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ORIGINAL PAPER

Culturo-Behavior Science Practicum: Analyses and Intervention in Multi-Level Contexts

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Abstract

The Association for Behavior Analysis International established a Verified Course Sequence (VCS) for Culturo-Behavior Science (CBS) that covers core concepts, procedures, and methodologies necessary to analyze and intervene in system-level social problems. However, the experiential practicum component lacks defined competency criteria; not surprisingly, the handful of current CBS practica also lack clear markers. We propose that Behavioral Community Psychology (BCP) can provide a framework for developing rationally articulated competencies and designed learning opportunities for students to demonstrate such core competencies. The structure that BCP offers is grounded in its fundamental values—community-researcher collaboration to address important systemic problems, an emphasis on social activism aimed at primary and secondary prevention of social problems, and the development of sustainable, pragmatic, empirically supported and replicable interventions that contribute to fundamental social change. We employ climate change as a practicum focus area to provide an example of how BCP can lead to clarification of important competency criteria used by instructional designers. We discuss how CBS concepts, measures, and procedures can be applied in the planning and evaluation of practicum learning experiences and in the selection of practicum sites to create new opportunities to transfer behavior science to socially significant issues. The intended audiences for this paper are faculty designing CBS experiential learning, students engaging with VCS practica, and personnel in sites hosting learners.

Keywords Cultural behavior science · Culturo-behavior science · Practica · Systems change · Sustainability · Multi-level selection

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Behavior analysis long has understood the influence of systems-level contingencies on behavior and cultural practices. Skinner (1953, 1981) described this process as cultural selection, with cultural contingencies constituting a third kind of environmental selection along with biological selection (evolution) and behavioral selection (learning). This contextual level of analysis is entirely consistent with the behavior analytic *weltanschauung* and is reflected in Kanfer and Saslow's (1969) classic 7-step functional analysis which "provides a method of analysis and some procedural guidelines" (p. 427) for identifying target behaviors, their controlling variables, and initial interventions that are then subject to "reanalysis...as the...plan proceeds" (p. 427). Importantly, the individual "operates in a complex of systems... all events, including biologic, economic, and social, must be admitted as potential variables in the analysis, without prior judgment about their order of importance... it is recognized that numerous common features appear in the behavior of individuals reared in the same cultural environment and exposed to similar learning experiences" (Kanfer & Saslow, 1969, p. 426–427). Thus, almost from its inception, applied behavior analysis has been cognizant of the importance of systems-level determinants on individual behavior.

The contextual emphasis grew in the 1970s, 1980s, and early 1990s when behavior analysis and community psychology formed an uneasy alliance. The core principles of both—which include a focus on environmental determinants of social problems rather than on internal deficit models—were melded and applied to social problems that were at least partly controlled by system-level contingencies (see Jason et al., 2021). Behavioral Community Psychology (BCP) combined the methodological rigor and potent behavior change technologies of applied behavior analysis with "the newly emerging field of community psychology … [which] emphasized a preventive, ecological, and systems approach toward optimizing the well-being of communities and the individuals within those communities" (Jason et al., 2021, para. 2).

Contemporaneous to the rise of BCP in the 1980s was the introduction of behavior analytic tools to conduct system-level analyses. The metacontingency (Glenn, 1986) offers a way to examine higher-level systems that "capture cultural, sociological, and ecological factors influencing the interaction of multiple individuals' behaviors in organized groups" (Ardila Sánchez et al., 2020, p. 418). Metacontingencies select the interlocked behaviors of organized groups (Glenn & Malott, 2004) and offer a foundation for description and analysis of important community behaviors (see Houmanfar et al., 2010; Houmanfar et al., 2020). The macrocontingency also selects cultural practices—similar patterns of behavior in populations—that are described as macrobehavior (Glenn, 2004; Todorov, 2013; Ulman, 1998).[1] These

[1] For example, the widespread, easy acquisition of guns results from interactions with established, durable features of the context such as, poorly regulated sales and marketing of arms products. The cumulative effect of which occurs at the societal level and is not contingent on each individual's behavior. The consequences of these behaviors are delayed, uncertain, cannot be independently manipulated (Glenn et al., 2016), and are often approached from an epidemiological perspective (e.g., one outcome of the macrobehavior of "easy" gun acquisition is mass shooting).

tools offer a unique and accessible frame from which to conceptually outline and prospectively engage in community intervention.

In 2019, the Association for Behavior Analysis International (ABAI) established a verified course sequence (VCS) in Culturo-Behavior Science (CBS) that may include courses covering multiple divergent but complementary approaches to system intervention. BCP, reinforcement contingencies, macrocontingencies, metacontingencies, and functional contextualism (Hayes et al., 2012),[2] among others, may inform the design and evaluation of experiential training in CBS via the ABAI VCS. The purpose of this paper is to present a framework that articulates the current status of the emerging learning experiences in the six current CBS VCS programs, promote faculty, student, and personnel in host sites to systematically mature this important endeavor, and encourage other academic programs to join the early adopters. Appreciation of the opportunities afforded by the CBS VCS is perhaps best understood in light of the trends from which the core principles, concepts, and procedures were developed.

Culturo-Behavior Science and ABAI Verified Course Sequence (VCS)

The CBS VCS, as noted above, covers a range of concepts, procedures, and methods that prepare students to address large-scale societal issues. Verification of the course sequence within academic programs indicates that the curriculum meets coursework eligibility criteria for those completing the coursework to obtain a certificate in CBS awarded by ABAI.

The CBS course sequence concentrates on three areas in graduate training. First, Foundational Knowledge in Behavior Analysis provides students with a common language and basic knowledge. Second, Behavioral Systems Analysis synthesizes the fields of behavior analysis and systems analysis with the goal of identifying behavioral solutions to socially significant cultural practices. Third, Experiential Learning (Practicum/Internship) focuses on real world intervention with issues such as sustainability, public policy advocacy, violence, science policy, governance, business management, public health, criminal justice, failing educational systems, or poverty. Thus, the CBS VCS likely entails multiple levels of analysis of complex social problems in a wide range of settings. This varies from the other ABAI VCS, which is focused on clinical/educational settings with learning experiences structured toward certification as a behavior analyst (or the Board Certified Behavior Analysis [BCBA]).

The expected student outcomes for each CBS VCS content area are summarized in Table 1.[3] In addition, four areas of focus are noted in the ABAI VCS CBS

[2] Two recent textbooks in the ABAI science series, one on cultural behavior science (Cihon & Mattaini, 2020) and another on behavior science applied in organized systems (Houmanfar et al., 2021), provide in-depth coverage of these topics.

[3] Readers are referred to Cihon et al. (2021) as the objects and competencies for each area are provided in full.

Table 1 CBS verified course sequence as outlined by ABAI

CBS VCS Content Area (per ABAI)	Expected Student Outcomes (per ABAI)
Basic principles in behavior analysis	1. Identify main concepts of behavior analysis 2. Analyze behavior using such concepts 3. Formulate the research questions, the experimental design, and collect and analyze data of experiments 4. Prepare scientific reports following international publishing standards
Behavioral Systems Analysis (BSA)	1. Explain conceptual development and technological application of behavioral systems analysis 2. Describe conceptual, methodological, and technological strengths and weaknesses associated with this approach 3. Integrate themes and topics in behavior analysis that may contribute to the conceptual, methodological, and technological development of BSA
Experiential learning (practicum/internship)	Site-specific – might include practica, thesis, and dissertation research

description (ABAI, 2022) that aim to integrate the three content areas. These are "Saying Doing" (consistency in modes of cultural expressions), "Subcultures" (identification of top optimizations), Systems Architecture and Engineering (alternate models of change), and Policy and Cultural Dissemination (pragmatic, iterative experimentation).

The CBS VCS experiential learning requirement includes 10 hours per week, 150 hours per semester, over two semesters (300 hours). It can be met through the student's professional employment if an appropriate level of supervision or oversight is provided by program faculty and the experiential learning occurs before the degree is awarded. It is critical that each program shows how it meets the hourly requirements and includes interdisciplinary work/supervision. The four focus areas offer a myriad of instructional design choices through which to orchestrate learning opportunities, define boundaries of analysis, collaborate with other disciplines, evaluate performance, and engage with community members. Behavioral learning objectives (Mager, 1997) for practicum students can structure the sequence of experiences along the four content areas and guide learners to demonstrate core competencies in behavior analysis. These skills include defining objective features of behaviors, creating observation systems, assessing behaviors to identify sources of variation, and conducting experimental and quasi-experimental tests of interventions to evaluate social validity.

CBS VCS Learner Certificate in Current Practice

Academic programs offering the CBS VCS implement their own methods for evaluating student learning and ABAI awards certificates of completion. While the two didactic courses may include the usual examinations, papers, and presentations as evidence of student learning, the evaluation of practicum competencies may be less

clear with ABAI certificates indicating completion of contact hours and not necessarily demonstration of specific competencies.

In an effort to better understand the state of current VCS practica, we met virtually on April 6, 2021, with the six CBS VCS program coordinators from around the world.[4] Our conversation revealed two important considerations: (1) individual course sequences vary with respect to experiential learning components based on some combination of location, focus, and opportunity and (2) great emphasis is placed on addressing culturally meaningful but problematic behaviors in the immediate environment. The large number of systemic problems and at-risk populations means there always is a sizable assortment of social concerns that can be addressed in these practica. However, this diversity also constitutes a challenge for establishing learning objectives and VCS criterion expectations.

Interestingly, several program coordinators reported success in acquiring community and organizational support for projects that focus on cultural contingencies, perhaps reflecting increasing interest by university leaders and grant funders in the program activities. This encouraging development suggests that opportunities may be present to expand similar programs in universities seeking to bolster community engagement.

Behavioral Community Psychology as the CBS Framework for VCS Practica

We suggest that Behavioral Community Psychology can serve as the framework for developing the contextual assessment and intervention skills that CBS practica students need to demonstrate. BCP can serve as a way to approach practica that generates a level of consistency in how faculty set goals for and evaluate student competencies and how personnel in host settings can contribute to and supervise the learning experiences.

Values: Behavioral Community Psychology's Foundation

BCP is defined explicitly by its core values. These foundational principles are summarized by Watson-Thompson et al. (2015, 2020). First, BCP prioritizes participatory research that engages all stakeholders at all stages of the project so that, for example, a community-needs assessment incorporates diverse interests. This approach facilitates the development of a sense of community and empowerment while building competencies to address communal goals. Second, BCP focuses on the prevention of systemic problems by examining the potential antecedent factors that enhance risk or promote resilience. Primary prevention seeks to intervene before the problem phenomenon occurs, such as prohibiting lead in water pipes, prompting vaccinations, or providing sex education. Secondary prevention is early intervention that remediates or avoids escalation of the problem,

[4] The six universities represented all current ABAI CBS VCS and thus involved input from Oslo Metropolitan University, Universidade de Brasília, Universidade Federal Do Pará, University of North Texas, University of Nevada, Reno, and Universidade de São Paulo.

exemplified by early applied behavior analysis treatment for autism.[5] Third, BCP embraces an ecological perspective that assesses environmental influences at the individual, family/social, community/organizational, and societal/cultural levels. Fourth, BCP adopts an activist social justice stance that addresses structural inequities that result in vulnerable and disenfranchised persons. Finally, BCP is action-oriented, with the goal of identifying change agents in the community who can help implement plans. A theme in each core value is stakeholder and community empowerment.

Fawcett (1991) earlier identified BCP's core values similarly—seeking collaborations with stakeholders and addressing functional relationships that are important to the community; conducting research that is practical, targets community concerns, and uses appropriate measures to capture the dynamic interaction between behavior and environment; developing and disseminating sustainable interventions that are owned by and maximize the benefits for the community and foster meaningful social change ("small wins"); and communicating successfully with community stakeholders. Jason et al. (2019) add policy activism and promotion of collective wellness to the set of values driving BCP.

These BCP values are consistent with the goals and foci of a CBS VCS practicum, making it an ideal approach through which to structure learning experiences. It reflects Pritchett et al.' (2021) call for applied behavior analytic research to embrace greater collaboration with study participants and increased inclusion of marginalized groups in designing, conducting, and evaluating efforts. The BCP approach also suggests that interpersonal skills as well as CBS technical competencies are needed to (a) conduct collaborative, culturally valid systems assessment in the field (cf. Watson-Thompson et al., 2015) and then (b) prioritize systems-level interventions to change behaviors that contribute to the target social dysfunction(s). The BCP-informed and skilled Culturo-Behavior scientist, therefore, will be capable of assessing the social problem in its ecological contexts using tools founded upon functional analysis (Kanfer & Saslow, 1969), metacontingency analyses (Houmanfar et al., 2010; Houmanfar et al., 2020),[6] and analyses of acts-in-context (Hayes et al., 2012). We discuss these assessment skills as critical components of a CBS practica using the super wicked problem as a context for our suggestions.

[5] A third kind of prevention, tertiary, is more or less a euphemism for intervention in the full-fledged problem and therefore not a major focus of BCP.

[6] Houmanfar et al. (2010) and Houmanfar et al., 2020) identified five elements that describe the interrelationships comprising the metacontingency. The cultural milieu (1) complements Kanfer and Saslow's (1969) analytic categories of "sociocultural milieu" and "social-cultural-physical environmental influences." It encompasses the shared values and prevailing beliefs/opinions that persons acquire from interaction with their environments and selects the socio-interlocking behaviors or socio-IBs (2) of individuals interacting in the system. Socio-IBs generate aggregate products (3) that then affect consumer and other cultural practices (4), which in turn dictate the social validity of the aggregate products. Finally, feedback (5) from enactors of cultural practices allows leaders to develop new rules that increase the likelihood that demands for change in socio-IBs and aggregate products are met in a way consistent with the dominant cultural milieu.

The Super Wicked Problem: A CBS Practicum Focus

Persistent social problems that thwart efforts to mitigate them illustrate what policy scientists call "wicked problems" (Rittel & Webber, 1973). These problems are typically defined in staunchly held but very different ways by various disciplines, interest groups, and government agencies. This generates a range of opposing solutions. For example, in the United States, the macrocontingency that supports gun use and results in mass shootings is a wicked problem interpreted by some as resulting from too many guns in the hands of citizens while others see "gun-free zones" as fodder for criminals. Solutions that focus on gun availability range from gun controls (e.g., reducing assault rifles in the general population) to "gun safety" (e.g., maintaining current gun accessibility but with education regarding safe use) to "gun expansion" (e.g., arming teachers in schools and congregants in churches). The problem might also be analyzed from the level of the metacontingency, as in an organized, armed militia coordinating insurrections to overturn perceived oppressive agencies.

Because wicked problems can be explained in numerous ways, they yield no consensus on solutions. Moreover, their ambiguity occasions uncertainty, illogical responses, and value conflicts among both those affected and those trying to solve the issue and increases the likelihood that non-scientific evidence will be championed as the solution. A special case of wicked problems are "super wicked problems" that possess four additional, complicating features: (1) time is running out, (2) those (e.g., us) seeking to end the problem are also causing it, (3) no central governance authority exists to manage the problem, and (4) existing policies related to critical behaviors discount the future (Levin et al., 2012).

The sustainability crisis is one of the super wicked problems threatening community well-being that offers practicum students hands-on experience applying CBS principles to systems-level problems. However, its extensive reach,[7] urgency, and empirical foundation—including in behavior analysis and contextual behavior science (see Alavosius et al., 2016; Alavosius & Houmanfar, 2020; Gelino et al., 2020; Gelino et al., 2021)—make it an ideal focus through which to explore a contextual assessment practicum. Levin et al. (2012) describe a forward reasoning approach to break out of unsustainable patterns and learn the self-management skills that can begin to address super wicked problems such as human-caused climate change. Behavior analysts also have developed this perspective.

Expansion of a behavior analytic science of individual behavior to an examination of the collective practices of a community or cultural group entails consideration of how the methodologies used effectively with individuals might be utilized within CBS. As discussed earlier, the concepts of the macro- and metacontingency provide a way to analyze cultural phenomena and suggest entry points to promote behavior change in communities. However, this kind of application is relatively unexplored experimentally in behavior analysis; hence the importance of practicum

[7] Recent computer modeling estimates that human-induced climate change may be occurring on 80% of the world's land mass, containing 85% of the world's people, with high income countries experiencing twice the prevalence rate as low-income ones (Callaghan et al., 2021).

experiences as fertile grounds in which to pilot test and develop methods of demonstrating control, measuring variation in multi-level contingencies, and shaping cultural practices.

A starting point is the development of metrics that reliably and validly measure variation in cultural practices. The field has developed measures of contingencies of reinforcement (e.g., the properties of motivating operations-antecedents-behavior-consequences that can be manipulated) but the quantifiable properties of macro- and metacontingencies are less clear. Houmanfar et al.'s (2010) and Houmanfar, Ardila Sánchez et al.'s (2020) elaborated metacontingency model suggests multiple entry points for interventions that produce changes in socio-IBs and aggregate products.

Practica that focus on problems such as sustainability likely begin by assessing and describing the variation in relevant cultural practices, their potential sources of control, and their outcomes (cf. Watson-Thompson et al., 2020). This is consistent with the behavior analytic methodological approach for demonstrating experimental control, assessing effects of interventions, validating clinical/socially significant changes in both lab and field settings, replicating results, and testing the generality of findings (e.g., Barlow et al., 2008; Hayes et al., 1999; Johnston et al., 1980; Sidman, 1960). Demonstration of functional relations between environmental variables and objective measures of behavior is a hallmark of behavior analysis and requires initial assessment and then continued assessment as interventions are introduced. Frequently, however, this level of control is not possible in a systems-level intervention.

Ready, Aim, Fire – Or Fire Then Aim?

This heading "ready, aim, fire" is a metaphor for the importance of conducting a comprehensive functional assessment to establish a baseline before intervening in a system, thus permitting treatment effects to be compared to pre-intervention measures. Although CBS strives to be consistent with the methodologic framework of behavior analysis, systems-level interventions at times are made prior to extensive baseline behavioral assessments, as when an emergency situation exists (e.g., behavior-based safety risks where observations detect life-critical variations in behavior; Alavosius & Burleigh, 2021). Climate change now occurring may likewise challenge those conducting CBS practica to act now. In this context, Levin et al.' (2012) recommendation for an iterative approach can be interpreted as *intervene now with the best available information, assess impact, learn from experience, and adjust interventions to achieve a step change*. However, demonstrating rigorous experimental control within natural settings with multiple sources of behavioral variation is a fundamental challenge to CBS practica. The multiple levels of selection addressed in didactic courses provide a starting point for selecting research designs and statistical models suitable to the complex contingencies likely to be encountered. In collaboration with host site participants, decisions about the sequence of assessments and interventions will be guided by technical factors, contextual urgencies, and professional ethics. Thus, the CBS VCS curriculum likely will need to include consideration of field evaluation designs, statistics, and related topics such as big data.

A CBS VCS Proposal for Practica Learning Objectives

We propose that programs develop learning objectives that articulate standards consistent with the BCP approach for how students will apply the CBS principles and concepts covered in the didactic courses.[8] These are summarized in Table 2. Certification of learning during the practicum can include assessment of students' competencies by faculty, supervisors and stakeholders from the host sites, and perhaps independent experts in behavior science outside of the students' academic program. A second level of certification might validate the intervention developed in a CBS practica. Codifying elements of the intervention (e.g., behavioral measures, independent variables, community supports) with measures of impact (e.g., incidence rates, prevalence rates, effect size) and social validity allows the aggregate product of the practicum to be evaluated and promotes decisions to increase the scale of intervention.

Demonstration Projects in Climate Sustainability

Recent examples of community assessment and outreach related to sustainability issues are not yet common in behavior analysis journals, but the research, practica, and comprehensive exams completed by doctoral students in ABAI certified programs can illustrate approaches to testing and transferring behavior science to a systemic level. Ardila Sánchez et al. (2019), for example, applied the concept of metacontingency and associated cultural milieu to describe Puerto Rico's recovery after a category-five hurricane devastated the island. The analysis examined documents, published reports, and media to articulate how factors such as the island's history as a territory of the United States, traditions, and economic policies likely affected rebuilding after the hurricane. The report illustrates the potential of assessing the cultural context as a key element in risk assessment of community systems and their readiness for climate-related catastrophes. Although none of the four CBS VCS learning objectives were met in this project, it could serve as a model of a preliminary, remote assessment to promote consensus on the definition of the problem and help frame a deeper analysis if on-site work were to become possible.

Leeming et al. (2013) assessed sustainability innovations in one location in a hotel chain that was seeking to showcase eco-friendly hospitality. The researchers conducted an inventory of technological and behavior options, replicating the emerging "green accreditation" process piloted by the Cambridge Center for Behavior Studies (see CCBS, 2013). Practicum students worked with the hotel's engineer and staff members to document the environmental impacts of energy controls, composting efforts, waste management, and more, as well as behavior changes by employees and guests. The observation and documentation of the interlocking

[8] As noted earlier, beyond CBS technical skills, a VCS practicum based in BCP principles will require competence in non-CBS skills as well. The collaborative research model implies that students also will learn or demonstrate competence in interpersonal and consultation skills; the social activism expectation suggests that students will learn or demonstrate facility in skills such as public advocacy.

Table 2 Proposed CBS verified course sequence learning objectives

Proposed CBS VCS Learning Objectives	Community Needs Assessment Task Item (per Watson-Thompson et al., 2020)	CBS VCS Focus Area(s) (per ABAI)	BCP Core Value Representation (per Jason et al., 2019)
Selecting and defining social problems in direct collaboration with community stakeholders		*Saying Doing* *Subcultures*	- Ecological - Interdisciplinary - Prevention-based - Research-focused - Wellness-focused
Arranging scope of consulting within defined boundaries for assessment and intervention in venues offering entry to students	Identification of purpose, components, and methods of assessment Development and implementation of assessment action plan	*Saying Doing* *Subcultures*	- Ecological - Interdisciplinary - Prevention-based - Research-focused
Accessing and analyzing data on participant and setting variables using system-level concepts, prosocial analyses via merged evolutionary science and functional contextualism, and BCP frameworks to establish goals and intervention strategies	Analysis and interpretation of data done collaboratively with stakeholders	*Systems architecture and engineering*	- Ecological - Interdisciplinary - Empowerment - Social justice - Prevention-based - Respect for diversity
Collaborating with community/organizational members to systematically test application of the conceptual model(s) taught in the didactic courses	Disseminating results to stakeholders and to the public Using data to revise goals and plans as needed to effectively address problems	*Policy and cultural dissemination*	- Participatory - Interdisciplinary - Promotes sense of community - Empowerment - Policy-focused - Activism/advocacy

behaviors of staff members and guests provided the students with many opportunities to suggest modifications within the hotel environment that would be likely to select eco-friendly behaviors. The energy costs and environmental impact of hotel operations were tracked from baseline through various innovations; for example, the hotel's occupancy rates were examined as the organization shifted toward more sustainable operations. The hotel's management experienced significant cost savings from the innovations with no loss in occupancy, allowing a data-based resolution to internal hotel debates as to whether environmental controls would dissuade or attract guests. This strategy embodies a replicable technology—developed with site leaders—for assessing organizational behavior as sustainability innovations are adopted; it also offers the potential to be generalized to other settings such as businesses, homeowners' associations, and community organizations. The students contacted all four learning objectives as they worked with the site's engineer to plan the scope of work, conduct observations and interviews, and analyze improvements to the hotel experience.

Newsome et al. (2021) examined the function of rules derived from instrumentation feedback on the eco-driving of commercial and civilian drivers. The research team abided by Institutional Review Board requirements to essentially contract with commercial organizations and citizens to collect data, design interventions, assess responses, and evaluate impact. Working with commercial fleet drivers to improve eco-driving behaviors entails understanding contingencies operating at the individual- and fleet-levels as well as of the engineering and transportation systems that establish routes, plot fuel efficiency, and manage a host of other variables that impact fuel economy (e.g., selections and maintenance of the fleet vehicles). This project charter specified what each party contributed to the effort and stated defined duties for all. Fleet drivers demonstrated a 9.8% improvement in fuel efficiency, but civilians showed no clear benefits from the instrumentation. Importantly, management considered the economic savings achieved by a commercial fleet to be substantial. This project engaged the student (and lead author of publication) with all four objectives through collaboration with the fleet manager of the organization and civilian drivers to define behaviors, gather metrics, analyze fuel efficiency, and document interventions and recommendations.

A final example of an interdisciplinary community-level assessment and intervention to improve sustainability is the Hood River Conservation Project (Hirst, 1988) that retrofitted homes with energy conservation technologies instead of building a new power plant to meet increasing consumption demands. Although the project team did not appear to include experiential learning by behavior analysts, the evaluation of energy consumption and the installation of conservation solutions showed that many behavior changes resulted in reduced consumption and no need for a new power plant. The behavior changes were shown to be a function of information campaigns, feedback streams, and incentives. This is a provocative example from the 1980s of how other disciplines approach community assessment. CBS can extend this kind of work by employing current social media and surveillance technologies for data collection, feedback, and communications related to consumptive behaviors. A replication of this project, using contemporary communication technologies, smart energy grids, and consumption dashboards, would enable students

to demonstrate learning along all four CBS learning objectives by collaborating with energy managers, homeowners, homeowners' associations, and community leaders to assess behaviors related to energy conservation, coordinate changes, and evaluate impact.

Experiential learning opportunities such as these appear to fit within the scope of the CBS practica requirements, and unfortunately, present themselves frequently in contemporary circumstances. Students undertaking such practica would learn to cooperate with community and organizational leaders to assess needs by examining institutional records, observe and measure behavioral variability, assess potential sources of that variability, craft practical interventions, and design field tests to evaluate behavior change, outcomes, and social impact. The application of the principles and concepts of CBS also facilitates the transfer of such knowledge to end-users. Therefore, a highly valuable BCP competency is the ability to communicate behavior analytic and CBS concepts and procedures to stakeholders with different perspectives and arrive at a consensus on needs, goals, interventions, and outcomes. These practicum efforts can help develop methodologies for assessment and intervention and advance the accumulating BCP and CBS literature. Codifying and publishing the project reports provide instructional examples, templates, and governing documents to advance CBS and educate community leaders who can create employment opportunities for competent Culturo-Behavior scientists.

Developing Capability, Competence, Context for Assessment

The practicum requirements help define suitable contexts for applications of CBS and prepare the student and the host-site personnel for continued relationships. A major challenge will be to nurture sites that provide open access to learners, share data, participate in practicum experiences, and engage with the development of an expanded focus within behavior analysis. Appropriate settings will allow students to apply key concepts acquired in foundational knowledge and behavioral systems analysis courses and learn how they are foundations for practical procedures to assess, predict, and change cultural behaviors.[9] The BCP emphasis on intensive and extensive collaboration with community stakeholders will require that faculty teaching these practica ensure students engage in or acquire effective problem-solving and communication repertories; developing such repertoires will depend on individual circumstances and may involve direct training by the instructor or program or referral to other resources for skill acquisition.

Students who learn to apply CBS concepts will have a diverse professional skill repertoire that may lead to greater employment opportunities. As culturo-behavior scientists become more common, the science routinely will be transferred to accepting hosts. These dynamics lay a foundation for expanding the primary and secondary prevention efforts that exemplify the BCP approach: As more behavior analysts

[9] CBS practica may be able to build upon existing experiential learning related to preparation of BCBAs and clinicians, but it is more likely that relationships with new settings will have to be developed to investigate behaviors relevant to persistent social problems.

become skilled at and involved in system-level assessment and intervention and in the dissemination of CBS findings, early identification of and intervention with aspects of systems-level social problems will be facilitated.

Summary: A Tentative Proposal for CBS Practicum

We cautiously outline a path forward for developing CBS experiential learning, recognizing the diversity of programs developing their VCS curricula independently. Regardless of the variation in programs, we suggest that BCP can be an especially apt approach through which to organize practical experiences, particularly since the four VCS learning objectives directly embrace core BCP values.

The learning objectives establish the criteria for competence in applying scientific principles in the description, assessment, intervention, and evaluation of cultural phenomena. Students must demonstrate comprehension of core concepts, the ability to describe these in oral and written communications, and the curiosity about how they translate into action within a host site. A mechanism to share experiential learning lessons and aggregate products will help refine training content and promote innovation. Perhaps ABAI can serve as a clearinghouse to disseminate this in conferences and publications and provide an important service to CBS VCS programs.

It will be important to select students with the interest, experience, and positions of influence within critical contexts to accelerate the development of the CBS practica and form innovative teams. The scope of practica can be articulated in project charters that define the expectations of the learners' analyses, engagement with host personnel and resources, and reports on accomplishments. Entry-level practica experiences can be designed for students admitted directly after undergraduate training. More complex experiences could be arranged for learners who are seasoned leaders and managers in host sites.

The development of ongoing internship sites likely entails cooperative relationships among faculty, learners, site personnel, and community members. In particular, cooperative agreements with on-site personnel are an essential element of charters as they articulate roles and responsibilities during experiential learning and the expected outcomes to be achieved (e.g., truck fleet fuel savings; Newsome et al., 2021; reduced fuel consumption, lower utility costs, sustained occupancy rates; Leeming et al., 2013). Practica that produce measurable beneficial outcomes likely increase the probability of receiving funding support for experiential learning from host sites or grant agencies. Financial resources, in turn, are likely to propel student engagement and attract more diverse applicants to the CBS VCS program. Although the dollar value of CBS applications is likely harder to quantify than BCBA services given the specified fee schedules, cost-benefit analyses (as Leeming et al. (2013) did in the previously described "green" hotel project), and other measures of return on investment. CBS practica contracts will help clarify the marketplace for graduates and create opportunities for employment.

Perhaps the most valuable deliverable at this stage of development of the CBS experiential learning courses are project reports that describe, in technically correct terms and in language understood by personnel at the host site(s), the

accomplishments of the practicum. Our reviews of the behavior analysis literature relevant to sustainability issues (Gelino et al., 2021; Newsome & Alavosius, 2011) found no long-term analyses of sources of behavioral variability at community-level scale. An ongoing practicum relationship with a succession of students, supervised by academic and site personnel, can generate a series of reports culminating in a comprehensive account of behavioral phenomena with replicable analyses and the potential for generalization to new contexts.

This CBS VCS proposal will require long-term field tests that transfer CBS concepts, procedures, and products to end-users in the community. The process is a programmatic and collaborative effort that applies CBS to socially significant issues. Further, the framing of the CBS VCS experiential learning within BCP represents a modification of a metacontingency that selects some of the interlocked behaviors of researchers, practitioners, and community collaborators. It establishes the context to create a lineage of interlocked behaviors that generate knowledge to help guide the replacement of harmful cultural practices with sustainable ones and prevent future systemic problems. This, we contend, is BCP par excellence!

Declarations

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

References

Alavosius, M. P., & Burleigh, K. (2021). Behavior-based safety: A replicable technology. In R. A. Houmanfar, M. Fryling, & M. P. Alavosius (Eds.), *Applied behavior science in organizations: Consilience of historical and emerging trends in organizational behavior management* (pp. 21–64). Routledge.

Alavosius, M. P., & Houmanfar, R. A. (2020). Global warming: Analysis of behavior and organizational practices as climate impacts increase. In T. M. Cihon & M. A. Mattaini (Eds.), *Behavior science perspectives on culture and community* (pp. 221–256). Springer.

Alavosius, M. P., Newsome, W. D., Houmanfar, R. A., & Biglan, A. (2016). A functional contextualist analysis of the behavior and organizational practices relevant to climate change. In R. D. Zettle, S. C. Hayes, D. Barnes-Holmes, & A. Biglan (Eds.), *Handbook of contextual behavior science* (pp. 513–530). Wiley-Blackwell.

Ardila Sánchez, J. G., Houmanfar, R. A., & Alavosius, M. P. (2019). A descriptive analysis of the effects of weather disasters on community resilience. *Behavior and Social Issues, 28*, 298–315. https://doi.org/10.1007/s42822-019-00015-w

Ardila Sánchez, J. G., Richling, S. M., Benson, M. L., & Rakos, R. F. (2020). Activism, advocacy, and accompaniment. In T. M. Cihon & M. A. Mattaini (Eds.), *Behavior science perspectives on culture and community* (pp. 413–436). Springer.

Association for Behavior Analysis International (ABAI) (2022). *Verified course sequence program: Culturo-behavior science.* https://www.abainternational.org/vcs/culturo-behavioral-science.aspx

Barlow, D., Nock, M., & Hersen, M. (2008). *Single case experimental designs: Strategies for studying behavior for change.* Pearson.

Callaghan, M., Schleussner, C.-F., Nath, S., Lejeune, Q. R., Knutson, T. R., Reichstein, M., Hansen, G., Theokritoff, E., Andrijevic, M., Brecha, R. J., Hegarty, M., Jones, C., Lee, K., Lucas, A., van Maanen, N., Menke, I., Pfleiderer, P., Yesil, B., & Minx, J. C. (2021). Machine-learning-based evidence and attribution mapping of 100,000 climate impact studies. *Nature Climate Change*. https://doi.org/10.1038/s41558-021-01168-6

Cambridge Center for Behavioral Studies (CCBS) (2013). *Cambridge Center for Behavioral Studies accreditation site visit report.* https://behavior.org/wp-content/uploads/2017/06/733.pdf

Cihon, T. M., Borba, A., Benvenuti, M., et al. (2021). Research and training in Culturo-behavior science. *Behavior and Social Issues., 30*, 237–275. https://doi.org/10.1007/s42822-021-00076-w

Cihon, T. M., & Mattaini, M. A. (Eds.). (2020). *Behavior science perspectives on culture and community*. Springer.

Fawcett, S. B. (1991). Some values guiding community research and action. *Journal of Applied Behavior Analysis, 24*(4), 621–636. https://doi.org/10.1901/jaba.1991.24-621

Gelino, B. W., Erath, T. G., & Reed, D. D. (2021). Going green: A systematic review of proenvironmental empirical research in behavior analysis. *Behavior and Social Issues.* https://doi.org/10.1007/s42822-020-00043-x

Gelino, B. W., Erath, T. G., Seniuk, H. A., Luke, M. M., Berry, M. S., Fuqua, R. W., & Reed, D. D. (2020). Global sustainability: A behavior analytic approach. In T. M. Cihon & M. A. Mattaini (Eds.), *Behavior science perspectives on culture and community* (pp. 257–282). Springer.

Glenn, S. S. (1986). Metacontingencies in *Walden 2*. *Behavior Analysis and Social Action, 5*(1), 2–8. https://doi.org/10.1007/BF03406059

Glenn, S. S. (2004). Individual behavior, culture, and social change. *The Behavior Analyst, 27*(2), 133–151. https://doi.org/10.1007/BF03393175

Glenn, S. S., & Malott, M. E. (2004). Complexity and selection: Implications for organizational change. *Behavior and Social Issues, 13*, 89–106. https://doi.org/10.5210/bsi.v13i2.378

Glenn, S. S., Malott, M., Andery, M. A. P. A., Benvenuti, M., Houmanfar, R. A., Sandaker, I., Todorov, J. C., Tourinho, E. Z., & Vasconcelos, L. A. (2016). Toward consistent terminology in a behaviorist approach to cultural analysis. *Behavior and Social Issues, 25*, 11–27. https://doi.org/10.5210/bsi.v25i0.6634

Hayes, S. C., Barlow, D. H., & Nelson-Gray, R. O. (1999). *The scientist practitioner: Research and accountability in the age of managed care* ((2nd ed.). ed.). Bacon & Allyn

Hayes, S. C., Barnes-Holmes, D., & Wilson, K. G. (2012). Contextual behavioral science: Creating a science more adequate to the challenge of the human condition. *Journal of Contextual Behavioral Science, 1*(1–2), 1–16. https://doi.org/10.1016/j.jcbs.2012.09.004

Hirst, E. (1988). The Hood River conservation project: An evaluator's dream. *Evaluation review, 12*(3), 310–325. https://doi.org/10.1177/2F0193841X8801200306

Houmanfar, R. A., Fryling, M., & Alavosius, M. P. (Eds.). (2021). Applied behavior science in organizations: Consilience of historical and emerging trends in organizational behavior management. *Routledge*

Houmanfar, R. A., Rodrigues, N. J., & Ward, T. A. (2010). Emergence and metacontingency: Points of contact and departure. *Behavior and Social Issues, 19*, 53–78. https://doi.org/10.5210/bsi.v19i0.3065

Houmanfar, R. A., Ardila Sánchez, J. G., & Alavosius, M. P. (2020). Role of cultural milieu in cultural change: Mediating factor in points of contact. In T. M. Cihon & M. A. Mattaini (Eds.), *Behavior science perspectives on culture and community* (pp. 151–170). Springer.

Jason, L. A., Glantsman, O., O'Brien, J. F., & Ramian, K. N. (Eds.) (2019). *Introduction to community psychology: Becoming an agent of change*. Creative Commons. https://press.rebus.community/introductiontocommunitypsychology/

Jason, L. A., Glenwick, D. S., & Moritsugu, J. (2021). Behavioral methods in community settings: A neglected or a vital force? *Behavior and Social Issues*. https://doi.org/10.1007/s42822-021-00046-2

Johnston, J. M., Pennypacker, H. S., & Green, G. (1980). *Strategies and tactics of human behavioral research* L. Erlbaum Associates.

Kanfer, F. H., & Saslow, G. (1969). Behavioral diagnosis. In C. M. Franks (Ed.), *Behavior therapy: Appraisal and status* (pp. 417–444). McGraw-Hill.

Leeming, E., Hansen, D., Alavosius, M. P., & Reimer, D. (2013). Sustainability in the field: Lake Tahoe hospitality and environmental protection. *Behavior and Social Issues, 22*, 21–39. https://doi.org/10.5210/bsi.v22i0.4116

Levin, K., Cashore, B., Bernstein, B., & Auld, S. (2012). Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences, 45*(2), 123–152. https://doi.org/10.1007/s11077-012-9151-0

Mager, R. F. (1997). *Preparing instructional objectives* (3rd ed.). The Center for Effective Performance.

Newsome, W. D., & Alavosius, M. P. (2011). Toward the prediction and influence of green behavior: Seeking practical utility in research. *Behavior and Social Issues, 20*, 44–77. https://doi.org/10.5210/bsi.v20i0.3234

Newsome, W. D., Sanguinetti, A., & Alavosius, M. P. (2021). Bringing behavior-analytic theory to eco-driving research: Verbal rules mediate the effectiveness of feedback for professional and civilian drivers. *Behavior and Social Issues*. https://doi.org/10.1007/s42822-020-00045-9

Pritchett, M., Ala'i-Rosales, S., Cruz, A. R., & Cihon, T. M. (2021). Social justice is the spirit and aim of an applied science of human behavior: Moving from colonial to participatory research practices. *Behavior Analysis in Practice*. https://doi.org/10.1007/s40617-021-00591-7

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences, 4*, 155–169 https://www.jstor.org/stable/4531523

Skinner, B. F. (1953). *Science and human behavior*. Macmillan.

Skinner, B. F. (1981). Selection by consequences. *Science, 213*(4507), 501–504. https://doi.org/10.1126/science.7244649

Sidman, M. (1960). *Tactics of scientific research: Evaluating experimental data in psychology*. Basic Books.

Todorov, J. C. (2013). Conservation and transformation of cultural practices through contingencies and metacontingencies. *Behavior and Social Issues, 22*, 64–73. https://doi.org/10.5210/bsi.v22i0.4812

Ulman, J. D. (1998). Toward a more complete science of human behavior: Behaviorology plus institutional economics. *Behavior and Social Issues., 8*, 195–217. https://doi.org/10.5210/bsi.v8i2.329

Watson-Thompson, J., Collie-Akers, V., Woods, N. K., Anderson-Carpenter, K. D., Jones, M. D., & Taylor, E. L. (2015). Participatory approaches for conducting community needs and resources assessments. In V. C. Scott & S. M. Wolfe (Eds.), *Community psychology: Foundations for practice* (pp. 157–188). Sage.

Watson-Thompson, J., Francisco, V. T., & Anderson-Carpenter, K. D. (2020). A behavioral community approach to community health and development: Tools for collaborative action. In T. M. Cihon & M. A. Mattaini (Eds.), *Behavior science perspectives on culture and community* (pp. 333–356). Springer.