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Review Article

Contextual Behavioral Science: Creating a science more adequate to the challenge of the human condition

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ABSTRACT

The present article describes the nature, scope, and purpose of Contextual Behavioral Science (CBS). Emerging from behavioral psychology but expanding from those roots, CBS is based on contextual assumptions regarding the centrality of situated action, the nature of epistemology versus ontology, and a pragmatic truth criterion linked to the specific goal of predicting-and-influencing psychological events with precision, scope, and depth. These assumptions and goals explain the characteristic features of CBS including its environmentalism, focus on theory and principles, and its reticulated or networked program of theory development, research and practice. Domains of development include increased linkage to multi-dimensional and multi-level evolution science; development of principles that describe the interaction of behavior and symbolic events with genetic, epigenetic, and cultural dimensions; expansion of theoretical and model development to a broader range of areas of human complexity; advances in measurement theory and practice; the development of techniques and components linked to contextual processes and principles; broad testing of these methods; additional research on mediation and moderation; more concern for effectiveness and training; and enhancement of a diverse development community.

Contents

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1. Introduction

As a functional contextualist sees it, the ultimate purpose of behavioral science is to change the world in a positive and intentional way. Science is taken to be an empirical strategy of interacting in and with the world so as to learn how to be more effective in organizing it, speaking about it, measuring it, and changing it. This distinctively pragmatic perspective derives from a focus on the functions of actions in a historical and situational context, and from being willing to apply that same view to the actions of scientists themselves. Some ways of behaving work better than others, and in a precisely parallel way, some ways of conceptualizing the world work better than others given particular analytic purposes. If the bold purpose of intentional positive change is to be embraced, a well thought out plan is essential. This article is about the purpose and plan of an emerging scientific tradition.

From a functional and contextual perspective, scientific analysis is a social enterprise that seeks the development of increasingly organized statements of relations among events that allow analytic goals to be accomplished with precision, scope, and depth, based on verifiable experience. From this perspective on science, the product of science is verbal, like other human activities such as law or literature, but what distinguishes it as a human invention are the conditions under which scientists can speak, and the evaluative criteria applied to what is said. The criterion of precision means that only a limited number of analytic concepts apply to a given case; scope means a given analytic concept applies to a range of cases; and depth means analytic concepts cohere across well-established scientific domains. A bread recipe has precision but no scope; animism has the opposite problem. Science has been especially successful in generating ideas that meet all of these goals simultaneously, and relations such as $E=mc^2$ are famous because they do so. Limits in precision and scope restrict the practical utility of scientific knowledge; limits in depth restrict its integration. Thus, the importance of the accomplishment of scientific goals with precision, scope, and depth are ultimately a practical matter.

The present article explores the nature and purpose of a contextualistic tradition that adopts this perspective, Contextual Behavioral Science (CBS). CBS is a strategy of scientific and practical development that gathers together a coherent set of philosophical assumptions and strategies of knowledge development and application. This article will examine the assumptions and analytic goals of CBS and their strategic implications.

There is a certain sense of history surrounding this article due to its scope and place in the inaugural issue of the *Journal of Contextual Behavioral Science*, and the fact that it is exploring CBS at a turning point in its development. Our goal in doing so is more active than passive—more prescriptive than simply descriptive. We are seeking to describe CBS but also to empower its future development.

Describing Contextual Behavioral Science in a declarative tone entails a risk, however. Contexts for action change over time, and all scientific perspectives are ultimately found to be wrong, at least to a degree. Living traditions should never allow themselves to become monuments to what was—they are postures toward what is, designed to create what can be. That is not a problem now, because CBS is only emerging as a popular approach, but it could become so. It is an unfortunate fact of scientific development that the healthy variation in ideas and practices that is needed to create long-term progress can become restricted based on history, social agreement, and the urge to be proven right. Thus, we want to be explicit that this article delineates CBS and recommends possible development paths from the point of view of a subset of its developers in the present context. CBS is a living tradition, and nothing in this article should be allowed to restrict its future development by those with the courage and creativity to take it in new directions so as to increase its rate of progress toward chosen goals.

2. Definition of Contextual Behavioral Science

It is worth beginning with the ending. Contextual Behavioral Science (CBS) *is a principle-focused, communitarian strategy of reticulated scientific and practical development. Grounded in contextualistic philosophical assumptions, and nested within multi-dimensional, multi-level evolution science as a contextual view of life, it seeks the development of basic and applied scientific concepts and methods that are useful in predicting-and-influencing the contextually embedded actions of whole organisms, individually and in groups, with precision, scope, and depth; and extends that approach into knowledge development itself so as to create a behavioral science more adequate to the challenges of the human condition.* The present article will attempt to make these definitional features more understandable.

3. CBS as a distinct extension of behavior analytic psychology

Several articles have been written on the nature of Contextual Behavioral Science and its roots in contextualistic behavioral psychology (e.g., Hayes, Levin, Plumb, Boulanger, & Pistorello, in press; Hayes, Levin, Long, & Follette, in press; Levin & Hayes, 2009; Vilaradaga, Hayes, Levin, & Muto, 2009). Among other topics, these articles have described philosophical contextualism and the research program that led to Acceptance and Commitment Therapy (ACT: Hayes, Strosahl, & Wilson, 1999, 2011) and to Relational Frame Theory (RFT: Hayes, Barnes-Holmes, & Roche, 2001).

The present article will touch upon that territory, but not in the same detail. We will include only limited descriptions of ACT and RFT and we will focus little on the roots of CBS in behavioral psychology. This latter decision is not meant to disguise the source of CBS, which is explicitly an extension of a behavioral perspective viewed as a contextualistic system (Hayes, Hayes, & Reese, 1988), but rather to avoid confusing characteristics of CBS with those of behavioral psychology writ large.

Confusion between the two is especially difficult for those without quite specific behavioral psychology backgrounds, and furthermore, although CBS and behavior analysis are historically intertwined, in some ways the two areas have diverged over time. Despite its lofty goals (Baer, Wolf, & Risley, 1968) applied behavior analysis has been unable to avoid domination of the field by the narrow topic of developmental disabilities, both in research and practice (Friman, 2010). Basic behavior analysis continues primarily to focus on animal learning rather than on human functioning — a tendency that may even be increasing (Dymond & Critchfield, 2001) — despite the evidence that symbolic behavior constitutes a new and characteristically human behavioral process that cannot be fully modeled using non-human studies. As grant and academic support for animal learning dwindles, basic behavior analysis "proceeds as an academic discipline in an ever-dwindling number of supportive universities" (McIlvane, 2009, p. 279) and for those who view symbolic behavior as central to human functioning that comes as no surprise. Meanwhile, some well-known behavior analysts reject a contextualistic characterization of behavioral psychology (e.g., Marr, 1993; Staddon, 1993).

All of these trends and characteristics are the opposite of those displayed by the CBS tradition, which is broadly focused, centered on human learning and language processes, growing rapidly in popularity in the academy and practical settings alike, and unabashedly contextualistic. We have reached a point in which the new alliances and connections that need to be made and that are being made by CBS (e.g., DeHouwer, 2011; Wilson, Hayes, Biglan, & Embry, in press) can no longer be built rapidly from the existing organizational or professional base within behavior analysis. Much as a spinoff company has to be held accountable to its own shareholders rather than to the parent company that gave rise to it, we have reached the time when CBS needs to succeed or fail on its own terms, as the existence of this very journal makes a bit more evident.

4. Clarifying assumptions of Contextual Behavioral Science

For scientists, the crucial aspect of philosophy of science is the process of explicating and taking responsibility for scientific assumptions. To ensure that theory, data, and methods comport over time, scientific assumptions need to be clear and coherent. If a research program wanders from its assumptions, the work becomes empty or unstable, and soon enough it is not a "program" at all. When the grand learning theories of the 1930s and 40s collapsed, individual research programs became increasingly fractionated, developing narrow ways of speaking that applied to the domain in which they were working, but lacking connection to any integrative theory. Meta-theoretical assumptions are needed to provide answers to such questions as "what is the goal of knowledge" or "How do we know something is true?" These are not empirical questions; rather, the answers to such questions are what permits empirical work to be done in a well-coordinated way.

Starting with assumptions in explicating CBS is risky, because they can seem abstract and disconnected from everyday life. It is necessary nonetheless because assumptions define the shape and purpose of the approach. We will attempt to avoid the downsides by providing concrete illustrations of how these assumptions change practices on the ground.

Drawing from the post-Darwinian functional tradition of American pragmatism (Dewey, 1925/1981, 1938/1981; James, 1907/1981; Pierce, 1878/1983; see Gifford & Hayes, 1999), and its further development within behavior analysis (Skinner, 1945), the philosophy of science that undergirds CBS is functional contextualism (e.g., Barnes-Holmes, 2000; Biglan & Hayes, 1996; Gifford & Hayes, 1999; Hayes, 1993; Hayes et al., 1988; Hayes & Long, in press; Wilson, Whiteman, & Bordieri, in press). Functional contextualism is a specific variety of scientific contextualism (Hayes, Hayes, Reese, & Sarbin, 1993), with clear assumptions about the units of analysis, ontology, epistemology, and truth criteria.

4.1. Units of analysis: the act-in-context

A functional contextual perspective focuses on the behavior of organisms interacting in and with a context, considered both historically and situationally: the ongoing situated act-in-context. Units drawn from this focus are holistic—the act and its context are not fully separable. For example, consider the act of "going to the store." It implies a place to go from and a place to go to; it implies conditions that establish the importance of going to the store (e.g., lack of food in the cupboard) and consequences of importance to going there (e.g., the food that will be obtained or the party that will be held). No amount of detail about the act itself disconnected from its context (e.g., how the legs move while walking) will make sense of such an act. History, circumstances, and consequences are aspects of the act itself in a functional sense. A person raising a hand to stretch is engaged in a fundamentally different act than a person raising a hand to say hello, even if the muscle movements are identical. The unit is whole, but at the same time aspects of that whole can be examined, much as the sides of a bubble can be examined without supposing that the bubble is assembled like building blocks from its various sides.

The act-in-context occurs not only at the individual level, but also at the group level. Social context and psychological actions blend into actions of groups as the scope of the unit expands into the social, psychological sociological, and anthropological domains. In much the same way, finer grained units emerge as extended actions are examined in a more fine-grained way, or the actions of whole organisms are examined in sub-organismic detail. Examination of the structure of the organism in light of the contributions of specific inheritance streams to a given psychological phenomenon — genetic, epigenetic, behavioral, and symbolic (Jablonka & Lamb, 2006) — extend the psychological analyses of situated actions into biology and the life sciences.

If the same basic formulation is maintained, those extensions of a functional contextual perspective into multiple overlapping units can be done seamlessly. Reductionism and expansionism are rejected because the utility of any explanation needs to be empirically established at its given level of analysis. The psychological level focuses on the situated actions of whole organisms (Hayes, 1993). That level is not explained by analyses at other levels (e.g., neuroscience, anthropology) but it is richly embedded with them, as we will discuss later. The consistency of the formulation of units of analysis (the situated action) and the goal of depth, encourages analysts to weave together what is useful across levels of analysis into an interconnected whole. That is what CBS is trying to do, in cooperation with its sister approaches in other scientific domains.

4.2. Evolutionary epistemology

The idea of an evolving, ongoing act-in-context becomes more complex when this same unit is applied to scientists or practitioners themselves. We appreciate the act by appreciating its context, finding purpose and function amid history and circumstance. But that appreciation is itself an act and it too has a purpose, function, and context. In one sense, Contextual Behavioral Science is just what emerges when evolutionary and

selectionist approaches to behavior are applied in a thoroughgoing way to knowledge development itself.

This flexible recursive contextual unit—the act-in-context consistently applied—presents challenges and opportunities scientifically speaking. Living creatures divide up the world by their interactions in and with it, phylogenetically and ontogenetically. Humans do such divisions verbally as well—such divisions are the very substance of science itself. Any behavioral stream can in principle be divided an infinite number of ways, limited only by the creativity of the analyst—what selects among them is the same thing that selects any situated action, namely, its effects. The effectiveness of an analysis, however, does not provide the basis to argue that it was effective *because* divisions contained within that analysis are pre-existing. Such an argument adds nothing to workability itself and thus has no known truth-value. Some use the term "ontology" to refer merely to explicit specification of conceptualizations, and about that no objection can be made. But a thoroughgoing selectivist or evolutionary epistemology cannot sustain ontological statements if one means the more traditional philosophical definition of what categories exist or can be said to exist in the world and the correspondence between analyses and these categories. Functional contextualists maintain a principled disinterest in ontology in that sense, while maintaining an intense interest in the epistemology implied by behavioral pragmatism (Barnes-Holmes, 2000).

The need to abandon an interest in ontology in the sense just described is an initially awkward implication of a naturalistic contextual account. Natural science relies on common sense linguistic habits that focus on what "is" not on what "works in experience" but that is the very habit examined contextualistically: "if the scientific activity of the behavioral pragmatist is the product of a behavioral history, then he or she can never claim to have found an ontological truth, because a different or more extended history may have produced a different truth" (Barnes-Holmes, 2000, p. 198). Evolutionary epistemology (Radnitzky & Bartley, 1987) has sometimes tried to avoid this implication of a thoroughgoing application of selectivist processes. Campbell (1959) provides an illustrative example of such avoidance by evolutionary psychologists in his "epistemology of the other"—focusing his evolutionary account on how organisms come to know even while "no effort is made to justify 'my own' knowledge processes" (p. 157). Campbell recognized that he was embracing an inconsistency but excused it on the grounds that it avoided solipsism (Campbell, 1959, p. 157); and only years later (Campbell, 1987) acknowledged that a more thoroughgoing pragmatist or contextualistic position is logically implied by a consistent application of evolutionary principles. Pragmatic philosophers also have attempted to dodge the implication. For example, Quine (1974, p. 41) attempted to avoid the problem by the concept of an observation sentence validated by witnesses with similar sensory systems. This demands the ontological assumption of relatively static similar sensory systems among humans (Barnes-Holmes, 2000), which inconsistently blends essentialist and pragmatic assumptions. It appears to be a kind of ad hoc repair patch arbitrarily glued to contextualism in order to avoid the a-ontological implications of its unit of analysis and truth criterion (Hayes & Long, in press).

Functional contextualism is based on the bolder and more consistent option taken by Skinner (1945): in order to create a consistent contextualistic science we must include an analysis of the history and context of scientific knowing itself. Our analyses cannot just be focused outwardly on others, as if we can conveniently forget that we too are behaving. When the scientist is included in the analysis we have to be a bit more humble. Language itself begins and ends as nothing but a social behavioral tool, not a passageway to pre-organized reality: "[Scientific knowledge] is a corpus of rules for effective action, and there is a special sense in which it could be 'true' if it yields the most effective action possible…. (A) proposition is 'true' to the extent that with its help the listener responds effectively to the situation it describes" (Skinner, 1974, p. 235). We have to test *that* kind of truth by showing that verbal principles help those who use scientific knowledge to respond effectively in and with the world. This is an approach consistent with the original truth criterion of pragmatists such as Pierce (1878/1983, p. 145): "there is no distinction of meaning so fine as to consist in anything but a possible difference of practice; or James (1907/1981, p. 165): "truth in our ideas means their power to work".

CBS is intensely interested in pragmatic truth linked to stated goals, *and nothing else*. The principled disinterest in common sense "ontological truth" and the enthusiastic interest in pragmatic truth is echoed in clinical procedures in CBS, such as in the emphasis on defusion and workability in ACT. It is also reflected in the willingness to use both technical and non-technical terms in CBS in different contexts for different purposes, which we will discuss later.

4.3. The truth criterion

If left there, the dispersive nature of individual aims would make it difficult for contextualism to serve as a coherent philosophy of science: one person would seek one kind of knowledge and another would seek a very different kind (cf., Ruiz & Roche, 2007). Science is social enterprise, however, and stating scientific goals publicly allows science to progress cooperatively and in a socially responsible, non-coercive way. CBS properly acknowledges the capacity of others to make their own values-based choices of scientific goals and invites others to choose to work with those who have similar aims and purposes.

Because purposes establish the criterion for pragmatic truth, logically they cannot themselves ultimately be right, correct, or true. They can be nested (smaller into larger; process goals into outcome goals), but they cannot ultimately be justified. If truth is a matter of workability, defending the validity of ultimate purposes is a fool's errand. Justifying a pragmatic purpose would require the statement of still more pragmatic purposes, ad infinitum. Outcome goals and values thus must ultimately be stated naked and in the wind. The importance of this idea is echoed in clinical procedures in CBS, such as in the emphasis on values in ACT as a choice rather than as a reasoned action, which then allows an examination of the workability of behavior. Some goals are merely process goals however (that is means to ends), and these can be justified empirically with reference to outcomes. In ACT that might occur with behavioral goals linked to values (e.g., if X is the value, then it may be an empirical fact that Y would be an effective committed action).

The *goal of functional contextualism is to predict-and-influence, with precision, scope, and depth, whole organisms interacting in and with a context considered historically and situationally*. This goal brings the definitions of science and psychology into contact with "prediction-and-influence" as a unified goal (we are hyphenating it here when treating the phrase as the goal of functional contextualism to emphasize that as a goal it is viewed as inseverable). That goal is what is most distinctive about functional contextualism as compared to other varieties of scientific contextualism such as the more descriptive contextual approaches labeled constructionism, dramaturgy, hermeneutics, and the like, that seek a personal appreciation of the participants in the whole (Hayes et al., 1993). Thus, the analyses that emerge from other contextualistic traditions are of unknown usefulness until they are examined by functional contextualists, as measured against their own purposes. It is also different than non-contextualistic positions such as elemental realism (mechanism)

that emphasize predictive verification and view influence as an occasional side-benefit of understanding, not as a primary test of it.

As CBS has come together as a scientific and practical area, it has adopted an additional goal that has become the slogan for the Association of Contextual Behavioral Science (ACBS) and is in the title of the present article: the creation of a behavioral science more adequate to the challenge of the human condition. This goal emerged as a social consensus and we see no reason to question its wisdom. We are not arguing that this goal is unique to CBS, merely that it is a characteristic that is a logical extension of the CBS strategy itself. As stated in the first sentence of this article contextual behavioral scientists seek to change the world in positive and intentional ways—that is what "prediction-and-influence" is for. If it is stated as an aspiration rather than a declaration of accomplishment, envisioning a behavioral science more adequate to the challenge of the human condition means that CBS is a wing of science that explicitly embraces pro-sociality and human development as a goal of scientific and professional development. This also means that in a CBS approach, minimization — the tendency of scientists to dismiss human complexity as being "merely" this or "just" that, in the absence of broad evidence for these claims — is firmly rejected. Minimization is a kind of intellectual bravado in which further questioning is waived away and further progress is needlessly abandoned. Preventing premature answers from dominating over important questions is seen in the parallel tendency of ACT practitioners to encourage clients to embrace bold questions in living, but to hold any answers lightly.

4.4. Monism

The situated action of contextualism is naturalistic and monistic: the word "behavior" refers to *any and all actions of the whole organism*, including those that are private. The monism of functional contextual science is not a matter of emphasizing the physical over the non-physical, but in the assumptive sense of starting with oneness. Behavior and its functions in context are not treated as proxies for inferred processes or hypothetical variables—they are viewed as legitimate levels of analysis in their own right.

One advantage of this approach is that the gap between concepts and the conditions under which they are applied can be kept small. All concepts require auxiliary assumptions and conditions in order to be tested (e.g., they need to be measured). The tendency to blame auxiliaries and conditions for conceptual failures has been the bane of theory falsification (Hayes, 2004a). The small gap between concepts and conditions is a major advantage of a reticulated model that treats behavior and context as legitimate targets of analysis rather than proxies for other things. The conditions under which one can speak of a consequence as a reinforcer, or a set of actions as being an arbitrarily applicable relational response, is so specific, contextually embedded, and available that there is little room to blame auxiliaries and conditions when models relying on such concepts are not supported. That is just not true with our more common psychological concepts such as "self-esteem" or "schemas" or "personality" and the like. Finally, monism is embraced in CBS, not as an ontological assumption, but instead as a strategic assumption. Disinterest in common-sense ontology allows the practical problems of dualism, including the ways that the mental and physical domains in dualism react or are related, to be left behind.

5. Strategic implications of functional contextual assumptions

Many of the features of CBS as a strategy of scientific development and many aspects of the basic and applied methods that have emerged from a CBS perspective flow from these foundational ideas, assumptions, and goals. We will explore a set of these implications that seem to be especially important and then examine how these implications touch ground in a practical way in a CBS approach.

5.1. Environmentalism, causality and experimental analysis

The hyphenation of the term "prediction-and-influence" is to indicate that the goal of functional contextualism is unified; for that reason, *causal analysis in a functional contextual approach ultimately must extend to the manipulable context of action* (Hayes & Brownstein, 1986). From a CBS perspective, any concept or theory that affords prediction but not influence is not yet known to be "true." Since a person who applies knowledge to behavior is and must be in the domain of the context of that action, knowledge statements meant to produce prediction-and-influence must start there: in the manipulable world of history and circumstance. Thoughts, emotions, and overt action cannot be directly manipulated in others—that is why they are "dependent variables" in behavioral science. A gap in knowledge is created (relative to the goal of causal analysis in a functional contextual approach) when such psychological variables are treated as causal because the person using this knowledge cannot apply it without a leap into the unknown (e.g., without guessing about how to change contextual events to change these variables or their relationships). Thus, any theory consisting entirely of dependent variables (e.g., thoughts cause emotions which cause overt actions) cannot be fully successful in a CBS approach.

This does not mean that private experiences are rejected, or that organisms are reactive or passive entities. Since public agreement is not used as a foundational criterion for truth in a functional contextual position, there are no barriers to considering private experiences as a legitimate focus of scientific and practical analysis. Furthermore, some actions do commonly relate to others (e.g., thinking may be related to overt actions); and actions alter the environment, not just the other way around. For pragmatic reasons, however, analysis is not complete until the context of psychological events, and the context of the relationship among them (e.g., why thoughts are related to overt behavior), are specified (Hayes & Brownstein, 1986). Strong correlations among behaviors often provide an excellent starting point (but not a good ending point) for experimental analyses focused on context that lend themselves to prediction and influence. The focus on the contexts that strengthen and weaken relations between thoughts, emotions, and actions is echoed in clinical procedures in CBS, such as in the emphasis on acceptance or defusion as contexts that foster response flexibility, and their instigation and modeling in the therapeutic relationship in ACT.

Sometimes theories in science cannot be tested against the criterion of influence for purely technical reasons, of course. For example, experimental tests of cosmological analyses might be theoretically but not practically possible given limits on the ability to generate and direct energy. Interpretation can be of use in these situations but not if they become permanent way stations, beyond empirical analysis. Interpretation is an extension of knowledge meant to create a consistent and testable account. In the physical sciences the principles on which interpretive extensions are based are often well established via experimental manipulation in the laboratory, and in the history of the physical sciences technical barriers to the tests of interpretations are often gradually overcome. That can happen in the behavioral sciences too but only if analyses are based on events that are manipulable in principle and are subjected to actual research as soon as possible. CBS embraces that approach. When experimental analysis is not possible for technical reasons (e.g., the analysis of large scale cultural change; or language

development in situ) smaller scale laboratory manipulations can be emphasized as solutions to the technical barriers are sought. The many demonstration studies in RFT that have manipulated experimental histories to establish complex performances are examples, such as training deictic framing and then examining Theory of Mind skills (Weil, Hayes, & Cappuro, 2011) or establishing relational framing skills and then examining intellectual ability (Cassidy, Roche, & Hayes, 2011)

In a CBS approach non-experimental forms of research, such as correlational, naturalistic, participatory action, and qualitative research, have an important role to play. For example, qualitative and naturalistic research help maintain rich contact with the quality of actions and contexts, allowing possibly key features to be abstracted, as we will note in more detail later. Ultimately, however, from a CBS perspective these ideas need to be tested through experimental analysis. In a sense, the ultimate purpose of research in CBS is the determination of causality, but that does not mean that causes are discovered. *"Cause" is taken to be merely way of speaking that indicates that prediction-and-influence can be accomplished in a particular context based on a particular analysis.*

5.2. The reticulated development of principles, theories, and practices

The *a priori* commitment to analyses with high precision, scope, and depth that can advance the human condition has over time had a profound effect on the CBS tradition, and it makes sense of the kind of research and practice that it encourages. There is an understandable tendency when faced with human need to abandon basic work in favor of applied technology. Practitioners and social change agents need help, and they need help *now*. The slow but hopefully steady progress of a basic scientific tradition may hold little appeal in that context, as the history of science shows (Kantor, 1963). Conversely, the behavioral forbearers of CBS often approached behavioral science purely as a bottom up enterprise in which basic principles alone would allow the analysis of human complexity (e.g., Skinner, 1938). Unfortunately, this has three key flaws: first, it can be slow to the point of obstruction of progress; second, there is nothing to ensure that the basic principles needed for applied work are in fact being developed merely by basic scientist indulging their current interests; and third, principles can be too complex to be mastered by front line practitioners for practical use. In the history of behavior therapy and behavior analysis, for example, practitioners often gave up waiting for adequate basic behavioral analyses and tried to move on without further delay. Committed behaviorists (e.g., Azrin, 1977) and those willing to jump to a cognitive position (e.g., Mahoney, 1974) both adopted this strategy, suggesting that the problem of speed was a practical rather than theoretical problem. But as these leaps away from the laboratory were taken, the need for basic principles remained unmet. Behavior analysis tried to proceed with direct contingency analysis as its primary tool kit, even narrowing the field to developmental disabilities and a few other areas if that was what was required to do so; cognitive behavior therapy abandoned the early dream of laboratory behavioral science as a guide to application and instead embraced clinical or even folk psychology theories of cognition and behavior change if that was what was needed to move on (Hayes, 2004b).

CBS has aimed to balance these tensions in a very different way: agreeing that principles are key to the scope of scientific work, but arguing for a reticulated (that is, a web-like) model of scientific and practical development, in which theoretical and technological progress occurs at multiple levels but in an interconnected way, with differing standards of progress appropriate to the particular level of the work given what else is known. For example, yes, applied work can proceed without basic analyses when none are available, but applied and basic scientists alike need to take long term responsibility for fostering such analyses and comporting applied accounts with them. And, yes, sometimes basic accounts will have very little to say about serious human issues, but basic and applied scientists alike need to take to heart what is missing and turn attention toward these gaps, closing them as soon as possible. We will describe more of what we mean by a "reticulated model of scientific and practical development" after defining additional elements that need to be placed into this coordinated network that encompasses the CBS approach.

5.2.1. Basic principles and analytic abstractive theories

The core unit of CBS naturally focuses on environment–behavior relations. Based on careful and systematic observations of action and its context, it is possible to develop ways of speaking about environment–behavior relations that are high in both precision and scope. That is what is meant by the term "behavioral principles" such as principles of reinforcement or stimulus control. These principles need to be embedded in similar contextual analyses that focus on other dimensions and time scales. For example, behavioral principles should be embedded in knowledge about the genetic and epigenetic bases of learning—how they evolved and the conditions under which they apply (Ginsberg & Jablonka, 2010). For that reason, we will at times use the term "contextual principles" to refer to the larger set that apply to the entire body of functional contextual knowledge.

Sets of contextual behavioral principles can be used to unpack the history and situational determinants of complex human actions. In classical behavioral clinical approaches this is done one at a time in the form of functional analyses of individual problems. For *de novo* functional analyses of that kind, practitioners need to master a wide variety of available principles, but when a set of such functional analyses exist in a domain, another possibility exists: to develop ways of speaking about entire sets of functional analyses. That is what a theory looks like in CBS and it is profoundly different than "theory" in more mainstream approaches (for a useful discussion of some of these differences, see Hineline & Wanchisen, 1989).

Unfortunately, modern psychology largely developed its ideas about theory from the hypothetico-deductive approaches of S-R learning theory. S-R theorists claimed that if a functional relation is "always the same … then we would have no need of theory" (Spence, 1944, p. 71), going so far as to say that theoretical constructs were "guesses" as to what variables *other than the ones under the control of the experimenter* are determining the response (Spence, 1944, p. 71, italics added). This turns the practical value of theory on its head. If the goal is prediction-and-influence, only variables under the control of the practitioner could possibly be of applied use. In the hypothetico-deductive view of theory, behavior becomes a mere indicator of inferred theoretical processes supposedly taking place, if anywhere, at other levels of analysis (e.g., such as the "mind/brain") but without being able to abstract these concepts from those other levels considered on their own terms.

CBS takes a different and more pragmatic approach in which "theories" are systematic and generally applicable analyses of classes of observations about action-in-context in a given domain that are stated in terms of coherently related sets of contextual principles, and that allow behavioral phenomena within that class to be predicted-and-influenced as a unified goal (Hayes, 1998a, p. 68). In this more inductive approach, theories are "analytic-abstractive"—they are abstractions from sets of functional analyses. Theories of this kind avoid the classic pragmatic problems of hypothetico-deductive theories (Skinner, 1950) and stay rooted to the contextual features so

necessary for the accomplishment of prediction-and-influence when knowledge is applied by practitioners.

An example is provided in CBS by RFT. Within the symbolic domain, RFT has provided a coherent and useful set of contextual principles that allow symbolic actions to be predicted and influenced. RFT heavily emphasizes behavioral principles (e.g., the reinforcement history that allows arbitrarily applicable relational responding to emerge and be maintained), but these are embedded in other contextual principles. For example, deriving relations can sensibly be interpreted as a form of human cooperation, which in turn was established by multi-level evolutionary selection (Hayes & Long, in press). RFT is held to account against functional contextual goals; it never refers to hypothetical entities or structures. RFT is an analytic abstractive theory.

5.2.2. Practical clinical models and middle level terms

The purely pragmatic approach to knowledge embraced by a CBS approach allows ways of speaking to emerge that are considered in reference to their own purpose and context. Practitioners need models that simplify human complexity without dismissing or minimizing its important qualities and features. It may be unrealistic and unnecessary to expect every practitioner to know the details of behavioral and other contextual principles and to be able to apply them *de novo* to complex situations, but applied methods can be guided by middle-level terms, organized into practically useful models.

The deliberately humble label of "middle-level terms" is meant to underline the fact that not all abstractive concepts need be technical terms (terms with very high precision, scope, and depth). Looser functional abstractions can help orient practitioners to some features of a domain in functional contextual terms so as to produce better outcomes and to facilitate knowledge development (i.e., for treatment and research utility).

The psychological flexibility model that underlies ACT is an example. It encompasses the core concepts of acceptance, defusion, flexible attention to the now, values, self-as-context, and committed action. None of these are yet technical terms; none of them have the same degree of precision, scope, and depth of classical behavioral principles such as "reinforcement," nor of technical RFT concepts such as "the transformation of stimulus functions," nor of contextual principles drawn from evolution science such as "multi-level selection". Overtime the reticulated approach inside CBS may increase the precision, scope and depth of some middle-level terms, rendering them more technical than they currently are but meanwhile they are designed to orient practitioners to key contextual features of various domains.

In some contexts, very high levels of precision are necessary. In others, little precision is needed. "Turn left at the stop light" may be all the precision necessary to help you navigate a drive to the grocery store. Although we could speak in very precise terms about the relative positions of you and the grocery store in terms of global coordinates, elevation, and the like, instructions given in those terms would likely confuse anyone who was not an orienteer. In some contexts, highly precise terms are not functional. Middle-level terms are most coherent in a reticulated approach when they summarize technical knowledge, but in other cases they merely orient listeners toward some aspects of a technical account and we do not currently know if they can be reduced in a point to point way to particular contextual behavioral principles. The converse does not follow. We should work toward a basic analysis of why a middle-level term is useful when it is known to be, including why a lack of precision may be functional under some circumstances. This holding of terms lightly is paralleled in ACT technology when we sometimes ask clients to let go of inflexible attempts to analyze treatment targets such as acceptance. Obsessive demands for precision in understanding the true nature of acceptance may actually interfere with the act of acceptance.

5.2.3. Multi-level and reticulated scientific and practical development

The liberal quality of theorizing that emerges when scientific and applied language is viewed exclusively through the lens of effectiveness is restrained in CBS by the *a priori* goal of analyses with precision, scope, and depth. These three features cannot ultimately be obtained via an "any thing goes" cacophony. What works in each area is a pragmatic matter, but if precision, scope and depth are key, what works in one area needs to influence the search for what works in another. This means that there needs to be a constant effort for middle level terms to be anchored gradually to more technical accounts. Metaphorically, clinical models need to be developed that are a bit like the operating systems of modern computers. An operating system can help get jobs done even without knowing the technical programming language that enables it to do so—but ultimately an operating system cannot be fully understood without knowing that language and how it was used in the case of a specific operating system. Furthermore, as new basic language methods are developed, better operating systems follow.

An instructive historical example is provided by the analysis of spirituality and self-knowledge (Hayes, 1984). Taken literally, "spirit" is about as far from natural science as one can get, but from a functional contextual perspective "terms are to be understood by identifying the conditions under which they are used and the effects their use has. Literal meaning is part of this picture (because the socially established structure of language must participate in its function) but is not synonymous with it" (Hayes, 1984, p. 100). The analysis of spirituality lead in that foundational article to a focus on perspective taking and its possible basis in human language, and to the possible clinical role of perspective taking in undermining excessive behavioral regulation by thoughts and feelings.

Both of these implications have been pursued over the years, the former in research in RFT and the latter in research on ACT. The concepts of self-as-context and perspective-taking have fostered a variety of clinical interventions (Hayes, Strosahl et al., 2011) and have helped explain the impact of methods used by others (e.g., Gestalt exercises, role-playing, and self-distancing exercises). At the purely clinical level these concepts are still somewhat vague, however. There is as yet no adequate clinical measure of "self-as-context," and a recent review of laboratory-based tests of ACT components (Levin, Hildebrandt, Lillis, & Hayes, 2012) found no studies that had yet tested clinical interventions focused on this sense of self in the laboratory. Only one small randomized trial has provided data relevant to the outcome impact of self-as-context (Williams, 2006).

Because CBS is a reticulated research program, however, much more can be said. Three possible bases were given for the basic processes that develop this sense of self (Hayes, 1984): (1) what we now call deictic relations: "words such as 'here' and 'there' are acquired which do not refer to a specific thing but to a relation to the child's point of view." (p. 102); (2) what we now call Theory of Mind skills, such as being able to apply perspective taking to dolls, other people, and oneself at different points in time and space? (p. 103); and (3) the invariant between perspective taking and self-referential terms (p. 103). The analysis was even applied to the behavior of a behavioral scientist grappling with the functional contextual definition of truth within functional contextualism itself (Barnes & Roche, 1997).

In the years since, a great deal has been learned about deictic relational frames such as I–You, Here–There, and Now–Then, and their relation to Theory of Mind skills. Measures have emerged of deictic relational responding and developmental trajectories plotted (McHugh, Barnes-Holmes, & Barnes-Holmes, 2004); and training is known to improve deictic performance with side benefits in Theory of Mind performance (Weil et al., 2011). This basic progress is beginning to impact other applied areas. For example, studies have shown that deictic responding can illuminate key clinical concepts such as social anhedonia (e.g., Villatte, Monestès, McHugh, Freixa i Baqué, & Loas, 2010), or the developmental delays shown in Asperger's Syndrome (Rehfeldt, Dillen, Ziomek, & Kowalchuk, 2007). Entire books have been written on the progress of a basic analysis of self in RFT and its applied implications (McHugh & Stewart, 2012). Until this is fully extended, the development process will not be complete, but clearly progress is being made and the impact of such research is measurable (Dymond, May, Munnelly, & Hoon, 2010).

Thus, rather than either a bottom–up basic approach, or a top–down clinical approach, CBS has evolved into a reticulated strategy based on the mutual interest between basic and applied workers on common core issues (Hayes, 1998b). Progress can occur at each level using standards appropriate to that level, but the implications need to be explored in an interconnected way with progress in either area influencing the other.

We should not expect RFT labs to provide an account that will apply point to point with existing clinical models. For example, while excellent progress has been made in the deictic basis of sense of self, the same cannot yet be said for acceptance. Fortunately, a reticulated approach does not demand this. As basic findings are extended, entirely new middle level terms may emerge and existing ones will fall away or be supported only in part. For example, cognitive control over behavior may be shown to be related to, say, the distinction between relational framing that is relatively brief and immediate versus extended and elaborated (for a detailed treatment see Hughes, Barnes-Holmes, & Vahey, in this issue; for a recent empirical example see Carpenter, Martinez, Vadhan, Barnes-Holmes, & Nunes, 2012). These new basic findings may provide a way to think about the issues engaged by concepts like "fusion" and "defusion" even if there is no point correspondence. What makes such a reticulated agenda possible is that the analyses are always contextual and the truth criterion is always the same.

5.2.4. Consilience

Like a fractal, this process of agreeing on core assumptions and goals, and constructing a multi-level reticulated model of theoretical development, applies to each issue, or area, or domain. It has been seen in a gross way in the effort over the last 30 years to co-develop ACT and RFT; and in a more fine-grained way in the similarly lengthy effort to develop a clinical analysis of self and a basic analysis of perspective taking. But it is also being seen in quite different efforts to link RFT to modern work in cognitive science (DeHouwer, 2011; DeHouwer, Barnes-Holmes, & Moors, in press), or to link ACT and RFT to multi-level selection in evolution science (Hayes & Long, in press; Wilson, Hayes et al., in press). It is being seen in the effort to link ACT to other contextual forms of cognitive behavior therapy (Hayes, Villatte, Levin, & Hildebrandt, 2011), or to the development of pro-social groups from an evolutionary point of view (Wilson, Hayes et al., in press).

Even if others are not contextualists or functionalists, maintaining a functional position encourages researchers to explore perspectives involving different philosophical assumptions and truth criteria merely to see what might be useful. For example, even if cognitive and functional perspectives are distinct and separate there is no reason for the researchers involved in the work to remain isolated from each other. What allows a higher level of integration, however, are commonalities among those with a functional contextual approach. Examining behavior in its historical and situational context, and interpreting it based on variation and selective retention (and applying that idea recursively even to knowledge development itself), provides a bridge to selectivist and contextualistic accounts of all kinds, in all areas, and at all levels.

In essence, Contextual Behavioral Science is emerging as a branch of evolution science, provided evolution science itself is viewed in a functional contextual way. Psychology is not subservient to biology, any more than biology is subservient to chemistry, but the concept of "depth" elevates the unity of science to that of an *a priori* analytic goal. As with all such goals, it need not be defended and justified—but it does need to be stated. For the goal of depth to be met, analyses need to be nested in a coherent fashion. The analysis of the behavior of whole organisms is part of the life sciences, and a contextual approach makes that a productive area of reticulated interaction with other areas of the life sciences, not merely a truism. If a unified fabric of science is never obtained, that is unfortunate, but in the meantime it is actively being sought by contextual behavioral scientists as a chosen goal.

The breadth of this perspective can seem overwhelming, but it need not be so. Consilience is an old idea made popular in recently times by Wilson (1998) but was developed originally by Whewell (1840) as a way of explaining how inductive sciences can come together despite the more narrow focus on particular domains in scientific work. A reticulated approach offers some new possibilities in the promotion of consilience. For one thing, a reticulated scientific tradition can advance even if very few people are working on interconnections between areas, domains, or levels. No one person need work on the enterprise as a whole. Only a few clinical researchers need to do basic research/only a few basic people need to do applied research; only a few evolutionary biologists need be interested in CBS/only a few behavioral researchers need to be examining behavior in the context of evolution in other dimensions (Jablonka & Lamb, 2006; Schneider, 2012); only a few existential and humanistic clinicians need be interested in ACT, RFT, and CBS/and only a few ACT practitioners or CBS researchers need be interested in humanistic therapy; and so on. What is key is that common assumptions allow developments to apply one area to the other, that the importance of interconnection is understood, and that at least some are able to link these developments and to carry them into the more specific areas of intellectual and practical work (see Hayes, 1998b).

It is worth contrasting this approach with the more common forms of reductionism that are integral to elemental realist perspectives. Perhaps the clearest example of the difference between the multi-level reticulated program of CBS and mainstream psychological science is the role of neuroscience and other biological areas. In the mainstream approach, brain processes are causal (cf., Hineline & Wanchisen, 1989), and when vague psychological terms are examined that are of unknown utility in prediction-and-influence at the psychological level, they are often seemingly explained by the high precision of neurobiological analyses. For example, suppose researchers wished to understand generosity and where it comes from. We might create a self-report measure of generosity and select people who are high or low on our measure. While imaging the brain, we might expose those high or low on this trait to various tasks seemingly involving generosity. If clear differences are found, the headlines around the world will declare the common vision of

this approach: "Brain Explains Generosity"; or "Researchers Learn that Generosity is Real"; or "Your Spouse Not Generous? Its in His Head."

All such conclusions are an illusion, in which ignorance at one level of analysis disappears into the very assumptions that establish importance for studies at another level of analysis (Fletcher, Schoendorff, & Hayes, 2010). The only reason the brain images are seemingly important is because generosity is of interest. The study provided no understanding of the history, context, function, and nature of generosity but rather was based on the guesses embedded in the self-report measure and tasks. It was these guesses that enabled the collection of sophisticated neurobiological information. Unfortunately, the ignorance we began with is now packed forever beyond reach into the assumptive base of the imaging study. Readers now *assume* these images have something to do with generosity (otherwise, why do the study?) but the elements of history, context, and function that were missing at the beginning are still missing at the end. They are nowhere to be found in the elegant images that technology has provided. It is a high cost because such variables might tell us how to create more generous schools, workplaces, and communities, as well as fostering a more interesting form of neurobiological knowledge.

Contrast this with a contextual behavioral neuroscience. In this approach, the material state of the brain is never by itself a scientifically adequate cause of psychological action; instead neurobiological evidence relative to psychology examines the depth of psychological accounts and provides a larger scientific context for them. If a behavioral event is understood in terms history, context, and function, nothing should appear at the neurobiological level that contradicts that understanding. If it does, then the analysis fails because it has no depth. If, conversely, relations between precisely defined situated actions and neurobiology are obtained then we have increased our understanding of neurobiology and of behavior, because *all of the factors of history, context, and function known to be important at the behavioral level can now inform our understanding of how the brain develops and functions.* As neurobiological evidence grows based on more adequate behavioral and contextual knowledge, the implications for behavioral science of neurobiological knowledge grow as well. For example, knowledge of contextual effects on brain functioning can later allow neurobiologists to provide additional clues to behavioral scientists about the possible contextual factors involved in complex performances that are not yet well understood at the psychological level based of patterns of neurobiological responding.

Skinner long ago provided examples of this approach (Skinner & Heron, 1937) and pointed out what this approach would mean: "What is generally not understood by those interested in establishing neurological bases [of behavior] is that a rigorous description at the level of behavior is necessary for the demonstration of a neurological correlate…both must be quantitatively described and shown to correspond in all their properties" (Skinner, 1938, p. 422). As has been pointed out "In one sense, that is a daunting idea because it means that no one aspect of this integrated research program can sprint ahead while other aspects lag behind. What it promises, however, is, over time, a more integrated and useful knowledge base" (Fletcher et al., 2010, p. 60).

As an example, RFT researchers believe that they have developed a relatively adequate account of metaphor as a matter of relating arbitrarily applicable relations (Lipkens, 1992; Lipkens & Hayes, 2009; Ruiz & Luciano, 2011; Stewart, Barnes-Holmes, Hayes, & Lipkens, 2001; Stewart, Barnes-Holmes, & Roche, 2004). That analysis is supported by neurobiological evidence showing that the brain responds to these RFT tasks similarly to actual metaphor (Barnes-Holmes et al., 2005). Were that not the case, the RFT analysis of metaphor would itself need further work. To the extent that it is, however, all of the psychological knowledge about relational learning informs our neurobiological knowledge, allowing neuroscientists to study how brain functions are responsive to the history and context that establish and regulate relational learning, and to a degree, allowing neurobiological responses to inform the contextual analysis of complex behavior.

6. Domains of CBS research and practical development

In previous writing on CBS (Hayes, 2008; Hayes, Levin, Plumb et al., in press; Hayes, Levin, Long et al., in press; Levin & Hayes, 2009; Vilardaga et al., 2009) several key aspects of system building have been delineated. These articles have generally described these items in a way that could apply to any analytic tradition (e.g., arguing that we need to be clear about assumptions, or we need basic principles) and only then describing how CBS per se approaches these issues (e.g., explaining functional contextualism and RFT).

In this paper we will describe the characteristics of CBS in a different way, stating each as a prescriptive agenda for CBS research and then offering a few examples. Any prescriptive statement can appear to be intellectual bullying if it is taken out of context. What prevents it from being so here (we hope) is that we have already described how a small set of core assumptions have guided the nature of CBS theory and practice and lead to certain key recommendations. For example, it may already be clear to the reader why the CBS research program needs to test its applied methods broadly (to test scope), or needs to focus on mediation and moderation (to test processes more precisely), or needs to consider dissemination at every step (to ensure that knowledge leads to effective action), or emphasize component analyses linked to manipulable processes (to make sure that principles and processes have pragmatic implications), and so on. These are the kind of implications we will develop below, primarily expressed as recommendations for action in CBS research and practice.

6.1. CBS research should develop connections with multi-dimensional and multi-level evolution science

The functional wing of behavioral psychology was always explicitly a form of evolutionary psychology:

> Selection by consequences is a causal mode found only in living things or in machines made by living things. It was first recognized in natural selection, but it also accounts for the shaping and maintenance of the behavior of the individual and evolution of cultures. In all three of these fields, it replaces explanations based on the causal modes of classical mechanics. The replacement is strongly resisted. Natural selection has now made its case, but similar delays in recognizing the role of selection in the other fields could deprive us of valuable help in solving the problems that confront us (Skinner, 1981, p. 501).

CBS brings additional content to that table. It contains a knowledge base about arbitrarily applicable derived relational responding as the core of human symbolic behavior, and encompasses a focus on human psychological flexibility and prosociality. It can establish itself as a new form of evolutionary psychology with a conscious agenda of linking knowledge about behavioral and symbolic development to other dimensions of human inheritance and development, including genetic and epigenetic factors, biological and behavioral developmental

plasticity, and cultural extensions of behavioral and symbolic development.

Evolutionary psychology as it has developed is explicitly hostile to behavioral psychology (e.g., Pinker, 2002; Tooby & Cosmides, 1992) due in part to hoary mischaracterizations that are simply irrelevant to CBS (e.g., supposedly behavioral researchers believe that humans are blank slates or black boxes; thoughts cannot be studied directly but must be studied based on inputs and outputs; and so on). Classical evolutionary psychology is relatively gene-centric and is so far unable to accommodate the role of general learning processes (Wilson, Hayes et al., in press). CBS is going to have to forge a new path forward that properly links itself to the contextualistic wings of the life sciences if it is to assume its natural place.

CBS has a broad focus on ontogenic development that can readily be embedded into multi-dimensional and multi-level evolution science. What we mean by "multi-dimensional" is the view that variation and selective retention occur in multiple strands of mutually interacting events (e.g., genetic, epigenetic, behavioral and symbolic; Jablonka & Lamb, 2006); what we mean by "multi-level" is the view that variation and selection occur at different levels of organization, with competition and selection occurring both between and within groups.

Multi-dimensionality places CBS concerns into a larger body of scientific work. Gene expression is regulated by an epigenetic system that is an inheritance system in its own right (Morris, 2012), and the epigenetic regulation of genes is massively impacted by environment and behavior (Francis, 2011; Jablonka & Lamb, 2006). There is increasing awareness that developmental plasticity is critical to both gene expression and to genetic evolution itself (Schneider, 2012; West-Eberhard, 2003). Multi-dimensional evolution science considerably increases the relevance of ontogenetic processes at all levels such as the relevant of opponent physiological adjustments to the consequences of long-term use of pharmacotherapy, or the importance of learning and symbolic development as examples of developmental plasticity. Any lack of understanding of the situated actions of whole organisms leaves a hole in the fabric of the life sciences. CBS has an important role to play in this domain. It will be necessary as interconnections are explored for CBS researchers and practitioners to consider data, methods and analytic techniques from the contextualistic life sciences more generally.

Similarly, principles of multi-level selection have profound implications for cooperation and pro-sociality (Nowak, Tarnita, & Wilson, 2010; Wilson & Wilson, 2007). All forms of selection, both within and between group, are engaged by phenotypes or forms, not directly by genotypes, and behavioral phenotypes are perhaps the most important. The genotype is an important inheritance system that retains some of the effects of selection, but the unit of selection itself is the phenotype, not the genotype.

Multi-level selection applies in principle to everything in CBS. For example, if humans are particularly cooperative because they are eusocial, then it seems likely that relational framing evolved in a social context of cooperation. This could help explain the evolution of relational framing itself (Hayes & Long, in press). Imagine that teaching an object→sign relation *from the point of view of the speaker* (see object→say "name") and teaching a sign→object relation *from the point of view of the listener* (hear "name"→look for object) eventually helps to establish the frame of coordination. In this case, the frame of coordination as an overarching operant depends in part on the coordination of roles between a speaker and listener who are sharing a common ground of intentional cooperation. The cooperative context thus provides a reason for social training in the first place and as a basis for a continuous process of genetic, behavioral, and cultural evolution in support of symbolic communication of a sort described by RFT. Such an evolutionary process could quickly create a minimally competent social/verbal community that could then shape additional relational frames, modeled on the mutuality of speaker and listener roles but no longer attached to them. For example, comparative frames that involve the derivation of $A < B$ given training in $B > A$, may involve learning that *from the point of view of* A, B is bigger, but *from the point of view of* B, A is smaller. This changes how we think about relational frames, because it suggests that the non-verbal basis of perspective taking was involved in giving rise to them, and they were, at least in part, originally cooperative acts.

CBS should consider itself that wing of pragmatic behavioral science that is consciously considering these strands of development and their interactions as part of the whole of human behavior considered in a multi-dimensional and multi-level way. As we expect to see CBS research on such topics such as

- the epigenetic effects of learning, education, psychological flexibility processes, and developmental plasticity generally, and how these effects impact the genetic regulation of structural and behavioral phenotypes;
- exploring how the parameters of general learning processes are modified by genetic evolution in some areas such as has been done with taste aversion;
- considering how preferences for specific environments alter the underlying neurobiological substrate of behavior;
- applying evolution science methods to relational framing, such as studying the implications of eusociality for non-verbal perspective taking or how this may have fed into the evolution of relational framing itself;
- examining the role of behavioral and symbolic development in cultural evolution;
- applying multilevel selection principles to guide the deployment of ACT in groups and organizations, and so on.

6.2. Basic principles and theories need to be further developed in behavior, language, and the interaction with other inheritance streams over time

The CBS tradition has always aimed to develop principles of organism–environment interactions within the lifetime of the individual. Behavior in context needs to be examined repeatedly and naturalistically, beginning in psychology with the intensive analysis of individuals and scaling to groups as a level of analysis across the behavioral sciences. Contextual behavioral principles include such things as habituation, the adaptation that an organism shows to the repeated presentation of a stimulus that could be potentially threatening or important but can in fact be safely ignored; respondent or Pavlovian conditioning, or learning to prepare for a meaningful stimulus based upon a signal that typically occurs just beforehand; and operant conditioning, or changing behavior based on the consequences that it produces. Work on such basic behavioral principles of this kind continues, but progress has clearly slowed over the decades and the biggest need for additional contextual principles appears to reside in three major areas: human language and cognition, the interactions among inheritance systems (e.g., between behavioral, symbolic, genetic, and epigenetic development), and the extension of these processes into human culture.

The need for a contextual analysis of human language and cognition is clear to practitioners, who need an account of cognition that provides directly manipulable contextual targets, which is part of what drove the development of RFT. But the need for such an analysis is equally clear to the contextualistic life sciences more generally. While basic learning processes likely

date to the Cambrian period, and thus are more than 500 million years old (Ginsberg & Jablonka, 2010), human symbolic relations are far, far younger. Homo sapiens may be as much as 195 thousand years old (McDougall, Brown, & Fleagle, 2005), but human symbolic behavior may be only about 100 thousand years old (Nichols, 1992). CBS itself has contributed to the evidence that symbolic behavior is a relatively new inheritance stream. Despite the best efforts of some of the finest behavioral researchers over the last 40 years, there still remains no unequivocal evidence for even the simplest symbolic activity as RFT defines it in a non-human species, including the higher primates (e.g., Dugdale & Lowe, 2000). Furthermore, relational learning has been shown in many studies to constitute a dividing line demarked by human language abilities (e.g., Devany, Hayes, & Nelson, 1986), not because language produces relational learning, but because it is itself a form of relational behavior.

From an RFT perspective the dividing line is not relational learning per se (since a wide variety of species can learn to relate events non-arbitrarily), it is bringing this learning under arbitrary contextual control. Initially, a young child who learns that A is related to B may not "understand" that B is therefore related to A, and thus the B–A relation also has to be taught directly. If the same relations are taught across a range of other "problems", however, eventually learning about a relation in one direction (*X–Y*) in a specific context generates a derived relation in the other direction (*Y–X*). In a sense, the child has learned how to learn about symbolic relations. Although the complexity of the relations may increase dramatically to levels that are potentially almost limitless, the basic process underpinning symbolic learning remains relatively simple—relational responses are selectively strengthened or weakened based on the consequences that the responses produce in the social and physical world of the human organism. In this sense, human language and cognition *evolve* during the life-time of each individual, given a proper social context, just as it has evolved as an inheritance system in its own right in the form of written language, books, tapes, digital recordings, and the like.

RFT researchers spent many years showing that relational learning was built upon the foundation of operant processes. In essence this program of research created a technical account of an interaction between two inheritance streams, namely, how operant learning helped create symbolic relations.

Very careful additional work will be needed to describe the complexities of human language and cognition in RFT terms, and to map out how genetics, epigenetics, behavior, and symbolic behavior interact and extend over time into cultural practices. Some of these areas will likely result in new contextual principles in their own right. The great advantage of the CBS approach is that the rich, reticulated nature of the research and the focus on manipulable contextual features ensures that practical concerns will enter into the choice of basic problems to study, making is less likely that basic advances will be disconnected from application.

As examples of this domain of CBS research we expect to see CBS research on:

- how relational learning helps explain complex cognitive and behavioral topics such as memory, reasoning, persuasion, emotion, intellectual ability, logic, discourse, reappraisal, problem-solving, goal-setting, and so on;
- how relational learning changes the operation of more primative learning processes (for example, how symbolic behavior alters the impact of classical conditioning);
- how the transformation of stimulus functions is regulated;
- how relational learning shapes human emotion;
- how perspective taking relates to human emotions such as love, compassion, or empathy; or
- how sense of self impacts on pro-sociality or cooperation, and so on.

6.3. Reticulated models and theories of domains, problems, interventions, and health need to be developed

Having a set of basic principles and theories is a good start, but in a reticulated approach, it is not enough. Principles are like well-built and highly polished tools: they are beautiful in their own terms but their real value comes when they are used. Behavioral principles, and the additional contextual principles that may emerge regarding the interactions between inheritance streams, dare not remain at the level of polished tools sitting on a shelf. CBS models and theories are needed in all areas of human complexity such as intimate relationships, meaning and purpose, problem-solving, intellectual ability, creativity, spirituality, sexuality, and so on; they are needed in the array of problems in psychopathology; that are needed in intervention, prevention, and health promotion.

Sometimes analytic-abstractive theories can be constructed in which the transition from basic principles, to functional analysis, to classes of functional analyses is seamless. RFT is an example. At other times, middle level terms need to be used that cannot yet be fully tied down to basic principles in a point to point way, with models that are built from organized sets of such terms. The psychological flexibility model underlying ACT is a primary current example. Bottom up strategies are likely to be more precise but can be slow and at times miss the phenomena of interest. Top down strategies maintain contact with the kind of complexity that needs to be explained but are likely to be more confusing since some middle level terms will fail to lead to technically or practically adequate accounts. The reticulated model aims to encourage both but keeping them in a dynamic tension designed to ensure the better long term integrations of applied and basic work.

The bold and broad goals of CBS go far beyond psychopathology and its amelioration, but the same combination of reticulated bottom–up and top–down work that has yielded gains there needs to be applied to other domains. As examples of this domain of CBS research we expect to see such things as

- theories of human wellbeing and happiness;
- models of education, prevention, or health development;
- theories explaining the human tendency toward prejudice and stigma and ways to counteract it;
- contextual models of violence, sexual abuse, and child neglect;
- a psychological flexibility account of the therapeutic relationship; and
- new approaches to increase pro-sociality and empowerment of social concern toward social disparities, environmental degradation, global climate change, poverty, child deprivation, and similar matters.

6.4. CBS needs to develop theoretically and technologically in the area of measurement of processes of change and behavioral outcomes

Adequate measures of processes of change and behavioral outcomes are integral to a reticulated approach. In the CBS ideal, practices improve outcomes by changing behavioral processes suggested by contextual principles and models. Measurement of processes of change thus is critical to the success of a CBS approach. Unfortunately classical test theory is poorly positioned to ensure quality measurement from a CBS point of view.

In classical test theory or the more modern item response theory, if a measure samples from the domain, is reliable and internally consistent, shows positive correlations with measures of

similar traits, negative correlations with measures of opposing traits, and zero order correlations with measures of orthogonal traits, the measure is declared valid. These classical views of validity emerge from elemental realist ontological assumptions (Borsboom, Mellenbergh, & van Heerden, 2003). Good measures are assumed to mirror, imperfectly, the true elements of the world. Particular responses are seen as behavioral manifestations of the underlying concept, which is not subject to direct observation. The consistency of item performance is used to model the latent construct.

In a CBS approach, truth is pragmatic and measures must show treatment or research utility, above and beyond any other property. Treatment utility (Hayes, Nelson, & Jarrett, 1987) means that a measure should tell a practitioner what to do. Change agents with the results of the measure need to be able to (1) better target interventions, (2) to change the level of the process, and (3) thereby produce better outcomes with such information than without it. Research utility refers to the measure's ability to model change and its determinants. Some measures of change processes may not prove useful at the level of the individual, but may show broader shifts in population-based studies or in laboratory studies.

Although there are beginnings (Hayes et al., 1987) to date no one has thoroughly examined classical psychometrics and its alternatives from a contextual point of view. It will be difficult because psychometric theory is so universally supported that it has even entered ethical codes as the definition of "quality" assessment. Some parts of psychometrics can be helpful to CBS measurement development, given that utility is primary, because it provides methods to document consistencies in action and in its contextual regulation. Response patterns of individuals on a measure are not an indicator of what is unseen, however, they are patterns requiring a contextual account. Suppose individuals who endorse "I feel sad" at a high level, also tend to endorse "I withdraw from people." We should not assume that this consistency indicates an inferred variable (e.g., depression)—rather we should study the conditions that establish, maintain, or undermine the relationship among these aspects of behavior. ACT studies have repeatedly demonstrated desynchronies among thought, emotion, and action after treatment (e.g., Bach & Hayes, 2002) because ACT, at times, fundamentally alters the social/verbal contexts that maintain the consistent response patterns detected by psychometric methods. If after treatment self-reports of, say, thinking or emotion no longer correlates with action, this may not indicate that the measure has failed (as would be assumed in classical psychometrics). It may indicate instead that treatment was successful in creating more flexible response patterns; indeed we can imagine conditions in which a reduction of Chronbach's alpha of a well-established measure is itself a measure of treatment success.

It seems important for researchers within CBS to devote resources toward developing specific and compatible measures, in addition to working on a more well articulated contextual assessment theory. Examples of new areas of assessment that seem especially resonant with CBS assumptions are experience sampling (Bolger, Davis, & Rafaeli, 2003) focused on psychological flexibility processes, or measures of the strength or fluency of relational framing, including relational measures of implicit cognition.

Experience sampling involves asking participants several times over the course of a day to respond to questions about activity, mood, and cognition. Once difficult to conduct, the ubiquity of smart phones has made it a broadly applicable clinical and research tool. It is especially resonant with a CBS approach because it embeds assessment in life as it is lived, it allows a large number of repeated measures over time, and items can focus on the direct properties of psychological events.

The development of relational measures of implicit cognition in RFT laboratories is the best developed current example showing why measures borrowed from mainstream psychology may at times be of limited use to CBS and how to go beyond them. Consider, for example, the now ubiquitous implicit association test (IAT; Greenwald, McGhee, & Schwartz, 1998). The test is based, as the name implies, on the assumption that cognition it inherently associative in nature. In a CBS approach, human language and cognition are argued to be relational, not associative (see Hughes, Barnes-Holmes, & DeHouwer, 2011, for an extended discussion). A novel measure of implicit cognition was needed that targeted relating as a behavioral probability rather than the mental construct of associating, and one was found in the Implicit Relational Assessment Procedure (IRAP). Although the work involved in developing the measure was necessarily slow and painstaking and still continues at the time of writing, recent research has begun to show that the IRAP could be extremely useful across a range of applied domains. For example, it has predicted treatment outcome when other mainstream measures fail to do so (Carpenter et al., 2012), and the IRAP appears to predict subtle differences in psychopathology that would be difficult to target using the IAT (Nicholson & Barnes-Holmes, 2012a, 2012b).

We would hope to see CBS assessment research and scholarship in such areas as

- measures of the fluency of relational framing with children that are appropriate for educational settings;
- tests of the treatment utility of psychological flexibility measures;
- additional implicit measures of psychological flexibility processes;
- IRAP procedures applicable to other existing self-report instruments, allowing implicit measures to cover a wider variety of psychological concepts;
- behavioral measures of response flexibility and other key outcomes;
- measures of values attainment, quality of life, and life functioning that can be customized to fit the individual;
- methods for identifying "functional symbotypes"—patterns of cognition and context with known behavioral functions (see Wilson, Hayes et al., in press);
- studies of how contextual interventions produce or restrain desynchrony among measures and items;
- contextual theoretical analysis of classical psychometrics; and
- experience sampling methods focused specifically on psychological flexibility processes, and so on.

6.5. *Specific techniques and components need to be developed and tested, linked to processes and principles*

When CBT broke away from traditional behavior therapy, functional analysis became far less central and attention turned toward packages linked to syndromes. By adding contextual cognitive principles to the mix, CBS affords a new way toward the vision of evidence-based processes linked to evidence-based procedures (Rosen & Davison, 2003). It is a mistake to think primarily in terms of testing packages of methods that contain a large variety of procedures. If some methods are contained in these packages that are inert or even harmful, it could take decades to ferret them out—and even when they are it may be too late to change practices easily. CBT is living through this right now with the loss of confidence in putatively critical cognitive methods (Longmore & Worrell, 2007). Randomized controlled trials of contextual clinical approaches such as ACT are important but in routine applied work it is more natural to use procedures linked to processes. The psychological flexibility model underneath ACT can be used to

organize flexible deployment of ACT methods, for example, but it can also be used to bring in procedures from Functional Analytic Psychotherapy (Kohlenberg & Tsai, 1991), Mindfulness-Based Stress Reduction (Kabat-Zinn, 1990), or Compassion Focused Therapy (Gilbert, 2009). Over time, fitting methods to individual needs based on good principles and theory seems destined to constitute the heart of applied work in CBS. Whether that work will mostly be called "ACT" or something else is not as important as whether clinical needs are met by a scientific tradition.

As clinical, educational, and social change procedures come to be based on technical RFT concepts, not just the middle-level terms of psychological flexibility, the inductive functional analytic focus of CBS will likely lead to new techniques and components. The wider range of applied problems CBS is dealing with seems to demand it. RFT research suggests how particular educational problems might be remediated, for example; relational fluency is clearly an important foundation of many intellectual skills and applied extensions of RFT already exist (Cassidy et al., 2011; see Rehfeldt & Barnes-Holmes, 2009, for a book-length treatment). However, more RFT-informed models and methods of learning and education are needed. Similarly, CBS researchers are focusing more on stigma and prejudice, and a number of social change methods suggested by RFT and psychological flexibility have been tested. Clear, testable models of stigma, prejudice, compassion, and cooperation are needed linked to innovative components and procedures.

A recent meta-analysis of 66 laboratory studies examining ACT components (Levin et al., 2012) provides an instructive example of the benefits of a component focus, living under the umbrella of models, theories, principles, and processes. As compared to inactive comparisons, significant positive effect sizes were observed for many of the elements of psychological flexibility: acceptance, defusion, present moment, values, mixed mindfulness components, and values plus mindfulness component interventions. Larger effect sizes were found for theoretically-specified outcomes, and for differences between theoretically distinct interventions. Finally, larger effect sizes were found for interventions including experiential methods (e.g., metaphors, exercises) as compared to rationales by themselves. This pattern of results provides support for the psychological flexibility model being applied in a process-focused fashion, helping to free practitioners from linear applications of entire packages.

We would hope to see more research in such areas as

- developing procedures linked to basic RFT processes—for example, using distinct methods to move cognitive processes that are brief versus those that are elaborated and extended (see Hughes et al., in this issue);
- developing specific procedures linked to evolution science principles, such as Ostrom's (1990) design principles for effective groups;
- developing new strategies for linking functional analysis to intervention components, not just clinically but also in education, prejudice, child development, and other areas;
- learning how to sequence psychological flexibility components for greater impact, based on individual need, and so on.

6.6. *A full range of research on processes of change needs to be deployed, especially in the area of mediation and moderation*

Based on its definition of science and its goal, CBS is fundamentally oriented toward the development of analytically adequate processes of change. Given its broad goals a full range of research on processes of change needs to be deployed. Qualitative research helps ensure that concepts maintain a rich contact with human experience (e.g., Berman et al., 2012). CBS has had a long-term commitment to the inductive and intensive analysis of individuals (e.g., Hayes, Barlow, & Nelson-Grey, 1999) in part because time-series and single-case designs allow the development of principles entirely at the psychological level. Correlational research provides a quick extension of concepts to a population (e.g., Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Naturalistic longitudinal research and experience sampling examine the role of identified processes in the development of pathology or health. All of these methods have already been used as part of the CBS research agenda, but the work needs to continue.

That is particularly true in the area of moderation and mediation, where CBS research has been especially strong. Moderation research provides evidence that functional analytic concepts about individual needs are useful in treatment outcome. Mediation research shows that processes of change are functionally important in the production of positive outcomes. So far moderation and mediation work has been focused on psychological flexibility processes in ACT outcomes (e.g., Hayes et al., 2006), but CBS has a broader range of topics to consider.

Examples of needed CBS research on processes of change might include studies on:

- the degree to which psychological flexibility predicts positive adjustment in the face of environmental stress such as the adjustment of military personnel to deployment or military families to their absence;
- how psychological flexibility processes propagate through social groups;
- the meditational role of changes in implicit cognition in clinical outcomes;
- naturalistic longitudinal studies on the role of relational fluency in child development;
- emotional, cognitive, and overt behavioral flexibility as mediators of exposure inerventions, and so on.

6.7. *We need increasing research on effectiveness, dissemination, and training*

In the typical approach to knowledge construction, issues of dissemination, effectiveness, and training can wait until knowledge is well-developed. The mainstream approach envisions a path from the laboratory, to small pilot trials, to open trials, to randomized studies, to multisite studies, to component and process analyses, and finally to effectiveness and dissemination, after the treatment has been thoroughly tested and refined.

The CBS approach is quite different (Hayes, Levin, Long et al., in press). The utility of knowledge is the very measure of truth we seek. Thus, from the beginning, interventions need to be designed with the streets in mind. There is no reason to delay testing in these settings. Indeed one of the earliest trials of ACT showed that outcomes were improved in a real world setting when clinicians were trained in ACT, even though clinicians were not required to use or implement ACT methods (Strosahl, Hayes, Bergan, & Romano, 1998). Knowing early on that outcomes were good when a high level of control was abandoned and treatment was tested in a more "real world" way supported the practical importance of the whole development program.

Any disconnect between science and practice slows down practice and undermines the usefulness of science. Clients in clinics are not randomly assigned to treatment conditions, compensated for participation, or regularly assessed by assessors blinded to treatment condition. They are not required to meet diagnostic criteria for one and only one condition. Their

therapists are not being recorded, observed by experts, rated, remediated, and required to work within a highly specified protocol. Scientists rightly prize the sort of tightly controlled evidence that emerges from well crafted efficacy trials, and the CBS tradition embraces such trials as well, but not at the cost of testing the impact of procedures in the hurly burly of applied agencies.

Treatment development ought to occur in rich contact with a range of applications, including a richer variety of provider types and application contexts. A narrow treatment development environment needlessly increases the risk that protocols and concepts will in the end apply narrowly (to specific environments, provider groups, cultures, or treated population) or not at all. High precision/high scope principles reduce this risk, but from a CBS approach, broad testing ought to lead to broadly applicable principles. In a reticulated approach the problem of narrow principles can be reduced by effectiveness studies, the use of practitioners themselves in research collaborations, and program evaluation studies of agencies and organizations using CBS methods.

We would hope to see more research in such areas as

- learning whether experiential training or use of mindfulness methods in the practitioners own life helps in the retention and use of ACT methods;
- examining methods of increasing group support among professionals as methods of increasing dissemination;
- testing the use of CBS informed methods by allied health professionals such as nurses, dieticians, occupational therapists, speech therapists, and so on;
- testing new and evolving technologies, such as smart phone applications in well established areas (e.g., ACT for chronic pain, smoking, or depression);
- whether learning to read psychological flexibility processes in clients increases skill in applying ACT;
- whether FAP training helps ACT practitioners applying contingent social reinforcement to produce better outcomes;
- testing cultural adaptations of ACT, mindfulness, or compassion-focused treatment;
- rigorous testing of CBS self-help books and web-sites
- testing whether increasing basic knowledge (e.g., of RFT; of flexibility principles) facilitates the application of clinical skills, and so on.

6.8. Applied protocols need to be tested broadly and at multiple levels of analysis

By its nature, CBS is an enormously broad approach, since it is essentially an approach to behavioral science writ large, not just clinical psychology, psychiatry, social work, nursing, education, or any other subarea. The approach is broad also in its focus on common core principles that can be scaled into components and packages to create intentional change.

This means that as applied or basic knowledge is developed, CBS research will attempt to detect the boundary conditions for these principles and processes. You can already see the result in ACT research, which has visited virtually every major applied domain in its short history, but we expect that to continue as other areas in CBS reach the same level of development.

One boundary condition that may prove more difficult is the shift from clinical interventions to prevention programs, school interventions, and similar areas. CBS naturally orients toward such topics as a matter of practical impact, and so far psychological flexibility applies well, but it remains to be seen if new technology needs to be developed to alter these processes in such contexts.

We expect to see more research in a wide variety of areas as

- behavioral medicine applications;
- addressing so called co-morbidity in an efficient way;
- reaching chronic, severe, and under served populations;
- resilience training and other prevention approaches;
- applying CBS knowledge to organizations, leadership, businesses, and public policy;
- integration of CBS methods into programs based in schools, churches, or the criminal justice system; or
- forensic use of the IRAP, and so on.

6.9. CBS is dependent on a development community consistent with CBS itself

The explicitly contextual perspective of CBS, and its prosocial goals, demands much of its development community. It makes no sense to understand how to promote pro-sociality and then fail to do so inside the development community itself; it makes no sense to argue that history and situations are critical and then fail to promote a professional community with a diversity of backgrounds. CBS is reflexive; it applies with equal force to researchers and practitioners as it does to research participants and clients. Thus, the development community needs to adopt values-based, communitarian strategies for decision making, consensus building, and organizational development. This is especially important as CBS expands from psychology to other disciplines, and from the developed world to professionals in developing nations. ACBS has been organized in a way that is consciously linked to the psychological flexibility model and to the evolution of pro-social groups. It is not enough merely to *attempt* to do that, however—this connection needs to be actively monitored and modified based on results.

Research in this domain of CBS might include studies on:

- the application of Ostrom's design principles to the functioning of ACBS special interest groups or chapters;
- the broad application of CBS knowledge through research—practice networks;
- how to form clinical support networks across a diverse variety of settings;
- how to better connect researchers to practitioners, and so on.

Organizationally ACBS might:

- Facilitate translation of materials into a wide variety of languages, especially treatment protocols, assessments, and worksheets.
- Provide a centralized forum for dealing with problems and facilitating adaptations to various cultural and language differences.
- Cultivate a broader base of professionals from a variety of disciplines, including traditional mental health providers from psychology, social work, and medicine, but also from disciplines that could fit into a contextual evolutionary science, including those from biology, sociology, education, public health, and business;
- Cultivate the involvement not just of those professionals working with clinical problems such as psychosis, depression, and anxiety, but those in the workplace, organizations, education, and medical arenas, among others.
- Cultivate the development of researchers and trainers who can link these areas.
- Cultivate the development of researchers and trainers from across a wide variety of cultures and language groups.
- Create free and low cost avenues to training competence, including free access to training protocols and treatment materials, and so on.

7. Summary and conclusion

The description we began with should now make much better sense: Contextual Behavioral Science (CBS) is a principle-focused, communitarian strategy of reticulated scientific and practical development. Grounded in contextualistic philosophical assumptions, and nested within multi-dimensional, multi-level evolution science as a contextual view of life, it seeks the development of basic and applied scientific concepts and methods that are useful in predicting-and-influencing the contextually embedded actions of whole organisms, individually and in groups, with precision, scope, and depth; and extends that approach into knowledge development itself so as to create a behavioral science more adequate to the challenges of the human condition.

We have attempted to characterize CBS as a scientific and practical tradition: what it is, where it came from, and where it is going. We have spend time listing areas of needed empirical work that might foster its expansive agenda. We want to reiterate that these are mere examples of areas we need to explore, not comprehensive lists, and furthermore they are seen from the limited point of view of a small number of developers. Our goal is not to limit this tradition but to empower it. Undoubtedly there are scores of important research areas we have left out of the discussion. Readers seeing holes in this paper are seeing something important and we hope it will inspire actions to fill them.

Contextual Behavioral Science is a new phase in the evolution of contextual thinking. None of its elements are truly new, but they have been brought together into a new form. We do not truly know yet if it will succeed but so far CBS seems progressive as measured by its basic science, applied science, practical extension, and professional growth. The present paper was not a declaration of victory – it was a call to action based on a strategic argument. CBS is a coherent and distinctive knowledge development approach that seems to be creating principles, theories, and methods of use to others. No one knows what the future holds for CBS, but it contains the vision of a reinvigoration of contextualistic perspectives in the behavioral and life sciences. We will likely never reach the day when the behavioral sciences are fully adequate to the challenge of the human condition, but focusing on that goal seems worthy of effort, and any day that brings us a little closer to it is a day well spent.

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