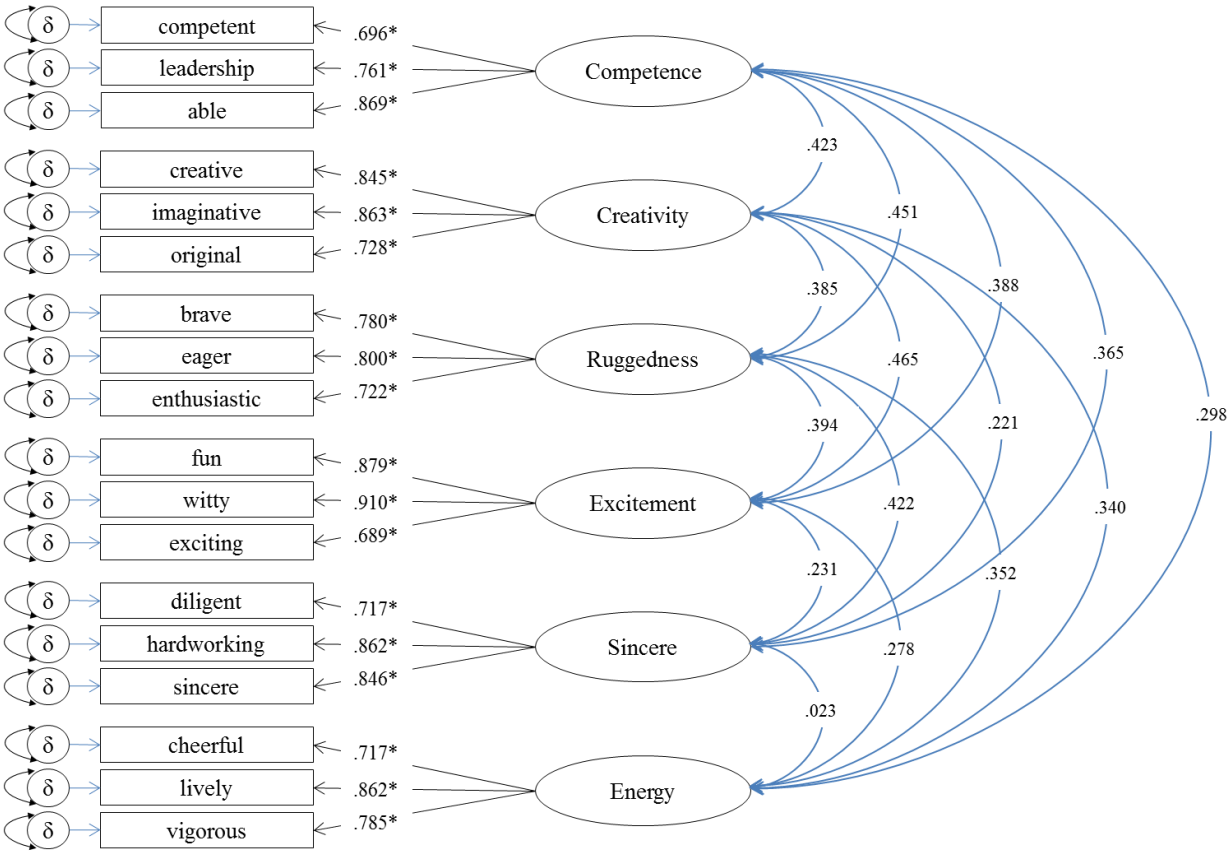
Table 4
Factor Reliabilities, Average Variance Extracted, Individual Item Loadings, and t Values for the Sport Brand Personality Model

Item	Factor Loading	S.E.	t	α	AVE
Competence				.817	.606
1. competent	.696	.030	23.193		
2. leadership	.761	.027	28.193		
3. able	.869	.023	37.730		
Creativity				.855	.663
1. creative	.845	.021	39.724		
2. imaginative	.863	.021	41.632		
3. original	.728	.027	27.215		
Ruggedness				.727	.590
1. brave	.780	.027	29.407		
2. eager	.800	.026	31.118		
3. enthusiastic	.722	.030	24.398		
Excitement				.836	.645
1. fun	.796	.023	34.761		
2. witty	.910	.019	47.119		
3. exciting	.689	.029	23.501		
Sincere				.863	.658
1. delight	.717	.026	28.208		
2. hardworking	.862	.019	47.717		
3. sincere	.846	.020	40.750		
Energy				.827	.624
1. cheerful	.717	.029	25.112		
2. lively	.862	.023	37.130		
3. vigorous	.785	.026	30.128		

The discriminant validity and reliability of all factors were measured. Reliability was evaluated using Cronbach's alpha. Average variance explained (AVE) was also calculated to indicate to the extent which the items on an underlying factor correlated with one another. The AVE values showed that Cronbach's α for each factor was: .817 (Competence), .855 (Creativity), .727 (Ruggedness), .836 (Excitement), .863 (Sincerity), and .827 (Energy). Each factor demonstrated alpha levels that were greater than .70. In addition, Hair, Anderson, Tatham, and Black (1998) suggested that AVE value above .50 have good convergent validity. In this study, each factor indicated AVE values that were greater than .50, thus providing evidence for convergent validity. Discriminant validity was evaluated using AVE values. Fornell and Larcker (1981) suggested that if the AVE value is larger than the squared correlation between two

referent factors, it is evidence of discriminant validity. Thus, the revised model's discriminant validity was satisfied (see Figure 1).

Figure 1. Final model for sport brand personality.



Discussion

Overall, the results of the present study make several contributions to the extant sport marketing and strategic brand management literatures. One promising development is the creation of a sport-centric brand personality scale. Rather than just extend Aaker's (1997) scale to a sport context, we sought to embrace and explore the concept of brand personality specific to the realm of sports. Also, whereas the Braunstein and Ross (2010) scale had mixed reliability results, the final scale generated in this study was found to be a valid and reliable measurement tool.

Another interesting contribution surfaces after cross-examining the current results with other brand personality research examples. In this study, six personality dimensions were identified (i.e., competence, creativity, ruggedness, excitement, sincerity, and energy). While several of these factors, such as ruggedness and sincerity, have been reported with sport and non-sport examples (Aaker, 1997, Aaker et al., 2001; Braunstein & Ross, 2010; Smith et al., 2006; Yang, 2002), other factors, such as creativity and energy, have not been examined previously.

On the one hand, this finding is in line with recent criticism regarding sport brand personality scale development. Specifically, brand personality scales (such as Aaker's scale) may be too tailored to a specific context or product to be fully applied outside of their primary setting (Heere, 2010). On the other hand, such criticism may be hasty in its dismissal of brand personality research because, as a greater number of sport brand personality scales are developed, a commonality among brand factors may emerge. As this research line matures, it could lead to the emergence of a core set of brand personality factors (similar to what has been seen with motives research in sport management). This core set of factors would then provide sport researchers and practitioners with a valuable brand personality foundation. Indeed, this foundation could provide them with the opportunity to: (a) investigate these "core" (and assumed to be generalizable) brand personality factors across a myriad of contexts and sport products and (b) discover supplementary brand personality factors that may be context specific.

Finally, another intriguing result of this study is that the multinational sport corporations, Nike and Adidas, were identified as possessing "creative" and "imaginative" personality traits. These personality traits differ from the stereotypical personality trait of "athletic," which is commonly associated with sport brands (Aaker, 1996). This result may be linked to global sport companies' strategic marketing efforts to "think globally, act locally" (Nederveen Peterse, 2003, p. 49). This kind of tandem marketing operation of local/global dynamics, global localization or glocalization, appears to be at work in the case of Korean sport brand consumers.

Nike and Adidas are actively involved in sponsorship partnership through Korea wherein they make creative and imaginative advertisements with either globally or locally well-known/popular sport organizations, teams, or athletes in order to create a brand image and brand personality that best suits their local consumers. These glocal communication efforts by Nike and Adidas appear to influence Korean sport consumers to perceive the sport brand personalities of these companies as both creative and imaginative. Moreover, it also appears to demonstrate that Korea sport consumers possess a more nuanced evaluation of Nike and Adidas. That is, they may be more aware of non-product-related characteristics, such as imaginative, in addition to being aware of more traditional product-related characteristic (e.g., athletic, vigorous, lively).

Managerial Implications

Given the continual dawning of new media technologies, sports advertisement and sponsorship communications enable multinational brands to enhance brand associations and brand awareness in rapidly changing sport marketplaces. Based on congruent theory referring to the image/personality of the endorsers or teams with the image/personality of the brand is promoted, the more effective the message (Gwinner & Eaton, 1999), the sport brand personality scale developed in this study can play an important role in (1) determining whether there is a good fit between the sponsor and the desired personality of a particular team. Specifically, there is no doubt that Samsung is perceived as a giant global electronics brand and their logo on the Chelsea FC's uniform is instantly recognized as official corporate sponsor of Chelsea FC by audiences (Kerr & Gladden, 2008). This synergy, whereby there is congruent between two high-quality products reflecting the high degree of characteristic similarity, reinforces each other's personality that would be seen as creative, prestigious, hardworking, and leadership. Hence, sport

brand personality scale provides a way to evaluate the sponsorship effectiveness between the sponsors and the sport entity before making sponsorship agreement.

Achieving a better understanding of sport brand personality enables sport organizations (2) to monitor the key brand personalities to effectively market and position to their target consumers and differentiate them from the competitors. Measuring sport brand personality, as (3) a roadmap for sport organizations to build an emotional connection with their consumers who make their purchase decisions based on their self-expressions.

Limitations and Future Research

One lingering challenge associated with brand personality research is that brand personality scale factors have been found to vary according to both product and context (Austin et al., 2003; Azoulay & Kapferer, 2003). The current study is no exception. The participants of this study were Korean consumers, and the sport brand personality category was sport products (i.e., apparel and footwear). As a result, the factors identified herein may not be generalizeable to other consumer populations and brands, such as professional and intercollegiate sport teams. Be that as it may, it remains worthwhile to conduct additional research about brand personality in sport in order to determine if a core set of generalizable brand personality factors exists.

In closing, the main objective of the present study was the development of a brand personality scale that could be used to measure a specified sport-related product category (i.e., apparel and footwear). More precisely: (a) a total of 47 sport brand personality traits were chosen through the first and second survey stages, (b) through EFA, a 6-factor model with 37-items was developed, and (c) after re-examining the model through CFA, an improved 6 factor model with 18 items was confirmed. The development of usable brand personality tool represents an important continuation as well as advancement of previous research attempts in this line of sport marketing inquiry, and we therefore hope it spurs continued interest in this important research area.

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About the Authors

Young Do Kim (yk09@fsu.edu) is a doctoral candidate in the Department of Sport Management at Florida State University. His primary research area lies in the field of sport marketing. More broadly, he is interested in the realm of sport consumer behavior. From the consumer behavior viewpoint in particular, he currently focuses more on the study of sport fan equity.

Marshall Magnusen (marshall_magnusen@baylor.edu) is an Assistant Professor in the Department of Health, Human Performance, and Recreation at Baylor University. He received his Ph.D. from the Florida State University. Dr. Magnusen has marketing research interests in customer satisfaction, relationship quality, and sport consumer consumption behaviors. His research has been published in such scholarly journals as the *European Sport Management Quarterly, International Journal of Sport Marketing and Sponsorship,* and *Journal of Management.*

Yukyoum Kim (ykim6@fsu.edu) is an Assistant Professor for the Department of Sport Management at Florida State University. He received his Ph.D. from the University of Florida. Most of his research lies in the field of marketing and sponsorship applied to the field of sport. Additionally, Dr. Kim has been involved in several research projects that focused on social media, cause-related marketing, fan identification, sport consumption motivation and constraints, service quality, sport product image, and curiosity. His accomplishments in the research areas above include 58 research presentations and 40 peer-reviewed articles in top sport- and business-related journals including the *Journal of Sport Management, Journal of Business & Industrial Marketing, Journal of Management and Organization, International Journal of Sport Communication, International Journal of Sports Marketing and Sponsorship,* and *Sport Marketing Quarterly.*

Discussion Questions

1. According to d'Astous and Lévesque (2003), a single category goods or service brand personality scale is imperative because of its own market uniqueness. This viewpoint stands in contrast to Aaker's (1997) brand personality scale (BPS). The BPS is a general measure that was developed to evaluate all different types of brands. If that is the case, can Aaker's brand personality scale be used to effectively measure distinctive characteristics of sport team brands?

2. What are several challenges associated with sport brand personality research? Discuss several reasons sport brand personality research has proven challenging for sport scholars. For example, in addition to the development of a reliable and valid brand personality scale, what other research developments would improve greatly the study of brand personality in sport?

3. In this study, the companies of Nike and Adidas were identified as possessing "creative" and "imaginative" personality traits. These personality traits stand in contrast to the conventional personality trait of "athletic," which is customarily associated with sport brands (Aaker, 1996). Do you view Nike and Adidas as being creative and imaginative companies? Explain why or why not. Also, what sort of strategic marketing efforts would you recommend to a sport company that is looking to be viewed by consumers as creative and imaginative?

To Cite this Article

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Life Forward

Patricia Lynch

Founder and President, Patricia Lynch Associates

PLA | PATRICIA LYNCH ASSOCIATES INC.

Patricia Lynch is founder and president of Patricia Lynch Associates Inc. (PLA), one of New York's most successful and prominent government affairs and media relations firms.

One of the few women-owned lobbying firms in a business dominated by men, PLA began in 2001 as a two-person start-up in Albany, New York. Today, it is a multinational firm with 38 employees in four cities and close to $10 million in annual revenues. In 2008, Patricia Lynch founded an international subsidiary, Lynch Sosa & Associates, headquartered in Panama.

PLA belongs to the elite club of women-owned businesses that have surpassed $1 million in revenues. Only three percent of all women-owned firms ever reach this mark, as compared to six percent of male-owned establishments.

Named twice in a row to Crain's list of the "50 Most Powerful Women in NY," Pat Lynch also has been named "Business Owner of the Year" by the *Albany Business Review* and on the list of "100 Most Influential New Yorkers" by *Campaign & Elections Magazine*.

Prior to starting PLA, Pat worked in the public sector for 25 years. She was a top strategist in the New York State Legislature and worked for two members of New York's Congressional delegation.

Interview

by Hagai Gringarten

Editor-in-Chief

1. Life is about stories. What is a favorite story you use as an icebreaker?

If the situation is appropriate, I find a way to remind people of the extraordinary challenges we've faced in New York in recent years: terrorist attacks, the upheaval in our political system, and natural disasters. It's been an incredible run. And the lesson is resilience. No matter what happens, you pick yourself up and carry on. We New Yorkers are pretty tough in this regard.

2. What is PLA's business model, and has the nature of public relations and communication changed since you started your firm?

Since starting this firm 11 years ago, I've always stressed client service. My goal was to become a trusted part of the clients' management team. My goal for myself and my people was, and is, to think 24-7 about not only achieving the initial objective but also identifying new opportunities for the client.

As for changes in the business, perhaps the single most dramatic change in recent years is the degree to which lobbying campaigns have become dependent on effective communications. In any kind of public policy issue today, you need an inside game focused on policymakers and an outside game focused on public sentiment.

3. What are the key aspects that have made PLA so successful?

One word: Talent. I've been very fortunate to be able to attract and retain some very talented individuals. We're a bipartisan team of people who have served at the highest levels of government. Collectively, we have some 200 years of experience in the legislative and executive branches.

4. PLA has worked with major clients, such as the Walt Disney Company and Coca Cola. What are your biggest accomplishments and challenges?

There's a long list of accomplishments for corporate clients and non-profit clients ranging from social change to government intervention to cost savings. We saved clients hundreds of millions of dollars in blocking unwise government policies. We've helped clients win contracts

worth billions of dollars. But, in perfect candor, the accomplishments that mean the most to me involve helping people and creating positive social change. For example, we played a key role in advancing legislation for social change in New York that created a fundamental shift in society, a move toward fairness and equal treatment for all, and I was proud to be associated with it.

5. What companies do you admire and why?

I have had the great fortune to be mentored by some of the leading business figures in New York. These are prominent people who have built great companies in development, finance, and entertainment. You'd surely recognize these icons in the business world, but the nature of our relationship is private, so I won't name them. Let me just say that I've been taught by the very best.

6. What are the lessons that come to mind from your career?

I hope I don't sound too simplistic or sentimental, but I'm an example of how it is still possible for a person to start from nothing and become very successful through hard work. I started out as a waitress. That's a fact. But now, I have a business that employs 38 people and grosses nearly $10 million per year. We're one of the top government relations and communications firms in New York. It's been a wonderful run, and it isn't over yet. I want to take PLA to the next level.

7. What books have you read lately?

I'm an inveterate reader of newspapers, periodicals, and blogs and Twitter. In addition, I have support staff constantly looking for the latest news that could have a bearing on our clients and our business. I'm also interested in books about management. I recently read Never eat Lunch Alone by Keith Ferrazi. I also love history. And a few of my favorites in this category include Franklin and Winston by Jon Meacham (fascinating story of a true friendship), New York by Edward Rutherford, and I just started Churchill by Roy Jenkins. Once a year, I re-read The Art of War. On the planes, when I'm in a relaxed mood, it's spy novels.

8. What elevator speech would you give your children about success in life?

The most important thing in life, next to faith and family, is finding a job you love. If you can do that, chances are you'll be very good at it, and you'll be happy.

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"Vistas y paisajes (68)"

Photo by Miguel J. Puldon.

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A More Sustainable Urban Living in the United States

Paola Plevak
University of Miami

Abstract

The predominant development model in the United States is resource intensive and energy demanding. As the urban population grows extensively around the world, soon this model will become socially and environmentally unsustainable. The challenge is to create an urban living model that will accommodate this overflow of people in a way that will not deplete natural resources in each region.

Several cities around the world serve as great examples of sustainable urban living, following different models of sustainable urban development, such as *Smart Growth.* Smart Growth is a proponent of mixed-use zoning codes, compact building, and increased opportunities for mass transit. In this way, natural resources are used more efficiently, and people, our social capital, become more fulfilled, healthy, and productive.

Keywords

urban sprawl, Smart Growth, compact cities, high density cities, growing urban population, public transportation, biking, pedestrians, green public spaces

Introduction

According to a report by the United Nations' Department of Economic and Social Affairs (2011), today, more than half of the world's population lives in urban areas and "in the next four decades all of the world's population growth is expected to take place in urban areas" (p. 1). Additionally, urban population growth will double in developing countries, "from 2.6 billion in 2010 to 5.2 billion in 2050" (United Nations, 2011, p. 1). These predictions, combined with rising energy costs, present complex challenges for current and future urban planning schemes in the U.S. and in some developing countries.

In the United States, suburban neighborhoods are located in the city's periphery, away from the center of industry, and without access to reliable public transportation. This kind of development makes the automobile the most practical and fastest means of transportation.

Furthermore, houses in the suburbs tend to be larger than those in the city, demanding more energy for maintenance, cooling, and heating, and to supply larger and more numerous household appliances (Gonzalez, 2009). The widespread use of combustion-engine automobiles and outsized housing models makes urban settings in the U.S. very inefficient, highly energy consuming, and dependent on foreign resources. This dependence on foreign energy leads to an unstable economy and, most importantly, the use of oil results in large quantities of carbon dioxide being released into the atmosphere, deteriorating the natural environment and exacerbating the effects of climate change (Gonzalez, 2009).

Every bioregion has a carrying capacity, the maximum population that the area can sustain with the resources available and still be able to replenish these resources without degrading the local environment. The challenge today is to implement a model of urban living that can accommodate the projected overflow of people in a way that will not deplete the region's natural resources or contaminate the surrounding environment. Furthermore, this shift is necessary so that other urban areas around the world can copy this model without compromising the carrying capacity of those bioregions.

The Earth's carrying capacity does not permit for everyone to duplicate the lifestyle that the "American Dream" promises. While the large-lot, single family housing model has spread beyond the U.S. to several emerging and developing countries, despite its negative social and environmental impact, this does not validate it for continued use (Duany, Plater-Zyberk, & Speck, 2000). Considering that the U.S. accounts for 5% of the world's population, and consumes almost 25% of the word's energy supply, if everyone lived according to the "American" lifestyle, it would necessitate the resource equivalent of five planets like Earth to sustain it (Freeling & Poblete, 2009).

Urban sprawl in the United States is the result of various factors, but was first set in motion by federal and local governments after World War II. After the war, there was a high demand for housing triggered by the Federal Housing Administration and the Veterans Administration (Duany et al., 2000). These agencies provided affordable mortgages and income tax deductions for mortgage interests to war veterans, and made it cheaper to purchase a single-family home than to rent a small apartment near the city (Duany et al., 2000). In addition to these federal agencies, "local towns enacted new zoning codes that separated individual houses from attached houses and apartments, and employment or shopping from residences" (Barnett, 2011, p. 145). These same codes also "required that stores, services, and offices be constructed in narrow strips along highways" (Barnett, 2011, p. 145). The car became almost indispensable for accessing this new development, and its use intensified after the Interstate Highway Act of 1956, which provided a combination of federal and local subsidies for road improvement (Barnett, 2011). The government neglected mass transit, as author Jonathan Barnett (2011) indicates in *City Design*:

> The highway system became the means of transforming cities, suburbs, and close-in rural areas into a new kind of multi-centered urban metropolis where jobs followed the population out of old urban locations to new suburban office and industrial parks, and shopping and office centers grew up at highway interchanges. (p. 145)

Overall, since the beginning of the 20th century, various political and economic factors—often influenced by large scale land developers, the oil industry, and the federal government—encouraged urban sprawl policies in the U.S. (Gonzalez, 2009). However, urban sprawl is socially, economically, and environmentally unsustainable, particularly with energy costs on the rise and the country's dependence on foreign, unstable governments for its supply.

In order to become less dependent on petroleum and other contaminants, U.S. cities should look to other models of sustainable urban development, such as their more densely populated counterparts in Europe. Sustainable cities are both environmentally and socially friendly. They are highly dense and spread across a compact form of development. They apply mixed use zoning policies where housing, commercial, industrial, and leisure spaces are built together, resulting in shorter commutes and making it easier for city-dwellers to use alternative means of transportation. In order to prevent car usage and traffic congestion, sustainable cities offer plenty of alternative public transportation and have a safe infrastructure for pedestrians and cyclists.

Another unique quality of mix-use neighborhoods is that people from diverse backgrounds collide in grid-street type communities (Duany et al., 2000). This diversity makes the community more vibrant and alive.

Last, the protection of natural ecosystems and the addition of *green* elements in a city, such as trees, parks, and green roofing, are paramount in developing a sustainable city. Green components address heat related stressors and diseases, and improve air quality, therefore, resulting in a better quality of life.

A Sustainable City Planning Approach: Smart Growth

Various offshoots of the compact city approach, and its emphasis on green urban design as the key to sustainability, have emerged through the models of New Urbanism and Smart Growth in the United States, the Urban Renaissance in the United Kingdom, Machizukuri in Japan, and other "healthy community" movements (Martine, 2011). Although each school has definite ideas about how cities must develop, all agree on "the notion that urban sprawl damages the environment, sacrifices natural areas and farmland for development, wastes energy and other resources, creates traffic congestion, and in other ways lowers the quality of life" (Martine, 2011, n.p.). The following are some of the measures presented by these models to offset sprawl:

> Compact form development, high density, mixed use, intensification of public transportation, greater pedestrian and bicycle transit, utilization of interstitial spaces, protection of natural ecosystems, revitalization of downtown areas, reduction of the amount of land affected by roads and parking lots, increased social and economic interactions and more efficient utility and infrastructure provision. (Martine, 2011, n.p.)

For the purpose of this article, the author will discuss the *Smart Growth* model. This model attempts to "limit the expansion at the metropolitan edges, redirecting development to the already urbanized communities" (Calavita, 2005, p. 42). In this way, existing infrastructure and public facilities are improved, and cities are revitalized. Smart Growth is directed towards

creating higher density, mixed-use community centers, and increasing opportunities for mass transit (Calavita, 2005).

The concept of Smart Growth emerged over the last 10 to 20 years, and became codified in Federal and State regulations. It has various flavors, but the basic principles are similar (Calavita, 2005).

According to the Smart Growth Network, the following are the movement's main principles:

1. Mix land uses.
2. Take advantage of compact building design.
3. Create a range of housing opportunities and choices.
4. Create walkable neighborhoods.
5. Foster distinctive, attractive communities with a strong sense of place.
6. Preserve open space, farmland, natural beauty, and critical environmental areas.
7. Strengthen and direct development towards existing communities.
8. Provide a variety of transportation choices.
9. Make development decisions predictable, fair, and cost effective.
10. Encourage community and stakeholder collaboration in development decision. ("Smart Growth Principles," n.d.)

Compact Cites by Limiting Sprawl

One of the tools required to stop the sprawl of urban development are Urban Growth Boundaries or UGB, enacted for the first time in Oregon in 1973 (Barnett, 2011). UGB is a regional boundary set in an attempt to control urban sprawl by mandating the use of the area inside the boundary for higher density urban development, and the area outside for rural, or rural-friendly, development only, including conservation spaces (Barnett, 2011; Dierwechter, 2008). The main purpose of UGBs is the following:

> New urban growth in compact communities and centers to be developed in a manner that uses land more efficiently, makes it easier to supply adequate parks and recreation areas, facilitates pedestrian and transit orientation, and helps communities to conserve natural resources. (Dierwechter, 2008, p.96)

In order to encourage urban infill development in already populated areas, campaigns need to counteract government and market forces that make it less profitable for developers to work in the city than in agricultural lands, or *green fields* (Duany et al., 2000). Ordinances should grant preference to urban infill sites. Ideally, approval agencies should accept development applications based on this preference, and applications for urban extension placed on hold until the agencies process all applications for urban infill (Duany et al., 2000).

Limiting expansion leads to compact cities where land developers use land to its full potential, growing vertically, and saving city dwellers both time and money when going to work, shop, or enjoy leisure time. Sprawling divides social classes, but compressing daily life into a

neighborhood requires a greater mix of land uses within the same space; therefore, more income types and social classes come together, this results in neighborhoods that are economically and socially vibrant and foster a sense of place and cultural understanding (Dierwechter, 2008).

Mix-Use vs. Single-Use Development

It is paramount to contain development within city boundaries, but it is also important to make urban life in cities livable. Livable cities mean cities that have interconnected neighborhoods via well-developed public transport systems, provide residents with access to shops, restaurants, and places of employ, and access to these through means other than cars. In order to have different types of buildings within a neighborhood area, the city code must allow for mix-use building. This type of zoning code entails a set of buildings, or neighborhoods, that have more than one purpose, such as residential, commercial, industrial, office, institutional, and other land uses.

The U.S. urban sprawl model is characterized by single-use developments present in zoning codes, alienating work from commercial areas and residential zones, and separating workers from places of employment. As a result, "costly commutes clog the roads and pollute the air, because low- and moderate-income workers are unable to find housing near their work" (Fair Share Housing Center, n.d., n.p.). Mixed zoning takes care of traffic congestion by shortening the distances between employers and workers.

Social impoverishment is caused by the single-use sprawl that segregates social classes and people of income-levels in a self-perpetuating cycle where "a child growing up in such a homogeneous environment is less likely to develop a sense of empathy for people from other walks of life and is ill prepared to live in a diverse society" (Duany et al., 2000, p. 185).

Smart cities attempt to democratize housing and services for people from different income levels, seeking to be socially and economically inclusive (Beatley, 2000).

Alternative Means of Transportation: Save Energy Costs and Reduces Emission of Green House Gases, GHG

In order to solve the problem of car dependency, it is not enough to halt development in city outskirts, it is necessary to provide a system of alternative transportation. Again, as an incentive to developers, regional governments must prioritize the types and place of urban development, for example, granting permits to projects in the inner city first. Another incentive that can tackle the issue of available public transportation is to give preference to projects that will develop along a transit corridor, where there are existing or future rail stops and major roadway intersections (Duany et al., 2000).

In addition, to alleviate traffic congestion, air pollution, and stress, a system that includes not only public transport but also safe and functional bicycle lanes and pedestrian pathways is necessary. Streets that accommodate various types of transport are called *complete streets*. Complete streets are living streets designed and operated to enable safe, attractive, and comfortable access and travel for all users, including pedestrians, cyclists, motorists, and public transport users of all ages and abilities. Stockholm is an exemplary sustainable city and features one of the best bicycle lane systems in the world (Calderon, 2010). A key point in the success of

this city's bicycle lane system is that it is immediately available to everyone within a short distance from where they live (Calderon, 2010). In addition, almost all neighborhoods have areas for bike parking, and many buildings provide common storage rooms for bikes (Calderon, 2010).

Walk-able Streets

Walking is another alternative to driving. Walk-ability is a measure of how friendly an area is to walking, and has many health, environmental, and economic benefits. However, evaluating walk-ability is challenging because it requires the consideration of many subjective factors. Factors influencing walk-ability include the presence (or absence) and quality of footpaths, sidewalks, or other pedestrian right-of-ways, traffic and road conditions, land use patterns, building accessibility, and safety – among other considerations (Victoria Transport Policy Institute, 2010). Walk-ability is a significant concept in sustainable urban design.

In order to make streets walk-able, they have to be and feel safe; in addition, the street space must be comfortable and interesting (Duany et al., 2000). Pedestrian environments must invite social interactions, first by mixing development, then by design. Narrow streets bring people together and result in a safer environment for pedestrians as cars speed less on narrow roadways and pedestrians feel more secure (Duany et al., 2000). Parallel parking is another important characteristic for two reasons: pedestrians feel protected from moving traffic, and it supports pedestrian life by delivering people straight to their destination (Duany et al., 2000).

Green Spaces: Resource Stewardship

Most environmentally friendly cities around the world that serve as models for sustainable urban living have set aside areas of land for conservation purposes. Many of these serve as habitats for endangered species, parks and recreation, arable land for local food supplies, and more. In the U.S., however, more farmland and wildlife habitats are displaced per resident as a result of the large areas consumed by sprawling suburbs (Santiago & Bandurovych, 2010).

Sustainable urbanism gives priority to the creation of neighborhoods where people feel comfortable and are "emotionally uplifting and aesthetically inspirational" (Beatley, 2000, p. 8). Adherents to smart growth and new urbanism believe that nature is important for livable cities and that "connections to nature are important to personal health and well-being" (Beatley, 2000, p. 8).

Many cities around the world, as well as in the United States, are already on the path to sustainability. Many municipalities around the country are already taking steps to become more socially and environmentally sustainable, which leads to more economical sustainability in the long term. This shows the knowledge for transformation is available, and city and municipality officials and planners already are applying the principles of sustainable urban living. In South Florida, where commuting seems the way of life, residents need to become more involved with local authorities so development projects, roads, and more fulfill their needs and desires. South Florida residents need to claim green spaces, reliable public transportation, and other improvements that can make neighborhoods more inviting for vibrant community living.

Finally, if urban life in the U.S. adopts a more sustainable model, when other cities around the world duplicate the "American" lifestyle, they will rely on a development model that addresses increased urban populations and serves as an example of sustainable development.

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About the Author

Paola Plevak (pplevak@miami.edu) is a former student at the University of Miami. She recently graduated from the International Administration Master's program with a concentration in sustainability. This article came about as part of her practicum report for graduation, part of an internship completed at the Public Works Department of the City of Fort Lauderdale. She is currently employed at the Earth Ethics Institute at Miami-Dade College as a Program Coordinator bringing sustainability components to the classroom, and bringing students together with the community to address sustainability issues.

Discussion Questions

1. What measures can I take to begin living in a more sustainable way?

2. What measures can the community take to shape itself into a sustainable one?

3. What city model in the U.S. can serve as a guide for creating a more sustainable community?

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Book Review

Book Details

Baez, J., & Golenbock, P. (2012). *Presumed guilty: Casey Anthony: The inside story.* Dallas, TX: BenBella Books, 421 pages, hardback, ISBN: 978-1937856380.

Reviewer

Anne-Marie Mitchell, J.D.

Synopsis and Evaluation

The flurry of media reporting sparked by the arrest and trial of the infamous Casey Anthony, unwittingly, became an overnight sensation that would last for months. Speculations about the whereabouts of Casey Anthony's three year old daughter, Caylee Anthony, quickly spiraled into allegations of murder. Today, most people vaguely remember photos of Casey's wild nights out during the 30 days after Caylee was reported missing, Internet searches for "chlorophorm," and, of course, the unforeseeable not guilty verdict. In *Presumed Guilty*, Jose Baez gives readers a first-hand look into the defense and trial of Casey Anthony. Although most already know the outcome, Baez recounts the bizarre series of events that unfolded as he developed his defense for Casey Anthony's life. The book is written in such a riveting way that you might forget you are reading non-fiction.

The book is hard to put down and is a great primer on the current state of our criminal justice system. Baez certainly points out some of the dysfunction of U.S. justice, particularly with the sensational media coverage; however, the failings are not for the reasons most people would think. This book does a good job of explaining the role of prosecutors, defense attorneys, and jurors, but Baez truly excels at explaining the keystone function of the presumption of innocence. Among the Constitutional protections afforded to the criminally accused, "innocent until proven guilty" is often the most difficult for people to accept. This benefit of the doubt, especially in high profile cases with highly suspicious facts like Casey Anthony's, is quickly muddled by the media's portrayal of the accused. While Baez's seeming fight against the whole world seemed a bit melodramatic at times, having witnessed the overwhelming media coverage of this trial - it doesn't seem as farfetched as I would otherwise believe. Baez gives a convincing explanation of the events leading to Caylee's death, and while no less a tragedy, this book may convince many naysayers of Casey's innocence before even describing the trial itself. At the very least, this book

provides some insight into the long, arduous task of putting up an admirable defense in today's U.S. legal system.

In the Author's Own Words

"I had spent months visiting her in jail trying to gain her trust, which is the key to the attorney-client privilege. You always hear about how defense lawyers hide behind it-that's certainly what the prosecution in this case kept harping upon-but it's a false argument. What's so important about the attorney-client privilege is that it allows the client to tell things to the lawyer, knowing that information won't go any further than their conversation. Without the attorney-client privilege, the client has no one at all to trust. Guiding the client through the legal system and protecting their interests, while doing it within the confines of the law, helps defense lawyers truly evaluate their clients' cases and assist them in determining if they should plea bargain or take their case to trial. It protects the system as a whole, and without it, individual rights cannot be protected and the system does not work" (p. 172).

Reviewer's Details

A graduate of The University of Chicago Law School, Anne-Marie Mitchell (annie787@gmail.com) is currently an associate of Stone Pigman Walther Wittmann, LLC, in New Orleans, Louisiana. She practices primarily in commercial litigation. She sometimes practices criminal defense on a *pro bono* basis. Her research interests include trial practice, law and economics, and Constitutional law.

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Book Review

Book Details

Harnish, V. (2012). *The greatest business decisions of all time: How Apple, Ford, IBM, Zappos, and others made radical choices that changed the course of business.* New York: Fortune Books, 207 pages, hardback, ISBN: 978-1-60320-059-2.

Reviewer

Hagai Gringarten, A.B.D.

Synopsis and Evaluation

Verne Harnish's *The greatest business decisions of all time: How Apple, Ford, IBM, Zappos, and others made radical choices that changed the course of business* (2012) provides a glimpse at game-changing historical business decisions. Harnish and nine contributing *Fortune* editors and writers provide insight into 18 historical and counterintuitive business decisions that took "companies, industries, and even nations in entirely new directions" (p. 24).

Harnish and his team attempted to organize a conceptual framework for their rational of picking best decisions by categorizing it into "People, Strategy, Execution, and Cash", but "it soon became clear that it didn't make sense to stuff each decision into one of these convenient boxes" (p. 25). Harnish does not clarify how they finally choose the best business decisions, but asserted that "picking the best business decisions is, of course, more art than science" (p. 21). Harnish and his team did not rank their decisions, but they all agreed on the single greatest decision of all time, which was Henry Ford's decision in 1914 to double wages. Facing challenges such as dispirited workforce, declining workmanship quality, absenteeism, and annual labor turnover of 370 percent, Henry Ford decided to raise wages from $2.50 to $5 a day. The following week, Ford Motors had more than 26,000 job applicants. As a result, productivity increased, annual labor turnover fell to 16 percent, and profits doubled within two years. According to the author, in an era in which employees were viewed as drones, Ford's unconventional decision "triggered a consumer revolution that helped create the wealthiest nation on earth" (p. 195).

Harnish asserted that all 18 decisions that made their final list "stood out from others because they were counterintuitive – they went against the grain of popular practice" (p. 25). Among their chosen selections, we find the following:

(1) The decision in 1996 by Apple board of directors to bring back Steve Jobs resurrected the company, altered global business landscape, and made Apple one of the most valuable companies in the world.
(2) The decision to offer free shipping and free returns made Zappos a billion dollar brand.
(3) CEO James Burke's text book handling of the Tylenol case deciding to pull Tylenol off the shelves nationwide and create a tamper-proof bottle at a cost of 100 million dollars, made the company come back from "I don't think they can ever sell another product" (p. 59) to become a market leader within a year.
(4) 3M's 15 percent rule where employees are encouraged to devote 15 percent of their work day to independent projects "has yielded billions of dollars of revenues for 3M" (p. 66).
(5) Boeing CEO Bill Allen decision in 1952 to develop the first transatlantic commercial jetliner in an era of prop planes. Launching the Boeing 707 at a cost of 185 million dollars was more than Boeing's net worth at the time, but "it remade a company, an industry, and the very culture of its time" (p. 152).

In his eloquent and seamless forward to the book, Jim Collins suggested that, "Their greatest decisions were not 'what?' but 'who?' They were people decisions" (p. 13). Harnish's *The greatest business decisions of all time: How Apple, Ford, IBM, Zappos, and others made radical choices that changed the course of business* (2012) offers a look at a good collection of historical business counterintuitive decisions that either by sheer luck, good timing, or just shrewd planning took companies and industries into entirely new direction and into history books.

The strength of this book is also its weakness: The collection of stories was selected and written by ten *Fortune Magazine* contributors, which adds to the book's strength in terms of combined skills, expertise, and knowledge of companies, industries, and people involved. But it resulted in lack of cohesiveness in writing style, which could have been the result of diverse story telling abilities, different writing styles, or the fact that some stories were more interesting than others.

Overall, this book is an insightful and interesting read, guiding and inspiring readers to think creatively and long term when it comes to making business decisions. This is an enjoyable, fast read, recommended for business history buffs, business leaders, students, and any aspiring CEOs in the making.

In the Author's Own Words

"A truism of life is that success equals the sum total of all the decisions one makes. And as Jim Collins suggests in the foreword to this book, it's the combination of thousands of decisions that lead to greatness. Yet there seem to be a handful of decisions that stand apart from the rest- a few 'black swan' moments, to borrow a phrase from Nassim Nicholas Taleb's groundbreaking book of the same name. They are often those fateful 'bet the farm' moments, when a CEO can go left or right, or not go at all. And the choices great leaders end up making are often counterintuitive and move companies, industries, and even nations in entirely new directions" (pp. 23-24).

Reviewer's Details

Hagai Gringarten's (hgringarten@stu.edu) doctoral research is in global leadership with a specialization in branding. His research interest includes branding, international business, and marketing. He has co-authored a non-fiction bestselling book *Over a Cup of Coffee* (Shiram Shachar, 2000). He also pursued postgraduate studies at Harvard Graduate School of Business and the Kellogg School of Management. He currently teaches branding, marketing, and other business courses at St. Thomas University, and serves as the Editor-in-Chief of the *Journal of Multidisciplinary Research.*

To Cite this Review

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"Vistas y paisajes (101)"

Photo by Miguel J. Puldon.

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Book Review

Book Details

Brunner, B. (2012). *Inventing the Christmas Tree* [*Die Erfindung des Weihnachsbaums*]. Translated by Benjamin A. Smith. New Haven, CT: Yale University Press.

Reviewer

Jonathan Chad Roach, Ph.D.

Synopsis and Evaluation

Bernd Brunner originally wrote and published *Inventing the Christmas Tree* in 2011 in German as *Die Erfindung des Weihnachsbaums.* Benjamin Smith provides this English language translation. Brunner is a freelance writer who explores cultural history. His earlier publications include *The Ocean at Home: An Illustrated History of the Aquarian* (Princeton Architectural Press, 2005), *Bears: A Cultural History* (Yale University Press, 2008), and *Moon: A Brief History* (Yale University Press, 2011).

Brunner offers a compelling narrative that explores the history of Christmas trees, especially their German history. He begins by searching for the first Christmas tree in references from 1419 at the Freiburg Fraternity of Baker's Apprentices, and in 1441 in Tallinn, Estonia (p. 3), as well as in earlier traditions involving decorated trees. On a side note, he also introduces the notion of Christkind, a Christmas gift bringer that Martin Luther promoted to replace the Roman Catholic St. Nicholas.

He also researches the religious conations of Christmas trees themselves. He writes, "for a long time the Christmas tree in Germany was considered Protestant – a Lutherbaum (Luther tree) – and the aversion of many Catholics went so far at the end of the nineteenth century that many simply called Protestantism the 'Tannenbaum religion'" (p. 31). Although this aversion to Christian trees as appropriate only for Protestants eventually lessened, Brunner records that as recently as 1909, Benedictine monks referred to the tradition of a Christian tree as a "fraud" (p. 33).

In one of the most interesting sections of the book, Brunner explores the history of Christmas tree decorations. He writes that "until the nineteenth century mostly edible objects were used: baked goods, sweets, apples, and nuts" (p. 33). He notes that the development of tinsel, probably by the Huguenots from Lyon, was originally the result of leftovers from metal

work and that glass globes most likely were created to replace apples. These are particularly engaging accounts. He also traces the development of tree stands and lights.

In addition, Brunner examines the place of Christmas trees in the United States of America, including its rejection by the Puritans, the tradition of placing gifts under the tree, and the use of trees in Christmas celebrations beyond the Northern Hemisphere as well as in non-Christian settings. In a couple of sections on the trees themselves, Brunner examines evergreen conifers and other alternatives, including 18th century pyramids (p. 30) as well as the use of artificial trees made from everything from recycled plastic to glass (pp. 84-85), and the use of cloning technologies to design the perfect tree (p. 89).

This is a popular title aimed at a general audience. It is an engaging read that carries the reader into a complex history of popular culture, religion, and tradition. Because of its incomplete citations and inclusion of only a selected biography, it is not an academic resource for researchers; rather, this book provides a widely accessible cultural history of a cultural phenomenon that many people never consider. Sometimes, its content seems over-romanticized and overstated. An example of this is Brunner's statement that the Christmas tree is the most enduring and important symbol of Christmas (p. 1), when based on Brunner's research, the use of Christmas trees dates back less than 600 years, whereas the use of the Nativity dates back to at least 1223 CE. But overall, this is an enjoyable book that I recommend for general audiences.

In the Author's Own Words

"When it's snowy and dark outside and the days are short, the tree lets us dream of nature's life force returning. Its deep evergreen is the symbol of life long-lasting, and its decorations – anticipating the buds and blossoms of the coming season – give the tree a hint of fairyland. A visual magnet, it lightens the gloom of winter, delivers a slice of the forest within the walls of the home, and, on Christmas Eve, awakens joy and hope that the sun will soon return for longer hours" (p. 1).

Review's Details

The Reverend Jonathan Chad Roach (jroach@stu.edu) is the Library Administrator at St. Thomas University. He holds a Ph.D. in practical theology from St. Thomas University, a Master of Library and Information Science degree from Wayne State University, and a Master of Divinity degree from Ecumenical Theological Seminary. He is ordained clergy in the National Association of Congregational Christian Churches and is currently working in the area of clergy burnout within a contextual theology of work.

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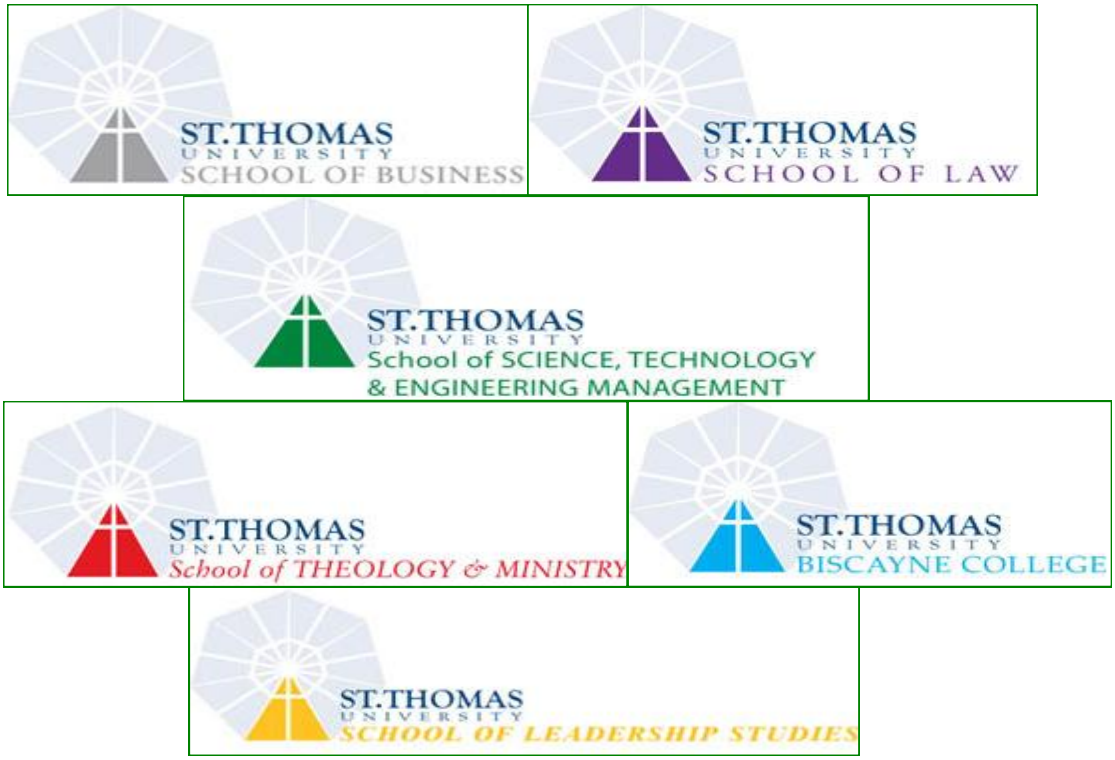
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