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The Nature of Culturo-Behavioral Science Interventions: Editorial

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Since his early works, Skinner (1948, 1953) had argued that the science of behavior could improve the culture. His writings inspired many to subscribe to the mission of improving the world with behavior science. Yet in 1982, in his address to the American Psychological Association (see Skinner, 1987), Skinner asked, "Why are we not acting to save the world?" Nearly 40 years later, behavior analysts ask the same question at a time when humanity faces extraordinary challenges due to global warming, a worldwide pandemic, extreme economic inequalities, and other large-scale problems. Behavior science as a discipline is an evolving, adaptive system, affected by changes in internal and external dynamics. For over 50 years now, the demand from parents of children diagnosed with autism, credentialing and legislation movements, and priorities of funding agencies have favored the development of behavioral research and applications to the treatment of developmental disabilities.

Although the work done has been of tremendous value to individuals, families, society, and the discipline, the focus on other critical cultural matters has taken a back seat. Nevertheless, a number of behavior analysts have been engaged in cultural studies since Skinner's earlier writings. And in recent years, there have been renewed interest and progress toward developing a culturo-behavioral science, channeled, in part, by several initiatives. This editorial has two parts: first, a description of initiatives aimed at the advancement of culturo-behavioral science and, second, a reflection on the nature of some culturo-behavioral science interventions, based mainly on content and initiatives presented at the first cultural conference of the Association for Behavior Analysis International (ABAI).

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Initiatives for the Advancement of Culturo-Behavioral Science

The study and understanding of culture from a behavioral science perspective have been advancing on several fronts: publications, a special interest group, higher education training, think tanks, and the first ABAI specialized conference.

Publications

The publication of *Behavior and Social Issues* (BSI) has been a major contributor to the continuous study of cultural matters in the behavioral community. With the pioneering vision of Joseph Morrow (its first editor) and other behavior analysts, BSI has been publishing research and conceptual articles for over 40 years (Luke et al., 2017). First issued in 1978, the journal was called the *Behaviorists for Social Action Journal* (BSA, 1978–1985); then, it changed its name to *Behavior Analysis and Social Action* (1987–1989). ABAI acquired BSI in 2018 and began its publication in 2019. By the end of 2021, Mark Mattaini will have been the journal's editor for the last 21 years, and Richard Rakos, past editor and one of the early founders, continues as consulting editor into the present.

Several books have been published throughout the years on the behavioral approach to cultural issues. Most recently, ABAI started the publication of a book series, and its first two volumes center on cultural matters (Cihon & Mattaini, 2020; Houmanfar et al., 2021).

Special Interest Group

The same pioneering group that launched BSI initiated the Behaviorists for Social Responsibility (BFSR) special interest group (SIG) of ABAI in 1977 (Luke et al., 2017). Since then, the members of the SIG have continued to advocate for a behavioral-scientific approach to cultural phenomena. (See Richling et al., 2020, for BSFR's recent report.) In 2018, BSFR became an associate SIG of ABAI. With this arrangement, all members of the SIG, currently about 60, receive complimentary electronic access to BSI, as well as other benefits.

Think Tank

The think tanks on cultural studies (TTCS) have been another contributing initiative to the advancement of culturo-behavior science. Members review specific literature and gather for several days at a time to discuss concepts, research, and applications. Participants in the think tanks have embraced the concept of the metacontingency proposed by Glenn (1988, 1991, 2004) and its relevance to understanding cultural evolution. The first think tank, TTCS1, was organized by João Todorov and Maria Malott in Campinas, São Paulo, Brazil, in 2005 (Todorov & Malott, 2005). Since then, there have been six other think tank gatherings: one in Norway, two in Brazil,

two in the United States, and one virtually (Vasconcelos et al., 2021).[1] Although several participants have remained constant through the TTCSs, new researchers have continuously been incorporated. Think tank activities have inspired a number of joint publications and presentations, as well as innovative research at several universities. The participants in the TTCSs have supported the creation of a specialized area of study in higher education, as described next.

Higher Education Training

During TTCS6, Maria Malott called an informal meeting with participants working in universities to explore their interest in developing a special curriculum for culturo-behavioral science. The response was so enthusiastic that, subsequently, Mark Mattaini and Maria Malott proposed to the ABAI Executive Council the formation of a task force that would explore the development of a culturo-behavior science verified course sequence (VCS) in higher education. That task force was assembled in 2018. The majority of the members of the task force were regular members of the TTCSs: Marcelo Benvenuti, Aécio Borba, Traci Cihon, Sigrid Glenn, Ramona Houmanfar, Maria Malott, Mark Mattaini, Ingunn Sandaker, and Laércia Vasconcelos. The product of the task force was the culturo-behavior science VCS for graduate programs, which was launched in 2020. Cihon et al. (in this issue) provide an outstanding review of culturo-behavior science course sequences and their experiential-learning opportunities.

Today, the following universities have established culturo-behavior science VCSs: the Federal University of Pará; Oslo Metropolitan University; the University of Brasília; the University of Nevada, Reno; the University of North Texas (master's and doctoral programs); and the University of São Paulo. There are 41 students currently enrolled in these programs. They, along with any student who completes the culturo-behavior science course sequence in the future, will receive a certificate of completion from ABAI.

Specialized Conference

The first ABAI specialized conference on cultural matters, titled "Culturo-Behavior Science for a Better World" (Association for Behavior Analysis International, 2020), showcased the increasing interest in culturo-behavior science. The conference was cochaired by Mark Mattaini and Maria Malott, and it took place virtually from October 7 to 9, 2020. Nearly 400 participants attended the conference. The program included a variety of culturally relevant topics, such as climate change, social justice, public health, science policy in education, and poverty. Ninety posters showed

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[1] TTCS2 was organized by Ingunn Sandaker in Oslo, Norway, in 2007; TTCS3 was organized by João Todorov and Marcelo Benvenuti in São Paulo, Brazil, in 2016; TTCS4 and TTCS5 both were organized by Sigrid Glenn in Denton, Texas, in 2016 and 2018, respectively; and TTCS6 was organized by João Todorov and Laércia Vasconcelos in Brasilia, Brazil, in 2019. Most recently, TTCS7 was organized by Maria Malott and Sigrid Glenn virtually in 2021 (Vasconcelos et al., 2021).

current research and projects from behavior scientists addressing cultural issues. The content of the 2020 ABAI conference captured current approaches of behavior analysts to the study of cultural matters. The next section describes these approaches, with special emphasis on 10 articles based on presentations at the conference. Reference is also made here to other content from presentations and activities at the event.

The Nature of Some Culturo-Behavioral Science Interventions

The term "culture" means different things across disciplines. Baldwin et al. (2006) listed 300 definitions, from diverse fields of study, many of them fundamentally different. Even within a discipline, the meaning of "culture" has changed over time. Not surprisingly, there are different understandings of "culture" among behavior scientists, and they imply different methods and results. Though the various approaches between our relatively small group are consistent with the basic tenets of behavior science, appreciating their distinctions can help culturo-behavior scientists to better understand, dialogue, and collaborate among those involved. In the chapter titled "Operant Contingencies and the Origin of Cultures," Glenn (2003) indicated that ultimately "cultures are nothing more than learned behavior and its physical products" (p. 223). In the same chapter, Glenn (2003) differentiated "operant lineages" from "culturo-behavioral lineages." Operant lineages consist of "re-occurring instances of the behavior of individual organisms and the environmental events functionally related to those re-occurring instances" (Malott & Glenn, 2006, p. 35). In contrast, a culturo-behavioral lineage consists of "the transmission of operant behavior across individual repertoires" (Glenn et al., 2016, p. 17). And yet, there are culturo-behavioral interventions that include no lineages. It is valuable to distinguish the units of analysis of interventions, whether they involve lineages (behavioral or cultural) or not.

The descriptor "culturo-behavioral science" was used in 2018 by the ABAI task force, cited previously, which helped to establish the ABAI culturo-behavior science course sequence in higher education. The group agreed that the term "culturo-behavior science" captures the domain of interest, although the implication was that "this science" involves phenomena of different natures—comprising lineages (behavioral and cultural), or descriptions of relations that do not go beyond the evolution of behavioral relations over time. Regardless of the unit of analysis, the social validity of cultural interventions heavily weighs on how their products impact society. Products could be either cumulative or aggregate. Cumulative products result from the sum of the products or actions of many individuals engaging in the same behavior. Aggregate products result from the addition of different components of the product, where each component is generated by different individuals.

Malott and Glenn (2006) used a taxonomy to analyze the cultural and behavioral interventions. Using similar framework, this section analyzes the units considered in articles within this special section, as well as the content of some posters presented at the conference. The articles are categorized in Table 1; columns refer to the following: (a) types of interventions based on the locus of change; (b) number of those who contribute to the product (one vs. multiple); and (c) behavior topography

Table 1 Types of Interventions Based on the Locus of Change

(a) Type of intervention	(b) Groups of people (one vs. multiple)	(c) Behavior topography (same vs. various)	(d) Cultural product of interest	(e) Authors (type of study)
(1) Behavioral lineages of a single group and the same topography	Single	Same	Child welfare in the U.S.	Ninness et al. (empirical)
(2) Behavioral lineages of multiple groups and various topographies	Multiple	Various	Adaptation and assimilation of immigrants in the U.S.	Rakos & Switzer (conceptual)
	Multiple	Various	Reduction of gas emissions and the impact on global warming	Bonner & Biglan (conceptual)
	Multiple	Various	Global safety and peace	Kennedy & Hallowell (conceptual)
	Multiple	Various	Global justice	Mattaini & Roose (conceptual)
	Multiple	Various	Reduction in homelessness in the U.S.	Holtschneider (conceptual)
	Multiple	Various	Positive culture and productivity of the school system	Horner & Kittleman, Part 1 (empirical)
(3) Cultural lineages	Multiple	Various	Supporting organizational process for best practices	Horner & Kittleman (empirical)
	Multiple	Various	Graduates with culturo-behavior science knowledge and skills	Cihon et al. (conceptual)
	Multiple	Various	Federal budget allocation for science	Baron & Hoeksema, Part 2 (conceptual)
(4) Cultural interventions with no lineages	Multiple	Various	Policy changes	Horner & Kittleman, Part 3 (empirical)

(same vs. various). These criteria were used by Malott and Glenn (2006). Column (d) specifies the cultural product of interest. Column (e) lists the authors of the specific article in this special section. In the same column, parentheses note whether the article is empirical or conceptual. The term "conceptual" is used broadly to mean a theoretical discussion, as well as a position on how to go about addressing societal problems. This taxonomy is not meant to be exhausting, but rather helpful in differentiating types of work being done in culturo-behavioral science.

It is stimulating to read this special section because it highlights that behavior scientists are focusing on issues that affect large numbers of people in society. In reviewing their particulars, all authors referenced in Table 1 point out significant problems and agree that culturo-behavioral interventions can contribute to ameliorate them. For instance, in discussing immigration policy, Rakos and Switzer (in this issue) indicate that global migration tripled between 1960 and 2017. They estimate that in the next 30 years, migration will account for two thirds of the population growth in the United States, the United Kingdom, and Australia. Yet more efforts are needed to help immigrants to adapt to new communities and aid local groups to embrace newcomers.

Global warming is anticipated to be one of the major contributors to these large displacements of people. Bonner and Biglan (in this issue) point out that greenhouse gas emissions are the primary culprit in global warming, and that international efforts to change behavior that would reduce greenhouse gas emissions have not yet been successful. Another factor contributing to the ills of societies worldwide is the increasing number of countries experiencing violent conflict. Kennedy and Hallowell (in this issue) indicate that violent conflict is the highest it has ever been in the last 30 years. They base this argument on measures such as civil unrest, violent demonstrations, and riots. As an example, they point out that from 2011 to 2019, the number of riots increased by 282% and the number of strikes by 821%. Along similar lines, Mattaini and Roose (in this issue) concentrate on global justice, which is affected by all the issues included in this special section and more. Additional factors involve challenges to support human rights, global health, subsistence, and the reduction of poverty.

Several authors refer to cultural challenges in the United States. For instance, in discussing child welfare, Ninness et al. (in this issue) mention that in 2016 alone, child protective services received about 4.1 million referrals involving approximately 7.4 million children. Furthermore, Holtschneider (in this issue) indicates that roughly 4.2 million individuals between the ages of 13 and 25 experience homelessness. Horner and Kittelman (in this issue) focus on the quality of the culture and productivity of schools as a critical component of society. In the United States, there are over 50 million students who attend roughly 130,000 schools (U.S. Department of Education, 2021). The values and skills learned by students impact society greatly.

Only 2 out of the 10 articles included in this special section describe empirical work; 5 consist of conceptual approaches to significant cultural issues. The remaining 3 papers address different issues relevant to culturo-behavior science. One article elaborates on the ABAI VCS (Cihon et al., in this issue), one is a conceptual article on complex adaptive systems (Krispin, in this issue), and one provides

recommendations to behavior scientists to advocate for research funding (Baron & Hoeksema, in this issue). The articles are classified based on the main locus of change—explicit or implied. Table 1 includes four types of interventions: (1) behavioral lineages of a single group and the same topography, (2) behavioral lineages of multiple groups and various topographies, (3) cultural lineages, and (4) cultural interventions with no lineages. Some authors combine several types of interventions.

Behavioral Lineages of a Single Group and the Same Topography

Traditional behavioral interventions focus on operant behavior. They target the repetition of behavior as a function of variables in the environment (antecedents and consequences) over time. These interventions center on the behavior of a single individual, several individuals, or several groups of individuals. They either target a similar behavior topography or multiple topographies. Ninness et al.'s (in this issue) research is an example of an intervention that focuses on one group, child welfare professionals, and one behavior class, to decide on the best course of action to protect a child based on risk assessment. The more professionals engage in informed decision making to create a cumulative impact, the more improved children's well-being in the country would be. Glenn et al. (2016) defined "macrobehavior" as "socially-learned operant behavior observed in the repertoires of several/many members of a cultural system" (p. 17). There are many interventions in behavior analysis that target one response topography that could have a significant impact on society if the change were adopted by many individuals, such as smoking cessation and seat belt use.

Behavioral Lineages of Multiple Groups and Various Topographies

Several articles in this culturo-behavior science special section focus on the behavior of various groups, each group engaging in different behavior topographies. This type of intervention could be conceived as an ecosystem of diverse contingencies existing in a community. The approach resembles that of community organizers. Members of the community and representatives from institutions come together and identify behaviors that need to change. Behavior scientists can contribute by helping to design effective behavioral contingency systems. Mattaini and Roose (in this issue) take this approach when discussing global justice. They call for involving members of communities to participate and cooperate to achieve common goals. The contingencies are more likely related, rather than interlocking, in the sense that they are established toward common ends. For the contingencies to be interlocking, the behavior or products involved in the behavioral contingencies for a group of individuals serve as an element or product of the contingency established for another group of individuals. The MATRIX project developed by the BSFR SIG is a prime example of interventions involving behavioral lineages of multiple groups and various topographies (Mattaini & Luke, 2014). Biglan (2020) used a similar approach when promoting the building of nurturing societies by mobilizing main sectors in "values-to-action" efforts. Although some of the recommendations presented in this

special section are general, the aforementioned strategies lead to cumulative products that result from the compounding effects of the actions and the products of each individual or group acting in similar ways.

Likewise, Bonner and Biglan (in this issue) call for multiple sectors in society to collaborate on the reduction of greenhouse gas emissions. Rakos and Switzer (in this issue) allude to the design of contingency systems that affect both the behavior of immigrants and that of those residing in the local communities. They argue that the products of adaptation and assimilation of immigrants are positive, for instance, in labor and economic growth. Holtschneider (in this issue) also calls for changing behaviors of groups of people that contribute to maintaining an economic system that perpetuates homelessness in young people. In the same vein, Kennedy and Hallowell (in this issue) call for different groups to engage in actions to improve safety and peace. Some of their examples include encouraging nonviolent collective action, like civil resistance movements, and arranging contingencies for cooperation and democracy.

Horner and Kittleman (in this issue) write about one of today's most successful, large-scale culturo-behavioral interventions. They describe the implementation of Positive Behavior Interventions and Supports (PBIS) Systems in 29,000 U.S. schools, as well as in 20 other countries. Their objectives are to create environments in schools that facilitate learning and improve students' performance. Each school is considered a unit of analysis. The PBIS System intervention starts with the identification of the valued outcomes particular to each school. Based on the desired outputs, a package including different types of interventions is determined. A component of the package consists of the identification of desirable behaviors (best practices) across several sectors of the school (Part 1). In this sense, the intervention targets multiple groups of individuals and various response topographies. A web of behavioral contingencies is implemented. But the PBIS System does not rely only on this type of intervention—several groups and various topographies. It involves other types of interventions, as described next.

Cultural Lineages

Horner and Kittleman (in this issue) pointed out that to ensure that the target behaviors are adopted and sustained reliably, the PBIS package also must include change interventions that lead to measurable results in supporting organizational systems and processes (Part 2). Processes typically involve groups of individuals who work together in generating a product. The behavior or product of one individual or group serves as a component or product for the contingencies operating on other individuals or groups. These interlocking behavioral contingencies (IBCs) repeat over time with variations. In the reiterations of the process, some individuals might be absent, others might be added, and some steps might vary. Therefore, the lineage involves more or less the same individuals engaging in IBCs over time. Likewise, Baron and Hoeksema (in this issue) describe the "policymaking ecosystem," consisting of the structures and processes of legislative activity that take place to determine the

federal budget year after year. The processes involved across agencies can be understood as metacontingencies composed of lineages of IBCs.

The culturo-behavior science VCS described by Cihon et al. (in this issue) involve the implementation of programs in universities that can be seen as metacontingencies. The hope is that a set of IBCs in each program generates graduates with sufficient knowledge and skills to engage in cultural-behavioral work. The aggregate products are the resulting repertoires of the students who have the skills to engage in cultural-change efforts. Several posters in the conference also speak to this type of intervention (Amezquita et al., 2020; De Albuquerque et al., 2020; Olla et al., 2020; Vasconcelos et al., 2020).

Krispin (in this issue) makes an important theoretical contribution to this issue. Unlike other articles, he does not focus on a particular problem in society. He says that culturo-behavioral science should expand the analysis of behavior of the individual and should include metacontingencies integrated into complex systems. He brings together concepts from other disciplines in an effort to outline the principles and conditions that might govern self-organizing, adaptive systems. He addresses the conceptual implications of interventions of this type—mainly cultural lineages.

Interlocking Behavior With No Lineages

Many events that take place in society involve the unique, nonrecurring, interlocking behaviors of multiple individuals. Although their products are aggregate, they are generated by the interlocking behaviors of multiple individuals that have no lineage. They might have a long-lasting impact, in which case they have been labeled "cultural cusps." Instances are unique interrelations of individuals that result in the formation of long-lasting international programs and the development of cultural movements (Arias et al., 2020; Malott, 2015, 2019, 2020). Other interlocking behavioral efforts that have no lineages do not generate significant products; they are like cultural incidents that do not spark much attention.

Some of these interventions are characteristics of policy change. Horner and Kittleman (in this issue) indicate that some of the changes required to change a school may be a policy or regulation (Part 3), which more likely than not does not involve a lineage. The dynamics that set the occasion to create a journal (this journal) on cultural matters from a behavioral perspective constitute another example; that product set the occasion for over 40 years of publications. The interrelations that led to the establishment of the culturo-behavior science VCS constitute another instance. The product set the occasion for the establishment of cultural lineages in graduate programs.

Conclusion

This article lists some initiatives that have sparked interest in the study of cultural issues. In addition, this article describes some of the approaches to cultural studies and initiatives referenced in the first ABAI culturo-behavioral conference. Some

interventions are behavioral in nature. Their loci of change are behavioral contingencies. Other interventions focus on lineages of IBCs of various individuals or groups. Yet other significant work is produced by interlocking behaviors of various individuals that do not involve lineages. Rather than judging a type of approach as superior to others, it would be more constructive to recognize their differences and embrace them. After all, they all may contribute in different ways to the understanding and betterment of society. These types of interventions are consistent with the process of environmental selection and the science of behavior. Further efforts should continue to distinguish other types of interventions that impact society.

The work described by Horner and Kittleman (in this issue) incorporates various types of interventions, all targeting phenomena of different natures. This integrated approach requires long-term and sustainable efforts—which are hard to accomplish without substantive funding. In fact, the PBIS program has been funded by the U.S. federal government since 1998. The program's most recent grant cycle of funding was $32 million for 5 years beginning in 2018 (Center on PBIS, 2018). Baron and Hoeksema (in this issue) make an important contribution by providing recommendations to behavior scientists for obtaining federal funding.

This is a stimulating time for the development of culturo-behavior science as a field. There is interest in topics of great significance to society, and important projects are on their way. Culturo-behavior scientists are increasingly collaborating with other disciplines. There is also an accelerating number of publications. More opportunities are becoming available to engage and collaborate through university labs, BFSR, and the TTCSs. Not surprisingly, the first cultural conference was well received. All these efforts can contribute to establishing a nurturing terrain for the continuing development of culturo-behavior science.

Declarations

Conflict of interest Author has not conflict of interest.

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