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Addiction treatment outcomes, process, and change: Texas Institute of Behavioral Research at TCU

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Abstract

For over 40 years the Texas Institute of Behavioral Research (IBR) has given special attention to assessment and evaluation of drug user populations, addiction treatment services, and various cognitive and behavioral interventions. Emphasis has been on studies in real-world settings and the use of multivariate methodologies to address evaluation issues within the context of longitudinal natural designs. Historically, its program of addiction treatment research may be divided into three sequential epochs – the first era dealt mainly with client assessment and its role in treatment *outcome and evaluation* (1969-1989), the second focused on modeling the treatment process and the importance of conceptual frameworks (1989-2009) in explaining the relationships among treatment environment, client attributes, treatment process, and outcome, and the third (and current) era has expanded into studying tactical deployment of innovations and implementation. Recent projects focus on adapting and implementing innovations for improving early engagement in adolescent residential treatment settings and drug-dependent criminal justice populations. Related issues include the spread of HIV/AIDS and other infectious diseases, organizational and systems functioning, treatment costs, and process related to implementation of evidence-based practices.

Keywords

Treatment outcomes; assessments; interventions; process; implementation; costs

INTRODUCTION

The Texas Institute of Behavioral Research (IBR) was established at Texas Christian University (TCU) in 1962 by Professor Saul B. Sells, four years after joining the TCU Department of Psychology. Sells earned his Ph.D. from Columbia University in 1936 and had studied under eminent American psychologists, including Robert S. Woodworth and Edward L. Thorndike. His early emphasis on practical applications of psychological science [1] influenced work he conducted as a military scientist in the U.S. Air Force, which

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included measurement and prediction studies of fighter pilot outcomes in air combat. The IBR offered an academic base for continuing his research on personality, personnel selection, social interactions, and organizational functioning [2]. Financial support initially came in the form of short-term research contracts and grants from several major airlines, the National Science Foundation, Office of Naval Research, and the National Aeronautics and Space Administration.

Sells served as the Director of the IBR until he faced mandatory retirement from TCU 20 years later. In the late 1960s he assembled a core team of scientists who maintained an unusually long lasting collaboration. They included Robert G. Demaree, D. Dwayne Simpson, George W. Joe, and Donald F. Dansereau. Simpson became IBR Director in 1982 when he moved the Institute to Texas A&M University. This was prompted in large part by the mandated retirement of Sells and lack of a leadership transition plan for the IBR. Based on sustained success in addiction treatment research and productivity at Texas A&M, Simpson and Joe were recruited by TCU to return the IBR to its original home in 1989. Patrick M. Flynn was appointed as the third Director in 2009, following a more deliberate process for leadership change. Like Sells before them, Simpson and Flynn also served as Professors of Psychology with duties devoted to full-time research.

The IBR has always functioned as an independent, multi-disciplinary research unit at TCU, which was founded in 1873 as a private and self-governing institution of higher learning. Located in Fort Worth, Texas, TCU was originally established in association with the Christian Church (Disciples of Christ). Students and faculty nevertheless represent many religious faiths (including Christian, Jewish, and Muslim) as well as secular beliefs. The University's name and historical affiliation has on occasion created suspicions about the contents and motives for some of the IBR's work, especially in the course of international collaborations.

OVERVIEW OF OPERATIONS AND RESEARCH STRATEGY

The mission of IBR for the past 20 years has been “to evaluate and improve the effectiveness of service delivery systems for reducing drug abuse and related health, mental health, and social problems.” The Institute is most closely affiliated operationally with the Department of Psychology at TCU, wherein scientists from the IBR (all with doctoral degrees, and mostly in psychology) hold adjunct professor and graduate faculty appointments, serve on student thesis and dissertation committees, and teach formal courses when time and opportunities permit. Their special skills in surveys, data management, and multivariate analytic techniques (sometimes taught as independent study courses) are foundational for graduate training in health services evaluation research.

Peer-reviewed federal grants (with all indirect funds accruing to TCU) support IBR scientists, student trainees, and staff of about 20, housed in its own separate office building on the TCU campus. Through this work, the IBR (1) generates and disseminates knowledge that impacts state, national, and international policy decisions in the addictions field, (2) provides critical methodological and substantive research training for graduate student trainees, (3) encourages staff and collaborating scientists to achieve their highest scholarly potential, and (4) raises the research reputation and visibility of TCU through scientific and public health contributions. Its history of research funding and publications reflect these principles, emphasizing a heritage in addiction treatment evaluation research, staff specializations and strengths, and a focus on knowledge or practice gaps for which service providers need help.

HISTORICAL PERSPECTIVE ON STAGES OF ADDICTION RESEARCH

Stage 1 Era (1969-1989): National evaluations of community-based treatment in the U.S

The fields recognized today as addiction treatment or program evaluation were not yet established in the late 1960s, and indeed the U.S. National Institute on Drug Abuse (NIDA) was not created until 1974. Saul Sells was known opportunistically in some Washington DC circles (and especially by Lois R. Chatham, head of a new branch in the National Institute of Mental Health) to be doing innovative behavioral prediction studies, including personality factor analytic and fighter-pilot selection and outcome evaluations. In 1968 the IBR was selected by Chatham and associates to establish a management information system for what was to become the first community-based treatment system for heroin addiction in the U.S. [3]. Lacking a competitive market of experienced behavioral science teams during this era, sole-source “contracting” was the funding tool used to engage the IBR for an embryonic study of this sort. Based on these data, Sells secured funding in 1972 to conduct the first national evaluation of treatment effectiveness based on this system (i.e., the *Drug Abuse Reporting Program*, DARP) along with post-treatment follow-up outcome studies on recovery evidence [4-9]. This funding transition was based on Sell's perception of the evaluation possibilities provided by these data and the governmental needs for finding and developing new behavioral science evaluation capabilities.

Results of this congressionally-mandated management and evaluation effort matured throughout a series of funding contracts, and helped define core methodological procedures and standards for studying addiction treatment process and follow-up outcomes conducted in natural field settings. It likewise established the foundations for a continuing role of IBR scientists in subsequent large-scale evaluations of treatment later funded by NIDA grants during the 1980s (i.e., the *Treatment Outcome Prospective Study* (TOPS) [10-12] and again in the 1990s (i.e., the *Drug Abuse Treatment Outcome Studies* (DATOS) [13-17]. These studies contributed evidence that treatment for drug addiction can be effective, but more importantly their collective focus on 65,000 clients for over 300 treatment programs located across the U.S. introduced systematic questions about the impact of program-level variations in service structure, quality, and clinical staff. Their scientific credibility was strengthened by the leadership of Barry S. Brown [18] at NIDA and formation of a multi-center research cooperative for conducting the DATOS project during the 1990s. Robert L. Hubbard and his associates at the National Development Research Institutes and M. Douglas Anglin and his associates at the University of California-Los Angeles were joined with the IBR team, and together they published over 80 large-sample treatment process and outcome evaluations (see www.datos.org).

The 20 years of prospective research funding for the DARP treatment evaluation and follow-up studies (i.e., from 1969 to 1989) of community-based treatment, along with the related evaluation projects for TOPS and DATOS, can be viewed as the IBR's Stage 1 Era with emphasis on client assessment and treatment outcome methods research. Basic client history, criterion measurement, field design and data collection procedures, analytic techniques, and outcome effectiveness findings thereby served as foundations for its next era, as summarized below.

Stage 2 Era (1989-2009): Defining treatment process for recovery pathways

In response to early concerns raised in the addiction field about the “black box of treatment” and indications of notable variations in program effectiveness, IBR shifted its attention to develop better strategies for studying *therapeutic process* (e.g., motivation, engagement, retention) and improving treatment care planning and services. More specifically, in 1989 a second 20-year wave of studies was initiated which transitioned systematically through

several conceptual stages focused on treatment infrastructure, therapeutic dynamics, and systems change. The research was funded by NIDA through a series of peer-reviewed 5-year grants, referred to herein as the Drug Abuse Treatment and Assessment Resources project (DATAR Phases 1, 2, 3, and 4).

Building on experiences from large-scale treatment effectiveness evaluations (especially DARP), the DATAR-1 project (1989-1994) focused initially on developing and testing manual-guided interventions for HIV/AIDS risk reduction and related assessments. The focus narrowed for DATAR-2 (1994-1999) when therapeutic process became its more explicit object of study. An array of client needs and progress assessments, along with additional targeted interventions, were conceptually integrated within a model of treatment process created for representing the stage-based dynamics of clinical change [19-21].

Several core studies helped establish that clients with higher motivation at intake are twice as likely to participate in treatment (attend sessions and be “on-time”) in the first few months of treatment [22-24]. In turn, clients showing higher levels of participation in counseling sessions are then twice as likely to develop favorable therapeutic relationships with their counselor. While session attendance is generally required before clinical bonds are formed, it also was clear that participation and therapeutic relationships become interdependent for mutual strengthening of early engagement in treatment. The next step, “early” recovery, reflects initiation of client changes in thinking and acting that build on the previous engagement stage. For instance, clients who report stronger therapeutic relationships in treatment are more than twice as likely to show positive changes in psychosocial functioning, as measured by self-esteem, depression, anxiety, risk-taking, social conformity, and decision-making [22]. Psychosocial functioning improvements, in turn, double the chances that favorable behavioral changes will follow (measured by urinalysis and self-reported drug use later in treatment), including the chances that clients will meet or exceed treatment retention expectations. Followup evaluations indicate better outcomes are thereby achieved [24-26].

Because means-end thinking, planning ahead, and decision-making skills are lacking for many addiction treatment clients, new cognitive intervention strategies were developed to enhance treatment effects. “Node-link mapping” is a special case of graphical communication techniques [27] and has been adapted by Dansereau and associates to addiction counseling on the basis of its effectiveness in educational research settings [28]. In brief, mapping-enhanced counseling is a cognitive strategy with proven benefits in increasing client motivation, engagement, participation, and retention in treatment [24-26]. It also promotes more positive interactions with other clients and treatment staff, both in community-based and correctional settings [29]. Manuals for adaptive treatment services provide guidance in use of mapping techniques for group and individual counseling settings using a variety of structured and free-flow formats, along with related motivational readiness and recovery oriented interventions [30]. This counseling technique – referred to as *TCU Mapping-Enhanced Counseling* – has been reviewed and included in the National Registry of Evidence-based Programs and Practices (NREPP; www.nrepp.samhsa.gov).

Growing emphases in the medical and behavior health fields to use “evidence-based practices” ushered in another shift of the DATAR project in 1999. It revolved around systemic barriers to implementing and sustaining innovations (including those from DATAR-1 and 2) in field practice. A new phase of work was approved for funding by NIDA in 1999 (DATAR-3), which was recognized through an award for “meritorious research” to extend financial support for this work an extra 5 years (as DATAR-4) until 2009. From this significant phase of the project, assessments of organizational needs and functioning [31] emerged along with a conceptual framework for studying innovation training adoption,

implementation, and sustained practice [32–36]. Findings showed that organizational climate within service provider settings is predictive of treatment quality as represented by client retention, satisfaction, and counselor rapport [31–37]. This work restructured the IBR program of research towards more specialized development and evaluation of *tactical deployment of evidence-based innovations* for its current and third major era of work.

Stage 3 Era (post 2009): Deploying innovations and evidence-based practices

The span of research conducted in the Stage 2 Era described above required numerous large-scale field collaboration in order to acquire adequate sample sizes to satisfy multivariate analytic protocols. Approximately 800 treatment programs located across the U.S. that completed TCU assessments of organizational and clinical functioning have been included in studies to address innovation implementation issues [35]. In general, these studies indicated organizational preparation and high quality training protocols are related to innovation adoption results, and that effective implementation of training principles is related to subsequent program improvements in client engagement and functioning.

The viability of research on therapeutic innovations is rightfully judged by its subsequent impact on clinical practice. This has evolved as the major theme for a Stage 3 Era of studies now underway at IBR. There are three key areas, listed below, believed to warrant special attention for innovation deployment in the coming years. These involve criminal justice populations, international applications, and treatment costs with organizational monitoring. Advances made in this work are expected to have significant international impact in the coming years.

(1) Criminal justice settings—To advance clinical applications for addiction problems in high-volume and resource-limited correctional treatment settings, several modifications to TCU assessment and therapeutic innovations have become necessary. They include conversions to single-page self-administered client assessments, adapted for use with automated data capture techniques (including customized scoring and feedback templates in an optical-scanning data capture package) to provide a feasible and low-cost information system for managing care. As reported in a special issue of *Criminal Justice and Behavior* [38], a series of reliable screening and assessment tools were recently adapted for use in a national network of criminal justice (CJ) systems to assess offender needs, risks, criminal thinking orientation, psychosocial functioning, treatment motivation, and therapeutic engagement [39–40]. When joined with an evidence-based library of brief targeted treatment intervention, they offer an effective formula for CJ treatment planning. Currently, over three-fourths of the states across the U.S. have CJ systems that use elements of these TCU resources, cited in NIDA publications on evidence-based treatment principles for CJ populations [41].

(2) International adaptations and applications—In March 2005, the IBR hosted a delegation of leaders representing treatment providers, researchers, and policy makers from England who were interested in potential applications of TCU resources for addiction treatment improvement initiatives in Britain. After collaborations were approved by NIDA under the DATAR-4 grant, it evolved into a significant relationship with England's National Treatment Agency for Drug Misuse (NTA) and affiliated scientists and service providers, especially in the Birmingham and Manchester regions. Clinical practice and program management materials have been effectively adapted with training provided to several thousand field workers, as part of a large-scale international transfer [42]. Similar but less systematic international collaborations have been carried out in Italy [43] as well as many other countries wherein TCU resources have been freely downloaded from the IBR website.

Indicative of the challenges in sustaining such collaborative work in Britain and elsewhere, Michael Ashton (Editor of *Drug and Alcohol Findings*) states that “The issue is not *whether* it will continue, but how effectively. The enthusiasm of staff using materials adapted from the body of work conducted at TCU, wherein they find someone is talking not about targets and guidelines but about recovery issues, is obvious. The challenge now is to build on and extend it by creating a central resource with the credibility only the Texas IBR link can provide” (personal communication, February 2010).

(3) Treatment costs and organizational monitoring—Further evidence is needed for elaborating the impact of organizational structure and workplace environment on staff when targeting quality improvement strategies and how these relate to costs of services. Flynn's recently completed Treatment Costs and Organizational Monitoring (TCOM) project at IBR built on DATAR research by developing an information system for outpatient treatment providers to assess and monitor both organizational attributes and program resources. These were then linked directly to client performance and program changes over time. More importantly, a new innovative costing tool [44] was developed and merged into the treatment process data system to collect, allocate, analyze, and report program accounting and economic costs.

Findings pointed to several attributes of drug treatment organizations that are important elements related to overall client engagement [44–46]. Practical information on methods and lessons learned in doing cost analyses using the *Treatment Cost Analysis Tool* in community-based programs were offered, including calculations of costs per counseling hour, group counseling hour, enrolled day, and episode of treatment.

INSTITUTIONAL DYNAMICS

A unique feature of the IBR has been its stability of staff and long-lasting relationships. In the late 1960s, Sells hired Simpson and Joe to join his research team (under Demaree's methodological tutelage), and Dansereau joined the TCU Department of Psychology at the same time bringing a specialization in cognitive studies. They have worked together ever since, with Dansereau's more direct involvement with IBR commencing in 1989 when he began adapting his mapping strategies into counseling applications as part of the DATAR projects. In 2000, Flynn joined the group (becoming Deputy Director in 2003) following several years as a fellow research collaborator with the IBR team during the DATOS project. Over the years, several scientists trained by this core team who developed special skills and interests were offered permanent positions for remaining at the IBR.

Almost all current IBR research and support staff (except recent trainees) have been with the team 20 years or longer, further increasing stability of its culture. Research roles are functionally specialized, but with assignments designed to involve all staff members in multiple research projects simultaneously. The relatively small size of the IBR staff contributes to a “family atmosphere.” Organizational health of the Institute has been examined using IBR assessment tools described earlier for treatment program research. Compared to general norms [31–47], anonymous staff survey findings have indicated high levels of satisfaction in the IBR and low interests in working elsewhere (although with communication and decision-making issues raised as concerns, similar to those of other comparable organizations). Geographic location and quality of life in the region contribute to staff satisfaction.

Institutional Setting and Relations

Reputations of any university depend in part on their faculty research accomplishments, grant funding, and publications. The IBR has served TCU well as indicated by the fact that

its funded grants historically have accounted for over half of all external research funding for the University. With the modest size of TCU (almost 9,000 students), IBR accomplishments help insure considerable independence in its self governance and related planning a portfolio of research. Director of the IBR reports directly to an associate provost at TCU rather than through specific departmental or college units. This structure has proven to offer a good model for growth and setting specialized research initiatives and resource allocations. This has been especially true in times of change, such as recent planning for leadership transition (from Simpson to Flynn).

Research Strategies and Funding

Stability of funding is crucial for healthy continuity of research centers like the IBR. Its early years relied largely on contract funding (by necessity of the time) but after NIDA was established in 1974 as an agency in the U.S. National Institutes of Health, the IBR has benefited from its selective approach (and high success rate) in securing long-range grant funds. These typically involve 5-year funding cycles which allow greater autonomy in planning and conducting long-term studies. By building on the IBR's early opportunities and experience in addiction treatment evaluations, NIDA eventually became the major and centrally sustaining source of its research funding.

It also meant changing the original IBR publication philosophy from producing technical reports commonly required under contracts to writing journal publications expected by agencies like NIDA. Transitioning from a long and detailed technical format (often called the "Sell's purple monsters" due to the characteristic purple color of their covers) to a briefer journal article format was the subject of much debate among IBR scientists at the time. Publishing in the journals most valued by NIDA (judged increasingly on the basis of ratings for scientific impact), maintaining priority on field-based and longitudinal evaluation projects in an atmosphere of emphasis on using clinical trials and neuroscience, and working within a culture that values multiple-center cooperative clinical trial studies have proved to be some of the main challenges in sustaining long-term relations with NIDA as a funding source.

IBR Impact on Policy and Practice

Graduate students trained and professionally launched from the IBR into responsible positions involving behavioral science and policy during the past 50 years, along with the large number of publications in professional journals – and even more significantly the record of obtaining federal grant awards by the IBR staff – have impacted the scientific reputation of TCU. Furthermore, receiving personal and professional feedback from an international base of practitioners affirming the benefits of TCU treatment resources developed, tested, and shared signifies a broad practical impact on addiction treatment delivery and quality (and has been a major source of encouragement to the IBR team). This impact has been amplified by free dissemination of these resources from the IBR Website (www.ibr.tcu.edu), which has been under continual development and refinement over the past 15 years. (User statistics currently show it hosts over 1000 visitors per day who average 20 minutes each for reviewing and downloading files.)

The major research eras described earlier for the IBR are related to a series of direct and indirect influences on policy and science, and these are summarized as concluding comments below (along with selected publications).

1. The mid-1960's ushered in legislation and establishment of a new system in the U.S. for providing addiction treatment in community-based health settings rather than public hospitals. Early IBR contributions for designing, collecting, monitoring, and analyzing longitudinal records for managing and evaluating a diverse and

developing national network of service providers were formative for advancing measurement and evaluation methodologies in this field [4- 8]. Notably, it began before the advent of high capacity computers and standardization of program evaluation protocols. As noted by A. Thomas McLellan (personal communication, June 2010), his early career conversations with Simpson about these assessments and related findings had a significant impact on his structured formulations for the *Addiction Severity Index*.

2. Outcomes of national drug abuse treatment evaluations beginning in the 1970s provided empirical evidence needed for sustaining public funding of newly established addiction services in community settings and related support for scientific research [9- 14- 48- 49]. The accrual of such field-based evidence for “recovery” initiatives likewise helped to inform public opinion about the value of addiction services as public health issues.
3. National outcome studies for mainstream outpatient and residential treatment modalities helped define effectiveness thresholds for retention based on post-treatment recovery results. They also pointed out limitations of using short-term stand-alone (medication-dependent) detoxification [7- 50-52]. Interestingly, similar issues are re-emerging as “continuum-of-care” challenges in the large-scale NIDA-funded Clinical Trials Network [53].
4. Evidence-based therapeutic process models defined at the IBR have helped design and conceptually organize practical stage-based resources for assessing and intervening in client needs, especially to address sequentially deficiencies in treatment engagement related to motivation/readiness, psychological and cognitive functioning, social and interpersonal skills, and community life supports [16- 20- 22- 24]. In the past decade the concept and terminology reflecting “engagement” has largely displaced “retention” as a therapeutic touch-stone in the published literature on addiction treatment.
5. Over the past 15 years, uptake of TCU assessment and intervention resources by national and state-level providers of addiction treatment in correctional systems has reached into the majority of states across the U.S. This variously includes tools for risk assessment and treatment placement, targeted interventions, continuum-of-care planning, and community re-entry [38- 54- 55].
6. Development and deployment of cognitive-based “relational thinking” tools for visual communication and decision-making provided new cognitive enhancements to counseling – with its international impact being demonstrated especially in England [27- 30- 42- 56]. *TCU Mapping Enhanced Counseling* has been included in the National Registry of Evidence-based Programs and Practices (NREPP) making it more accessible to substance abuse treatment providers.
7. Pressures for using evidence-based practices have necessitated more sophisticated initiatives for implementation research, and IBR studies on assessing organizational functioning and readiness for change have broadened awareness of the complex influences of treatment system and organizational dynamics in effectively transferring clinical and procedural innovations into practice [31- 33-35]. These are being recognized as challenges to be reckoned with in the NIDA-funded Clinical Trials Network [57].

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Unnumbered addiction treatment programs, service staff, and clients in the United States, England, and Italy have collaborated in research conducted by the Texas IBR during the past 40 years. They, along with many IBR

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