Acceptance and commitment therapy: What the history of ACT and the first 1,000 randomized controlled trials reveal

Steven C. Hayes and Grant A. King

Journal of Contextual Behavioral Science, 33 (2024), Article 100809

https://doi.org/10.1016/j.jcbs.2024.100809

© 2024 The Authors. Published by Elsevier Inc. on behalf of the Association for Contextual Behavioral Science. CC BY 4.0. Reformatted from the publisher's HTML for course reading. Original article text, figures, tables and references retained. No instructional content added.

Abstract

Contextual Behavioral Science (CBS) and Acceptance and Commitment Therapy or Training ("ACT" in either case) are arguably entering their 5th decade of development. This paper describes features of their early history and divides development into three phases, plus a fourth that is just beginning. In the context of that review, it examines what can be learned by a content analysis of the first ~1000 randomized controlled trials on ACT-based interventions, from 1986 through 2022. The expansive vision of CBS and the early ACT research base defined their breadth as far wider than psychological intervention targeting traditional psychiatric syndromes, emphasizing instead the principles, processes, and components needed for a more generally applicable approach. After an era of scientific establishment, ACT research has expanded globally and topically. Many RCTs now take place in lower- and middle-income countries with cultural and policy environments that give rise to unique research priorities. Finally, based on the ACBS Task Force Report and new research findings, we suggest that ACT research may be entering a new era of personalized and process-based intervention based on new "idionomic" forms of functional analysis.

1. Introduction

When notable milestones are met, often people look both backward and forward, reflecting on the twists and turns of the journey so far, and contemplating the journey ahead. The milestones themselves may be invisible at the beginning of the journey – only as events unfold does it become clear that a particular peak could be ascended, or a particular river crossed. Accomplishing such goals provides a moment to pause and consider.

This is such a moment. Acceptance and Commitment Therapy or Training (ACT in either case; Hayes, Strosahl, & Wilson, 1999; 2012) has reached and surpassed 1000 randomized controlled trails (RCTs).

ACT emerged from a particular wing of behavior analysis where RCTs are not commonly looked to as marks of progress. Indeed, generating such a large number of RCTs was never the actual or stated goal of any notable ACT co-developer so far as we are aware. As we will show, however, there are unusual features revealed by a detailed examination of this achievement that do indeed reflect on the core assumptions of what has come to be known as Contextual Behavioral Science (CBS). Beyond its historical interest, we believe identifying these assumptions also has implications for the future of ACT and perhaps process-oriented intervention science more generally.

We will argue that the trajectory of ACT shows features of a continuous evolution, as foundations were laid and implications were explored from a combination of a contextualistic approach (Hayes et al., 1988), an expansive social and scientific vision, and a commitment to the development of principles that allow behavior to be predicted and influenced with precision, scope, and depth. These were largely characteristic of behavior analysis itself but with modifications we will describe later, and as CBS arose it bent the twig from which the now large tree of ACT RCTs has become inclined. By appreciating their basis in foundational aspects of CBS (Hayes, Barnes-Holmes, & Wilson, 2012), the revealed features of the first 1000 RCTs can be better understood as part of comprehensive program. This may in turn allow a clearer examination of the future of CBS research in general and ACT research in particular.

One reason such an exercise seems warranted is that ACT and CBS are now attended to by persons and institutions who know little about their history, traditions, or core assumptions. Stripped of historical context, it would be easy for those who are not familiar with these elements to assume that ACT is "playing the same game" as other evidence-based methods, even if that is not the case.

This kind of confusion has already occurred previously. For example, shortly after the turn of the century ACT became a central figure in the "third wave" of cognitive behavior therapy (CBT) as change processes such as acceptance, cognitive defusion, mindfulness, and values entered into evidence-based therapy in behavioral and cognitive approaches alike (see Hayes, 2004; Hayes et al., 1994; Hayes, Folette, & Linehan, 2004). Without understanding the historical or philosophical context for this profound change, it initially appeared to some that ACT was a mere technological addition instead of a change in the core agenda of the family of CBT methods. As a result, early critics could complain that these "new" techniques were already there to some degree inside CBT, missing the deeper shift in perspective that was underway—towards focusing not on the form of clients' thoughts and feelings, but rather on clients' relationship with their own private events.

The same risk is present today. ACT has increasingly spread around the world as the Association for Contextual Behavioral Science (ACBS) has expanded and become more impactful (Zettle & Wilson, 2023) and as attention has turned toward ACT from global science agencies (e.g., see World Health Organization, 2020). ACT is now on several different lists of evidence-based interventions for this or that syndrome (contextualscience.org/state_of_the_act_evidence). These achievements, while worthwhile in their own terns, can make it seem that ACT (and CBS more broadly) is just another psychotherapy tradition seeking validation for its treatment of mental illness, instead of a much larger knowledge development strategy that fundamentally questions a mental "illness"

focus. For example, if a science agency "validates" ACT for depression, it might now seem as though ACT is designed to treat latent diseases such as depression (Hofmann & Hayes, 2019). If researchers and practitioners were to internalize such an idea, it would likely destroy the coherence of CBS and ACT development over time, as the latent disease model is hostile to a broad agenda of behavior change built on a more universally applicable set of principles.

The danger of incoherence was pointed out early in the CBS and ACT journey as its foundational assumptions were elaborated as a form of contextualism. Drawing from Pepper (1942), it was noted that "The root metaphor structures an understanding of the technical categories. A technical construct sustaining no conceptual contact with its underlying metaphor becomes empty and meaningless" (Hayes et al., 1988, p. 98). In other words, if ACT is based on pragmatic assumptions that flow from an "act in context" perspective, its own theoretical and technological successes should be examined through a functional and contextual lens. Upon reaching a milestone like the present one it is worthwhile to look backward, to see if ACT is meeting its own standards inside the CBS tradition, and then forward, to consider the implications of that analysis for the future. That is the main purpose of the present article.

1.1. CBS core assumptions and the history of ACT development

The need for clarity about the core assumptions of a CBS approach has long been emphasized. Indeed, the second page of the first article in the first issue of this very journal described CBS as:a principle-focused, communitarian strategy of reticulated scientific and practical development. Grounded in contextualistic philosophical assumptions, and nested within multidimensional, 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. (Hayes, Barnes-Holmes, & Wilson, 2012, p. 2).

CBS is based on work in a behavioral approach to psychology going back over much of the last century (e.g., Skinner, 1974). The focus on basic principles that could be scaled to human complexity was taken in whole cloth from Skinner and his "from rats to Walden II" agenda. The only addition was to clarify that these principles needed precision, scope, and depth. Such a commitment is evident in the stated purpose of ACBS: "creating a behavioral science more worthy of the challenge of the human condition." Minor modifications were made to the pragmatic philosophy of radical behaviorism in the form of what came to be called "functional contextualism" (Hayes, 1993). Features of this refinement were stated a series of articles on contextualism and the impact of Skinner's focus on prediction and control and thus were central from the beginning of what we now call CBS (e.g., Hayes & Brownstein, 1986). No one today would fail to note that Relational Frame Theory (RFT; Hayes et al., 2001) is a defining feature of the CBS tradition and most view it as central to understanding ACT. But some of the key ideas behind RFT are readily discernible in Hayes, 1984, which describes the central role of equivalence relations

and perspective taking and the relevance of these ideas to the impact of self-rules or to the nature of contemplative practice. Thus, the earliest publication pointing toward RFT simultaneously linked these features to what we now call ACT.

These two aspects of CBS evolved together from the beginning. The first measure of what is today called “cognitive defusion” was created and used in one of the earliest CBS-relevant RCTs (Zettle & Hayes, 1987). Similarly, a full item set for what became the Acceptance and Action Questionnaire (AAQ; Hayes, Strosahl, et al., 2004) is in a graduate student project in the Hayes lab started 18 years before the AAQ appeared (Melancon, 1988; see the “Distancing Questionnaire” in its Appendix). In a paper finished the evening before his death, Skinner (1990/1999) stated forcefully that “the behavior of the organism as a whole is the product of three types of variation and selection” namely contingencies of survival, reinforcement, and cultural evolution (p. 578), a theme that intertwined behavioral and evolutionary science that continued in early CBS writings (Hayes, 1987a) and that is central to CBS today (Wilson & Hayes, 2018).

It is easy to lay out these early aspects unambiguously because CBS began in a single small research team. At first, this work was barely noticed and was very poorly cited. As doctoral students graduated and began labs of their own, and other persons gravitated to the work, visibility increased, and CBS gradually became the international communitarian effort it is today. But the features the first 1000 trials can much more easily be understood if that early work in Dr. Hayes's lab is briefly described. Parenthetically, in order to avoid the word “I” in a multi-authored publication, we will refer to the first author of this article in the third person despite the odd feeling it may create to do so.

Perhaps the easiest way briefly to characterize this earliest period is to examine the first 11 of 56 Ph.D. dissertations that came from Dr. Hayes's lab at the University of North Carolina – Greensboro (UNCG; 1976–86), and the University of Nevada, Reno (UNR; 1986–2023). Those are listed in Table 1. Five are studies on basic principles of cognition from an RFT point of view and their development and extension into more complex forms, two are on extending RFT into domains that might be relevant to therapy, three are on processes of change in ACT or its progenitor, one is an RCT, and one is the first study on what we are only now calling “idionomic analysis” of longitudinal changes in psychological processes – a study that was so far ahead of its time it will be discussed in the “future” section of this paper.

Table 1. Doctoral dissertations from the Hayes lab, 1984–1994.

Name and Date	Project Topic	Modern Topic Area
Robert Zettle, 1984	RCT of Treatment for Depression	ACT and Process Measurement
Jeanne Devany, 1985	Equivalence and language development	RFT
Arlinza Turner, 1986	Sexual arousal correlates between and within persons	Idionomic analysis

Name and Date	Project Topic	Modern Topic Area
Irwin Rosenfarb, 1986	Rule-based versus shaped social skills	Applied Implications of RFT and Rules
Elga Wulfert, 1987	Contextual control over stimulus equivalence	RFT
David Steele, 1987	Multiple stimulus relations	RFT
Joe Haas, 1991	Consequences for Rule Following and contingency sensitivity	Applied Implications of RFT
Sue Melancon McCurry, 1991	Metaphor use in ACT	ACT and Processes of Change
Durriyah Khorakiwala, 1991	Processes of change in ACT session transcripts	ACT and Processes of Change
Gina Lipkens, 1992	The nature and impact of analogy and metaphor	RFT and Complex Cognition
Barbara Kohlenberg, 1994.	Transformation of stimulus functions	RFT and Rules

As this list makes clear, the interest in basic principles, extending high precision basic principles to clinically relevant issues, assessing processes of change (including with qualitative work to maintain contain with the emotional and contextual meaning of client's experience), and even idionomic longitudinal analysis were all there from the beginning of the first CBS laboratory. An RCT is also included in this work, and others will be described below, but these were not initially prioritized because other foundational elements were believed to be far more important given the broad goals of the research team. As a result, while the first randomized controlled trials on what is arguably ACT began in 1981 and 1982, only four ACT RCTs existed in published form in 2004 when the arrival of the “third wave” was declared more than 20 years later (Hayes, 2004).

1.2. When did ACT begin?

There have been multiple attempts to divide the history of ACT into phases, but none have been drawn from the earliest documents. We wish here merely to add to the existing literature on ACT development rather than to critically analyze other available accounts (e.g., Zettle, 2005; Zettle & Wilson, 2023) so these will only be referenced in areas where the accounts concur.

The earliest name for ACT was “Comprehensive Distancing” (CD). The term was drawn from Beck's use of “distancing” to describe a process of standing back and observing private experiences. In Beck's approach (1970), this was done early in cognitive therapy to create the foundation needed for deliberately correcting cognitive distortions and deficiencies: “Once the patient is able to ‘objectify’ his thoughts, he is ready for the later stages of reality testing: applying rules of evidence and logic and considering alternative explanations.” (p. 190). In CD this distancing was done as a process goal in itself – that is, as a core feature of what today would be called psychological flexibility. The word “comprehensive” implied that standing back and observing private events were thought to be central to the success of the overall approach. Some have treated ACT and CD as

distinct even to the point of conducting studies on CD rather than ACT in modern times (e.g., Ojserkis et al., 2014). However, it will become clear through an exploration of history and early CD protocols that it is best viewed as an early but relatively holistic form of ACT itself.

Hayes has described the personal events that initiated CD in a TEDx talk released in February 2016 (www.youtube.com/watch?v=o79_gmO5ppg) and in the book A Liberated Mind (Hayes, 2019). The culmination of his 3-year long struggle with panic disorder described in that talk and book occurred in the winter of 1980-81. It is not our present goal to unpack the strands of history that interacted with behavioral psychology and personal experience within that moment (e.g., Gestalt, Esalen, EST and the human potential movement, psychedelics, mystical spiritual traditions) nor their full phenomenological expression. There is no need to do that here because our point in the present context is merely that this event, in the winter of 1980/81, marked the beginning of the CD/ACT research program within the first CBS lab and did so in readily assessed ways. Under the name CD, this research program had all of the features now known as the three pillars of ACT. These are not directly described in empirical articles written at the time because that story was told only decades later (Hayes, 2019), but we will show how they are documented in the foundational CD protocols.

The original CD protocol was an unpublished five-page manual that is referred in Robert Zettle's 1984 dissertation as "Hayes, 1981". It written in early 1981 and is titled "The Big D" (the lab's slang name for "Comprehensive Distancing" and our name for it in this paper). It and the other original initiating documents mentioned below can be found on the ACBS website (https://contextualscience.org/node/49769).

The second CD protocol was a pain tolerance protocol also written in Spring of 1981 – it will be discussed here as "the pain protocol". A randomized trial based on this protocol was conducted in the 1981-82 academic year, and the results were presented at the Association for the Advancement of Behavior Therapy conference in Los Angeles in November 1982 (Hayes et al., 1982). This study was held back from publication for 17 years, however, because it was feared that without a clear basic and applied process account of ACT (CD), publishing a series of RCTs would slow scientific progress by casting a shadow over the more difficult and slower piece-by-piece construction of principles, processes, measures, and intervention components that a CBS approach demanded. This study finally appeared in print 17 years later (Hayes, Bissett, et al., 1999) when the first ACT text finally appeared (Hayes, Strosahl, & Wilson, 1999). The protocol itself was long presumed to be lost but was discovered by Dr. Zettle in a cardboard box in his attic in 2024, misfiled with other papers. It is an onion skin carbon copy of a typewritten document, almost unreadable in physical form due to age, but easily readable as a scanned document (available at the link above).

A third CD protocol is Dr. Zettle's dissertation which was defended in 1984. Since it was crafted to function as part of a component analysis of Beck's approach for use with persons with depression it is focused especially on the cognitive elements, with some arms of the study only having 3 sessions of CD per se. It will be termed "the Zettle protocol."

A fourth CD protocol was a small pilot study focused on weight loss and bodily shame, but it was never presented and has been lost to history (for a modern re-emergence see Lillis et al., 2009).

The final CD protocol of interest here is a pre-doctoral project on CD by Susan Melancon (now Dr. Sue Melancon McCurry) crafted in 1987-88 and submitted for approval in 1988 (Melancon, 1988). It was based on the transcripts of a 10-session co-therapy case seen by Dr. Hayes and Ms. Melancon in the academic year of 1986–1987. Dr. McCurry transcribed each session immediately after it took place and shared it with the small supervision team (five students at the time, three of whom had transferred from UNC-G). These tapes and transcripts formed the basis for all of the earliest studies carrying the name "ACT" because listening to the tapes of these sessions and reading the written transcripts were a primary means of training early ACT therapists in the lab. This protocol will be called the “Melancon protocol."

The “openness” pillar of ACT was addressed in these protocols by such things as exercises, descriptions, and metaphors focused on being “willing to experience having depressive thoughts and feelings” (the Zettle protocol, p. 466). The polygraph metaphor was used to foresee the problem of trying to control anxiety based on rules and threats (the pain protocol, p. 2).

The “awareness” pillar was present in such exercises as just sitting for 1 min without moving, while noticing what comes up (pain protocol, p. 3). After discussing the chessboard metaphor that is still in use today in ACT, the pain protocol directed therapists to point out: “Fortunately, we don't have to change the piece, because the piece are not us anyway. [Discuss]. We are the board. We are the context in which all of these things occur” (p. 4; the incorrect grammar in the pain protocol is left in place as this is a historical document). The Zettle protocol uses similar language and adds the “house with furniture” metaphor as a “self-as-context” intervention that is still described in much the same metaphorical and hierarchical way.

In the TEDx talk Dr. Hayes describes how the “actively engaged” pillar of ACT took shape. Commitment to actions linked to openness and awareness was there from the first moment, but values work started implicitly before evolving into an explicit feature. This can be seen in the documents. The Big D protocol tied behavioral commitment elements to inner choices but in a way that is highly similar to SMART goals (although that is a concept that appeared in print later: Doran et al., 1981). Such a combination is still today found in ACT research (e.g., Chase et al., 2013). In the Big D protocol values as such are only intimated in phrases such as “to do what works”; or “do what needs to be done; ” or viewing commitments as an “outside expressions of what the inside knows is to be done.” (p. 5). The Big D protocol directs therapists to use a core ACT values analogy, however, that of “going down the road” and choosing a direction as forks in the road appear – a values metaphor that is still in use today.

By the time of the Melancon protocol, values work is recognizably modern. For example, the protocol says “Tell client that commitments are based upon life values that a person has. Say, ‘We talked about values before, when we talked about what you would like your life to stand for. People often are afraid to make commitments because they are afraid that they will be unable to live up to

the standards they set for themselves, to live up to their values. However, commitment is a process, not an outcome: it's an acknowledgement that you are heading in a direction, despite the fact that sometimes you find yourself off the path.' Ask client to talk about his or her values, what (s)he would like his life to stand for." (p. 154).

The meaningful takeaway from these historical records is that from the earliest days an "open, aware, and active" approach to intervention was part of CBS development. RCTs were delayed in favor of basic principles and work extending these to more complex phenomena with applied implications. These were studied in interaction with other known processes. Applied process measures were developed through qualitative work, transcript analysis, and questionnaires. Training in ACT was experiential more than rule based, reflecting the concerns of early CBS research itself (e.g., Rosenfarb, 1986, appearing later as Rosenfarb et al., 1989). From the beginning, problems were regularly targeted that went beyond traditional psychiatric syndromes, such as behavioral health. And efforts were made to break out of top-down normative ways of assessing change. All of these elements will prove to be relevant to what follows.

2. Eras of ACT and CBS development

For the purposes of the present paper, we believe that ACT and CBS development can be usefully divided into three pivotal eras. In the interests of brevity, since this summary is meant to set up the examination of the first 1000 RCTs, ACT development as such will be emphasized.

2.1. Establishing foundations (Era 1) – 1980 to 1999

Along with the development of treatment protocols in 1981 as already documented, training soon began with the first clinical workshops (e.g., Hayes, 1982, 1983). In addition to the work on functional contextualism and RFT there were active attempts to test traditional cognitive models (e.g., Rosenfarb et al., 1989; Rosenfarb & Hayes, 1984; Zettle & Hayes, 1987); and to establish a more pragmatic or contextualistic approach to the role of theory, assessment, and empirical evaluation (Hayes, Nelson, & Jarrett, 1987). An overall applied model emerged that had all of the features of the "open, aware, and actively engaged" psychological flexibility model we know today but described them under the umbrella of "experiential avoidance" (e.g., Hayes et al., 1996). It included social principles drawn from Functional Analytic Psychotherapy (Hayes et al., 1989) that co-evolved as part of the CBS tradition, setting up future social extensions. Elements of interbehaviorism also entered into RFT and functional contextualism (Hayes & Hayes, 1989). A small number of single-case designs were used to evaluate ACT protocols (see Hayes, 1987b). The first effectiveness trial on the impact of ACT training appeared (Strosahl et al., 1998), as did an additional RCT (Zettle & Rains, 1989). Features of the model became clearer through the elaboration of the values elements of ACT, especially by Kelly Wilson (Zettle & Wilson, 2023). Almost all ACT training began with personal experiential training, often in intense workshop settings, and included listening to tapes of clinical sessions and direct shaping of clinical skills rather than memorizing written protocols. Consistent with the histories by Zettle (2005) and Zettle and Wilson (2023), the end of this era can be marked by the publication of the first book on ACT (Hayes, Strosahl, & Wilson, 1999), which laid out all of these developments.

2.2. Earning inclusion (Era 2) – 2000 to 2011

As ACT matured, the emphasis shifted to validating its efficacy across diverse domains and the range of labs involved expanded greatly, including in labs across the world, as ACBS was founded and soon was organizing international conferences. RFT was fully explicated in book form (Hayes et al., 2001). Although the behavioral research tradition from which ACT emerged was highly skeptical of the use of RCTs as a primary method of evaluation due the tendency to homogenize individual outcomes (Sidman, 1960), ACT could not enter modern treatment contexts without larger-scale grant-funded research of this kind. Thus, Era 2, encompassing the third decade of ACT development, was marked by the rise of RCTs examining ACT across a wide spectrum of areas, including grant-funded studies. These included psychiatric disorders such as psychosis (Bach & Hayes, 2002; Gaudiano & Herbert, 2006), obsessive-compulsive disorders (Twohig et al., 2010), and addiction (Gifford et al., 2004; Hayes, Wilson, et al., 2004). As a continuation of Era 1, there was a very wide range of applications to topics that lay outside of the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM). That was evident in the first RCT of this era, which was on worker stress (Bond & Bunce, 2000). Early ACT RCTs addressed physical health problems (Dahl et al., 2004; Gregg et al., 2007; Hesser et al., 2009; Lundgren et al., 2006), diet and exercise (Lillis et al., 2009), prejudice and its impact (Hayes, Bissett, et al., 2004; Masuda et al., 2007), and clinicians' willingness to learn (Varra et al., 2008). Extensions of ACT to primary care and organizations became more central (Hayes, Bond, Barnes-Holmes, & Austin, 2006; Robinson et al., 2004). Measure of ACT processes began to appear and proliferate (Hayes, Strosahl, et al., 2004), casting the overall ACT model in terms of psychological flexibility became routine (Strosahl et al., 2004), and mediational analyses began to be conducted in earnest (e.g., Bach & Hayes, 2002) including re-analysis of RCTs from Era 1 (Zettle et al., 2011). Tests of specific ACT components were common as well (e.g., Masuda et al., 2004; Masuda et al., 2009). Integral ACT concepts such as self-compassion or mindfulness were given clearer expression (e.g., Eifert & Forsyth, 2005).

It was during this period that the characterization of the "third wave" of CBT was put forth in an ABCT Presidential Address (Hayes, 2004) and the early experiential avoidance model was expanded under the label of "psychological flexibility" (Hayes, Luoma, et al., 2006). When the first broadly focused ACT self-help books emerged and became very popular (Hayes & Smith, 2005; Harris, 2008), a phase of both interest and resistance emerged in the relationship of ACT with CBT and evidence-based therapy (Hofmann & Asmundson, 2008; Öst, 2008). Part of this resistance was undoubtedly due to the popular media, which cast the arrival of the "third wave" as a war within behavioral and cognitive therapy (e.g., Cloud, 2006). There were also contentious oral arguments at conferences, but it is difficult to find any actual ACT publications from this era that seem harsh as viewed from today's context. General attacks on the ACT model waned as a broad interest in mindfulness emerged in the mainstream of evidence-based therapy (Baer et al., 2006; Brown & Ryan, 2003; Hofmann et al., 2010). Overall, the pace of ACT research and RCTs increased significantly. By the declaration of the arrival of the third wave (in 2004, 22 years after the first ACT workshop), there were only four randomized controlled trials on ACT. Just seven years later, in 2011, there were over 60.

2.3. Expanding research and building bridges (Era 3) – 2012–2023

The original ACT book appeared in a second edition in 2012, which marks the beginning of Era 3 as ACT development entered its fourth decade. By then ACT was beginning to be viewed as a permanent member of the evidence-based therapy community, and the focus shifted to one of forging connections and exploring the implications of ACT and its now mature applied model. The rate of RCTs increased further, from 83 in 2012 to over 1050 in 2023. This era saw ACT explicitly intertwining with Evolutionary Science (Atkins et al., 2019; Wilson & Hayes, 2018), helping to launch a focus on a process-based approach to evidence-based therapy (Hayes & Hofmann, 2018; Hofmann et al., 2021; Hofmann & Hayes, 2020), and making concerted efforts to disseminate its principles more globally. The "Extended Evolutionary Meta-Model" or "EEMM" (it rhymes with "team") was presented as a kind of neutral ground for process-based intervention approaches that would allow specific models to discuss how they foster health variations, from which successes can be selected, retained, and fitted to context. The breadth of given models could be ascertained by how they addressed the psychological dimensions of self, cognition, affect, attention, motivation, and overt behavior, as well as processes in biophysiological domains and sociocultural domains (Hayes et al., 2020). The EEMM in turn began to deepen our understanding of the components of psychological flexibility (Ong et al., 2024). For example, emotional flexibility also suggests non-attachment to "positive" emotions (Ciarrochi et al., 2020), which like such concepts as self-compassion (Yadavaia et al., 2014) or mindfulness, were always implicitly part of ACT but became much more explicit, measured, emphasized, and studied.

The global expansion of ACT can perhaps be seen most notably through its testing and dissemination by the World Health Organization (Epping-Jordan et al., 2016). As will be evident in the review below, it is also seen in the global expansion of randomized controlled trials of ACT in the developing world.

Mediational analyses greatly accelerated, enabling Stockton et al. (2019, p. 354) to conclude after a review of over 50 mediational studies of ACT that "processes of change in ACT are linked to the various components of the psychological flexibility model." Meta-analyses of ACT increased in a fashion similarly to RCTs themselves, passing 500 by the end of this era (bit.ly/ACTmetas). A watermark study (Hayes et al., 2022) reviewed the entire world's literature on mediators of psychosocial treatments for mental health and found that more than half of the findings clearly fit within ACT's psychological flexibility model and virtually all of them could be fit into that model as expanded by the EEMM.

At the heart of its extensive journey, one thing has remained unchanged: ACT's radically transdiagnostic focus. The requirements of funding agencies naturally necessitate research devoted to specific syndromal disorders, but as we have documented, from the beginning ACT research has involved a wide range of problems and positive goals while maintaining a focus on transdiagnostic processes of change.

We believe that the implications of process-based therapy are now rapidly carrying ACT into a new phase of development, but we will discuss that possibility after describing the content and focus of the first 1000 RCTs of ACT as documented by ABCS.

3. The content and focus of the first 1000 ACT RCTs

For more than a decade, known RCTs on ACT have been cataloged by ACBS based on their problem focus, the conditions compared, and the size of the participant cohort (bit.ly/ACTRCTs). This list began informally over a decade ago, simply as a page on the ACBS website managed by the ACBS Communications Committee. Committee Chair Chris Berghoff regularly updated the RCT webpage for several years with help from committee members and ACBS staff, who have increasingly assumed the burden of its maintenance in more recent times. The first public announcement of the list was apparently a September 14, 2014 notice to members that the number of RCTs had exceeded 100.

ACBS committees, members, and staff have put considerable effort toward finding all available studies regardless of language and research outlet. There is a known bias in common indexing engines against non-English sources and lower-and-middle-income countries (Howes et al., 2004) which can distort systematic reviews and meta-analyses (Egger et al., 1997). Because one of the main purposes of the ACBS list was to help foster more complete meta-analyses, several years ago ACBS staff began consulting international databases beyond such sources as Web of Science or Google Scholar so as to combat this bias. These databases included the Directory of Open Access Journals (DOAJ) https://doaj.org/; China-Asia On Demand (China) https://caod.oriprobe.com/; CNKI (China) https://oversea.cnki.net/index/; Korean Citation Index (Korea) http://www.kci.go.kr; DBPIA (Korea) http://www.dbpia.co.kr; Scientific Information Database (Iran) http://www.sid.ir; Thai Journal Citation Index (Thailand) http://www.tci-thailand.org; African Journals Online http://www.ajol.info; J-Stage (Japan) http://www.jstage.jst.go.jp; and http://europepmc.org. When new meta-analyses were reported that covered non-English materials, ACBS staff would also examine them to find ACT RCTs. There have never been filters in this list based on the direction or nature of outcomes, and a link has always been provided for anyone to recommend missing studies. While this list is undoubtedly not comprehensive it is clearly the most thorough list of ACT RCTs currently available.

As the ACBS website itself notes in the introduction to the RCT list, the mere presence of an RCT is not an indication of a positive finding, nor of the scholarly or clinical importance of a specific research study, and thus it is necessary carefully to delimit the meaning and purpose of the present review. The present review describes the content and focus of the worldwide research literature on ACT and data on where this research is occurring as seen through the lens of published RCTs. We will also attempt to link this information to relevant aspects of the historical development of the ACT research program, as we have just covered. This is explicitly not a review of research findings – it is a content review of the focus of ACT research, placed in a historical and geographical context.

Limiting the scope of this review should not be seen as dismissing the importance of careful reviews of research findings. The ACBS website lists more than 500 reviews or meta-analyses that touch on the ACT literature (bit.ly/ACTmetas), and many of these systematically evaluate research quality, effect sizes, holes in the literature, and similar matters. Studies are also now appearing that are meta-analyses of meta-analyses (e.g., Gloster et al., 2020). The ACBS website contains a list of studies with failures to find support for ACT methods in primary outcomes (https://contextualscience.org/negative_findings). These and similar resources should be consulted on such important matters.

This paper seeks to explore this large compendium of ACT RCTs through content analysis. Such an exercise is important because even excellent meta-analyses in specific problem areas cannot tell the whole story of ACT development due to its "breadth by design." Content analysis of this kind has been used by others in evaluating the focus of research across regional areas, for example (Evans et al., 2014), or for special populations such as sexual minorities (Vaughan et al., 2014). Our goal is to allow every available study to contribute to our understanding of ACT development based merely on topical focus and content.

Through this analysis, we hope to show that the history of ACT research as seen through RCTs coheres with CBS core assumptions and the narrative of ACT development that we have laid out in the introduction. If this is the case, we would expect RCTs in all eras of ACT development to have a transdiagnostic orientation and a focus on basic components. We would also expect to see a dramatic expansion in later years in the pace, scope, and geographic spread of ACT RCTs.

4. Method

4.1. Data

Data on RCTs were collected from the list of RCTs maintained on the ACBS website (Association for Contextual Behavioral Science, nd) and imported into an Excel spreadsheet. The data collected included the APA-style citation of the article as well as a one-line summary for each article that contained information on the population, outcomes, sample size, treatment condition, and comparison conditions of the study. As described above, summaries have been generated during the more than a decade-long existence of this page by a committee of the Association, along with ACBS staff and officers. Summaries were based on reading the abstract and title of the paper, or the body of the paper in cases where the abstract did not contain sufficient information and the full paper was available. Most non-English articles included English abstracts but for those requiring translation to get key information, online translation engines or committee members fluent in the language at issue were used to collect the needed indexing information from the articles themselves. Studies with a date of publication up to 2022, the last complete year available, were included in the present analysis. It should be explicitly pointed out that a limitation of the summaries present in the ACT RCTs list is that they rely on human observers abstracting the needed information. No reliability check has been performed. In the interest of full transparency and reproducibility, we have made our dataset available through OSF and have also collected additional datasets that contain the abstracts of the included studies, which can readily be used by others for text analysis (Hayes & King, 2024).

4.2. Sample size, treatment condition, comparison arms

Treatment and comparison arm information was taken from the one-line study summary. Terms drawn directly from the paper were distilled down to groupings of treatment conditions and comparison arms. A full list of treatment conditions and comparison arms can be found in Appendix Tables A1 and A2.

4.3. Population and outcome measures

Population and outcome measures for each study were extracted using a combination of information from the summary field and the study title. Because RCTs often study the intersection of different groups, we decided upon a hierarchy of populations so that we could best characterize the "primary" population of each study in a variegated way. The hierarchy used was as follows.1.Medical conditions2.Studies of parents or caregivers3.Studies of couples4.Studies of behavioral health issues (smoking, substance use, diet, etc.)5.Mental disorders6.All other issues7.If none of the above was present, the study population was coded as the demographic category that the participants belong to (i.e., students, older adults, etc.)

The rationale for this ordering is that while the population categories higher up on the hierarchy are often comorbid with DSM-defined mental disorders, studies of these populations are qualitatively distinct in that they tend to look at different outcomes than those seen in studies

focusing solely on mental disorders. For instance, studies of medical conditions often look at physical functioning and quality of life. Studies of parents or caregivers typically look at coping and burnout, studies of couples look at relationship quality, and studies of behavioral health issues look at behavioral outcomes. Therefore, it is useful to distinguish these studies from those of mental disorders more generally.

As an example, if an RCT listed their population as “smokers with depression,” the primary population is coded as “smokers.” Likewise, if the population was listed as “individuals with HIV and comorbid anxiety,” the primary population would be coded as “HIV.” A study would only be coded with a population of a demographic category such as “older adults” if there are no other inclusion criteria higher in the hierarchy. For instance, “Older adults with depression” would be coded as “depression.” Due to the large number of studies whose populations had comorbid mental disorders, the primary study population does not fully reflect whether studies focused on mental disorders. Therefore, to provide an additional estimate of the total number of studies related to DSM-defined disorders, we performed a supplementary analysis that began with these indicators as will be described below.

Up to 3 possible outcome measures were allowed for each study. If more than 3 primary outcomes were listed in the title or summary of the study, only the first 3 mentioned in the title, abstract, or text were listed. Outcomes were combined if they were functionally equivalent. For example, “emotional status,” “emotional wellbeing,” “psychological wellbeing,” and “wellbeing” were all simply coded as “wellbeing.” In situations where a specific mental disorder was mentioned in the study summary or title, it was assumed that symptoms or features of that disorder were captured as an outcome. For example, if the study title or summary mentioned “social anxiety,” one of the outcomes would be coded as “social anxiety symptoms” even if it was not explicitly listed in the abstract as an outcome.

The above processes initially resulted in 119 unique populations and 413 unique outcomes. These were grouped based on similarity into 10 more general population categories and 40 more general outcome categories for analysis. A list of the final population and outcome categories, as well as examples of the original unique categories that make them up, can be found in Appendix Tables A3 and A4. Additionally, the full crosswalk of original to final categories can be found along with our full dataset on OSF (Hayes & King, 2024).

4.3.1. Alternative characterization of studies of DSM disorders

Given the fact that our method of coding the primary population of each study gives precedence to some other categories (medical illness/physical impairment, parents/caregivers, couples concerns, behavioral health) over DSM diagnoses, the primary study population does not fully capture studies of DSM-defined disorders that co-occur with the above categories. We therefore performed two additional analyses to answer the question "Is this a study of ACT for treatment of a DSM-defined disorder?" in the absence of any other population information. We will label these analyses as our "conservative characterization" and "liberal characterization" of DSM-disorder-related studies, defined as follows.•Conservative characterization: a study is coded as DSM-disorder-related if the inclusion criteria for the study include a DSM diagnosis or a cutoff on a scale or test that measures symptoms of a DSM diagnosis – for instance, a study would be categorized this way if participants were those with a depression score of 10 or higher on the Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995).•Liberal characterization: a study is coded as DSM-disorder-related if it either meets the criteria for the conservative characterization, or additionally, if a scale or test that measures symptoms of a DSM diagnosis (such as the DASS) is among the primary outcome measures of the study.

We use these alternative characterizations to provide upper bounds for the proportion of studies that are related to DSM-defined mental illnesses.

4.4. Journal statistics

Journal names were extracted from the study citation. Journal data were collected by first searching for the journal name on the ISSN portal (ISSN International Center, nd) and SCImago Journal & Country Rank (SCImago, nd) to find the ISSN and country of publication. For journals that did not appear on these websites, the journal title was searched on Google to find the journal website, which listed the ISSN and country of publication in the vast majority of cases. ISSN and journal metrics were left blank for journals if no website listing their ISSN could be found.

After finding the journal ISSN, it was entered into the Resurchify Journal Ranking (Resurchify, nd) to collect the impact score, H-Index, and SJR. The 2022 versions of each statistic were used, as they were the most recent available at the time of data collection. Journals that did not have available metrics through Resurchify were labeled as "non-indexed" journals. The country that a study is associated with was determined by the publication location of the journal. It should be noted that author location information is at times unavailable or incomplete, especially in LMIC studies, and authors sometimes come from multiple different countries. Information on the location of study populations is also frequently missing. For these reasons, using the journal publication location was the most practical way to geographically describe a study. This information was sorted into either lower- and middle-income countries (LMIC) or high-income countries (HIC) based on the FY24 World Bank Group country classifications by income level (World Bank, 2023). Low, lower-middle, and upper-middle income groups were included within our LMIC label.

While it was not possible to categorize studies based on the country of origin of authors or the study populations, even a cursory exploration of the ACBS list shows that journals published in LMIC largely serve authors from LMIC regions, publishing studies conducted with local populations. In many of these journals, articles were published in languages other than English.

5. Results

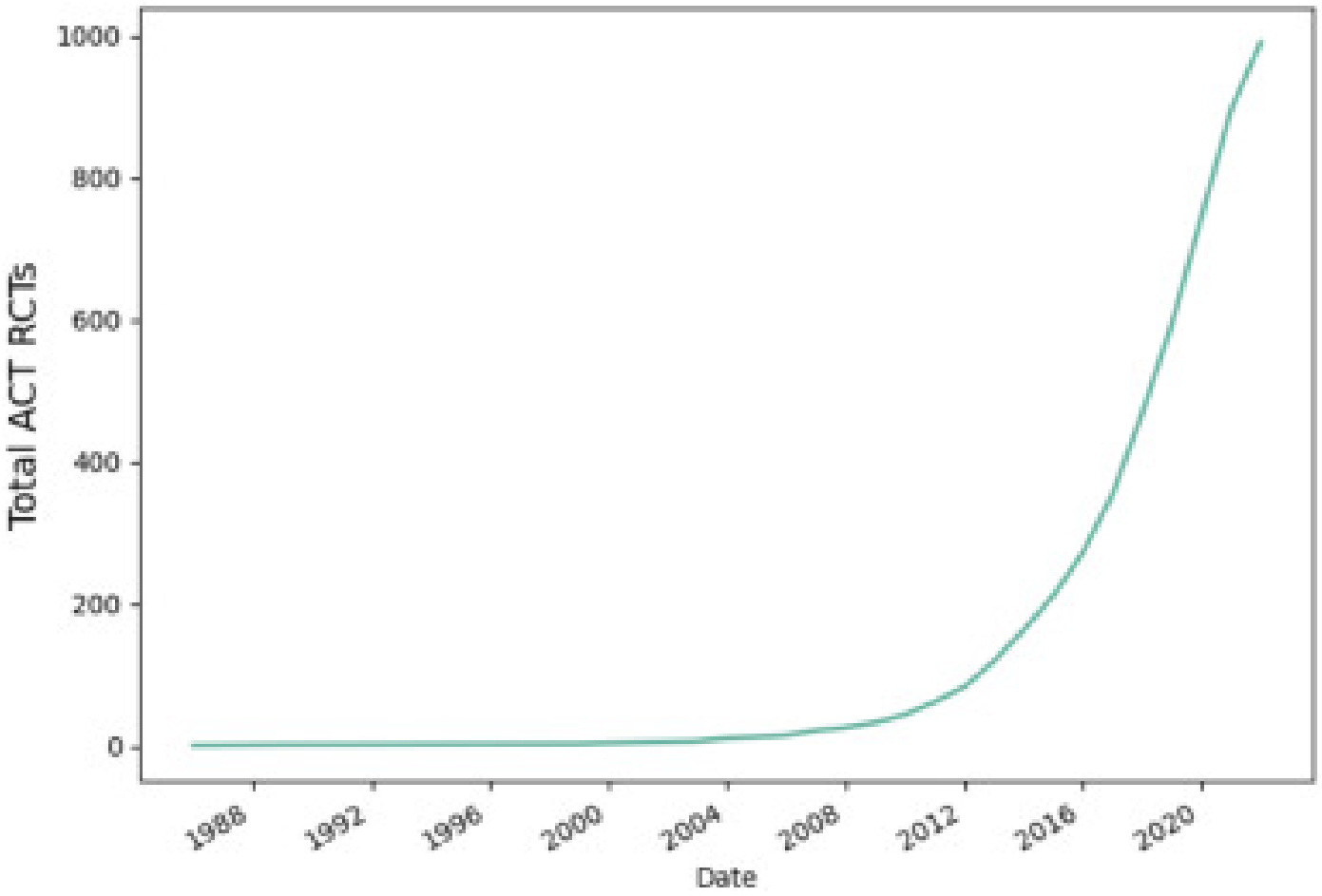
Because the results are fairly voluminous, we will present them in logical collections designed as best we can to reflect on key features of ACT development. We will address data on productivity and impact factor of outlets; geographic spread and research from lower- and middle-income countries (LMIC); interventions and comparison arms studied; populations addressed and outcome measures; the evolution of research focus across eras; and finally, a comparison of studies from LMIC and high-income countries.

5.1. Productivity and impact factor of outlets

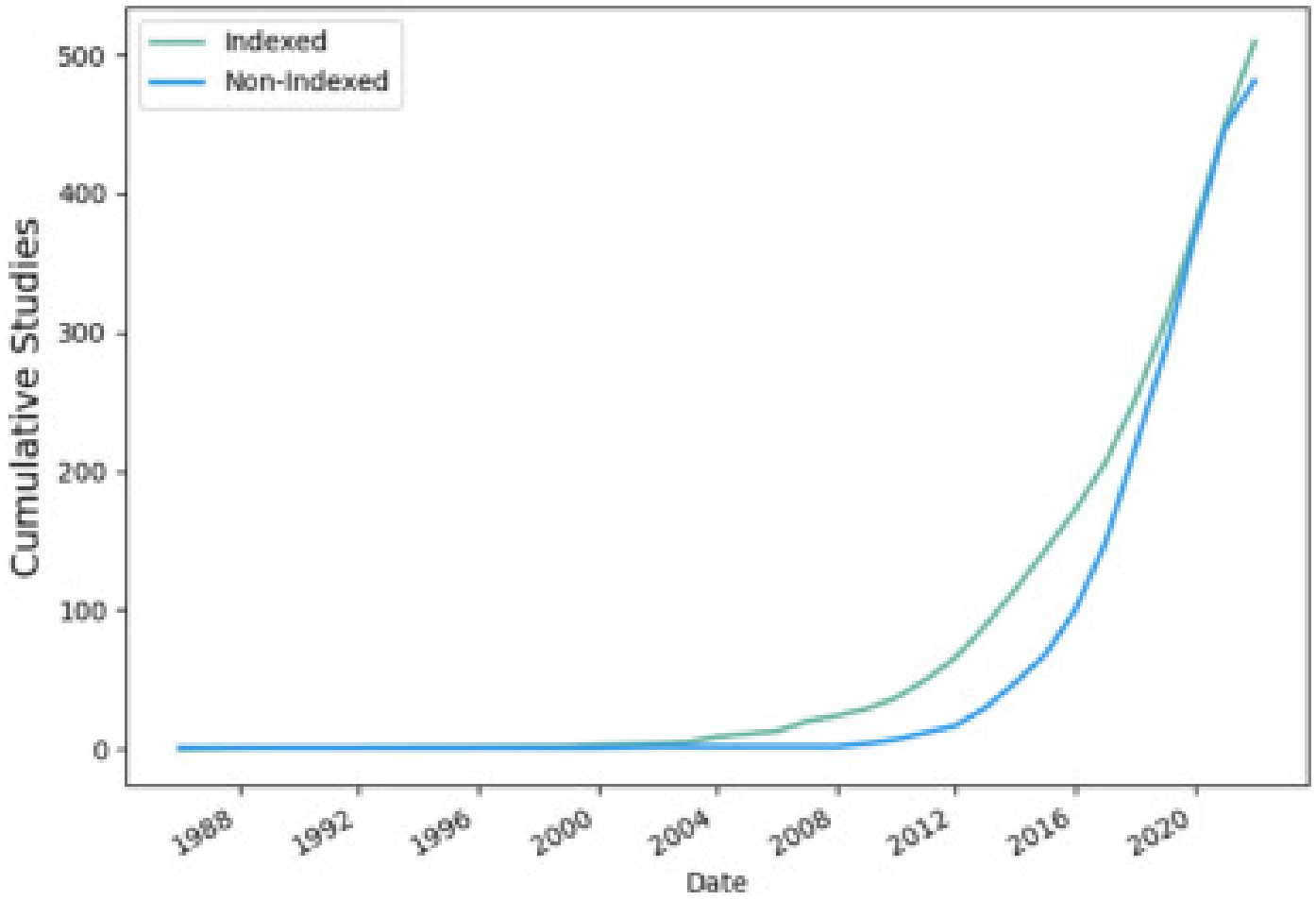
The first analyses will examine trends in the rate of RCTs from 1986 through 2022, considering productivity trends in both indexed journals with known impact factors and non-indexed journals. The international breakdown of non-indexed journals will then be examined.

5.1.1. Number of studies

As is shown in Fig. 1, a total of 990 RCTs of ACT and ACT-based interventions were published between 1986 and 2022. The pace of this research increased over time, with 93.7% of this research (928 studies) occurring since 2012 and 64.2% (636 studies) since 2018.



Slightly more than one-half of the RCTs on ACT (509 studies; or 51.4%) have been published within 'indexed' journals for which metrics could be found, with the remaining studies (481 studies; or 48.6%) published in 'non-indexed journals' (see Fig. 2). The growth of studies has been similar in both, but it began somewhat later and has increased somewhat more rapidly in non-indexed journals than in indexed journals.



5.1.2. Impact factor

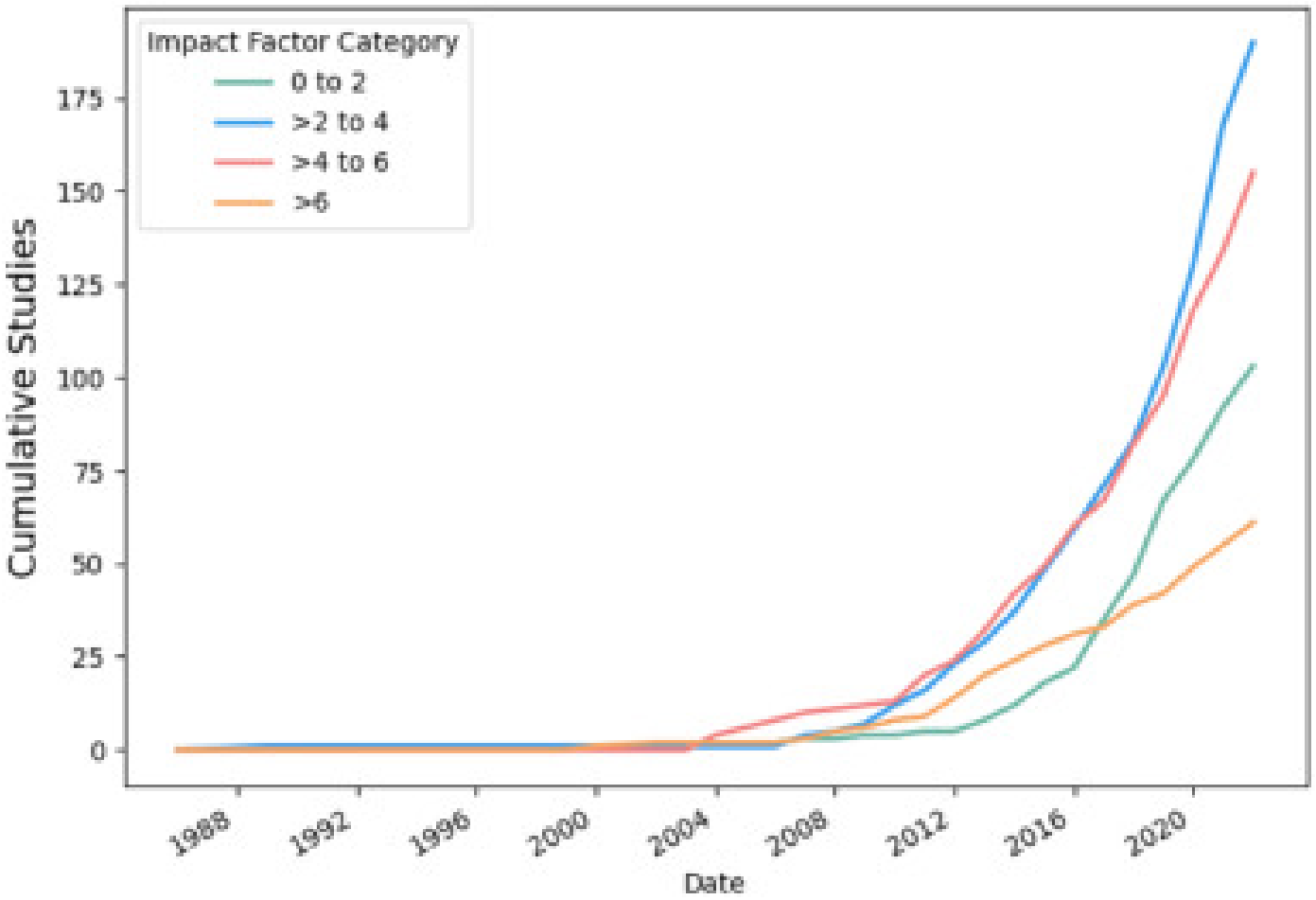
Of the studies in indexed journals, the average impact factor (IF) of the journals in which ACT RCTs are published is 3.75. Table 2 shows the total number of RCTs grouped by their impact factors. For example, 406 ACT RCTs (41.0%) have been published in journals with an IF of 2 or above; 303 (30.6%) are in outlets with an IF of 3 or more.

Table 2. Studies by journal impact score.

Impact Score Category	Number of Studies	Percentage of Total
More than 6	61	6.2%
5 to 6	81	8.2%
4 to 5	74	7.5%
3 to 4	87	8.8%
2 to 3	103	10.4%

Impact Score Category	Number of Studies	Percentage of Total
1 to 2	39	3.9%
0 to 1	64	6.5%
Non-Indexed	481	48.6%
Total	990	100%

Fig. 3 shows the cumulative RCTs over time across these groupings. Early ACT research tended to be centered in journals with impact factors between 2 and 6. More recent research has reached both higher and lower impact journals.



5.2. Geographic spread and research from lower- and middle-income countries

Table 3 and Table 4 show the region and specific country of the non-indexed journals. A full 95.4% of these non-indexed studies were published outside of Europe and the Americas. Of the 482 studies in non-indexed journals the most common countries of origin were Iran (307 studies; 63.8%), China (59 studies 12.3%), South Korea (56 studies 11.6%), and India (11 studies 2.3%). Overall, 83.2% of the non-indexed studies came from lower and middle-income countries (LMIC; N = 400). Note that this does not represent all studies from LMIC, as some studies (N = 63) were published within indexed journals with LMIC home offices, bringing the total number of LMIC studies to 463. Considering that English is not a widely spoken language in any of the LMICs represented by our dataset, this distribution suggests that the rise of ACT RCTs in non-indexed journals is in part a reflection of the relative unavailability of outlets for researchers from countries where English is not widely spoken. However, recent systematic reviews of studies from South Korea (An, 2020) and Iran (Akbari et al., 2022) do raise some concerns about study quality. For that reason, it is important to re-emphasize that the purpose of this study is descriptive analysis of the focus and approach of ACT RCTs – not an analysis of their findings or quality.

Table 3. Non-indexed studies by region.

Region	Number of Studies	Percentage of Non-Indexed	Percentage of Total
Asia (Australia, China, India, Indonesia, Japan, Korea, Pakistan, Thailand)	142	29.5%	14.3%
Middle East (Algeria, Egypt, Ethiopia, Iran, Lebanon, Turkey)	317	65.9%	32.0%
Europe and the Americas (Belgium, Bulgaria, Canada, Germany, Italy, Netherlands, Romania, Spain, Switzerland, USA, United Kingdom)	22	4.6%	2.2%
Total	481	100%	48.6%

Table 4. Non-indexed studies by country.

LMIC	Country	Number of Studies	Percent of Non-Indexed	Percent of Total
Yes	Iran	307	63.8%	31.0%
Yes	China	59	12.3%	6.0%
	South Korea	56	11.6%	5.7%
Yes	India	11	2.3%	1.1%

LMIC	Country	Number of Studies	Percent of Non-Indexed	Percent of Total
Yes	Thailand	5	1.0%	0.5%
Yes	Turkey	5	1.0%	0.5%
	United States	5	1.0%	0.5%
	United Kingdom	4	0.8%	0.4%
	Japan	4	0.8%	0.4%
	Canada	3	0.6%	0.3%
Yes	Pakistan	3	0.6%	0.3%
	Switzerland	2	0.4%	0.2%
	Spain	2	0.4%	0.2%
Yes	Brazil	2	0.4%	0.2%
Yes	Egypt	2	0.4%	0.2%
Yes	Indonesia	2	0.4%	0.2%
	Australia	2	0.4%	0.2%
Yes	Bulgaria	1	0.2%	0.1%
	Romania	1	0.2%	0.1%
	Belgium	1	0.2%	0.1%
Yes	Ethiopia	1	0.2%	0.1%
	France	1	0.2%	0.1%
Yes	Palestine	1	0.2%	0.1%
Yes	Algeria	1	0.2%	0.1%
Total LMIC		400	83.2%	40.4%
Total		481	100%	48.6%

5.3. Interventions and comparison arms

Fig. 4 shows that standalone ACT (i.e., ACT not used as part of a combination treatment) is by far the most tested intervention, making up more than half of all the RCTs in any given year. As the total volume of studies has increased in the past decade, a substantial portion of studies has been devoted, however, to studies of more specific types of ACT-based interventions, including Group ACT, Online and Self-Guided ACT, or to ACT in combination with other interventions. Many studies also feature multiple ACT-based treatment arms (e.g., ACT in online format versus face-to-face).

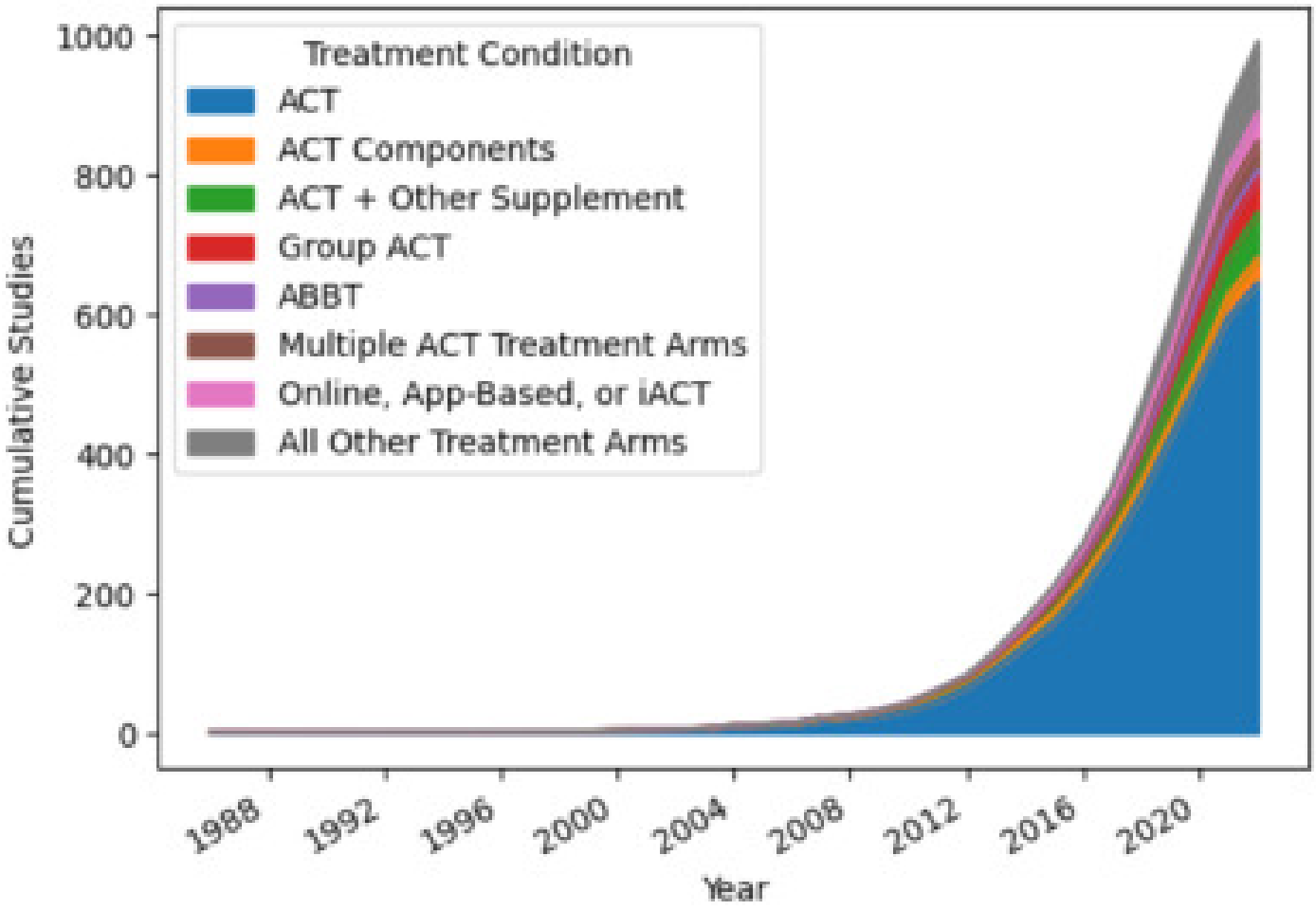
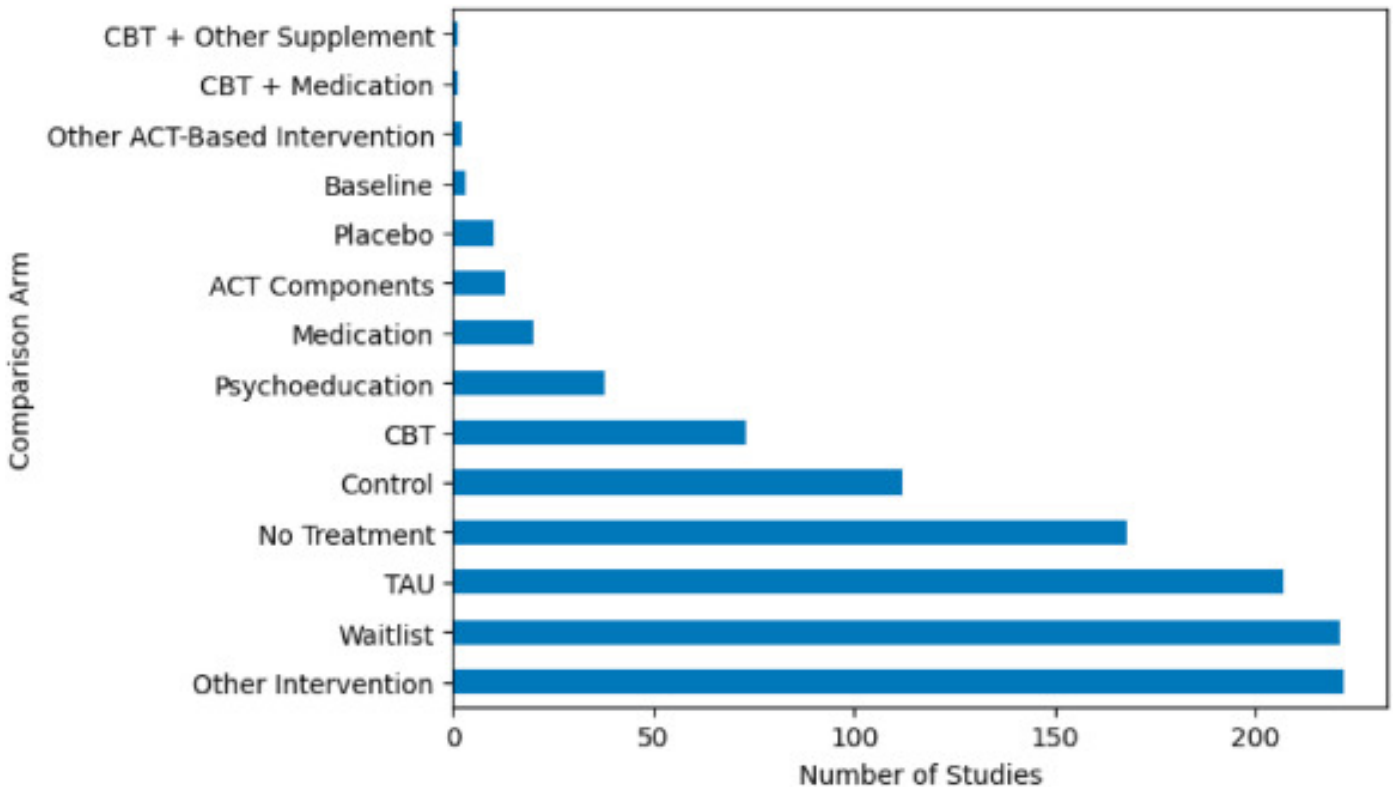
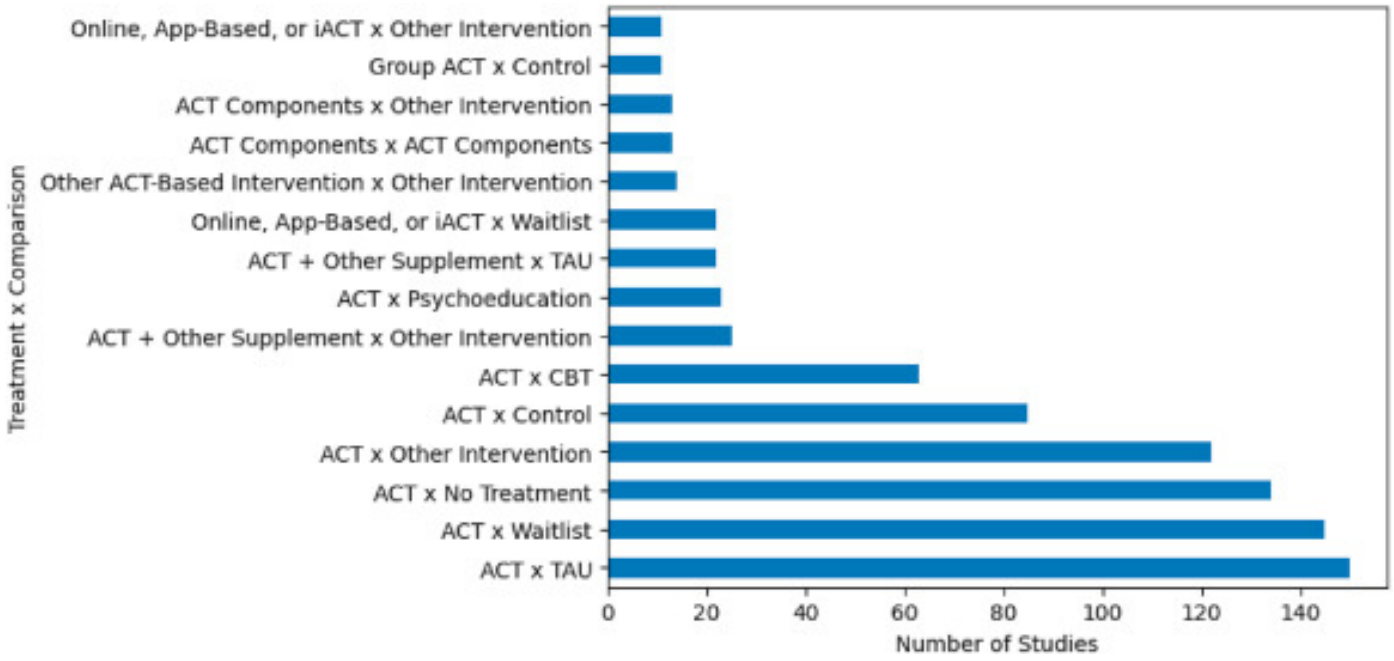


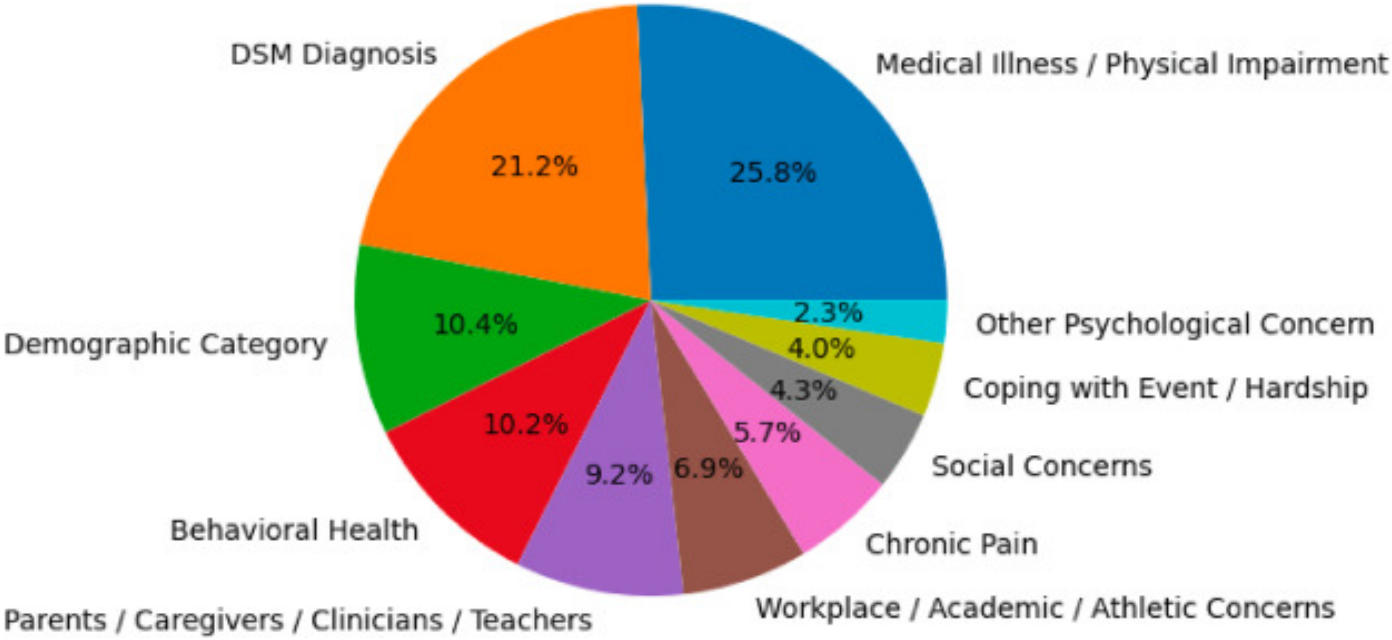
Fig. 5 shows that the most common single comparison condition for ACT-based interventions is another intervention. Other common comparisons are waitlist, treatment-as-usual, or no-treatment controls, as well as CBT (including CT). For example, 63 RCTs compared ACT to CBT. Fig. 6, which shows the most common combinations of treatment and comparison arm, shows a similar pattern—ACT compared to TAU, waitlist, or no treatment are the top three most common combinations.


CBT + Other Supplement
CBT + Medication
Other ACT-Based Intervention
Baseline
Placebo
ACT Components
Medication
Psychoeducation
CBT
Control
No Treatment
TAU
Waitlist
Other Intervention
Comparison Arm
0
50
100
150
200
Number of Studies


Online, App-Based, or iACT x Other Intervention
Group ACT x Control
ACT Components x Other Intervention
ACT Components x ACT Components
Other ACT-Based Intervention x Other Intervention
Online, App-Based, or iACT x Waitlist
ACT + Other Supplement x TAU
ACT x Psychoeducation
ACT + Other Supplement x Other Intervention
ACT x CBT
ACT x Control
ACT x Other Intervention
ACT x No Treatment
ACT x Waitlist
ACT x TAU
Treatment x Comparison
0
20
40
60
80
100
120
140
Number of Studies

5.4. Populations and outcomes

Many if not most forms of psychotherapy are diagnosis-specific (e.g., Persons & Tompkins, 2007), In contrast, and in accord with its history, ACT focuses on a wide variety of concerns and populations. As is shown in Fig. 7, all DSM diagnoses combined made up less than a quarter (21.2%) of ACT RCTs based on our population determination process. Indeed, a slightly larger portion of RCTs was devoted to studying the effectiveness of ACT for coping with medical illness and physical impairment (25.8%) than to studying "mental disorders," with some of the most studied medical illnesses including cancer, diabetes, and multiple sclerosis. Other significant study types included studies of behavioral health (weight loss, exercise, smoking, and other substance use - 10.2%), performance (including academic, workplace, or athletic performance - 6.9%), parents or caregivers (including clinicians - 9.2%), and social concerns (4.3%). If the categories related to physical health issues are summarized (medical illness and physical impairment + behavioral health + chronic pain) they are twice as large (41.7% of the RCTs) as are the studies clearly focused on the DSM.

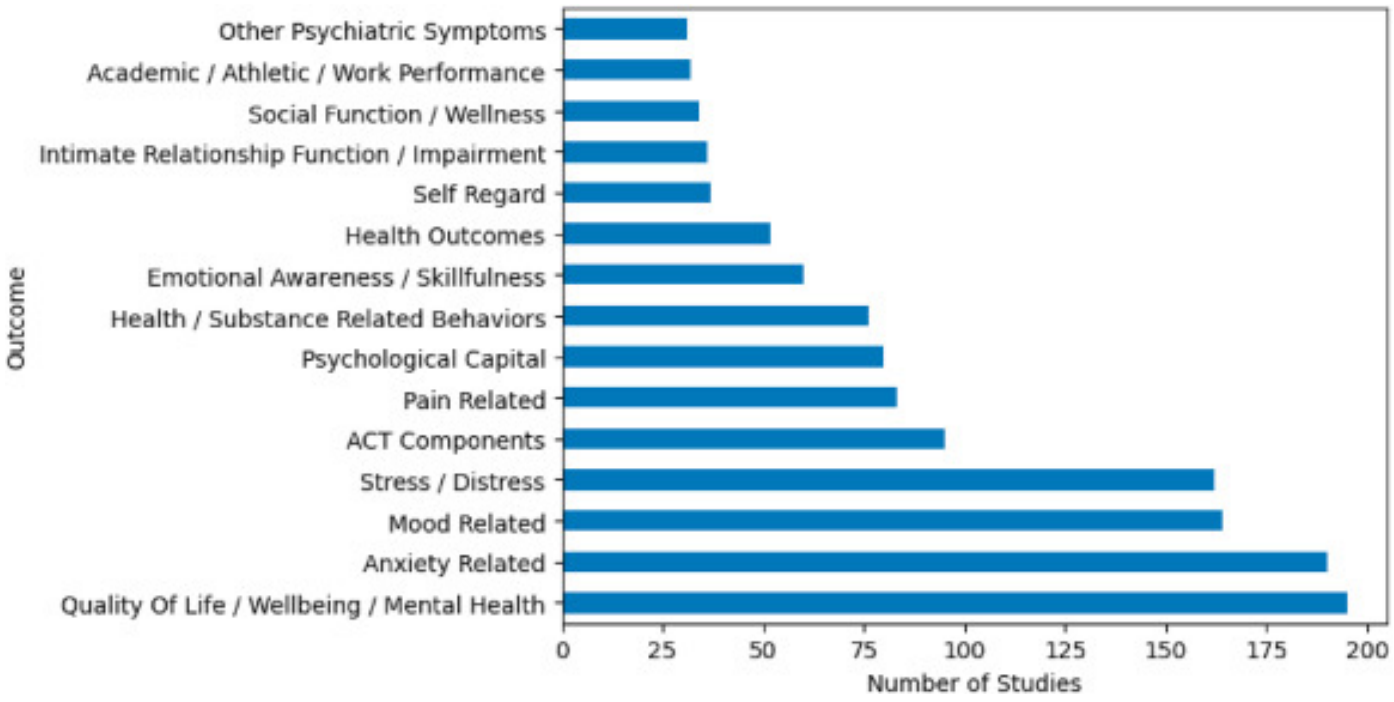


The analysis in Fig. 7 coded the primary study population in a way meant to examine treatment targets in a more variegated fashion. This method somewhat under-estimates the number of studies focused on DSM disorders, however, so supplementary analyses were conducted to examine this issue further. If a DSM-based inclusion criterion was used (our "conservative characterization" of the upper bound of DSM-based studies), the percentage of DSM-based studies increases from 21.2% to 29.1% of all ACT RCTs. If reliance on primary measures linked to DSM categories was used (our "liberal characterization" of the upper bound)

35.3% of all studies were related to DSM-defined disorders. Thus, regardless of the method of characterization, only a minority of studies of ACT can be said to focus on specific DSM diagnoses,

and the categories related to physical health issues still dominate notably.

An extremely wide variety of outcomes were also targeted (see Fig. 8). In accord perhaps with the values-based nature of ACT itself, general quality of life and well-being-related outcomes make up the largest single category. Anxiety and mood-related outcomes (predominantly symptoms of anxiety and depression) were also common. Measurement of ACT components and processes was a primary focus of 95 studies (9.6%), and 80 studies primarily examined participants' psychological capital (hope, efficacy, resilience, and optimism; 8.1%).

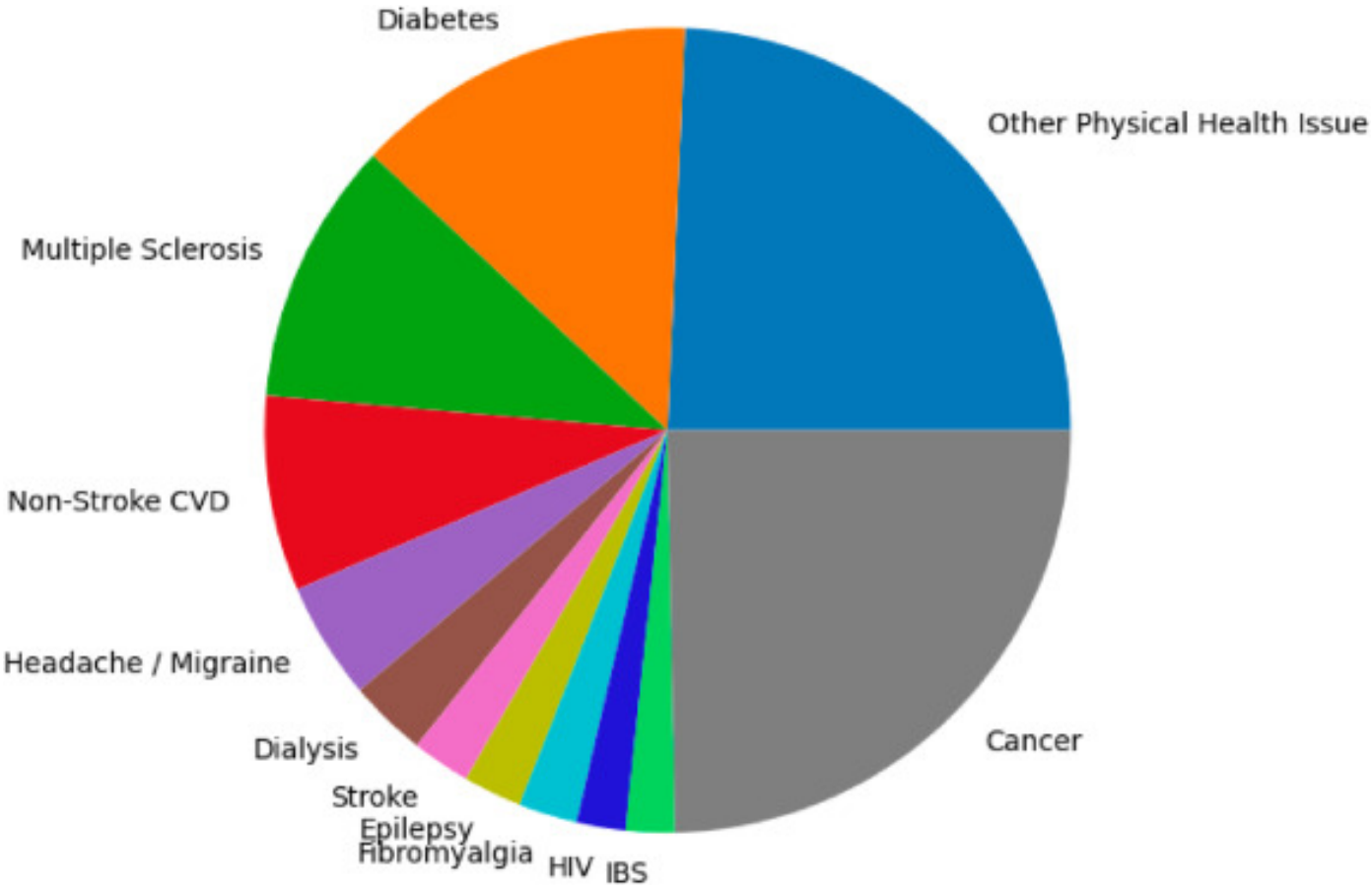


5.5. Diversity of populations and outcomes studied

The description of general population and outcome categories above does not fully capture the true diversity of ACT research. It thus seems worthwhile to do a deeper dive into the largest population category to demonstrate the enormous variety of problems that ACT has been applied to.

5.5.1. Medical illness and physical impairment

The “medical illness and physical impairment” category (shown in Fig. 9) comprised over a quarter of all ACT RCTs, the largest population category overall. It is made up primarily of studies of populations with chronic medical conditions. Of the total of 255 studies in this area the most common targets were cancer (63 studies; 24.7%), diabetes (35 studies; 13.7%), multiple sclerosis (27 studies; 10.6%), non-stroke CVD (20 studies; 7.8%), chronic migraines (12 studies; 4.7%), end-stage renal disease (8 studies; 3.1%), stroke (6 studies; 2.4%), fibromyalgia (6 studies; 2.4%), epilepsy (6 studies; 2.4%), irritable bowel syndrome (5 studies; 2%), and HIV (5 studies; 2%). Populations represented by less than 5 studies were grouped into the “Other Physical Health Issue” category, which represents a variety of ailments including (but not limited to) vitiligo, physical disabilities, tinnitus, traumatic brain injury, osteoarthritis, Parkinson's disease, psoriasis, and COVID.



As is shown in Fig. 10, the most common outcome of studies of medical illness and physical impairment was quality of life, followed by stress/distress, anxiety-related symptoms, and mood-related symptoms. Other notable outcomes included health outcomes, physical symptoms, and coping/adjustment.



5.5.2. Other population categories

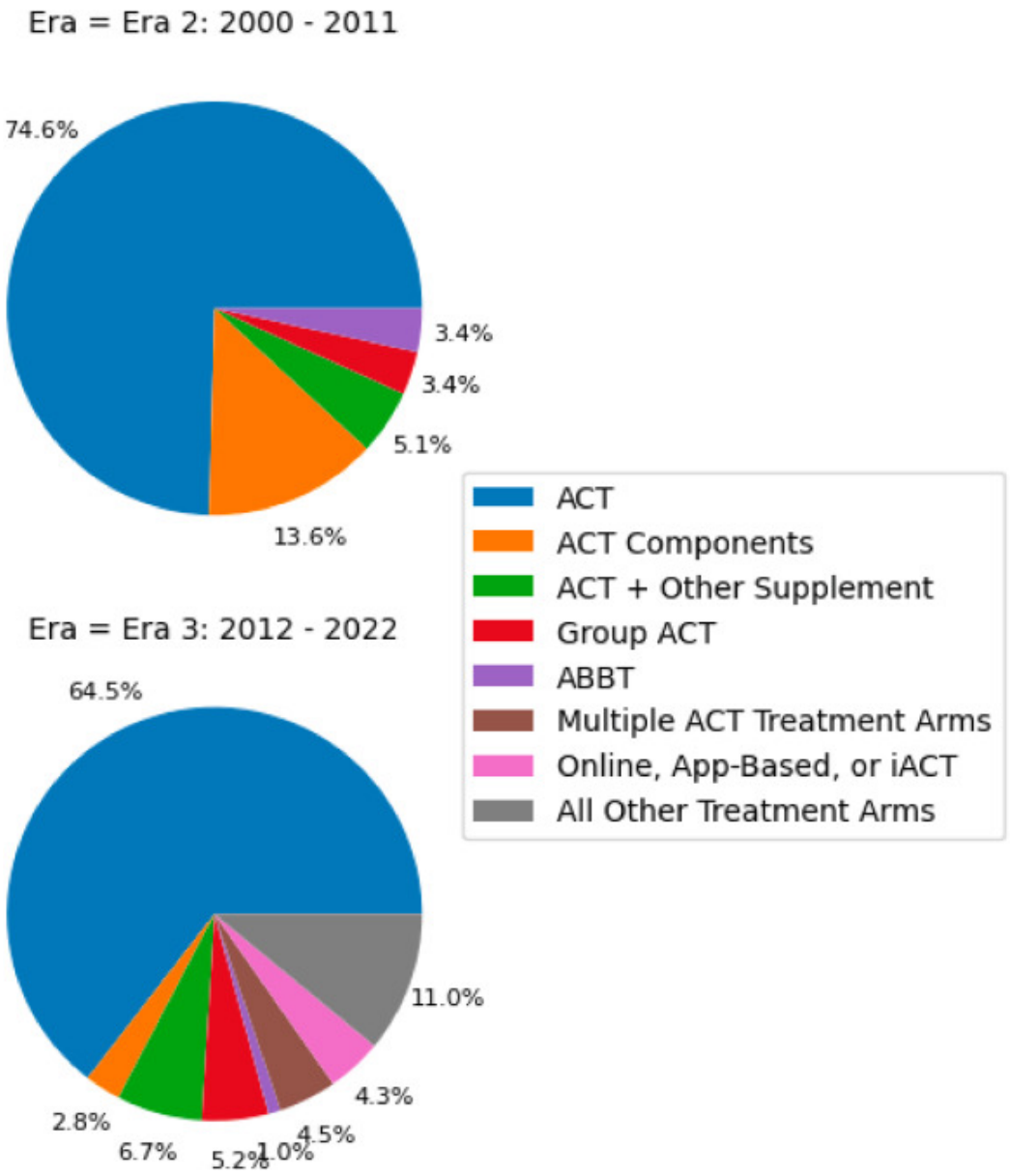
A full discussion of all of the unique subpopulations and outcomes that make up each population category of our analysis is too lengthy for the body of this paper. However, we have provided detailed explorations of these data in the supplementary material in the hope that these can be used by persons wanting to characterize the nature of ACT research for administrators, funders, or colleagues. As with the "medical illness and physical impairment" category, many of our other categories comprise an enormous variety of different presentations and outcomes. ACT has been applied to a truly comprehensive set of problems, from traditional presentations like social anxiety and chronic pain, to innovative applications such as clinician training, athletic performance, caregiver coping, couples' issues, stigma, and even financial literacy.

5.6. Evolution of ACT research across eras

This content analysis begs the question of whether the distribution of interventions, populations, and outcomes seen in the data are consistent with the historical narrative of ACT research eras that we describe in the introduction. In answering this question, we exclude Era 1 (establishing foundations) as it only includes three studies, which we feel are too few for interpretation. Below we explore how the content and foci of RCTs in Eras 2 and 3 reflect our historical narrative of the main themes of these eras: for Era 2, earning inclusion in evidence-based practice, and for Era 3, expanding research and building bridges.

5.6.1. Interventions studied

Fig. 11 presents the proportion of studies of each ACT intervention during Era 2 (59 studies) and Era Three (928 studies). The studies from Era 2 focused primarily on standalone ACT and specific ACT components. This reflects the need for RCTs in this era to prove ACT's effectiveness and inclusion in evidence-based practice but is also consistent with our assertion that it has been focused from the beginning on specific components that are designed to move particular processes of change. Era 3, in contrast, shows a widening of focus to include other interventions, including ACT in combination with another intervention, group ACT, online/app-based ACT, and studies that compare multiple different ACT-based treatment arms.



5.6.2. Populations and outcomes studied

Fig. 12 shows the distribution of populations studied during Eras 2 and 3. While the volume of studies was smaller during Era 2, studies of ACT for DSM diagnoses made up the largest category during these years (30.5% in Era 2, 18 of 59 studies). This reflects the fact that during this period, RCTs for specific syndromes were naturally a relatively larger priority because of the need to earn inclusion in a mainstream that focused on diagnostic categories. However, in Era 3, there was a substantial increase in studies of individuals with a medical illness or physical impairment, making it the largest category in recent years (26.8% in Era 3, 249 of 928 studies). Studies of parents, caregivers, clinicians, and teachers; social concerns; and coping also became more common during this period.

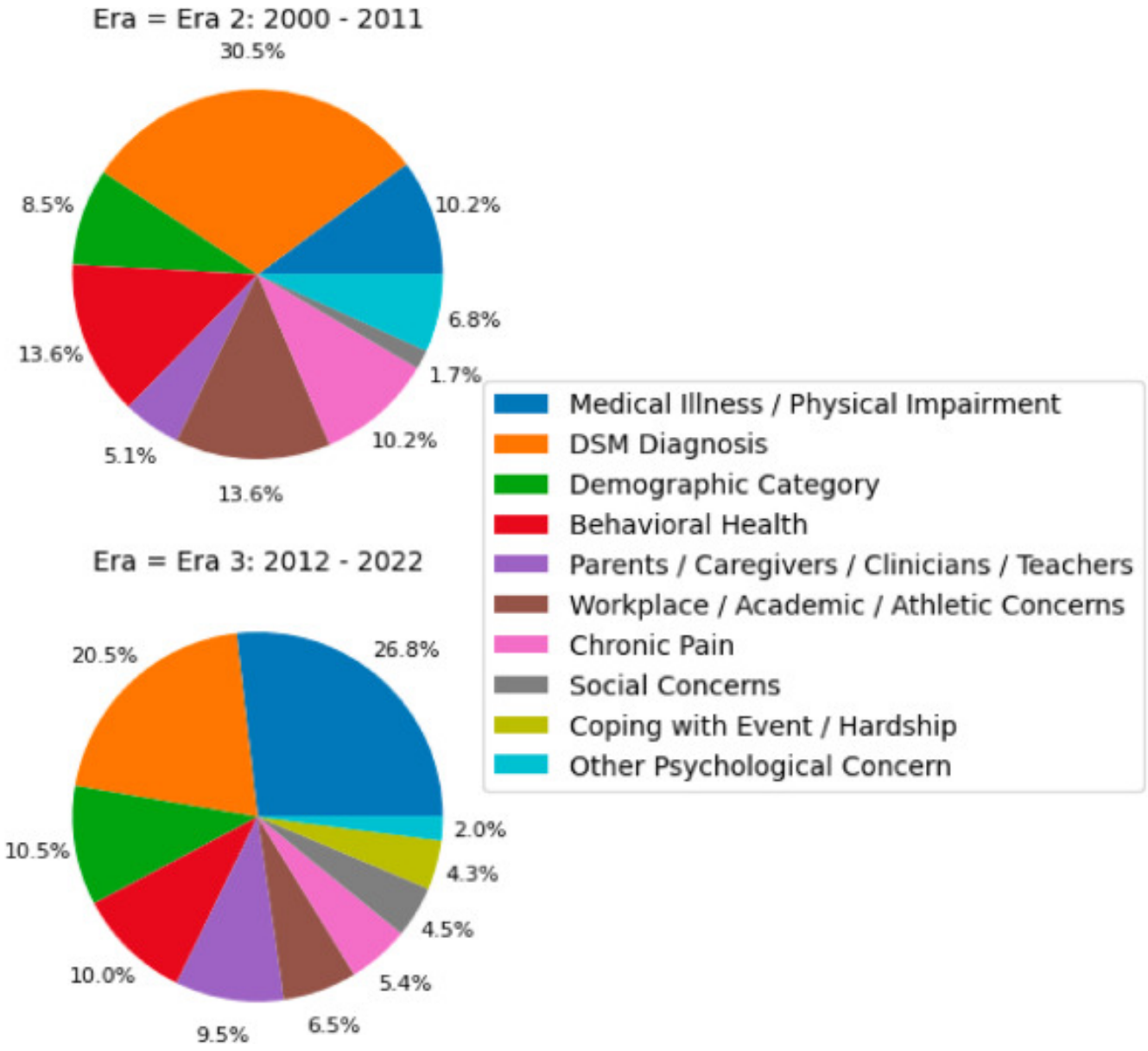
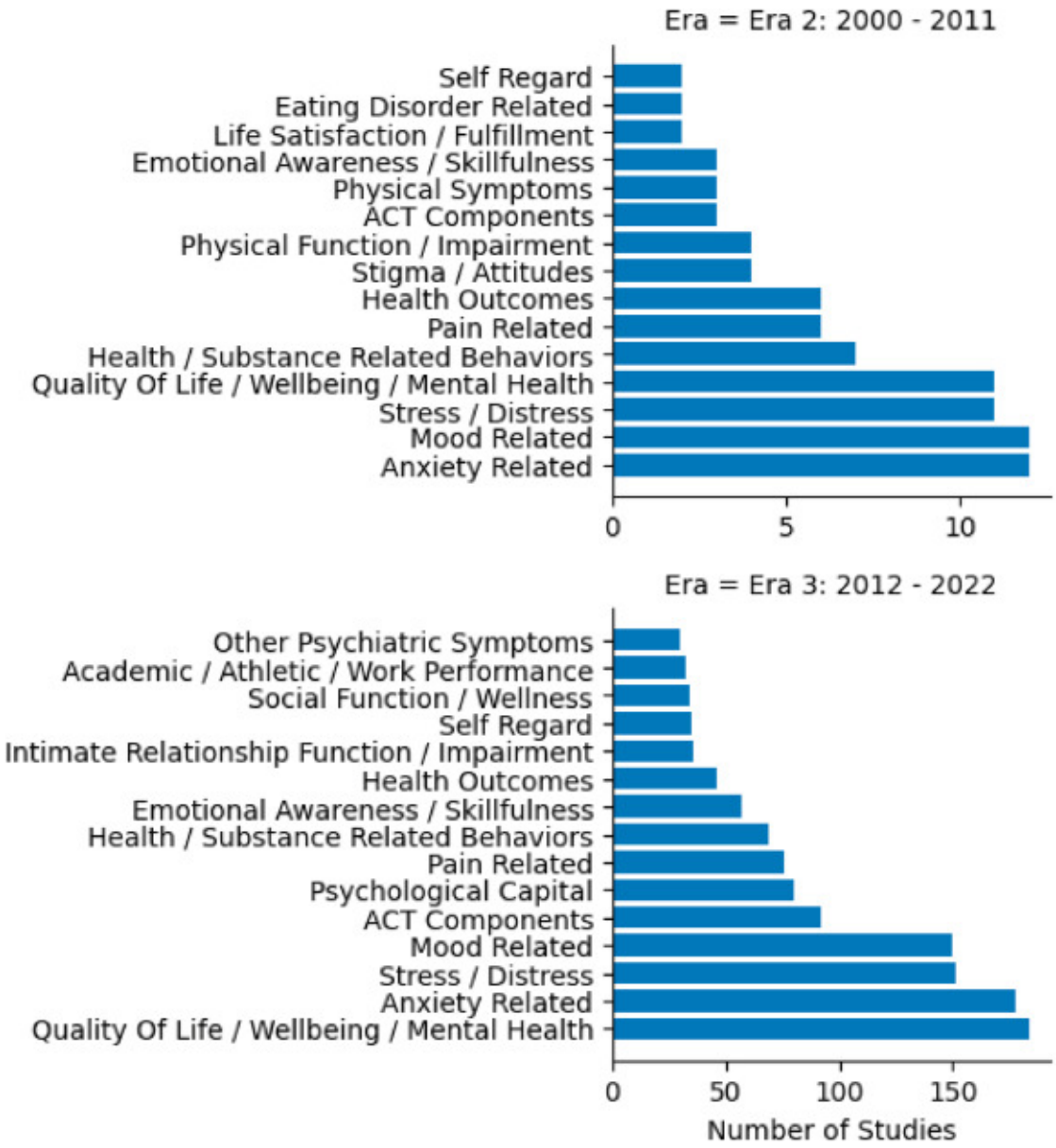


Fig. 13 shows the most frequently studied outcomes during Eras 2 and 3. In Era 2 the primary outcomes were mood and anxiety related, reflecting a more syndromal focus. However, measures of quality of life, wellbeing, and general mental health become the most popular outcome by Era 3, followed by anxiety-related outcomes, stress, and distress.

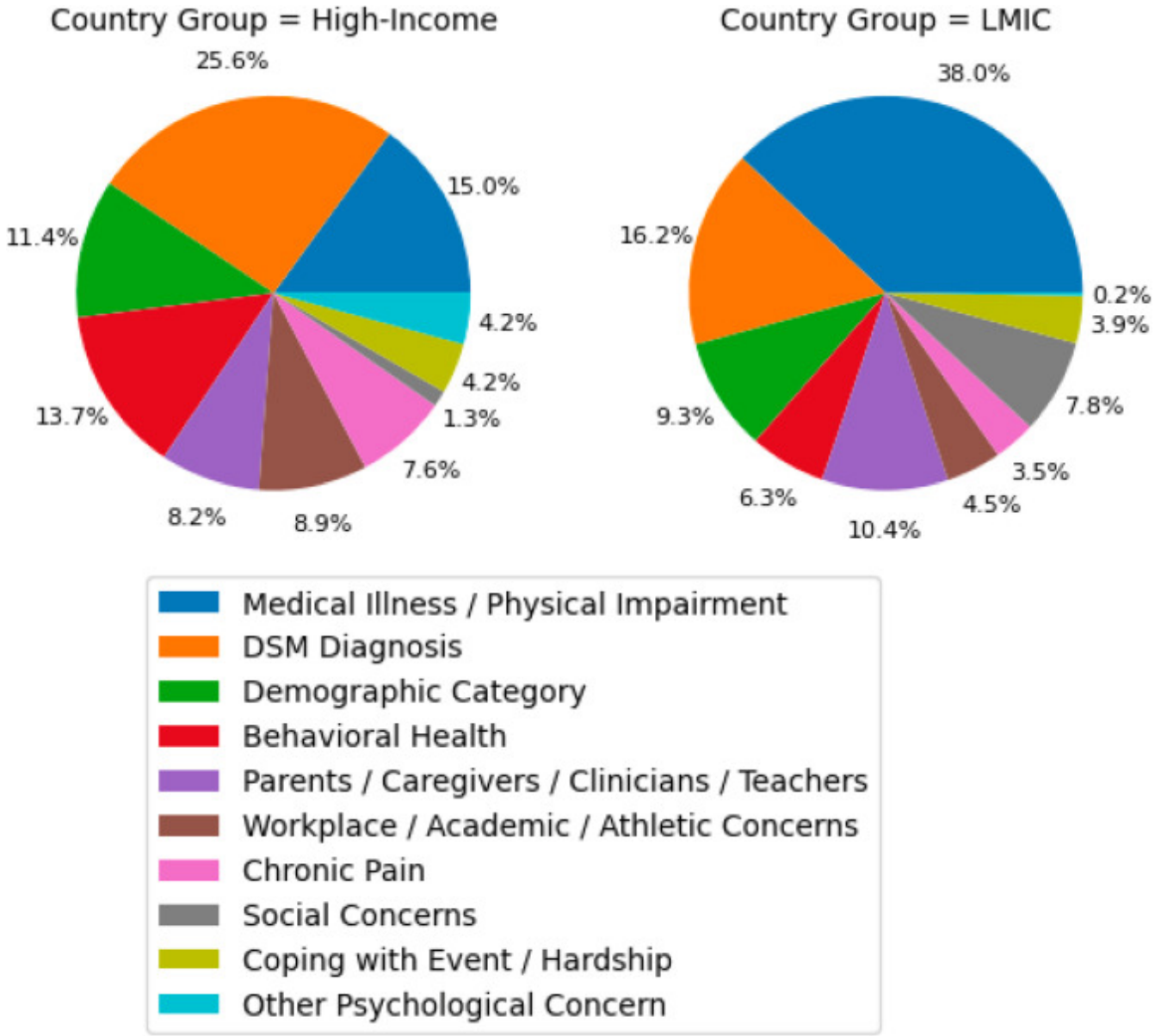


5.7. Studies from LMIC vs high-income countries

We turn now to the differences in populations for studies published in high-income countries (N = 527) versus lower- and middle-income countries (LMIC; N = 463). We draw special attention to the content areas researched by LMIC, as previous content analyses have shown that these reflect local health priorities which may often be overlooked by western researchers (Evans et al., 2014).

5.7.1. Population differences

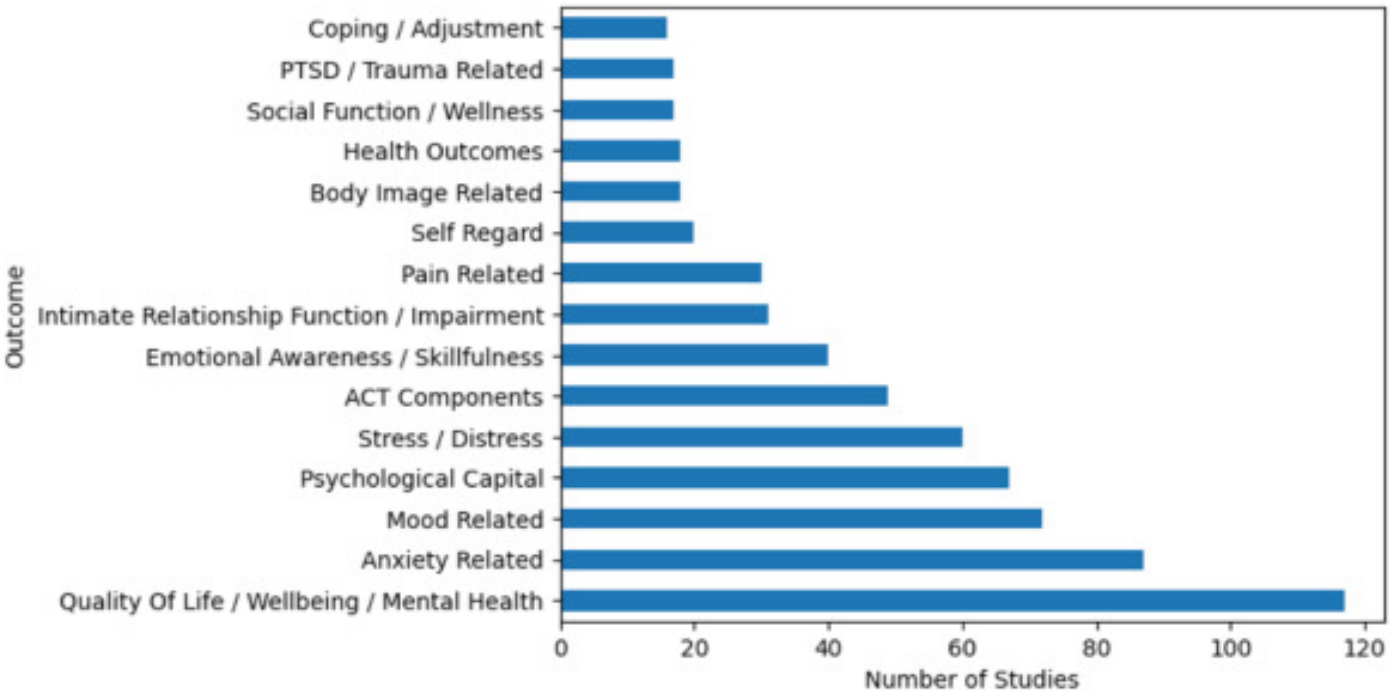
As can be seen in Fig. 14, high-income countries have more studies of classic DSM diagnoses (25.6% of total, vs 16.2% in LMIC), behavioral health issues (13.7% vs 6.3%), workplace/academic/athletic concerns (8.9% vs 4.5%), and chronic pain (7.6% vs 3.5%). LMIC more commonly study medical illness/physical impairment (38.0%, vs 15.0% in high-income countries), parents/caregivers (10.4% vs 8.2%), and social concerns (predominantly studies of couples' issues – 7.8% vs 1.3%). LMIC researchers also apply ACT to a range of populations that are not seen at all in high-income country RCTs, including patients on dialysis, sufferers of vitiligo and thalassemia, transgender individuals, and orphans. It is clear that the use of ACT in these countries reaches far beyond traditional diagnostic categories.

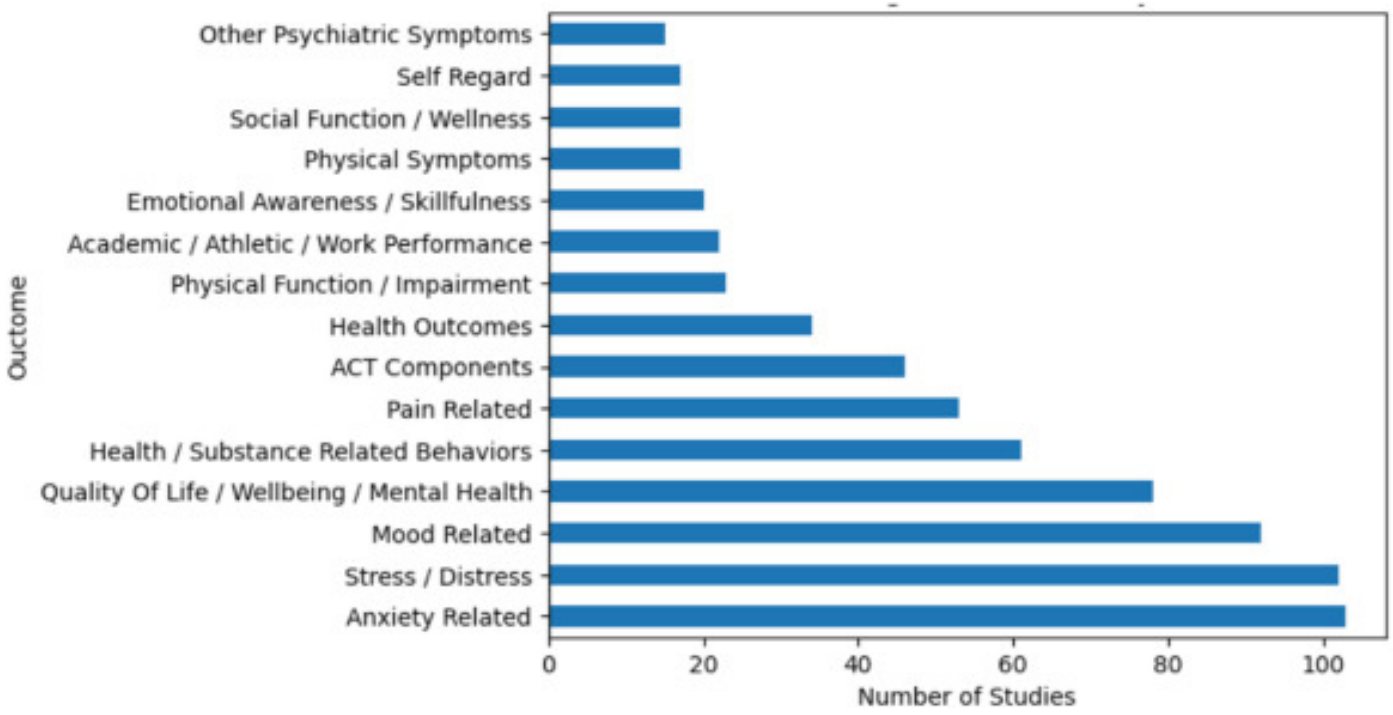


Our alternative characterization of DSM-related studies also reveals differences between LMIC and high-income countries. In high-income countries, studies related to DSM-defined disorders make up between 33.0% (conservative upper bound) and 39.7% (liberal upper bound) of studies. However, in LMIC these studies make up between 24.6% and 30.2% of studies.

5.7.2. Outcome differences

Some differences are also seen in the outcomes studied (see Fig. 15, Fig. 16). For example, while quality of life, wellbeing, and general mental health are the most common targets in LMIC, they are the fourth most common in high-income countries. Measures of psychological capital (hope, efficacy, resilience, and optimism) are the 4th most common outcome in LMIC studies, but do not make the top 15 outcomes in high income country studies.





These population and outcome differences persist between LMIC and high-income countries even when limiting to studies only within the last 5 years, so they cannot be explained by differences in the general course of ACT research over time. More likely, they reflect differences in funding environments and concerns particular to these countries.

6. Discussion

6.1. How do the content and focus of ACT RCTs reflect on the ACT research agenda?

We started this paper with a detailed discussion of the history of CBS and ACT development, arguing that most of their key features have been present over more than 40 years, but that some have gradually become more explicit across the phases of its development. The RCT list alone is not an adequate window through which to consider all of these issues. For example, the RCT list does not record whether processes of change were assessed, they do not assess the progress of RFT, nor whether mediational analyses were conducted (see Hayes et al., 2022 for data of that kind). RCTs are, by definition, limited to a single type of research design. Many details of the elements of various ACT protocols and comparison conditions are not assessed in ways that can be readily indexed. Nevertheless, we can see how some of the key strategic decisions made early in CBS and ACT research history are reflected in these data.

ACT and CBS were built on an attempt to target a small but coherent set of processes of change across virtually every area of complex human behavior via a form of functional analysis that added an analysis of human language and its impact to behavioral principles, as well principles of evolutionary science. The term “transdiagnostic” is an inadequate characterization since it falsely

implies that psychological flexibility processes are a new way to diagnose or address mental disorders. Improving athletic performance, fostering healthy relationships between couples, or reducing prejudice are not “transdiagnostic” efforts. There is no current and widely used term for an agenda that is as broad as the range of topics this review reflects. ACT focuses on processes of change that empower people across most life concerns. As we have argued throughout this paper, such a universal focus is entirely consistent with the early vision of behavior analysis and CBS, which sought out high precision/high scope principles that could apply to many forms of human action (e.g., Skinner, 1974). The description of CBS cited as this journal was inaugurated (Hayes, Barnes-Holmes, & Wilson, 2012) describes the similar breadth of the agenda built into ACT research from the beginning.

RCTs were initially held back because of the early hope that, as change agents and researchers recognized the relevance of broadly applicable principles, processes, and intervention components, ACT and CBS research would increase in rate, broaden in scope, and spread across the globe. That is exactly what has occurred, as this review has documented. This core idea did not begin with CBS—it is a mere extension of Skinner's vision for psychology (1974; 1981; 1990/1999)—but the CBS modifications of behavior analysis arguably succeeded in helping to fulfill Skinner's vision.

The publication of ACT RCTs has accelerated significantly in the third era of ACT research development, with 93.7% of research occurring between 2012 and 2022. Furthermore, the total number of RCTs in journals with high impact factors is now very substantial, suggesting that funded research may be increasing. At the very least it is clear that researchers turn to ACT regularly to try to craft solutions to practical problems across a broad array of human issues that span far beyond traditional diagnostic categories. Only 21.2% of RCTs are devoted to populations primarily defined by DSM disorders alone (35.3% in our most liberal upper bound analysis). Moreover, this breadth seems to have increased as ACT research in LMICs has become more common, since LMICs have notably lower levels of interest in the DSM, and notable higher levels of interest in such issues as coping with medical illness or fostering successful couples and families.

It is hard to mention a specific human problem that is not addressed to some degree in the first 1000 ACT RCTs. The amount of data available needs to be kept in mind when considering what is reported above. For example, “only” 8% of available RCTs focus on participants’ hope, efficacy, resilience, and optimism. But that means that 80 RCTs are focused on these measures of psychological capital – a notably large dataset for virtually any specific type of psychosocial intervention. The depth of this dataset can be seen in the breadth of ACT meta-analyses, which now can be done in a myriad of areas.

In well-done and more focused meta-analyses it becomes more possible to consider study quality and formal evaluations of research findings. It is already beyond the capacity of all but the most irrationally well-funded teams to evaluate the entire ACT literature. It is doubtful we will ever see a meta-analysis of that kind again, because even if ACT RCTs slow down their rate of growth, they

are still increasing substantially year by year.

In accord with our characterization of eras of research, a substantial proportion of studies in its first 3 decades of development were devoted specifically to studying ACT components. As the number of ACT RCTs has increased in the past decade, this focus has shifted towards the study of related therapies, interventions combining ACT with other treatments, non-traditional delivery methods (such as self-help and web-based ACT), and an expanded problem focus.

This is consistent with our belief that after establishing theoretical foundations for ACT in the first 3 decades and demonstrating its basic empirical credibility, it appears that the ACT research community has shifted in the 4th decade to a more expansive agenda that encourages innovation, connections with related developments, and exploration of the implications of the ACT model to a wider variety of human concerns.

6.2. Unique contributions of LMIC research

Considering the growth of ACT research in LMICs, it is notable that the fundamental diversity and transdiagnostic nature of ACT research in these countries is even more pronounced. When looking at DSM-defined disorders, behavioral health, and chronic pain, these categories together make up 46.9% of all studies in high income countries. In LMIC, these categories together make up only 26.0% of the total, with the gap filled by a greater proportion of studies devoted to caregivers, couples' issues, and those with medical illness. When looking at the outcomes of studies there is a greater focus in LMICs on quality of life, wellbeing, and psychological capital as compared to high income countries, with not as much focus as much on mood symptoms, anxiety symptoms, and health or substance-related behaviors. These different priorities reflect the fact that priorities for psychological care are different in LMIC (Evans et al., 2014).

In order to avoid perpetuating inequalities in health research production that adversely affect the developing world, western ACT researchers should learn from these priorities and widen their focus to include more populations and health concerns researched by these countries. There are undoubtedly many culture-bound features of ACT, but these numbers suggest that cultures around the world are having little problem adapting the psychological flexibility model to fit their perspectives (for a more detailed examination of LMIC ACT research see Sahdra, King, et al., 2024).

6.3. Non-indexed studies

It is worth briefly mentioning that while non-indexed studies do raise concerns about quality, it is important not to conflate the two issues without careful analyses of study quality on a study-by-study basis. Most studies of ACT from non-indexed journals are from Iran (63.8%) or China (12.3%), two relatively scientifically advanced but relatively geopolitically isolated countries where English is not widely spoken. Consider that 56 of the 81 papers in non-indexed journals from high income countries are from South Korea (69.1%) in journals that do not publish in English, suggesting that linguistic isolation may be of particular importance for non-indexed studies in high income countries as well.

It is important not to indulge in an “averaging error” when considering the issue of study quality. Over 200 ACT RCTs have been published in journals with an impact factor above 4; and over 50 in those with an impact factor above 6. This is a substantial body of work and if these studies are shown to be high quality (impact factor alone cannot tell us that) their conclusions are not undermined by poorly done studies published elsewhere. Yet that is the perverse impact that comes from simply averaging studies as is sometimes done in ACT in meta-analyses (e.g., Öst, 2008; 2014). Thus, we need to reemphasize that if research findings are the issue, research quality needs to be directly assessed study by study and overall findings evaluated in a fashion that fairly weighs the cumulative evidence. That may be difficult, and especially so for non-English articles, but given modern tools to overcome this language barrier it cannot continue to be accepted indefinitely as grounds for non-inclusion and non-consideration of non-indexed studies (Sahdra, King, et al., 2024).

6.4. Future directions for ACT research: Another era is upon us

Given the evaluation by major scientific bodies that ACT's effectiveness is firmly established, attention now needs to turn to how the large body of ACT work can be used to produce an impact on a wider range of problems and prosperity goals, in a wider range of cultures and communities, and to leverage its base of process information to improve prevention and psychosocial intervention person by person with increasingly targeted intervention kernels. ACT and CBS now have a leadership role that they did not have in previous decades, so the strategies that have produced progress need to be made more available to the field at large.

Historically speaking, ACT and its basis in contextual behavioral science has been a healthy but disruptive force in evidence-based intervention (Cloud, 2006; Hayes, 2004). There are reasons to expect that by returning to its foundations for new inspiration, ACT and CBS can once again push the field forward.

That possibility was taken seriously by ACBS several years ago when a comprehensive review of the strategies and tactics of CBS research was suggested by the ACBS Publications Committee to the ACBS Board in 2017. The Board agreed and a broad and representative committee was appointed by ACBS President Louise Hayes to examine past CBS research, consider anew the core features of a CBS approach, and suggest research strategies to guide future development. After a multi-year process the report of the ACBS Task Force on the Strategies and Tactics of Contextual Behavioral Science Research appeared (Hayes et al., 2021). The report, which has been formally adopted as ACBS policy, suggests that CBS research needs to be multi-level, process-based, multi-dimensional, prosocial, and pragmatic. Through the years, the empirical results have already shown that this report will likely usher in a new era of ACT research development.

Importantly, the report makes clear that all of these recommendations flow directly from CBS, very much as it was characterized earlier in this article. We would argue that all of these assumptions and key sensitivities were present, at least implicitly, in 1981 when ACT began. Now, however, they are becoming empirical extensions of the ACT/CBS research program. Some of the

recommendations comport directly with trends documented in this article. For example, the expansion of research into LMIC countries comports with the recommendation (#29) that "CBS research needs more cross-cultural focus and greater attention to biases or assumptions that may influence the research that is conducted and explication of its implications" and that (#24) "CBS research needs to address diversity issues (gender; language; race, ethnicity; sexual orientation and identity, etc.) in treatment and process of change research."

Almost every one of the 33 recommendations of the Task Force will seriously alter how and why RCTs are conducted. Such a set of recommendations would have been a ticket to irrelevance in Era 2, but the relative maturity of ACT research means that leading the field into new directions is now feasible.

We will examine only a handful on the recommendations to see why a new era is likely upon us.Recommendation 10. CBS researchers need to conduct RCTs in a way that fosters idiographic analyses of process of change.Recommendation 12. CBS research needs more idiographic and longitudinal, dynamic network-based research, especially in conjunction with high temporal density behavioral and biophysiological measures.Recommendation 13. CBS research needs more focus on the empirical evaluation of interventions and intervention components or kernels based on the degree to which they move processes of change.Recommendation 14. CBS research needs to develop alternatives to traditional psychometrics as quality standards for measures that are idiographically useful; sensitive to context; appropriate for repeated, frequent measurement; and that emphasize observable behavioral and biophysiological changes in addition to self-report.Recommendation 27. CBS research needs to be considered within an extended evolutionary science framework for the purpose of fostering greater scientific consilience. At the same time CBS researchers need to encourage an expansion of evolutionary and cultural science research beyond observation and description to include studies of influence and change.

It is becoming statistically clear that processes of change cannot be properly studied using standard group level mediational analysis – they require idionomic modeling (see Hofmann et al., 2020). In an idionomic approach, the relation of processes of change to intervention and outcome is first modeled idiographically with no information being shared between persons. Then comparisons to others are made, and if they appear to reveal new relationships, these nomothetic generalizations are retained only if they incrementally add to our idiographic understanding (Hayes et al., 2022; Hernández et al., in press).

In accord with Recommendation 14, new longitudinal measure have now been developed in accord with the EEMM and Recommendation 27 (e.g., the "Process Based Assessment Tool" or PBAT: Ciarrochi, Sahdra, et al., 2022). When that tool is applied clinically (Sanford et al., 2022) new forms of functional analysis emerge, in accord with Recommendation 12, that allow intervention kernels to be used and evaluated in a personalized way with clients (Ong et al., 2022) as is envisioned by Recommendation 13. Already we know that when examined this way adaptive behavioral variability and maladaptive behavioral rigidity relate to emotional and cognitive flexibility within young adults over time in a theoretically coherent way (Westhoff et al., 2024). But in area after area

surprises are found. For example, such classic psychological flexibility processes as “doing what matters” are reliably associated with emotional distress in some people over time (Sahdra, Ciarrochi, et al., 2024). This fact is only revealed by idionomic analysis. Furthermore, the variables that help explain this distress are invisible when using standard normative statistics but are readily visible if an idionomic approach is used.

Stated another way, the world looks much more nuanced and personalized when the recommendations of the Task Force Report are followed. A harsh but accurate way to state it is that normative averages have been deceiving researchers who have then been unknowingly lying to practitioners, and the traditional normative statistics that have claimed to solve this problem may have made it worse (Sahdra, Ciarrochi, et al., 2024). Yet another way to say this, which harkens back to the first section of this article, is that the idiographic approach of behavior analysis has been right all along, but that the transformational effects of relational framing now require that this central insight be examined using dynamical systems, not traditional single-case designs (e.g., Hayes, Barlow, & Nelson-Grey, 1999).

If Recommendation 10 were followed (CBS researchers need to conduct RCTs in a way that fosters idiographic analyses of process of change) and every new RCT done on ACT implemented the other recommendations we have just described, a massive amount of new data would appear, and based on what has been done so far it seem likely that these new idionomic analyses may reveal unexpected findings in many areas. A simple examination of recent issues of JCBS will make that evident.

But the change that is coming will not be seen only in RCTs. As Recommendation 28 anticipated (CBS research needs to develop practical research and intervention tools, focused on functionally important processes of change, meaningful intervention goals, and user-friendly methodological and statistical approaches that meet its underlying assumptions), we need to focus on how to fully personalize intervention science at the clinical level, not just with the researchers conducting RCTs. It seems quite possible that the gravitational center of ACT research could soon shift to “on the ground” practitioners around the world if idionomic measurement and analysis in fact can create a new, empirical, and effective form of functional analysis. Once there, progress may be as much or more dependent on LMIC research as it has historically and unfortunately been on high income countries. If “quality” of research means the expenditure of massive amounts of money to follow a myriad of expensive methodological demands focused on a small set of “disorders”, then “high quality” research can only occur in high income countries. If, however, the long-standing process and component vision of ACT must be implemented idionomically, person by person, and if cultural context and specific goals matter in how processes of change interact, then it may be impossible to develop a high-quality idionomic research program that is limited to high income countries and DSM disorders. The Task Force Recommendations explain why: the lack of diversity of context, culture, and goals within HIC research may be far too limiting for the possible benefits of an idionomic approach to be fully realized.

The implications of idionomic analysis are perhaps startling, but it may be equally startling to realize that the third dissertation ever done in the first CBS lab was an idionomic analysis (Turner, 1986). His story deserves to be told as this article ends because it underlines the larger theme we have stated and perhaps validates the approach we have taken in examining the history and meaning of the 1000 RCT milestone.

Arlinza E. “Sonny” Turner was an African American student from an impoverished background in rural North Carolina and was one of the first to join the first CBS lab. Brilliant but very poorly educated in a small town that virtually never saw high school graduates go to college, he rose from struggling with writing grammar as a beginning graduate student to becoming the Chief Psychologist at Beth Israel Medical Center in New York and a professional well known for his skill in writing clear and highly useful evidence-based treatment manuals (e.g., Turner & Muran, 1992). He felt the double stigma of race and sexual identity in an era when prejudice against ethnic minorities was beginning to be more seriously addressed, but prejudice against sexual minorities was barely recognized. Sonny saw in the radical idiographic approach of behavioral analysis a chance to have the voices of stigmatized people heard and amplified, and he was fascinated by the early research by Lamiell (1981) that showed that measuring within-person relationships gave a different picture than the same relationships measured across persons.

His dissertation found that if you measure sexual arousal in males to gay and straight stimuli both physiologically and by self-report repeatedly over time, within-person correlations showed notably higher consistency between self-reported and physiologically assessed arousal than did between-person analyses at any given point in time. He also showed that these different ways of analyzing data were differentially responsive to experimental manipulations. Some participants were led to believe that their physiological arousal was being monitored in real time by the experimenter (“public”) or that it was not (“private”). Group-level analysis failed to show any impact of this manipulation, but within-person correlations fell significantly when participants were viewing nude males in a public context.

This is arguably one the earliest applied idionomic studies ever done. It was so out of the box that it proved to be almost impossible to publish. When Dr. Turner died of AIDS in 1995, it still had not been accepted, 10 years after the dissertation was completed. It was published in an all-Spanish-language journal posthumously (Turner & Hayes, 1996). It has languished there and has only been cited 6 times since, whereas as a group the other 6 UNC-G dissertation have all been published and highly cited (median citation count in Google Scholar: 119). It may yet prove to be the most important one of all.

This courageous and bittersweet story validates the structure of the present article. It is not possible to understand ACT without understanding CBS and its roots in Skinner's radical behaviorism viewed as a contextualistic enterprise. Because there was a first CBS lab, we have for the first time in print listed those earliest dissertations and explored the earliest written ACT and CD documents. That history begins to make sense of the anomalous features of ACT and CBS development: its radically broad focus, the way it has penetrated the LMIC word, the way its model

has been readily expanded to include innovation without creating incoherence. The story of Sonny Turner underlines the fact that even as almost entirely new chapters are being written, CBS is a robust approach that was built over decades with the involvement of scores of people in a way that is continuing to pay off. What appeared to be a weakness—its initial obscurity and deliberately slow development strategy in many areas—allowed a solid foundation to be built on a coherent set of assumptions. Many, many features of ACT and CBS that exist today evolved over time, but none that we know of were added capriciously or in a way that was entirely new or simply random.

7. Conclusion

We have attempted to examine how the ACT research journey emerged from a combination of idiographic, process-oriented behavioral psychology, combined with a contextualistic perspective on emotion, cognition, sense of self, motivation and similar issues. We have shown that ACT research has grown in ways that fit with its earliest history and initial assumptions, while continuously making them more explicit. If that is the case, then revisiting those assumptions once again, such as has been done with the Task Force Report, may point the way to a bright and impactful future for ACT research.

As the Task Force recommendations take hold, the next era of CBS and ACT development seems certain to continue to shift toward high density measurement of processes of change, personalized and kernelized precision interventions, alternative delivery methods, and an even wider range of targeted human issues. This is a bold—and in some ways risky—agenda, but so too was the first 40 years of CBS and ACT development. While the future is unknown it seems entirely possible that the next four decades of development could be as exciting and impactful as the first four have been.

CRediT authorship contribution statement

Steven C. Hayes: Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Data curation, Conceptualization. Grant A. King: Writing – review & editing, Writing – original draft, Visualization, Formal analysis, Data curation.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Steven C. Hayes reports a relationship with multiple publishers, professional associations, universities, and training companies that includes: royalties, speaking and lecture fees, and travel reimbursement. Steven C. Hayes has copyrights for multiple books related to ACT from which he receives royalties. Other authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

The following is/are the supplementary data to this article.Download: Download Word document (767KB)Multimedia component 1.

Appendix.

Appendix Table A1. Treatment Arm Codes

Treatment Arm Code	Description
1	ACT
2	ACT + CBT (including internet-based ACT + CBT)
3	ACT + Medication
4	ACT + Other Supplement
5	Online, App-Based, or iACT
6	Phone or Video-Based ACT
7	Group ACT
8	ACT Workbook or Self-Help
9	ACT Components
10	ACT-Based Training
11	MAC
12	ABBT/ABBI
13	Multiple ACT Treatment Arms
14	Other ACT-Based Intervention
15	Other Intervention

Note

. MAC = Mindfulness-Acceptance-Commitment; ABBT/ABBI = Acceptance-Based Behavior Therapy/Acceptance-Based Behavioral Intervention.

Appendix Table A2. Comparison Arm Codes

Comparison Arm Code	Description
1	No Treatment

Comparison Arm Code	Description
2	Waitlist
3	Control
4	Baseline
5	Placebo
6	Treatment As Usual
7	CBT
8	CBT + Medication
9	CBT + Other Supplement
10	CT
11	Medication
12	Psychoeducation or Health Education
13	ACT Components
14	Other ACT-Based Intervention
15	Other Intervention

Appendix Table A3. Population Category Grouping

Number	Final Population Category	Original Populations Included (non-exhaustive list)
1	Medical Illness/Physical Impairment	Cancer, Diabetes, Multiple Sclerosis
2	DSM Diagnosis	Depression, Social Anxiety, Anxiety, Psychosis/Schizophrenia
3	Demographic Category	Adolescents, Older Adults, General Populace, Transgender People
4	Behavioral Health	Substance Use, Weight Loss/Obesity, Exercise, Dental Hygiene
5	Parents/Caregivers/Clinicians/Teachers	Parents/Caregivers, Healthcare Workers, Clinician Training, Teachers
6	Workplace/Academic/Athletic Concerns	Stress/Burnout, Students – Academic/Career Issues, Athletes, Military Personnel
7	Chronic Pain	Chronic Pain

Number	Final Population Category	Original Populations Included (non-exhaustive list)
8	Social Concerns	Marital/Couples Concerns, Mental Health Stigma, Aggression
9	Coping with Event/Hardship	PTSD/Trauma, Infertility, Divorce, Refugees, Suicide Prevention/Recovery
10	Other Psychological Concern	Subclinical Social/Psychological Issues, Perfectionism, Confidence, Paranoia

Appendix Table A4. Outcome Category Grouping

Number	Final Outcome Category	Original Outcomes Included (non-exhaustive list)
1	Quality of Life/Wellbeing/Mental Health	Quality of Life, Wellbeing, Mental Health
2	Stress/Distress	Stress, Psychological Distress, Burnout Symptoms, Distress Tolerance
3	Psychological Capital	Resilience, Self-Efficacy, Hope
4	ACT Components	Psychological Flexibility, Experiential Avoidance, Mindfulness
5	Physical Symptoms	Fatigue Interference, Inflammation, Psoriasis Symptoms
6	Health Outcomes	Weight Loss, Life Expectancy, Glycemic Control
7	Sleep	Insomnia Symptoms, Sleep Quality
8	Body-Image Related	Body Image, Body Image Flexibility, Body Image Dissatisfaction
9	OCD Related	OCD Symptoms, Perfectionism, Contamination-Related Thoughts
10	PTSD/Trauma Related	Post-Traumatic Growth, PTSD Symptoms, Event Centrality
11	Eating Disorder Related	Eating Disorder Symptoms, Binge Eating Behavior, Emotional Eating
12	Pain Related	Pain, Pain Intensity, Pain Tolerance, Pain Catastrophizing
13	Mood Related	Depression Symptoms, Happiness, Negative Thinking, Demoralization

Number	Final Outcome Category	Original Outcomes Included (non-exhaustive list)
14	Anxiety Related	Anxiety Symptoms, Social Anxiety Symptoms, Death Anxiety, Public Speaking Anxiety
15	Paranoia/Hallucination	Paranoia, Schizophrenia Symptoms, Auditory Hallucinations
16	Coping/Adjustment	Coping Style, Psychological Adjustment, Social Adjustment
17	Illness Perception/Empowerment	Disease Perception, Illness Cognition
18	Stigma/Attitudes	Stigma towards Psychological Disorders, Dysfunctional Attitudes
19	Emotional Awareness/Skillfulness	Emotional Regulation, Alexithymia, Emotional Expression Ambivalence
20	Self-Regard	Self-Esteem, Self-Compassion, Self-Care, Self-Criticism
21	Specific Negative Emotions	Shame, Anger, Loneliness
22	Academic/Athletic/Work Performance	Athletic Performance, Workplace Absence, Procrastination
23	Substance Expectancy/Craving	Cravings, Social Media Addiction
24	Life Satisfaction/Fulfillment	Life Satisfaction, Life Meaningfulness, Spiritual Health
25	Motivation	Achievement Motivation, Motivation, Motivational Beliefs
26	Self-Control/Impulsivity	Self-Control, Impulsiveness
27	Physical Function/Impairment	Functioning, Physical Impairment
28	Cognitive Function/Impairment	Problem Solving, Executive Functioning, Cognitive Impairment
29	Social Function/Wellness	Interpersonal Problems, Interpersonal Relationship Quality, Interpersonal Forgiveness
30	Intimate Relationship Function/Impairment	Marital Satisfaction, Marital Conflict, Relationship Quality, Relationship Skills
31	Sexual Function/Impairment	Sexual Function, Sexual Self-Esteem, Sexual Intimacy
32	Family Function/Impairment	Parent-Child Relationship, Family Empowerment

Number	Final Outcome Category	Original Outcomes Included (non-exhaustive list)
33	Health/Substance Related Behaviors	Smoking Cessation, Treatment Adherence, Physical Activity
34	Externalizing Behavior	Aggression, Child Behavioral Problems
35	Self-Destructive Thoughts/Behavior	Suicidal Thoughts, Self-Harm
36	Therapist Training Related	Willingness to use Evidence-Based Interventions, Counselor-Client Congruence
37	Other Behaviors	Behavioral Inhibition, Behavioral Activation, Infidelity
38	Other Psychiatric Symptoms	Rumination, Trichotillomania Symptoms, Intolerance of Uncertainty
39	Not Specified	Not Specified
40	Other Outcomes	Treatment Acceptability, Brain Activation

References

M. Akbari, M. Seydavi, C.H. Davis, M.E. Levin, M.P. Twohig, E. Zamani The current status of acceptance and commitment therapy (ACT) in Iran: A systematic narrative review Journal of Contextual Behavioral Science, 26 (2022), pp. 85-96

W. An A systematic review and meta-analysis of Acceptance and Commitment Therapy in South Korea Doctoral dissertation Utah State University (2020)

Association for Contextual Behavioral Science. (n.d.). ACT Randomized Controlled Trials (1986 to present). Retrieved September 10, 2023, from https://contextualscience.org/act_randomized_controlled_trials_1986_to_present .

P. Atkins, D.S. Wilson, S.C. Hayes Prosocial: Using evolutionary science to build productive, equitable, and collaborative groups Context Press/New Harbinger Publications, Oakland, CA (2019)

P. Bach, S.C. Hayes The use of acceptance and commitment therapy to prevent the rehospitalization of psychotic patients: A randomized controlled trial Journal of Consulting and Clinical Psychology, 70 (5) (2002), pp. 1129-1139

R.A. Baer, G.T. Smith, J. Hopkins, J. Krietemeyer, L. Toney Using self-report assessment methods to explore facets of mindfulness Assessment, 13 (1) (2006), pp. 27-45

A.T. Beck Cognitive therapy: Nature and relation to behavior therapy Behavior Therapy, 1 (1970), pp. 184-200

F.W. Bond, D. Bunce Mediators of change in emotion-focused and problem-focused worksite stress management interventions Journal of Occupational Health Psychology, 5 (1) (2000), p. 156

K.W. Brown, R.M. Ryan The benefits of being present: Mindfulness and its role in psychological well-being Journal of Personality and Social Psychology, 84 (4) (2003), pp. 822-848

J.A. Chase, R. Houmanfar, S.C. Hayes, T.A. Ward, J.P. Vilardaga, V.M. Follette Values are not just goals: Online ACT-based values training adds to goal-setting in improving undergraduate college student performance Journal of Contextual Behavioral Science, 2 (2013), pp. 79-84, 10.1016/j.jcbs.2013.08.002

J. Ciarrochi, B. Sahdra, S. Hofmann, S.C. Hayes Developing an item pool to assess processes of change in psychological interventions: The Process-Based Assessment Tool (PBAT) Journal of Contextual Behavioral Science, 23 (2022), pp. 200-213, 10.1016/j.jcbs.2022.02.001

J. Ciarrochi, B.K. Sahdra, K. Yap, T. Dicke The role of nonattachment in the development of adolescent mental health: A three-year longitudinal study Mindfulness, 11 (9) (2020), pp. 2131-2139

J. Cloud Happiness isn't normal Time, 167 (7) (2006), pp. 58-67

J. Dahl, K.G. Wilson, A. Nilsson Acceptance and commitment therapy and the treatment of persons at risk for long-term disability resulting from stress and pain symptoms: A preliminary randomized trial Behavior Therapy, 35 (2004), pp. 785-802

J.M. Devany Stimulus equivalence and language development in children Unpublished doctoral dissertation University of North Carolina – Greensboro (1985)

G. Doran, A. Miller, J. Cunningham There's a S.M.A.R.T. way to write management goals and objectives Management Review, 70 (11) (1981), pp. 35-36

M. Egger, T. Zellweger-Zähner, M. Schneider, C. Junker, C. Lengeler, G. Antes Language bias in randomised controlled trials published in English and German The Lancet, 350 (9074) (1997), pp. 326-329

G.H. Eifert, J.P. Forsyth Acceptance and commitment therapy for anxiety disorders: A practitioner's treatment guide to using mindfulness, acceptance, and values-based behavior change New Harbinger Publications, Oakland, CA (2005)

J.E. Epping-Jordan, R. Harris, F.L. Brown, K. Carswell, C. Foley, C. García-Moreno, et al. Self-help plus (SH+): A new WHO stress management package World Psychiatry, 15 (3) (2016), p. 295

J.A. Evans, J.M. Shim, J.P. Ioannidis Attention to local health burden and the global disparity of health research PLoS One, 9 (4) (2014), Article e90147

B.A. Gaudiano, J.D. Herbert Acute treatment of inpatients with psychotic symptoms using acceptance and commitment therapy: Pilot results Behaviour Research and Therapy, 44 (2006), pp. 415-437

E.V. Gifford, B.S. Kohlenberg, S.C. Hayes, D.O. Antonuccio, M.M. Piasecki, M.L. Rasmussen-Hall, et al. Acceptance-based treatment for smoking cessation Behavior Therapy, 35 (2004), pp. 689-705

A.T. Gloster, N. Walder, M. Levin, M. Twohig, M. Karekla The empirical status of acceptance and commitment therapy: A review of meta-analyses Journal of Contextual Behavioral Science, 18 (2020), pp. 181-192, 10.1016/j.jcbs.2020.09.009

J.A. Gregg, G.M. Callaghan, S.C. Hayes, J.L. Glenn-Lawson Improving diabetes self-management through acceptance, mindfulness, and values: A randomized controlled trial Journal of Consulting and Clinical Psychology, 75 (2007), pp. 336-343

J. Haas The effects of verbal consequences for rule-following on sensitivity to programmed contingencies of reinforcement Unpublished doctoral dissertation University of North Carolina – Greensboro (1991)

R. Harris The happiness trap Shambala, New York (2008)

S.C. Hayes The Big D: Comprehensive cognitive distancing procedures Unpublished paper accesses on May 8, 2024 from https://contextualscience.org/node/49769 (1981)

S.C. Hayes Cognitive distancing and psychopathology Morganton, NC: Workshop presented to Broughton Hospital, Broughton, NC (1982)

S.C. Hayes Comprehensive distancing: A contextual approach to thoughts and feelings Workshop presented to the Guilford county community mental health center, Greensboro, NC (1983)

S.C. Hayes Making sense of spirituality Behaviorism, 12 (1984), pp. 99-110

S.C. Hayes Upward and downward continuity: It's time to change our strategic assumptions Behavior Analysis, 22 (1987), pp. 3-6

S.C. Hayes A contextual approach to therapeutic change N. Jacobson (Ed.), Psychotherapists in clinical practice: Cognitive and behavioral perspectives (1987), pp. 327-387 New York: Guilford

S.C. Hayes Analytic goals and the varieties of scientific contextualism S.C. Hayes, L.J. Hayes, H.W. Reese, T.R. Sarbin (Eds.), Varieties of scientific contextualism, Context Press, Reno, NV (1993), pp. 11-27

S.C. Hayes Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies Behavior Therapy, 35 (4) (2004), pp. 639-665

S.C. Hayes A liberated mind: How to pivot toward what matters Penguin/Avery, New York (2019)

S.C. Hayes, D.H. Barlow, R.O. Nelson-Grey The Scientist-Practitioner: Research and accountability in the age of managed care (2nd ed.), Allyn & Bacon, New York (1999)

S.C. Hayes, D. Barnes-Holmes, B. Roche Relational Frame Theory: A Post-Skinnerian account of human language and cognition, Plenum Press, New York (2001)

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

S.C. Hayes, R. Bissett, Z. Korn, R.D. Zettle, I. Rosenfarb, L. Cooper, et al. The impact of acceptance versus control rationales on pain tolerance Psychological Record, 49 (1999), pp. 33-47

S.C. Hayes, R. Bissett, N. Roget, M. Padilla, B.S. Kohlenberg, G. Fisher, et al. The impact of acceptance and commitment training and multicultural training on the stigmatizing attitudes and professional burnout of substance abuse counselors Behavior Therapy, 35 (2004), pp. 821-835

S.C. Hayes, F. Bond, D. Barnes-Holmes, J. Austin Acceptance and mindfulness at work: Acceptance and Commitment Therapy, Relational Frame Theory, and organizational behavior management (2006) Binghamton, NY: Haworth

S.C. Hayes, A.J. Brownstein Mentalism, behavior-behavior relations and a behavior analytic view of the purposes of science The Behavior Analyst, 9 (1986), pp. 175-190

S.C. Hayes, J. Ciarrochi, S.G. Hofmann, F. Chin, B. Sahdra Evolving an idionomic approach to processes of change: Towards a unified personalized science of human improvement Behaviour Research and Therapy, 156 (2022), Article 104155

S.C. Hayes, V.M. Follette, M.M. Linehan (Eds.), Mindfulness and acceptance: Expanding the cognitive behavioral tradition, Guilford Press, New York (2004)

S.C. Hayes, L.J. Hayes The verbal action of the listener as a basis for rule-governance S.C. Hayes (Ed.), Rule governed behavior: Cognition, contingencies, and instructional control, Plenum, New York (1989), pp. 153-190

S.C. Hayes, L.J. Hayes, H.W. Reese Finding the philosophical core: A review of Stephen C. Pepper's World hypotheses Journal of the Experimental Analysis of Behavior, 50 (1988), pp. 97-111

S.C. Hayes, S.G. Hofmann Process-based CBT: The science and core clinical competencies of cognitive behavioral therapy Context Press/New Harbinger Publications, Oakland, CA (2018)

S.C. Hayes, S.G. Hofmann, J. Ciarrochi A process-based approach to psychological diagnosis and treatment: The conceptual and treatment utility of an extended evolutionary meta model Clinical Psychology Review, 82 (2020), Article 101908

S.C. Hayes, N.S. Jacobson, V.M. Follette, M.J. Dougher (Eds.), Acceptance and change: Content and context in psychotherapy, Context Press/New Harbinger, Oakland, CA (1994)

S.C. Hayes, G.A. King ACT randomized controlled trials content analysis Retrieved from osf.io/rtszq (2024)

S.C. Hayes, B.S. Kohlenberg, S.M. Melancon Avoiding and altering rule-control as a strategy of clinical intervention S.C. Hayes (Ed.), Rule-governed behavior: Cognition, contingencies, and instructional control (1989), pp. 359-385 New York: Plenum

S.C. Hayes, Z. Korn, R.D. Zettle, I. Rosenfarb, L. Cooper Rule governed behavior and cognitive behavior therapy: The effects of comprehensive cognitive distancing on pain tolerance Paper presented at the meeting of the association for Advancement of behavior therapy (1982) Los Angeles

S.C. Hayes, J. Luoma, F. Bond, A. Masuda, J. Lillis Acceptance and commitment therapy: Model, processes, and outcomes Behaviour Research and Therapy, 44 (2006), pp. 1-25

S.C. Hayes, R.M. Merwin, L. McHugh, E. Sandoz, J. A-Tjak, F.J. Ruiz, et al. Report of the ACBS task force on the strategies and tactics of contextual behavioral science research Journal of Contextual Behavioral Science, 20 (2021), pp. 172-183

S.C. Hayes, R.O. Nelson, R. Jarrett Treatment utility of assessment: A functional approach to evaluating the quality of assessment American Psychologist, 42 (1987), pp. 963-974

S.C. Hayes, S. Smith Get out of your mind and into your life: The new Acceptance and Commitment Therapy, Harbinger, Oakland, CA: New (2005)

S.C. Hayes, K.D. Strosahl, K.G. Wilson Acceptance and commitment therapy: An experiential approach to behavior change Guilford, New York (1999)

S.C. Hayes, K.D. Strosahl, K.G. Wilson Acceptance and commitment therapy: The process and practice of mindful change (2nd ed.), Guilford, New York (2012)

S.C. Hayes, K.D. Strosahl, K.G. Wilson, R.T. Bissett, J. Pistorello, D. Toarmino, et al. Measuring experiential avoidance: A preliminary test of a working model Psychological Record, 54 (2004), pp. 553-578

S.C. Hayes, K.G. Wilson, E.V. Gifford, R. Bissett, M. Piasecki, S.V. Batten, et al. A preliminary trial of twelve-step facilitation and acceptance and commitment therapy with polysubstance-abusing methadone-maintained opiate addicts Behavior Therapy, 35 (2004), pp. 667-688

S.C. Hayes, K.G. Wilson, E.V. Gifford, V.M. Follette, K. Strosahl Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment Journal of Consulting and Clinical Psychology, 64 (1996), pp. 1152-1168

Hernández, C., Sahdra, B. K., Ciarrochi, J. & Hayes, S. C. (in-press). The idionomic assessment of mindfulness. Chapter to appear in O. N. Medvedev, C. U. Krägeloh, R. J. Siegert & N. N. Singh (Eds.) Handbook of assessment in mindfulness research . New York: Springer.

H. Hesser, V. Westin, S.C. Hayes, G. Andersson Clients' in-session acceptance and cognitive defusion behaviors in acceptance-based treatment of tinnitus distress Behaviour Research and Therapy, 47 (2009), pp. 523-528

S.G. Hofmann, G.J. Asmundson Acceptance and mindfulness-based therapy: New wave or old hat? Clinical Psychology Review, 28 (1) (2008), pp. 1-16

S.G. Hofmann, J.E. Curtiss, S.C. Hayes Beyond linear mediation: Toward a dynamic network approach to study treatment processes Clinical Psychological Science, 76 (2020), Article 101824, 10.1016/j.cpr.2020.101824

S.G. Hofmann, S.C. Hayes The future of intervention science: Process based therapy Clinical Psychological Science, 7 (1) (2019), pp. 37-50, 10.1177/2167702618772296

S.G. Hofmann, S.C. Hayes Beyond the DSM: Toward a process-based alternative for diagnosis and mental health treatment Context Press/New Harbinger Publications, Oakland, CA (2020)

S.G. Hofmann, S.C. Hayes, D. Lorscheid Learning process-based therapy: A skills training manual for targeting the core processes of psychological change in clinical practice Context Press/New Harbinger Publications, Oakland, CA (2021)

S.G. Hofmann, A.T. Sawyer, A.A. Witt, D. Oh The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review Journal of Consulting and Clinical Psychology, 78 (2) (2010), p. 169

F. Howes, J. Doyle, N. Jackson, E. Waters Evidence-based public health: The importance of finding 'difficult to locate' public health and health promotion intervention studies for systematic reviews Journal of Public Health, 26 (1) (2004), pp. 101-104

ISSN International Center. (n.d). ISSN Portal. Retrieved September 10, 2023, from https://portal.issn.org/ .

D. Khorakiwala An analysis of the process of client change in a contextual approach to therapy ProQuest Dissertations Publishing (1991) (Publication No. 9131276) [Doctoral dissertation, University of Nevada, Reno]

B.S. Kohlenberg Transfer of function through equivalence: Modification effects based upon nodality and contextual control Unpublished doctoral dissertation University of Nevada, Reno (1994)

J.T. Lamiell Toward an idiothetic psychology of personality American Psychologist, 36 (1981), pp. 276-289

J. Lillis, S.C. Hayes, K. Bunting, A. Masuda Teaching acceptance and mindfulness to improve the lives of the obese: A preliminary test of a theoretical model Annals of Behavioral Medicine, 37 (2009), pp. 58-69

G. Lipkens A behavior analysis of complex human functioning: Analogical reasoning Unpublished doctoral dissertation University of Nevada, Reno (1992)

P.F. Lovibond, S.H. Lovibond The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the Beck depression and anxiety Inventories Behaviour Research and Therapy, 33 (3) (1995), pp. 335-343

T. Lundgren, J. Dahl, L. Melin, B. Kies Evaluation of acceptance and commitment therapy for drug refractory epilepsy: A randomized controlled trial in South Africa—a pilot study Epilepsia, 47 (2006), pp. 2173-2179

A. Masuda, S.C. Hayes, L.B. Fletcher, P.J. Seignourel, K. Bunting, S.A. Herbst, et al. The impact of acceptance and commitment therapy versus education on stigma toward people with psychological disorders Behaviour Research and Therapy, 45 (2007), pp. 2764-2772

A. Masuda, S.C. Hayes, C.F. Sackett, M.P. Twohig Cognitive defusion and self-relevant negative thoughts: Examining the impact of a ninety year old technique Behaviour Research and Therapy, 42 (2004), pp. 477-485

A. Masuda, S.C. Hayes, M.P. Twohig, C[Truncated]