Amplifying and Extending the Effects of Clinical Care

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Outline

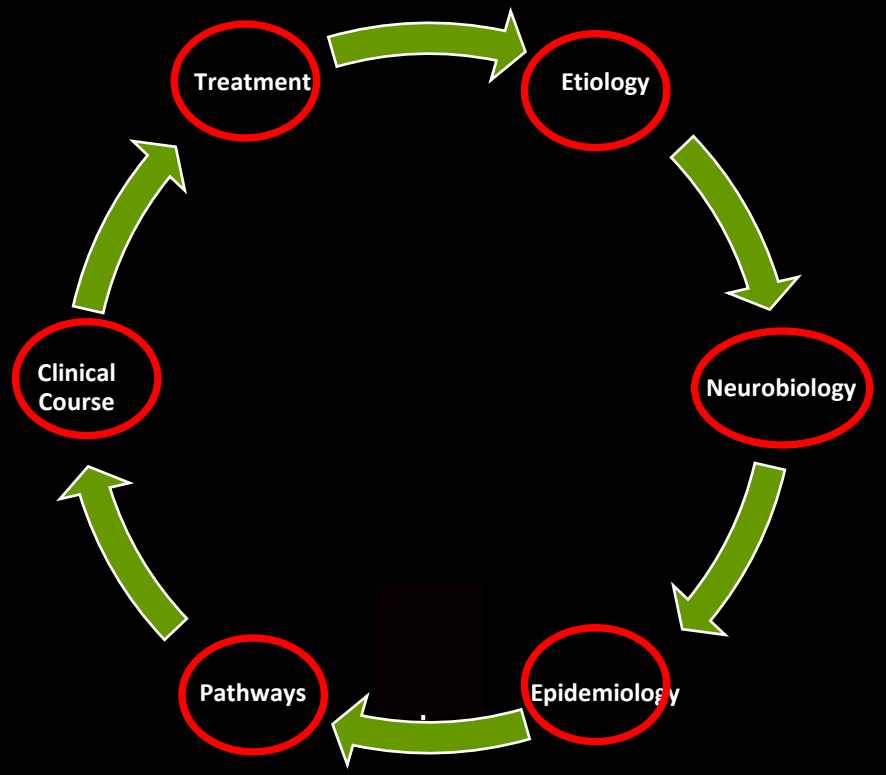
How did we get here? A rationale for the new public health and scientific focus on addiction “recovery”

Ingredients of recovery– facilitating access to the scaffolding, building materials, permits, and supportive environments

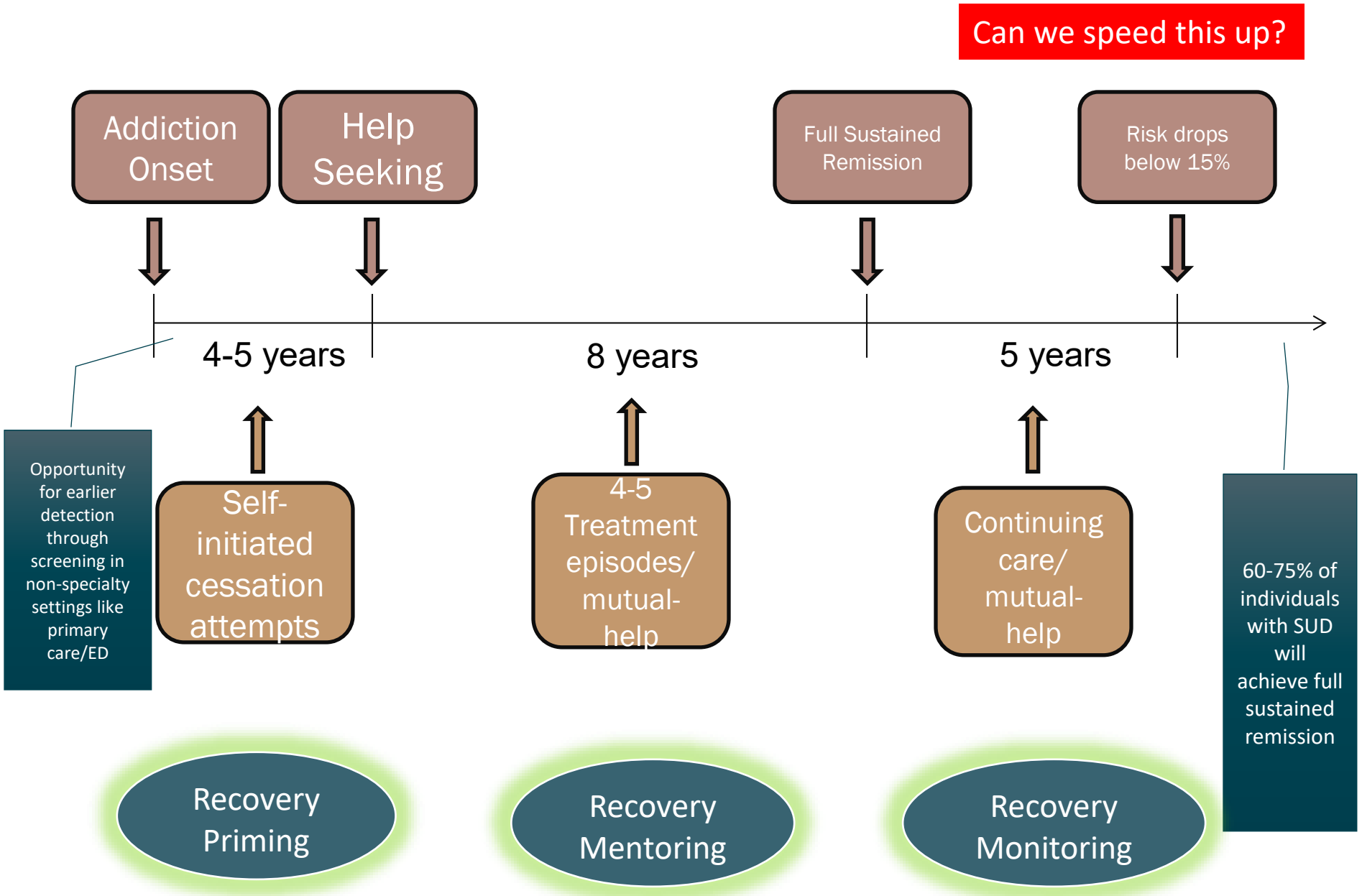
Recovery Process – Recovery milestones and their utility. Who needs what, when, for how long, at what intensity?

50 years of criminal justice, treatment, and public health, approaches

Past 50 yrs since declaration of “War on drugs” led to large-scale federal appropriations and a number of paradigm shifts…



The clinical course of addiction and achievement of stable recovery can take a long time …



Kelly JF (2022)

50 years of Progress: Burning building analogy…

- **<u>Putting out the fire</u>** –addressing acute clinical pathology - good job
- **<u>Preventing it from re-igniting</u>** (RP) - emphasized - pragmatic disconnect…
- **<u>Building materials</u> (recovery capital) – mostly** neglected
- **<u>Scaffolding</u> (building skills and support beyond acute stabilization)**
- **<u>Granting "rebuilding permits"</u>** - (removing barriers - neglected)

Recovery Capital

Individual

(coping, motivation, self-efficacy)

Social

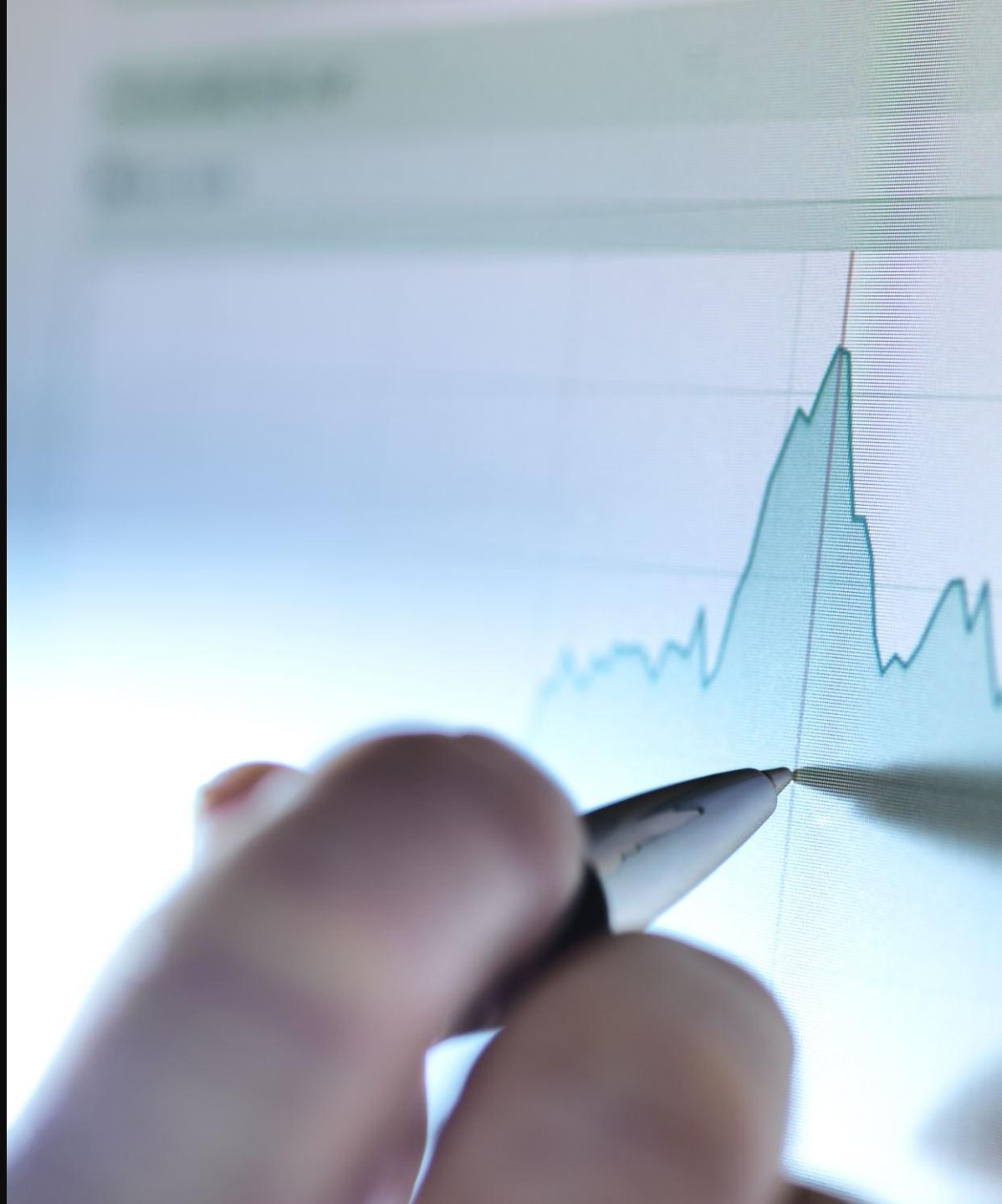
(recovery-specific/family, friends)

Financial

(income, resources)

Cultural

(identity, values)



Challenges of Initial and Early Recovery

Increased sensitivity to stress

Decreased capacity to experience normal reward

Post-Acute Withdrawal Phenomena

- Sensitivity to stress
- Memory problems
- Sleep difficulties
- Emotional overreactions/numbness
- Cognitive challenges
- Physical coordination challenges

More rapid initial achievement and maintenance of stable remission may occur through attending BOTH to clinical pathology AND environmental and resource deficits….(“recovery capital”) AND legal/other barriers

Outline

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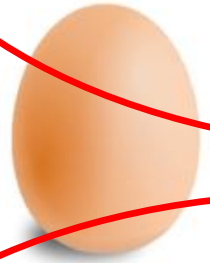
STAGES OF CHANGE

RELATED TREATMENT & RECOVERY SUPPORT SERVICES

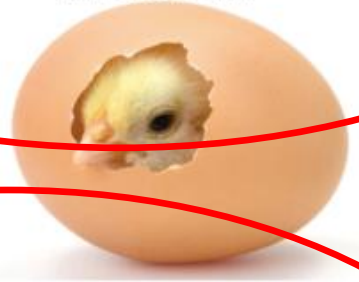
PRECONTEMPLATIVE

In this stage, individuals are not even thinking about changing their behavior. They do not see their addiction as a problem: they often think others who point out the problem are exaggerating.



CONTEMPLATIVE

In this stage people are more aware of the personal consequences of their addiction & spend time thinking about their problem. Although they are able to consider the possibility of changing, they tend to be ambivalent about it.



PREPARATION

In this stage, people have made a commitment to make a change. This stage involves information gathering about what they will need to change their behavior.

ACTION

In this stage, individuals believe they have the ability to change their behavior & actively take steps to change their behavior.

MAINTENANCE

In this stage, individuals maintain their sobriety, successfully avoiding temptations & relapse.

HARM REDUCTION
* Emergency Services (i.e. Narcan)
* Needle Exhanges
* Supervised Injection Sites

SCREENING & FEEDBACK
* Brief Advice
* Motivational Interventions

SREENING, BRIEF INTERVENTION, & REFFERAL TO TREATMENT (SBIRT)

CLINICAL INTERVENTION
* Phases/Levels (e.g., inpatient, residential, outpatient)
* Intervention Types
  - Psychosocial (e.g. Cognitive Behavioral Therapy)
  - Medications: Agonists (e.g. Buprenorphine, Methadone) & Antagonists (Naltrexone)

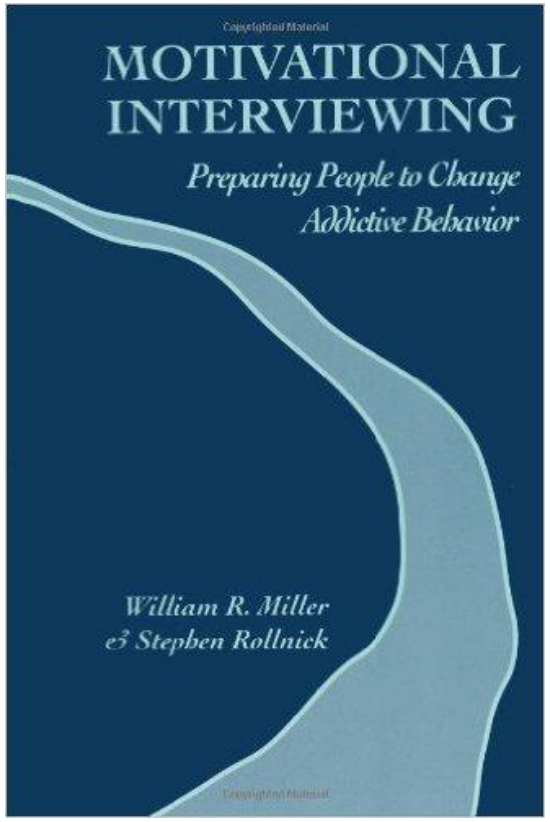
NON-CLINICAL INTERVENTION
* Self-Management/Natural Recovery (e.g. self-help books, online resources)
* Mutal Help Organizations (e.g. Alcoholics Anonymous, SMART Recovery, Lifering Secular Recovery)
* Community Support Services (e.g. Recovery Community Centers, Recovery Ministries, Recovery Employment Assistance)

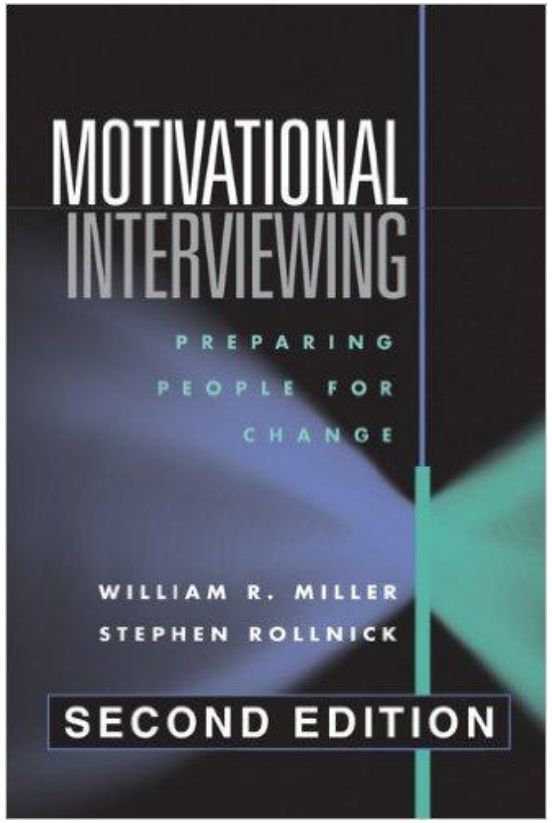
CONTINUING CARE (3m- 1 year)
Recovery Management Checkups, Telephone Counseling, Mobile Applications, Text Message Interventions

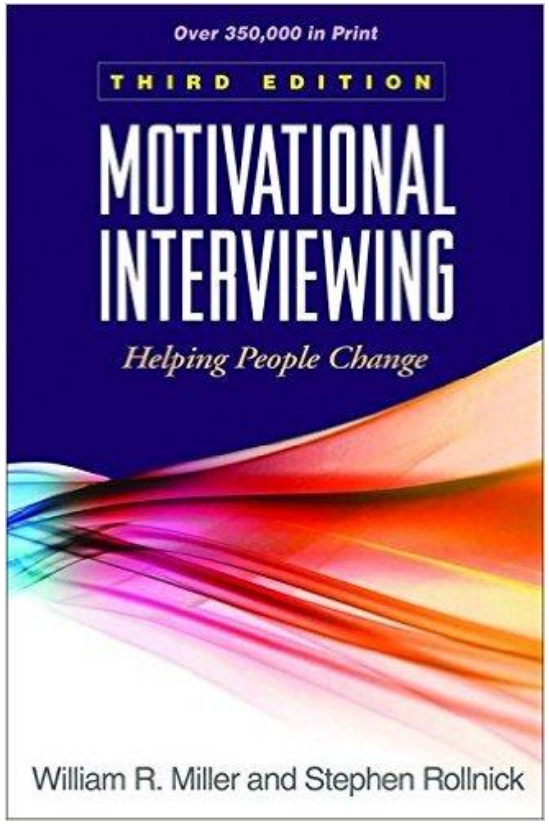
RECOVERY MONITORING (1-5+ yrs)
Continued Recovery Management Checkups, Therapy visits, Primary Care Provider Visits

Harm Reduction Strategies

- Anti-craving/anti-relapse medications (“MAT”)
- Overdose reversal medications (Narcan)
- Needle exchange programs
- Heroin prescribing
- Overdose prevention facilities (safe Injection facilities)



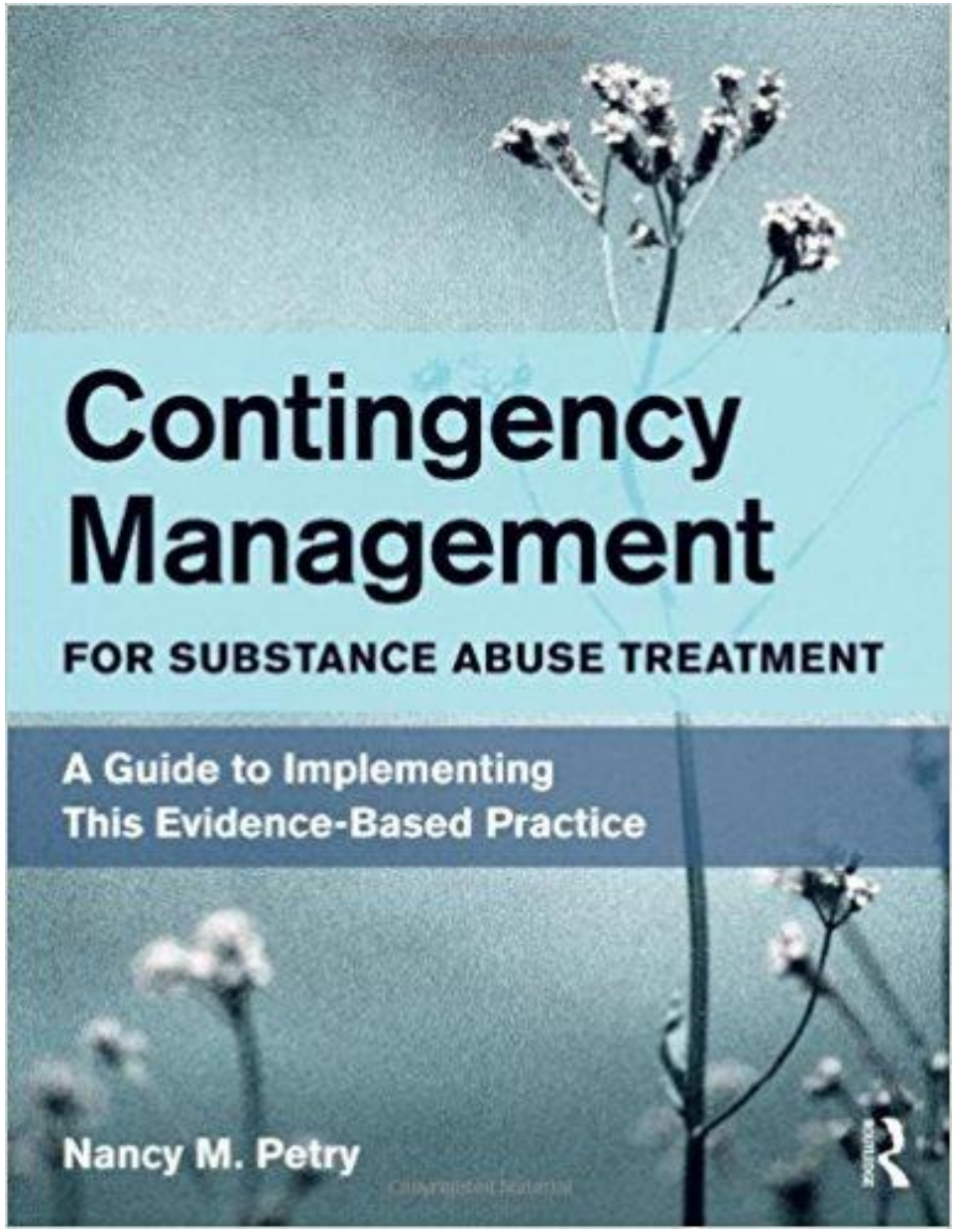


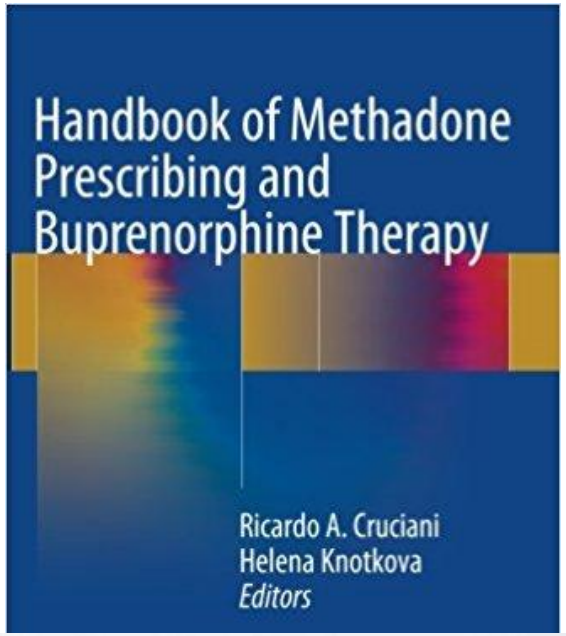


What people really need is a good listening to…

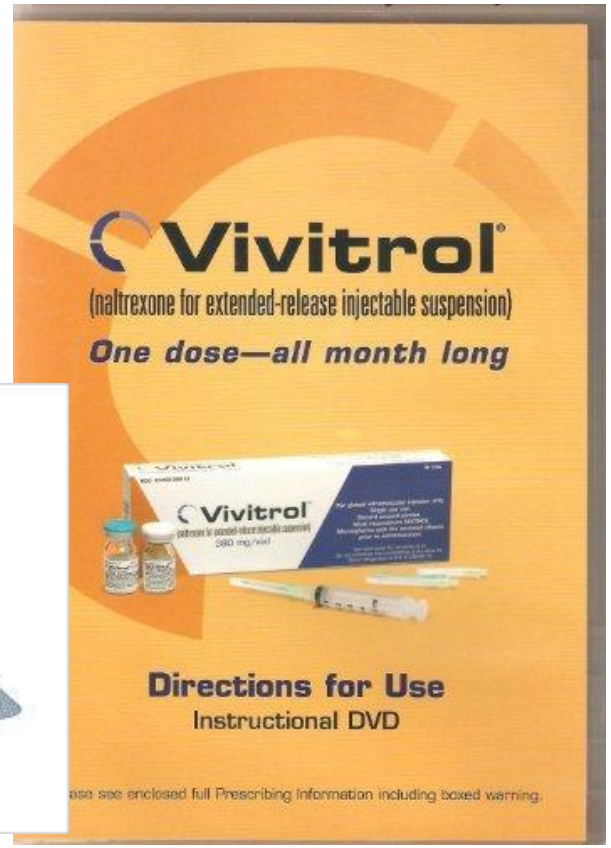
“Quitting smoking is easy, I’ve done it dozens of times” –Mark Twain

Swift, certain, modest, consequences shape behavioral choices…




Handbook of Methadone Prescribing and Buprenorphine Therapy
Ricardo A. Cruciani
Helena Knotkova
Editors


50 mg
REVIA
(naltrexone hydrochloride) Tablets
For Oral Use

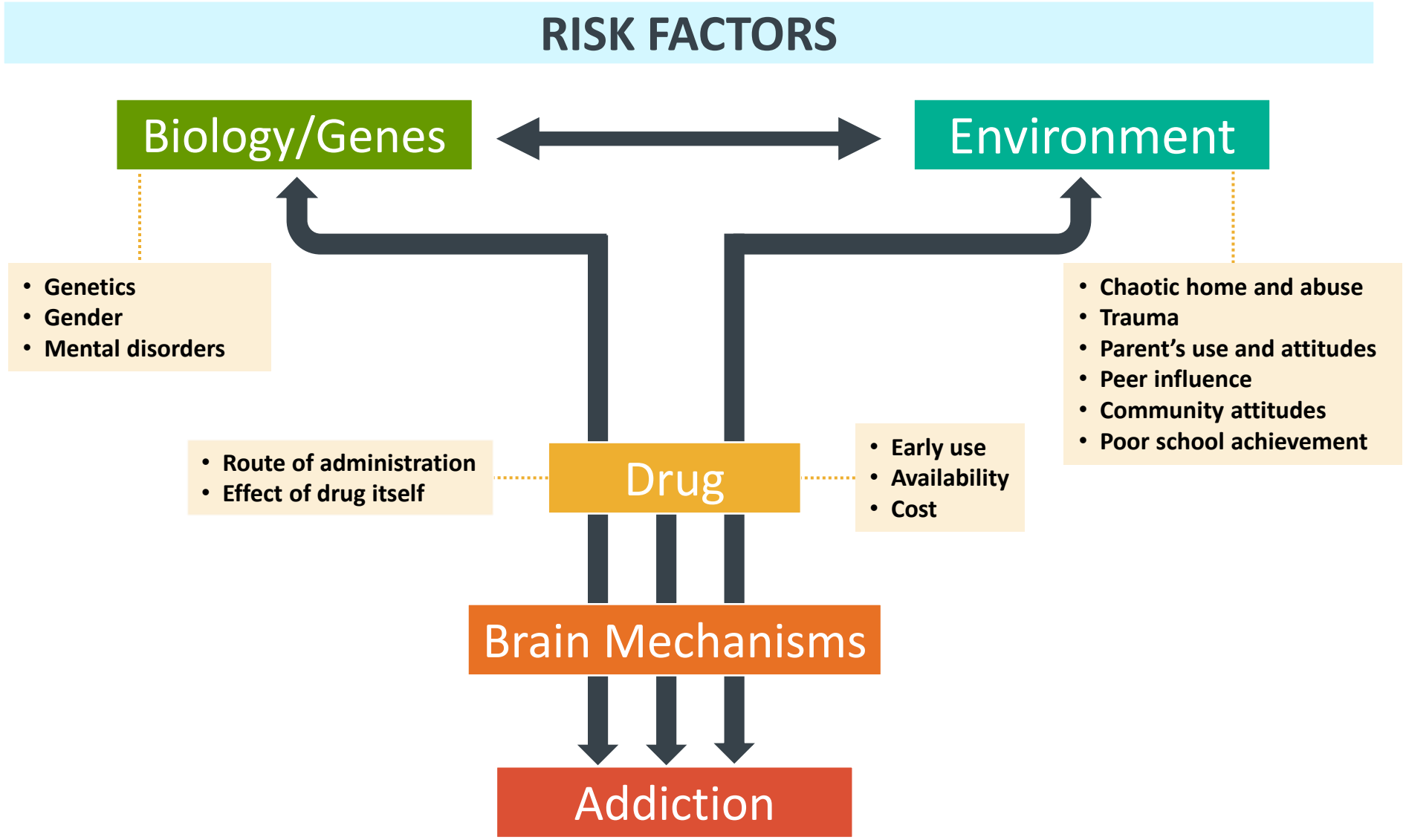

Vivitrol
(naltrexone for extended-release injectable suspension)
One dose—all month long
Directions for Use
Instructional DVD
see enclosed full Prescribing Information including boxed warning.


Disulfiram Tablets I.P.
SUFITAL
SUFITAL

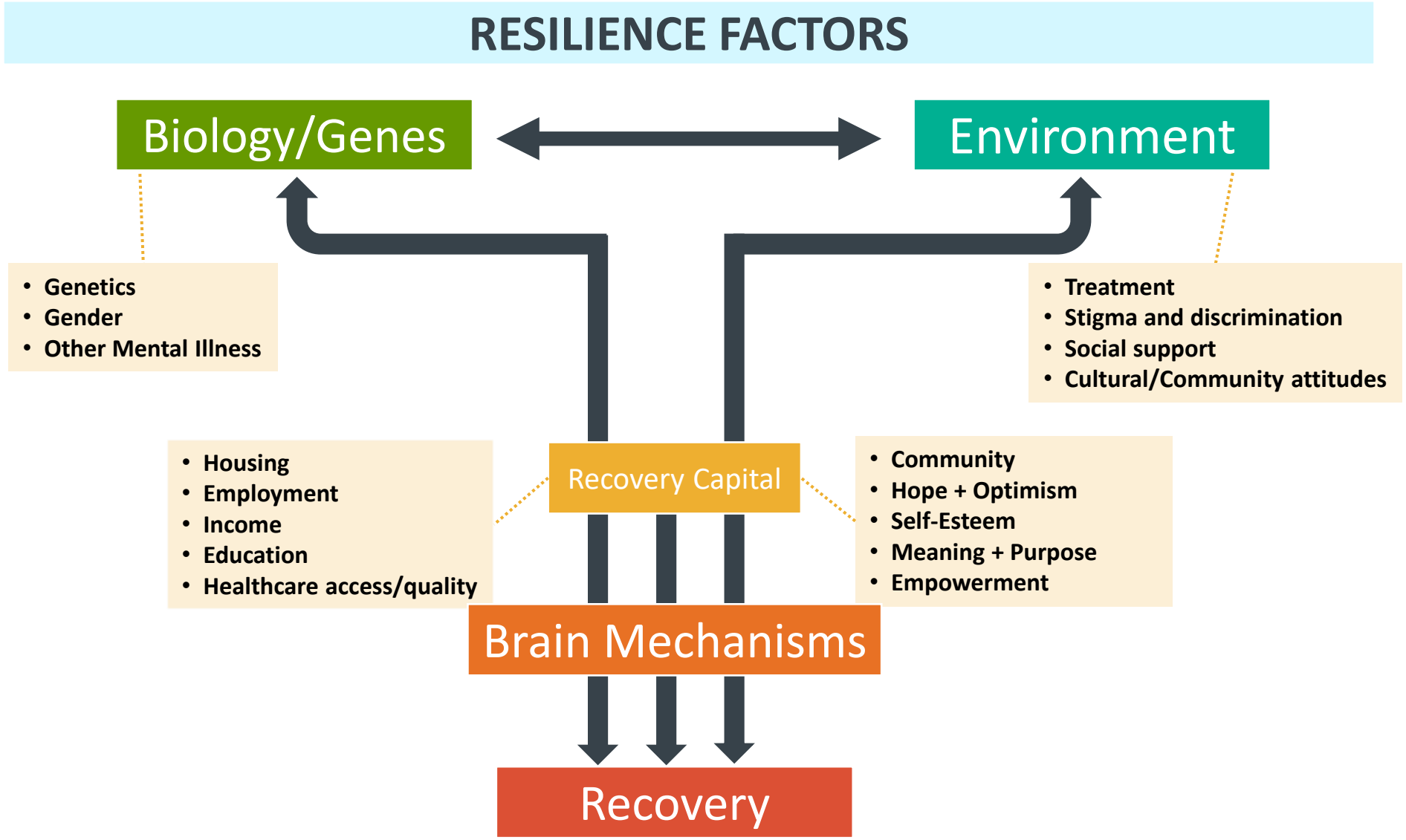

NDC 12496-1208-1
1 sublingual film
8 mg/2 mg
Suboxone®
(buprenorphine and naloxone) sublingual film
8 mg/2 mg
Rx only
Children who accidentally take SUBOXONE will need emergency medical care. Keep SUBOXONE out of the reach of children.
Do not cut, chew or swallow sublingual film.
suboxone.com


glenmark
NDC 68462-435-18
ACAMPROSATE CALCIUM
DELAYED-RELEASE
TABLETS
333 mg
Rx Only
180 Tablets

ADDICTION IS A DYNAMIC COMPLEX DISORDER



RECOVERY IS A DYNAMIC COMPLEX PROCESS

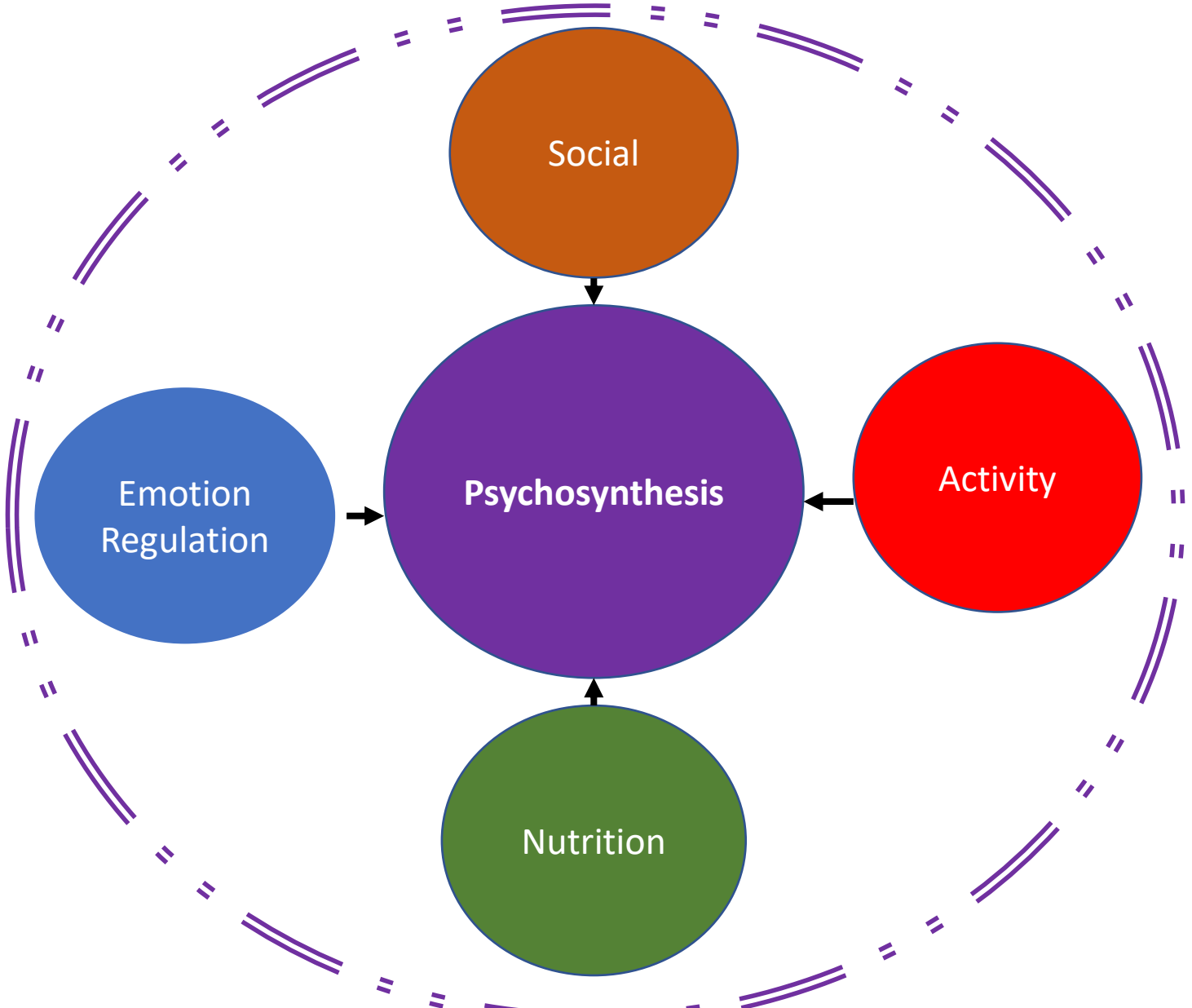


How Organisms Recover

Photosynthesis

Psychosynthesis

Psychosynthesis: A Social Activity Nutrition Emotion Regulation (SANER) Approach to Recovery



Social

Activity

Nutrition

Emotion

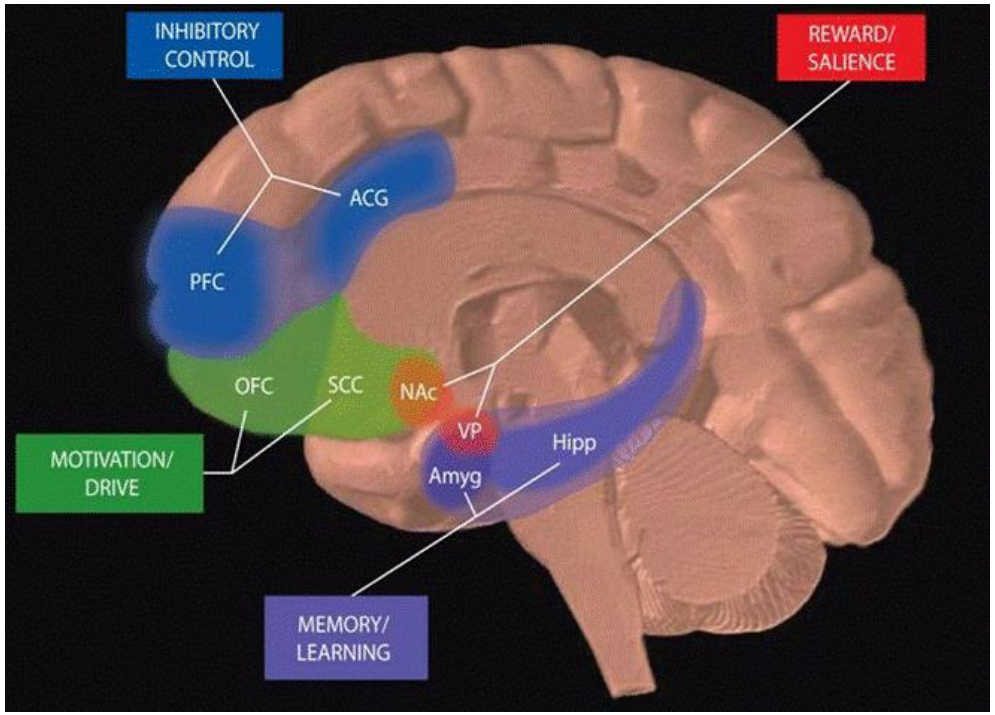
Regulation

(SANER)

Kelly JF (2021; 2022)

Neuroscience of Recovery Capital

Can social factors, recovery housing, and employment, change the brain, mitigate stress, upregulate down-regulated receptor systems, and increase the chances of long-term remission?



Social relations as strong a variable in premature mortality risk as other health risk factors (e.g., tobacco)

OPEN ACCESS Freely available online PLoS MEDICINE

Social Relationships and Mortality Risk: A Meta-analytic Review

Julianne Holt-Lunstad[1]*, Timothy B. Smith[2], J. Bradley Layton[3]

1 Department of Psychology, Brigham Young University, Provo, Utah, United States of America, **2** Department of Counseling Psychology, Brigham Young University, Provo, Utah, United States of America, **3** Department of Epidemiology, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, United States of America

Abstract

Background: The quality and quantity of individuals' social relationships has been linked not only to mental health but also to both morbidity and mortality.

Objectives: This meta-analytic review was conducted to determine the extent to which social relationships influence risk for mortality, which aspects of social relationships are most highly predictive, and which factors may moderate the risk.

Data Extraction: Data were extracted on several participant characteristics, including cause of mortality, initial health status, and pre-existing health conditions, as well as on study characteristics, including length of follow-up and type of assessment of social relationships.

Results: Across 148 studies (308,849 participants), the random effects weighted average effect size was OR = 1.50 (95% CI 1.42 to 1.59), indicating a 50% increased likelihood of survival for participants with stronger social relationships. This finding remained consistent across age, sex, initial health status, cause of death, and follow-up period. Significant differences were found across the type of social measurement evaluated ($p < 0.001$); the association was strongest for complex measures of social integration (OR = 1.91; 95% CI 1.63 to 2.23) and lowest for binary indicators of residential status (living alone versus with others) (OR = 1.19; 95% CI 0.99 to 1.44).

Conclusions: The influence of social relationships on risk for mortality is comparable with well-established risk factors for mortality.

Please see later in the article for the Editors' Summary.

Citation: Holt-Lunstad J, Smith TB, Layton JB (2010) Social Relationships and Mortality Risk: A Meta-analytic Review. PLoS Med 7(7): e1000316. doi:10.1371/journal.pmed.1000316

Challenges undermining change attempts…

Increased sensitivity to stress

Decreased capacity to experience normal levels of reward

Social Buffering

- Stress-buffering effects of social relationships- one of the major findings of past century
- Mechanisms of this poorly understood

Psychological Bulletin

0033-2909/13/$12.00 DOI: 10.1037/a0032671

Psychobiological Mechanisms Underlying the Social Buffering of the Hypothalamic–Pituitary–Adrenocortical Axis: A Review of Animal Models and Human Studies Across Development

Camelia E. Hostinar
University of Minnesota

Regina M. Sullivan
New York University Langone Medical Center

Megan R. Gunnar
University of Minnesota

Discovering the stress-buffering effects of social relationships has been one of the major findings in psychobiology in the last century. However, an understanding of the underlying neurobiological and psychological mechanisms of this buffering is only beginning to emerge. An important avenue of this research concerns the neurocircuitry that can regulate the activity of the hypothalamic–pituitary–adrenocortical (HPA) axis. The present review is a translational effort aimed at integrating animal models and human studies of the social regulation of the HPA axis from infancy to adulthood, specifically focusing on the process that has been named *social buffering*. This process has been noted across species and consists of a dampened HPA axis stress response to threat or challenge that occurs with the presence or assistance of a conspecific. We describe aspects of the relevant underlying neurobiology when enough information exists and expose major gaps in our understanding across all domains of the literatures we aimed to integrate. We provide a working conceptual model focused on the role of oxytocinergic systems and prefrontal neural networks as 2 of the putative biological mediators of this process, and propose that the role of early experiences is critical in shaping later social buffering effects. This synthesis points to both general future directions and specific experiments that need to be conducted to build a more comprehensive model of the HPA social buffering effect across the life span that incorporates multiple levels of analysis: neuroendocrine, behavioral, and social.

Keywords: stress, social support, early caregiving, oxytocin, prefrontal cortex

It is an empirical reality that some individuals succumb, whereas others thrive, when confronted with similar stressors. Having access to social support may be an important modulator of these widespread individual differences in responses to potentially stressful events. Indeed, some exciting experiments in humans (e.g., Heinrichs, Baumgartner, Kirschbaum, & Ehlert, 2003; Kirschbaum, Klauer, Filipp, & Hellhammer, 1995; Taylor et al., 2008) and animals (e.g., Hennessy, 1984, 1986; Vogt, Coe, & Levine, 1981) have identified a dampening of the hypothalamic–pituitary–adrenocortical (HPA) axis response to stressors by social factors as one of the possible mechanisms underlying the benefits of social support. Longitudinal studies also reveal relations between social support and basal levels of stress hormones such as salivary cortisol (Rosal, King, Ma, & Reed, 2004). Understanding the social buffering processes affecting this neuroendocrine axis would allow the possibility of interventions that might have cascading positive effects across multiple biological and psychological systems. Despite the important implications of this knowledge, our understanding of the underlying neurobiology and relevant components of social interaction that permit these HPA activity-regulating effects remains vastly incomplete.

General Framework

RESPONDING TO STRESS: SOCIAL BUFFERING

…and researchers have started to examine possible neurobiological connections between social support and individual stress responses

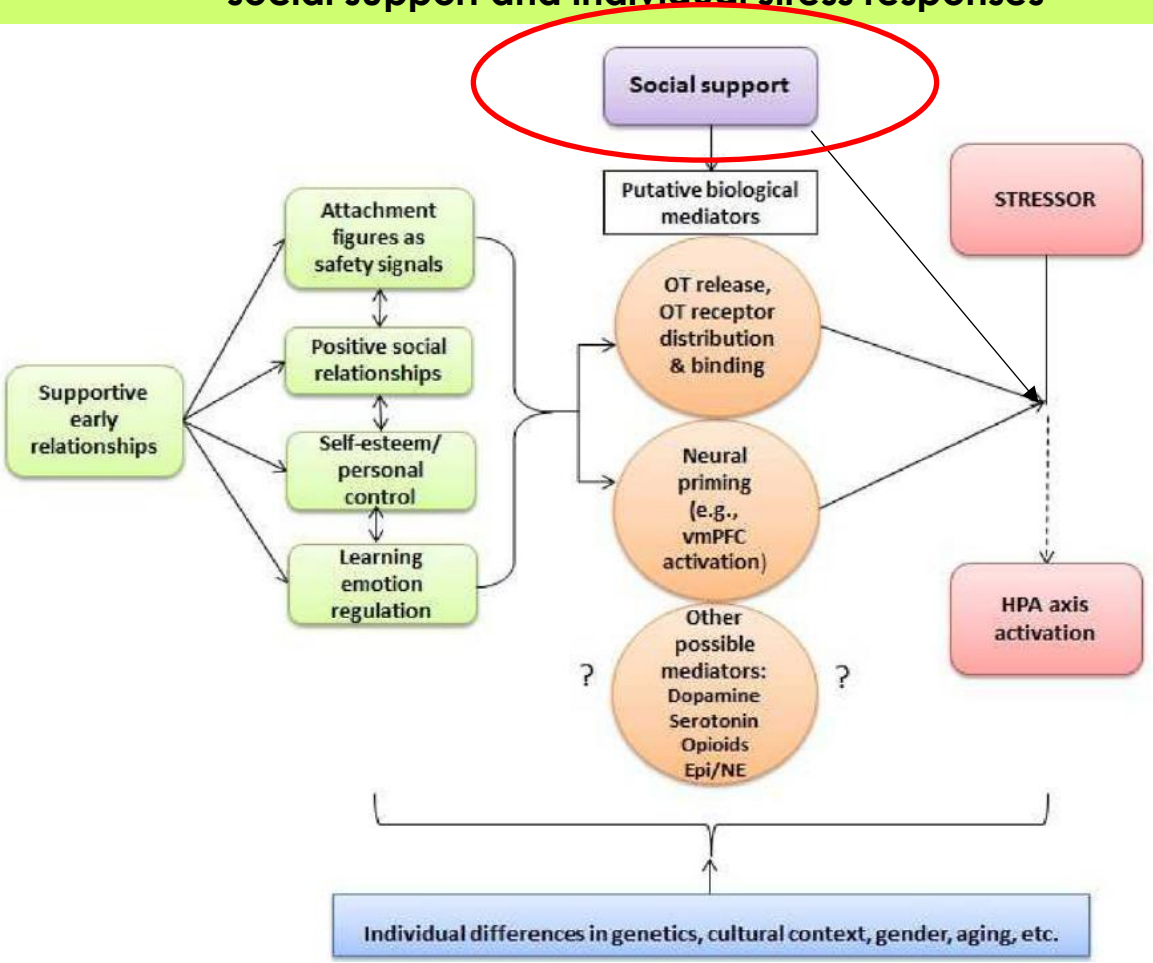


Figure 1. A Developmental Working Model of Social Buffering of the HPA Axis in Humans

OT = oxytocin, vmPFC = ventro-medial prefrontal cortex, Epi = epinephrine, NE = norepinephrine

Hostinar, C. E., Sullivan, R. M., & Gunnar, M. R. (2014). Psychobiological Mechanisms Underlying the Social Buffering of the HPA Axis: A Review of Animal Models and Human Studies across Development. Psychological Bulletin, 140(1).

D2/D3 RECEPTOR BINDING & SOCIAL STATUS AND SUPPORT

AIM

Assess whether $D_{2/3}$ receptor levels correlate with social status and social support (particularly, to determine if low social status and low social support correlate with low $D_{2/3}$ receptor binding)

SAMPLE

N = 14 healthy participants (i.e., non-smoking with no Axis I disorders, significant medical conditions, or use of medications before the scan) who were scanned using positron emission tomography (PET) imaging to measure $D_{2/3}$ receptor binding potential (BP)

MEASURES

- Barratt Simplified Measure of Social Status (BMSSS) to measure social status
- Scale of Perceived Social Support (MSPSS) to measure social support
- [^{11}C]raclopride to measure $D_{2/3}$ receptor binding in the striatum

OUTCOMES

- Positive correlation between **$D_{2/3}$ receptor** binding potential and **social status**
- Positive correlation between **$D_{2/3}$ receptor** binding potential and **perceived social support**
- Results similar to prior studies of nonhuman primates, which show higher $D_{2/3}$ receptor levels in monkeys who are dominant in their social hierarchy, compared to those who are subordinate

BRIEF REPORTS

Dopamine Type 2/3 Receptor Availability in the Striatum and Social Status in Human Volunteers

Diana Martinez, Daria Orlowska, Rajesh Narendran, Mark Slifstein, Fei Liu, Dileep Kumar, Allegra Broft, Ronald Van Heertum, and Herbert D. Kleber

Background: Previous positron emission tomography (PET) imaging studies in nonhuman primates have shown that striatal dopamine type 2/3 ($D_{2/3}$) receptors correlate with social hierarchy in monkeys and that dominant animals exhibit higher levels of $D_{2/3}$ receptor binding. The goal of the present study was to examine this phenomena in human subjects using PET and the radiotracer [^{11}C]raclopride.

Methods: Fourteen healthy volunteers were scanned with [^{11}C]raclopride to measure $D_{2/3}$ receptor binding potential (BP). Social status was assessed using the Barratt Simplified Measure of Social Status. In addition, participants were asked to assess their level of social support using the Multidimensional Scale of Perceived Social Support (MSPSS).

Results: A correlation was seen between social status and dopamine $D_{2/3}$ receptors, where volunteers with the higher status had higher values for [^{11}C]raclopride BP. A similar correlation was seen with the perceived social support, where higher [^{11}C]raclopride BP correlated with higher scores on the MSPSS.

Conclusions: The results of this study support the hypothesis that social status and social support is correlated with $D_{2/3}$ receptor binding.

Key Words: [^{11}C]raclopride, dopamine 2/3 receptor, PET imaging, social status

Previous studies in animals have shown a correlation between dopamine transmission in the brain and social hierarchy (1). In monkeys, dominant and subordinate social rank are determined by physical and social triumph and defeat. Dominant animals win more physical confrontations and receive more social attention, such as grooming or huddling. Two positron emission tomography (PET) imaging studies have investigated the relationship between social status and $D_{2/3}$ receptors in the striatum in monkeys. Both showed that social dominance was associated with higher $D_{2/3}$ receptor binding compared with subordinate animals (2,3).

In humans, social hierarchy is a more subtle phenomenon that can be approximated by measuring social status and social support (4). Thus, the goal of the present study was to examine the correlation between these factors and dopamine $D_{2/3}$ receptor binding in human subjects. Given the known effect of disease states on striatal $D_{2/3}$ receptors, including substance dependence, schizophrenia, and anxiety disorders (5–7), only healthy control volunteers were included in this study. Social status was measured using the Barratt Simplified Measure of Social Status (BMSSS) (8) and social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS) (9). Our hypothesis was that low social status and low levels of social support would correlate with low $D_{2/3}$ receptor binding in the striatum measured with [^{11}C]raclopride.

From the Departments of Psychiatry (DM, DO, MS, FL, DK, AB, HDK) and Radiology (RVH), Columbia University, College of Physicians and Surgeons, New York, New York; and Department of Radiology (RN), University of Pittsburgh, Pittsburgh, Pennsylvania.
Address correspondence to Diana Martinez, M.D., New York State Psychiatric Institute, 1051 Riverside Drive, Box #31, New York, NY 10032; E-mail: dm437@columbia.edu.
Received Dec 18, 2008; revised Jul 23, 2009; accepted Jul 28, 2009.

Methods and Materials

The study was approved by the Institutional Review Board of the New York State Psychiatric Institute and all subjects provided written informed consent. Study participants were nonsmoking healthy control subjects and were required to have no DSM-IV Axis I disorder (including substance abuse or dependence), no significant medical conditions, and no use of medications before the scan (6 months for medications that could affect dopamine, 2 weeks for all others). Subjects (nine men and five women) were recruited from the New York City metropolitan area. Participant screening included a psychiatric assessment with the *Structured Clinical Interview for DSM-IV Axis I Disorders* (10), physical examination, electrocardiogram, and laboratory tests. All subjects were asked for data to complete the Barratt Simplified Measure of Social Status and to complete the Multidimensional Scale of Perceived Social Support. The scans performed on female subjects were not controlled for menstrual cycle phase.

[^{11}C]raclopride was prepared as previously described (11), and PET studies were acquired using a bolus injection of the radiotracer. The PET scans were obtained on the ECAT EXACT HR+ (Siemens/CTI, Knoxville, Tennessee) in three-dimensional (3-D) mode. Emission data were obtained as 15 frames of increasing duration up to 60 minutes. The PET images were reconstructed by filtered backprojection (Shepp .5 filter) with attenuation correction using the data from a 10-minute transmission scan.

All image analysis was performed in MEDx (Sensor Systems, Inc, Sterling, Virginia). Each subject underwent a transaxial T1 magnetic resonance imaging (MRI) scan, acquired on the GE Signa EXCITE 3 T/94 cm scanner (GE Medical Systems, Milwaukee, Wisconsin), for delineation of the regions of interest (ROIs). The regions of interest outlined on the MRI included the subdivisions of the striatum, which have been previously described (12). Briefly, these included the ventral striatum (VST), the dorsal caudate rostral to the anterior commissure (AC) (precommissural dorsal caudate [preDCAU], the dorsal putamen rostral to the AC (precommissural dorsal putamen [preDPUT], the caudate caudal to the AC (postcommissural caudate [postCAUT], and the putamen caudal to the AC (postcommissural putamen [postPUT]).

Martinez, D., Orlowska, D., Narendran, R., Slifstein, M., Liu, F., Kumar, D., . . . Kleber, H. D. (2010). Dopamine type 2/3 receptor availability in the striatum and social status in human volunteers. *Biological Psychiatry, 67*(3), 275-278. doi:10.1016/j.biopsych.2009.07.037

D2/D3 RECEPTOR BINDING & SOCIAL STATUS AND SUPPORT

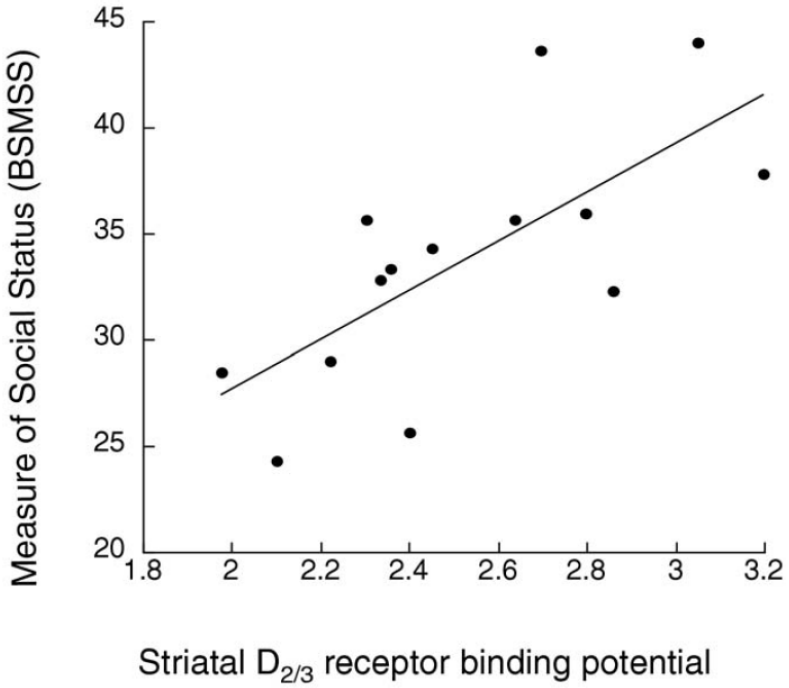


Figure 1. Correlation between [^{11}C]raclopride BP (x axis) and social status, measured with the Barratt Simplified Measure of Social Status (BSMSS). A positive correlation was seen, where higher BP correlated with higher BSMSS ($r = .71$, $p = .004$, age-corrected $p = .007$). BP, binding potential.

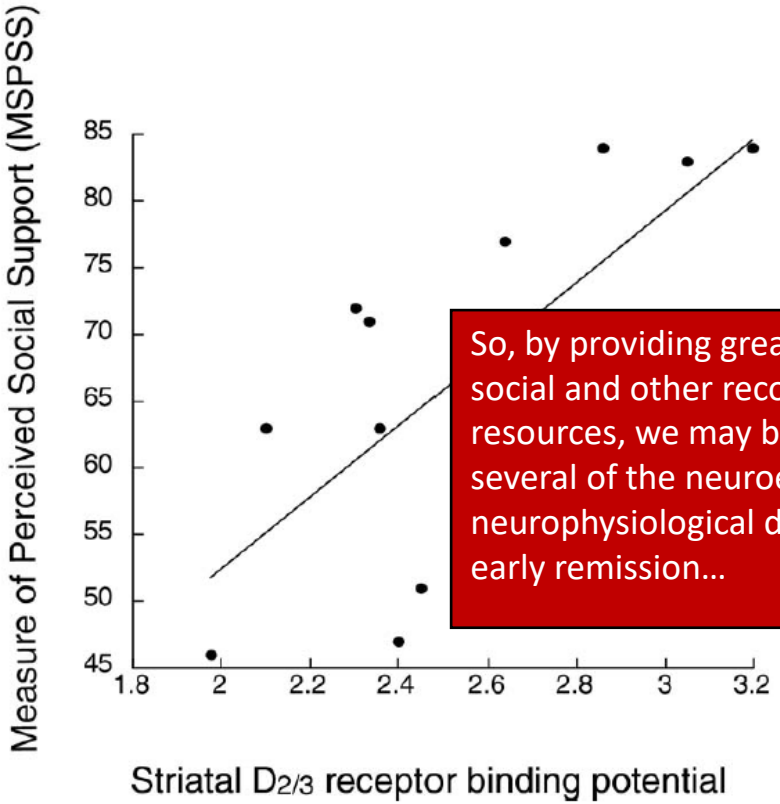


Figure 2. Correlation between [^{11}C]raclopride BP (x axis) and score on the Multidimensional Scale of Perceived Social Support (MSPSS). A positive correlation was seen, where higher BP correlated with higher score on the MSPSS ($r = .73$, $p = .005$, age-corrected $p = .02$). BP, binding potential.

So, by providing greater access to social and other recovery specific resources, we may be able to mitigate several of the neuroendocrine/ neurophysiological deficits present in early remission…

$D_{2/3}$ receptor binding increases as **social status** increases.

$D_{2/3}$ receptor binding increases as **social support** increases.

Martinez, D., Orlowska, D., Narendran, R., Slifstein, M., Liu, F., Kumar, D., . . . Kleber, H. D. (2010). Dopamine type 2/3 receptor availability in the striatum and social status in human volunteers. *Biological Psychiatry, 67*(3), 275-278. doi:10.1016/j.biopsych.2009.07.037

Recovery support services have grown intended to facilitate access to conducive and supportive environments and recovery capital …

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National Alliance for Recovery Residences
Community • Standards • Ethics • Education

ALCOHOLICS ANONYMOUS

Anchor
Recovery Community Center
Peer-to-peer support services

LifeRir

HOPE for NEW HAMPSHIRE RECOVERY

WOMEN FOR SOBRIETY

ASSOCIATION OF RECOVERY COMMUNITY ORGANIZATIONS
FACES & VOICES OF RECOVERY

ARHE
ASSOCIATION OF RECOVERY IN HIGHER EDUCATION

FOR ADDICTI

SMART Recovery®

Advantages of recovery support services in disease/recovery management….

- Available
- Accessible
- Flexible
- Enduring
- Low/no cost

Recovery support services have grown intended to facilitate access to conducive and supportive environments and recovery capital …

NARR
National Alliance for Recovery Residences
Community • Standards • Ethics • Education

ALCOHOLICS ANONYMOUS

Anchor
Recovery Community Center
Peer-to-peer support services

LifeRir

HOPE for NEW HAMPSHIRE RECOVERY

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SMART Recovery®

Cochrane Database of Systematic Reviews

Alcoholics Anonymous and other 12-step programs for alcohol use disorder (Review)

Kelly JF, Humphreys K, Ferri M

Kelly JF, Humphreys K, Ferri M.
Alcoholics Anonymous and other 12-step programs for alcohol use disorder.
Cochrane Database of Systematic Reviews 2020, Issue 3. Art. No.: CD012880.
DOI: 10.1002/14651858.CD012880.pub2.

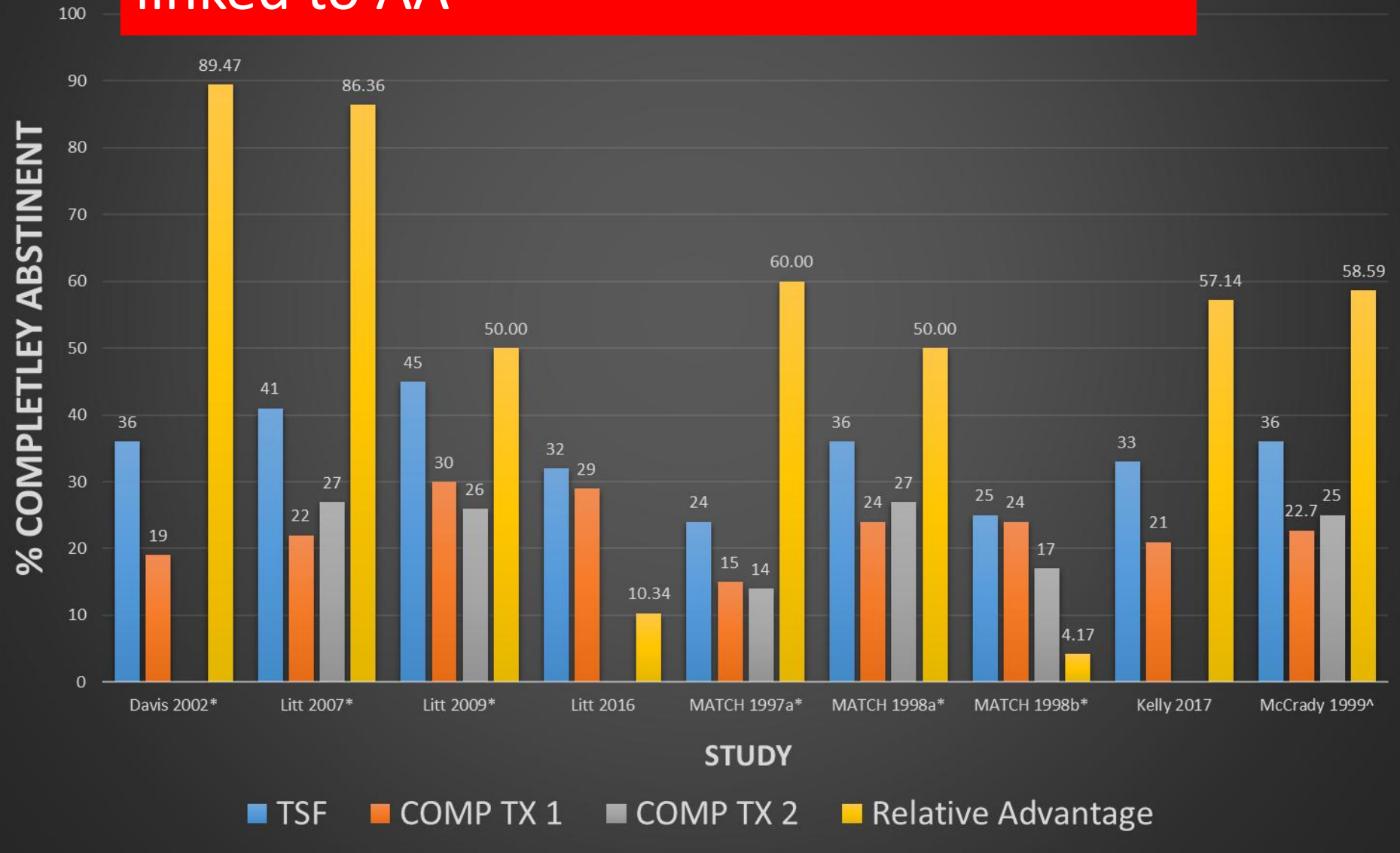
www.cochranelibrary.com

WILEY

Cochrane Systematic Review on AA/TSF (2020)

- Kelly, JF
- Humphreys, K
- Ferri, M

20-60% higher remission rates when addiction patients are clinically linked to AA



Economic Studies

Healthcare Cost Savings

AA and similar organizations are the closest thing public health has to a “free lunch”

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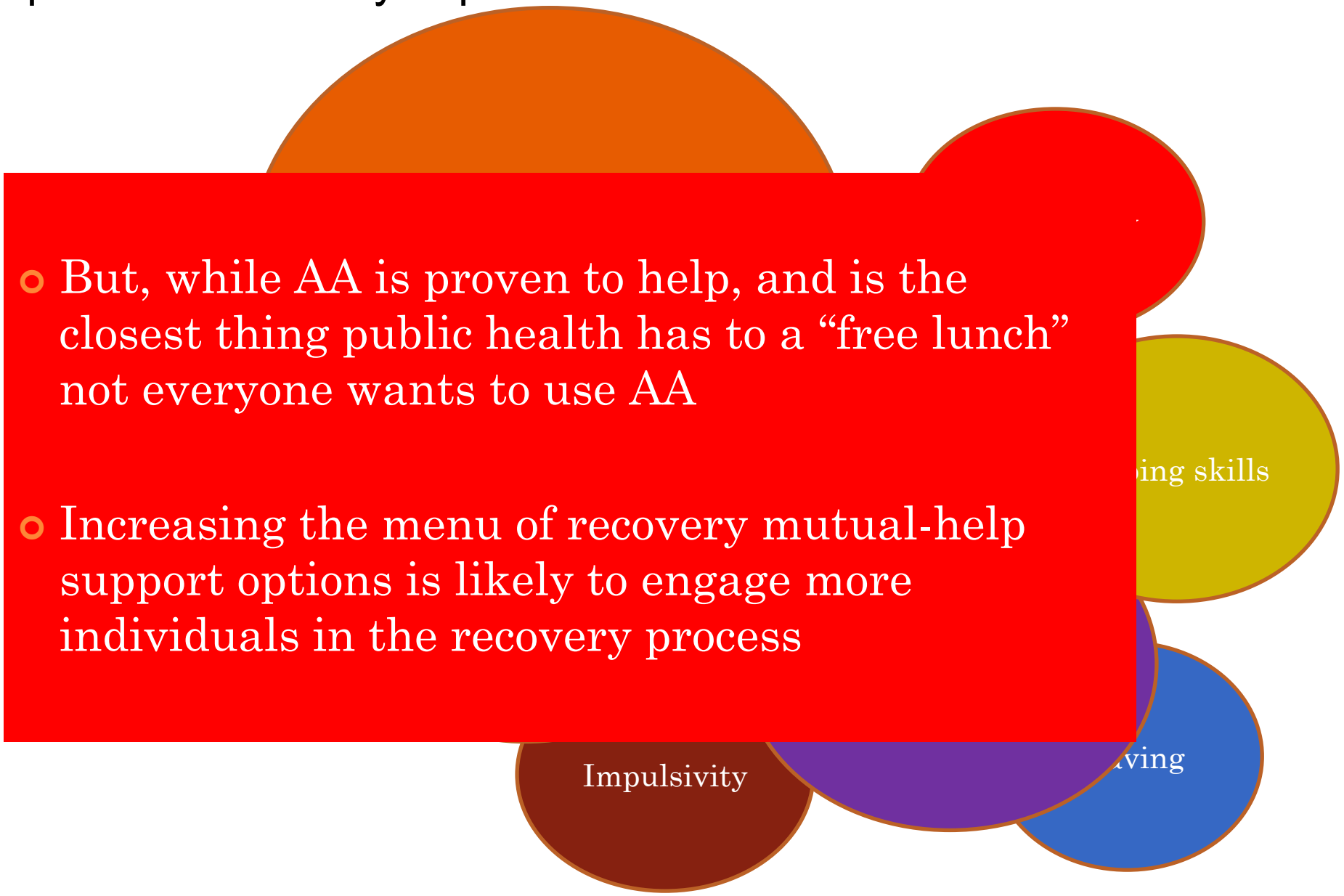
Empirically-supported MOBCs through which AA confers benefit: AA mobilizes social and personal recovery capital…



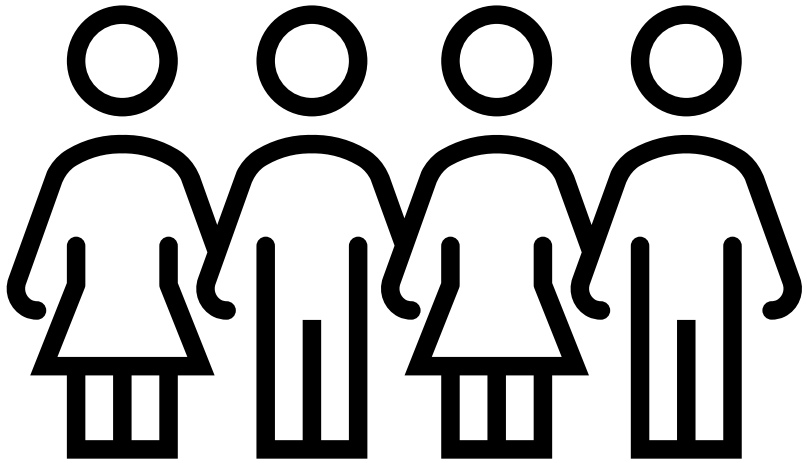
- But, while AA is proven to help, and is the closest thing public health has to a "free lunch" not everyone wants to use AA
- Increasing the menu of recovery mutual-help support options is likely to engage more individuals in the recovery process

Kelly, 2022 (adapted from Kelly, 2017; Kelly, Magill, Stout, 2009)

Do Fitness Centers Keep people fit?

- Of course!
- If you go and if you work out regularly
- Ongoing challenge is engaging and retaining people in some kind of ongoing exercise regimen…
- Fitness Centers therefore provide not just one, but an array, of different classes, spaces, equipment, pools, and courts, so that people can find something appealing…
- …and move toward increasing physical fitness

Emerging Evidence for Additional Mutual-Help Organizations….



J Subst Abuse Treat. 2017 February ; 73: 16–26. doi:10.1016/j.jsat.2016.10.004.

Comparison of 12-step Groups to Mutual Help Alternatives for AUD in a Large, National Study: Differences in Membership Characteristics and Group Participation, Cohesion, and Satisfaction

Sarah E. Zemore, Ph.D., **Lee Ann Kaskutas, Dr.P.H.**, **Amy Mericle, Ph.D.**, and **Jordana Hemberg, MPH**
Alcohol Research Group, Emeryville, CA

Abstract

Background—Many studies suggest that participation in 12-step groups contributes to better recovery outcomes, but people often object to such groups and most do not sustain regular involvement. Yet, research on alternatives to 12-step groups is very sparse. The present study aimed to extend the knowledge base on mutual help group alternatives for those with an alcohol use disorder (AUD), sampling from large, active, abstinence-focused groups including Women for Sobriety (WFS), LifeRing, and SMART Recovery (SMART). This paper presents a cross-sectional

Recovery support services have grown intended to facilitate access to conducive and supportive environments and recovery capital …

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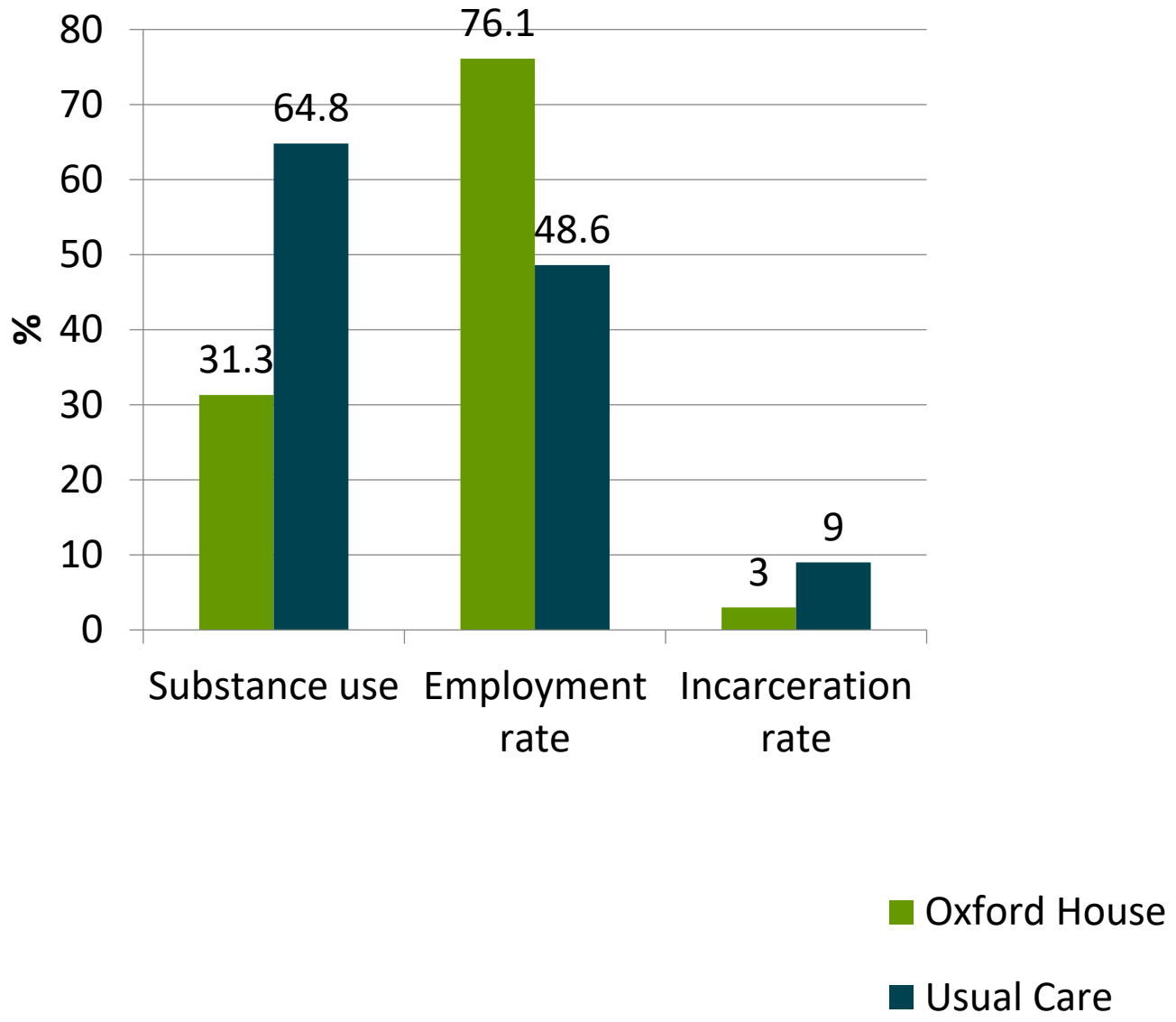
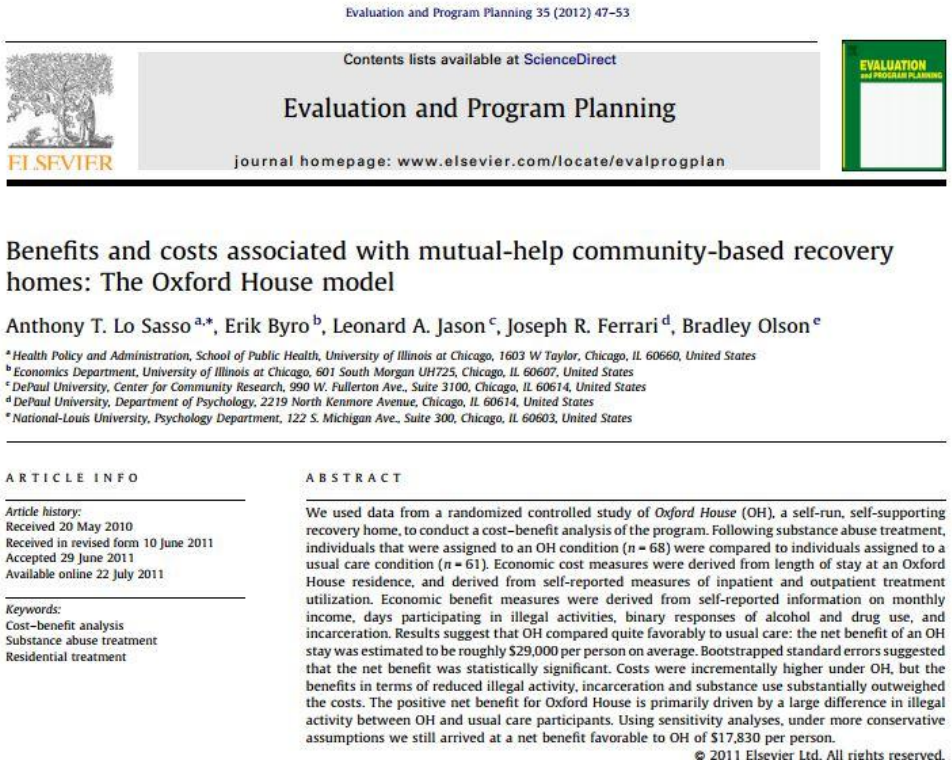
Oxford House vs. Usual Care

Recovery Residences had –

- half as many using substances across 2 yrs
- 50% more employed
- 1/3 re-incarceration rate



Cost-benefit analysis of the Oxford House Model



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Benefits and costs associated with mutual-help community-based recovery homes: The Oxford House model

Anthony T. Lo Sasso [a,*], Erik Byro [b], Leonard A. Jason [c], Joseph R. Ferrari [d], Bradley Olson [e]

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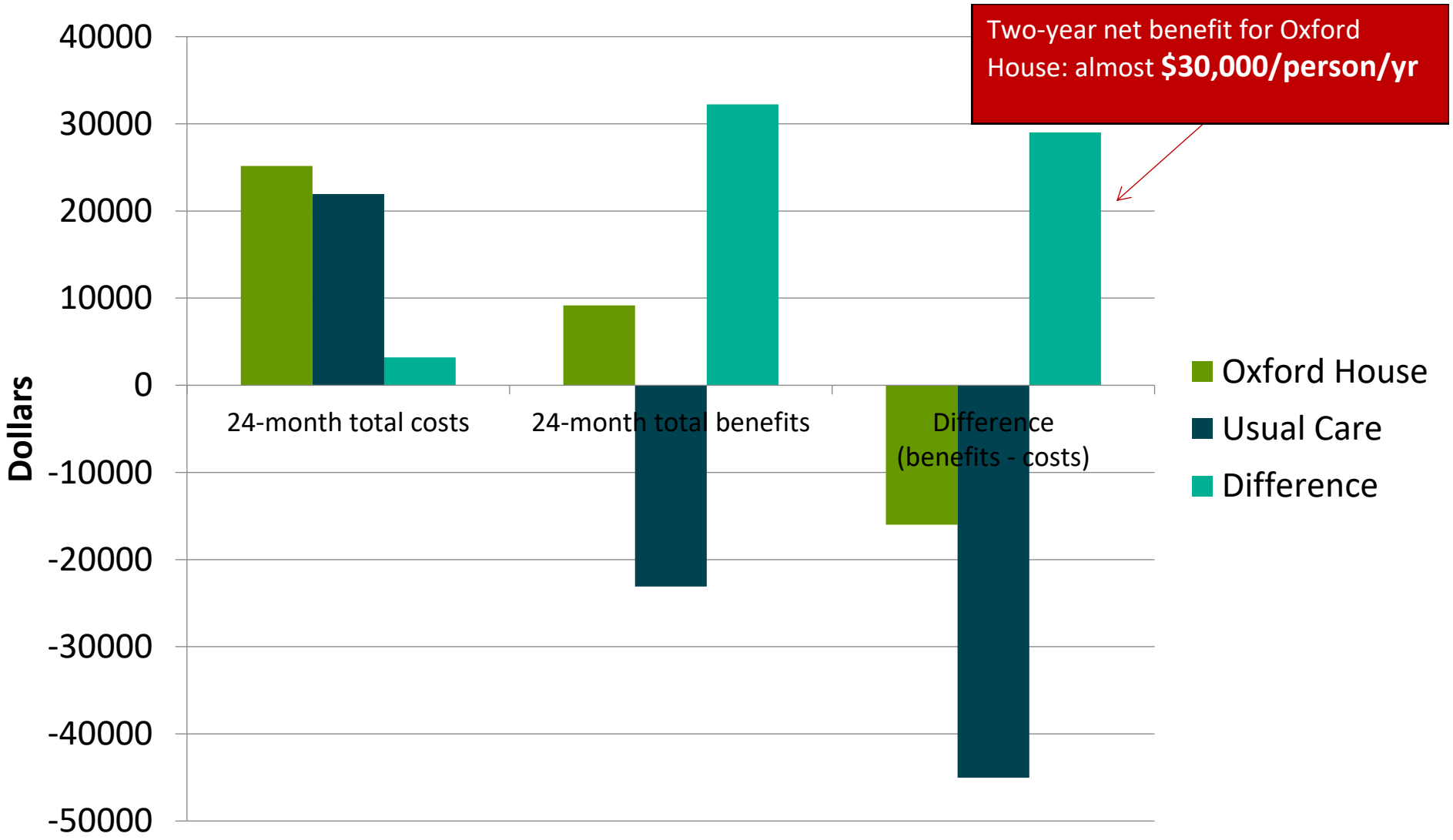
ABSTRACT

We used data from a randomized controlled study of *Oxford House* (OH), a self-run, self-supporting recovery home, to conduct a cost–benefit analysis of the program. Following substance abuse treatment, individuals that were assigned to an OH condition ($n = 68$) were compared to individuals assigned to a usual care condition ($n = 61$). Economic cost measures were derived from length of stay at an Oxford House residence, and derived from self-reported measures of inpatient and outpatient treatment utilization. Economic benefit measures were derived from self-reported information on monthly income, days participating in illegal activities, binary responses of alcohol and drug use, and incarceration. Results suggest that OH compared quite favorably to usual care: the net benefit of an OH stay was estimated to be roughly $29,000 per person on average. Bootstrapped standard errors suggested that the net benefit was statistically significant. Costs were incrementally higher under OH, but the benefits in terms of reduced illegal activity, incarceration and substance use substantially outweighed the costs. The positive net benefit for Oxford House is primarily driven by a large difference in illegal activity between OH and usual care participants. Using sensitivity analyses, under more conservative assumptions we still arrived at a net benefit favorable to OH of $17,830 per person.

- **Sample**: 129 adults leaving substance use treatment between 2002 and 2005
- **Design**: Cost-benefit analysis using RCT data
- **Intervention**: Oxford House vs. usual continuing care
- **Follow-up**: 2 years
- **Outcome**: Substance use, monthly income, incarceration rates

Mean per-person societal benefits and costs



Recovery support services have grown intended to facilitate access to conducive and supportive environments and recovery capital …

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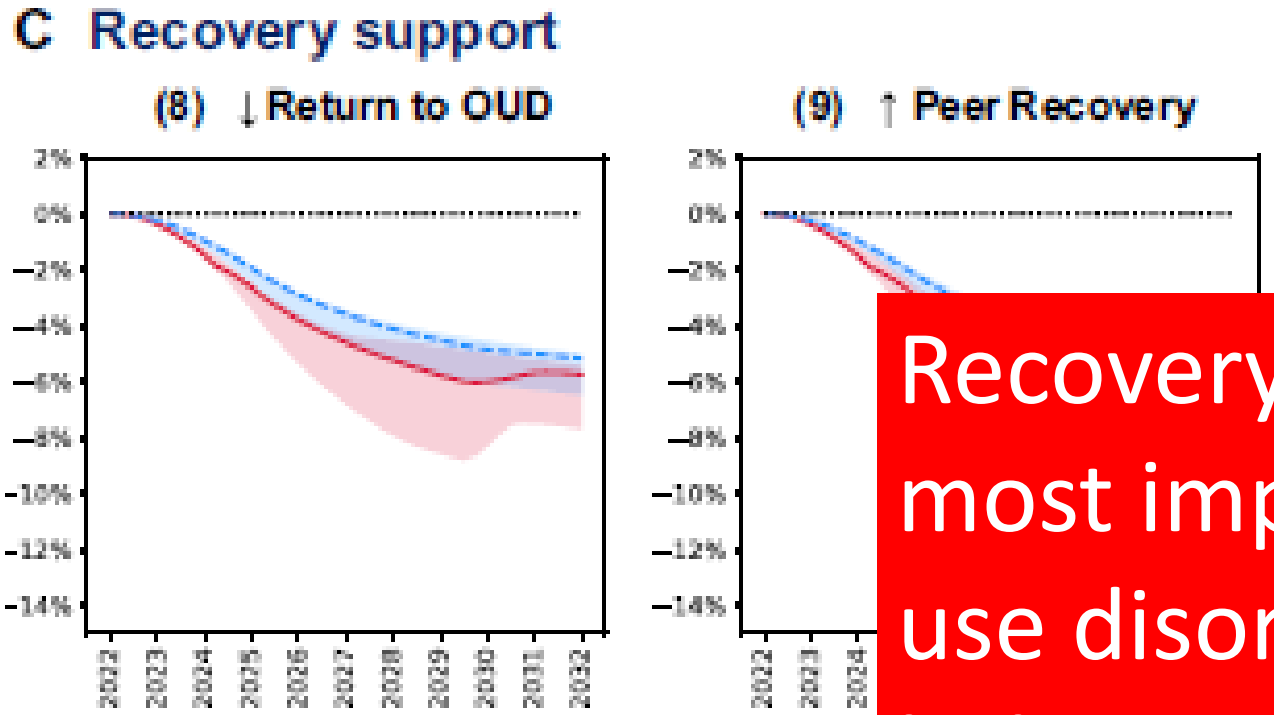

SCIENCE ADVANCES | RESEARCH ARTICLE

HEALTH AND MEDICINE

Reducing opioid use disorder and overdose deaths in the United States: A dynamic modeling analysis

Erin J. Stringfellow[1], Tse Yang Lim[2], Keith Humphreys[3], Catherine DiGennaro[1], Celia Stafford[4], Elizabeth Beaulieu[1], Jack Homer[2,5], Wayne Wakeland[6], Benjamin Bearnot[7], R. Kathryn McHugh[8], John Kelly[9], Lukas Glos[10], Sara L. Eggers[10], Reza Kazemi[10], Mohammad S. Jalali[1,2]*

Opioid overdose deaths remain a major public health crisis. We used a system dynamics simulation model of the U.S. opioid-using population age 12 and older to explore the impacts of 11 strategies on the prevalence of opioid use disorder (OUD) and fatal opioid overdoses from 2022 to 2032. These strategies spanned opioid misuse and OUD prevention, buprenorphine capacity, recovery support, and overdose harm reduction. By 2032, three strategies saved the most lives: (i) reducing the risk of opioid overdose involving fentanyl use, which may be achieved through fentanyl-focused harm reduction services; (ii) increasing naloxone distribution to people who

Recovery support services found most impactful in reducing opioid use disorder prevalence through helping to sustain and stabilize remission and prevent relapse

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LifeRing Secular Recovery

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One-Stop Shopping for Recovery: An Investigation of Participant Characteristics and Benefits Derived From U.S. Recovery Community Centers

John F. Kelly, Robert L. Stout, Leonard A. Jason, Nilofar Fallah-Sohy, Lauren A. Hoffman, and Bettina B. Hoeppner

Background: Recovery community centers (RCCs) are the "new kid on the block" in providing addiction recovery services, adding a third tier to the 2 existing tiers of formal treatment and mutual-help organizations (MHOs). RCCs are intended to be recovery hubs facilitating "one-stop shopping" in the accrual of recovery capital (e.g., recovery coaching; employment/educational linkages). Despite their growth, little is known about who uses RCCs, what they use, and how use relates to improvements in functioning and quality of life. Greater knowledge would inform the field about RCC's potential clinical and public health utility.

Methods: Online survey conducted with participants (N = 336) attending RCCs (k = 31) in the northeastern United States. Substance use history, services used, and derived benefits (e.g., quality of life) were assessed. Systematic regression modeling tested a priori theorized relationships among variables.

Results: RCC members (n = 336) were on average 41.1 ± 12.4 years of age, 50% female, predominantly White (78.6%), with high school or lower education (48.8%), and limited income (45.2% < $10,000 past-year household income). Most had either a primary opioid (32.7%) or alcohol (26.8%) problem. Just under half (48.5%) reported a lifetime psychiatric diagnosis. Participants had been attending RCCs for 2.6 ± 3.4 years, with many attending <1 year (35.4%). Most commonly used aspects were the socially oriented mutual-help/peer groups and volunteering, but technological assistance and employment assistance were also common. Conceptual model testing found RCCs associated with increased recovery capital, but not social support; both of these theorized proximal outcomes, however, were related to improvements in psychological distress, self-esteem, and quality of life.

Conclusions: RCCs are utilized by an array of individuals with few resources and primary opioid or alcohol histories. Whereas strong social supportive elements were common and highly rated, RCCs appear to play a more unique role not provided either by formal treatment or by MHOs in facilitating the acquisition of recovery capital and thereby enhancing functioning and quality of life.

Key Words: Recovery Community Centers, Recovery, Addiction, Support Services, Recovery Coaching, Addiction, Substance Use Disorder.

PROFESSIONAL TREATMENT SERVICES often play a vital role in addressing substance use disorders in the United States and around the world. Such clinical services can provide life-saving medically managed detoxification and stabilization as well as deliver medications and psychosocial interventions that can alleviate cravings and help prevent relapse. Extending the framework and benefits of these professional treatment efforts, peer-led mutual-help organizations (MHOs), such as Alcoholics Anonymous (AA), Narcotics Anonymous (NA), SMART Recovery, and many others are commonly used to provide additional long-term free recovery support over time in the communities in which people live (Bøg et al., 2017; Kelly, 2017; Kelly et al., 2017a). Adding to these resources in recent years has been a new dimension of recovery support services that are neither professional treatment nor MHOs. These new services (e.g., recovery community centers [RCCs], recovery residences, recovery coaching, recovery high schools, and collegiate recovery programs; Kelly et al., in press; White et al., 2012, 2012) combine voluntary, peer-led initiatives, with professional activities, and are intended to provide flexible community-based options to address the psychosocial barriers to sustained remission (White et al., 2012, 2012).

RCCs are one of the most common of these new additions to recovery support infrastructure and are growing rapidly (Cousins et al., 2012; Kelly et al., in press; Kelly et al., 2017b). RCCs are literally and metaphorically, "new kids on the block," as these novel entities are most often located on

From the Recovery Research Institute (JFK, NF-S, LAH, BBH), Massachusetts General Hospital and Harvard Medical School, Boston, Massachusetts; DePaul University (RLS), Chicago, Illinois; and Decision Sciences Institute (LAJ), Providence, Rhode Island.

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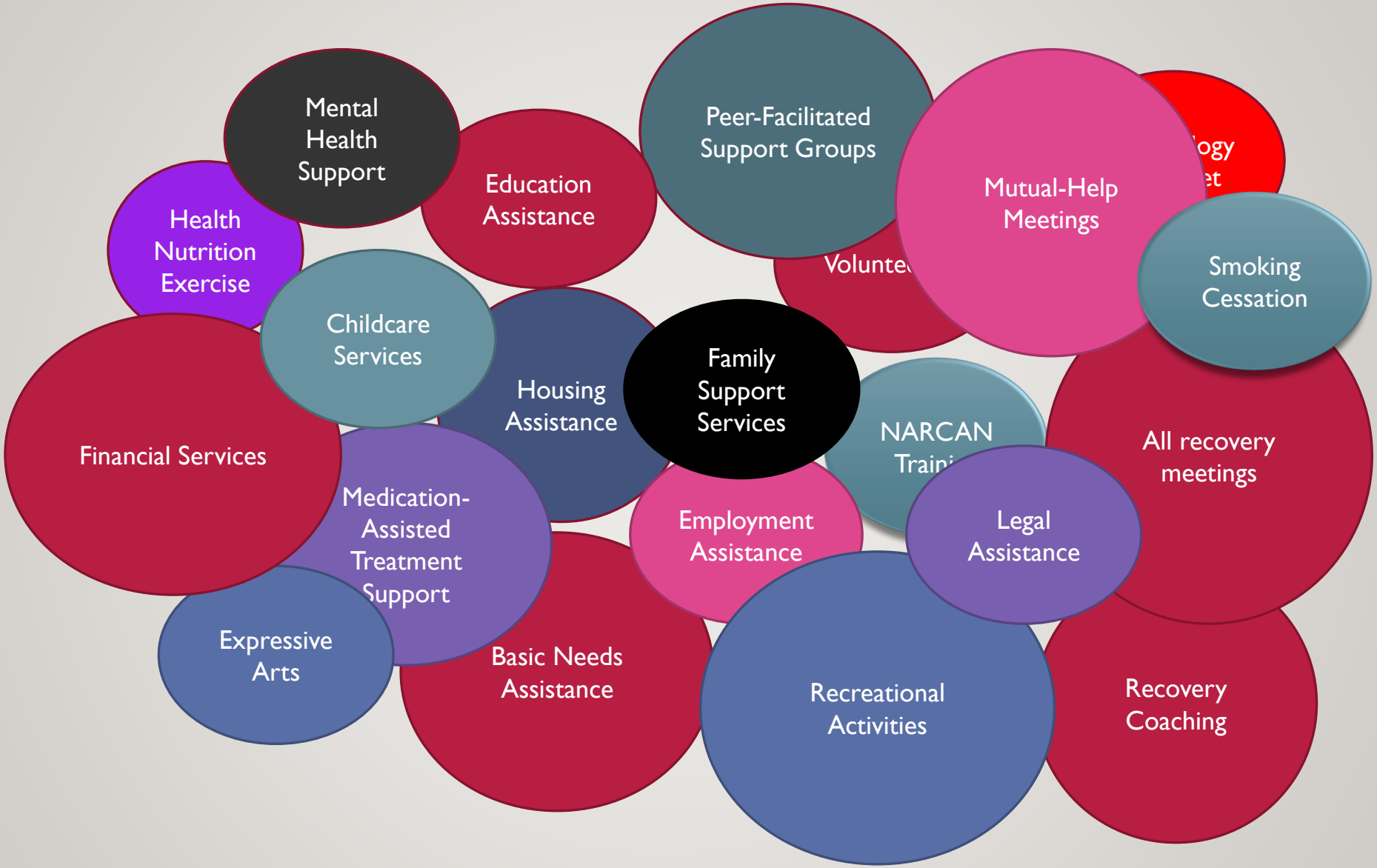
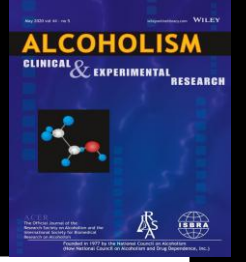




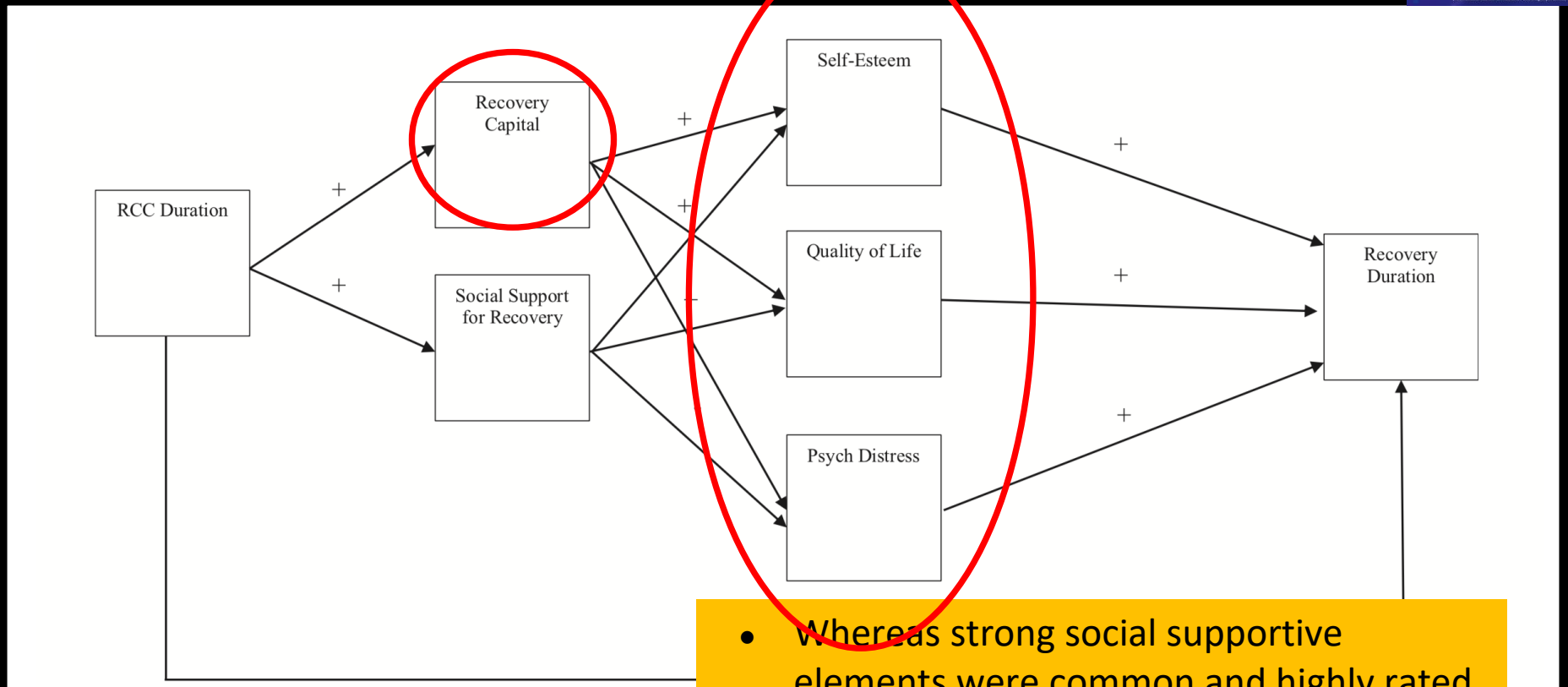
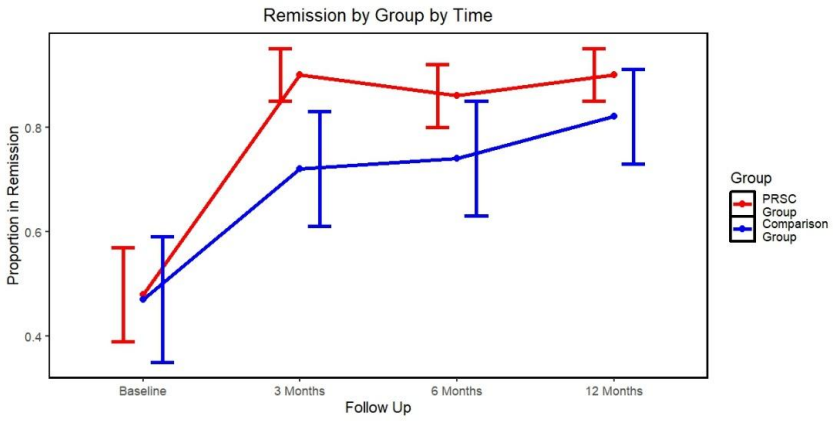


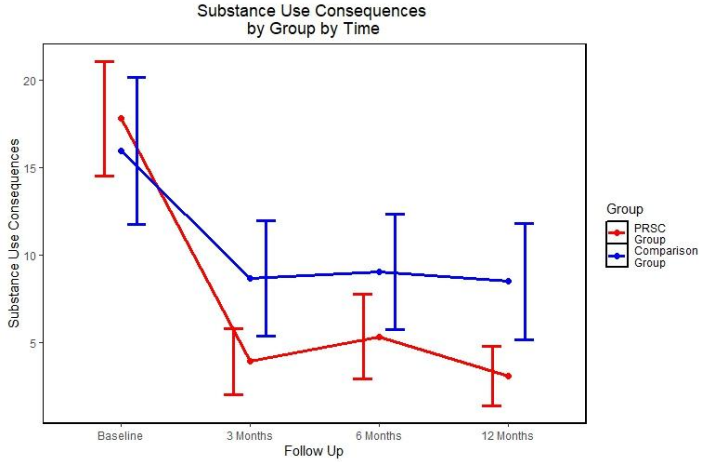
Fig. 1. Conceptual model of the theorized relationships among
"+" = theorized positive association among linked variables; "−" =
ote:

- Whereas strong social supportive elements were common and highly rated, **RCCs appear to play a more unique role not provided either by formal treatment or by MHOs** in facilitating the acquisition of recovery capital and thereby enhancing functioning and quality of life.

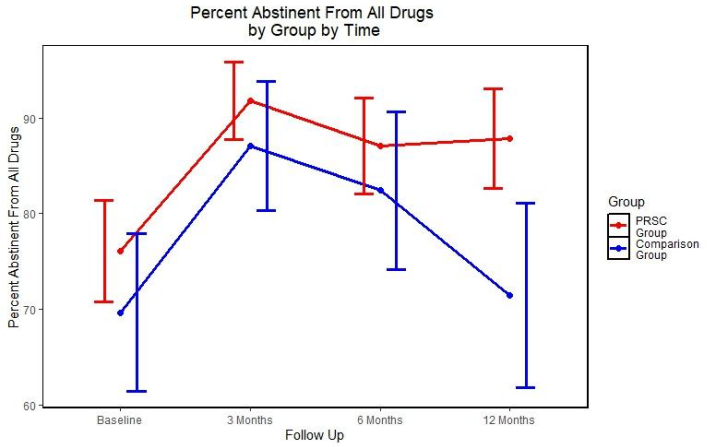
Higher Remission Rates



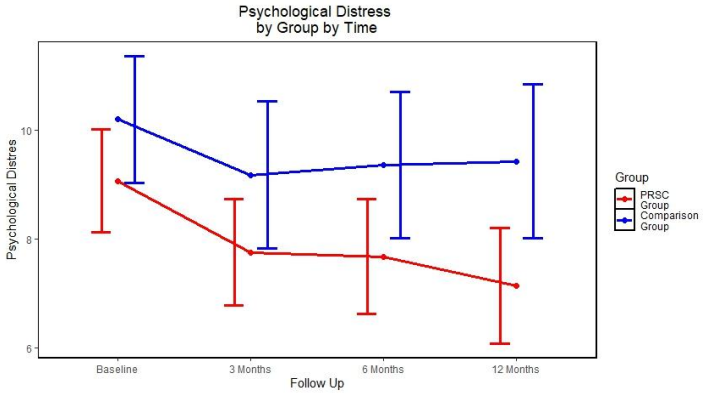
Fewer Substance-Related Consequences



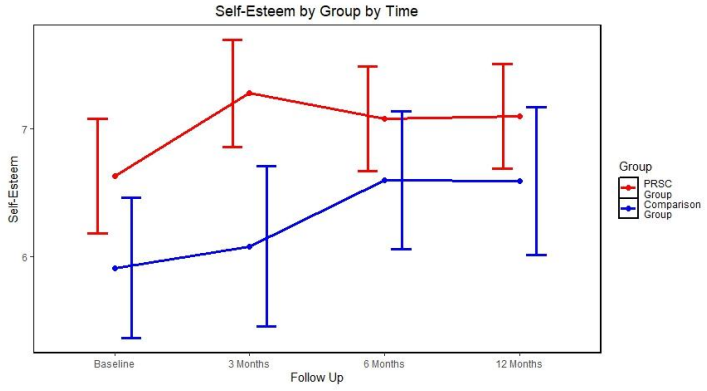
Higher Abstinence Rates



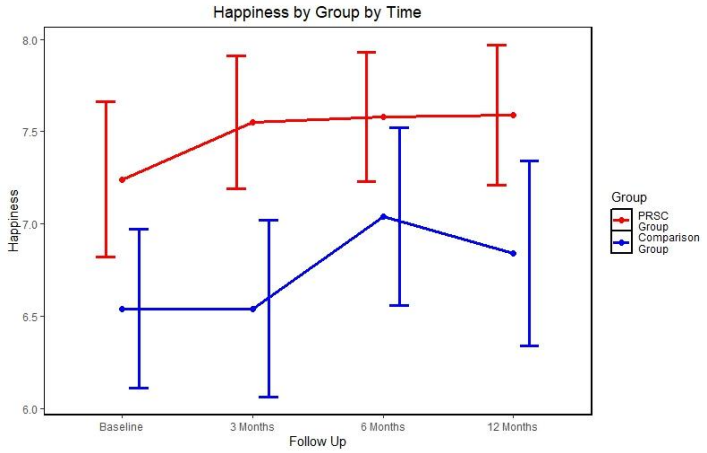
Fewer Psychiatric Problems



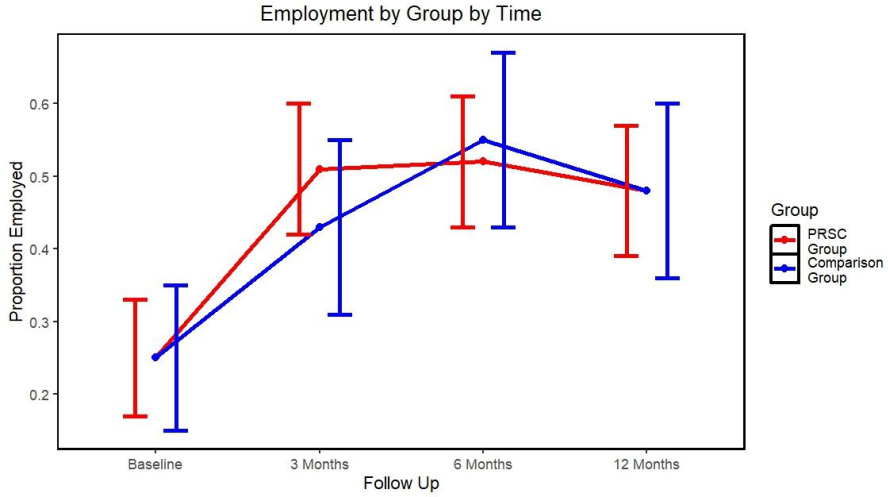
Higher Self-Esteem and Pos. Soc. Identity



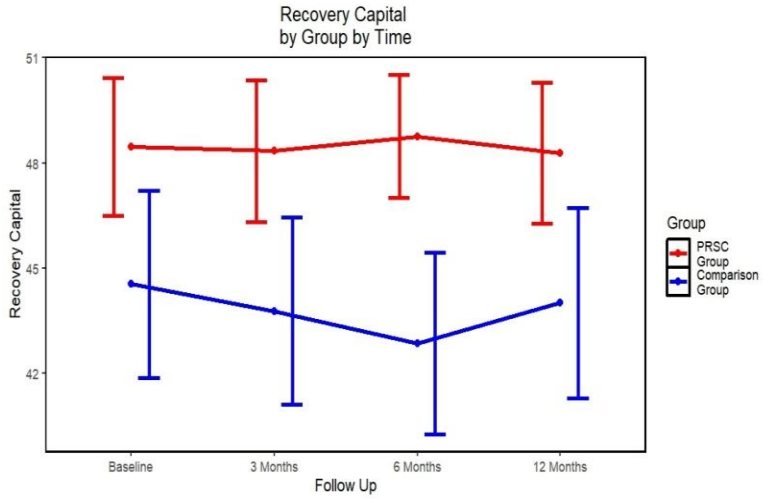
Higher Life Satisfaction



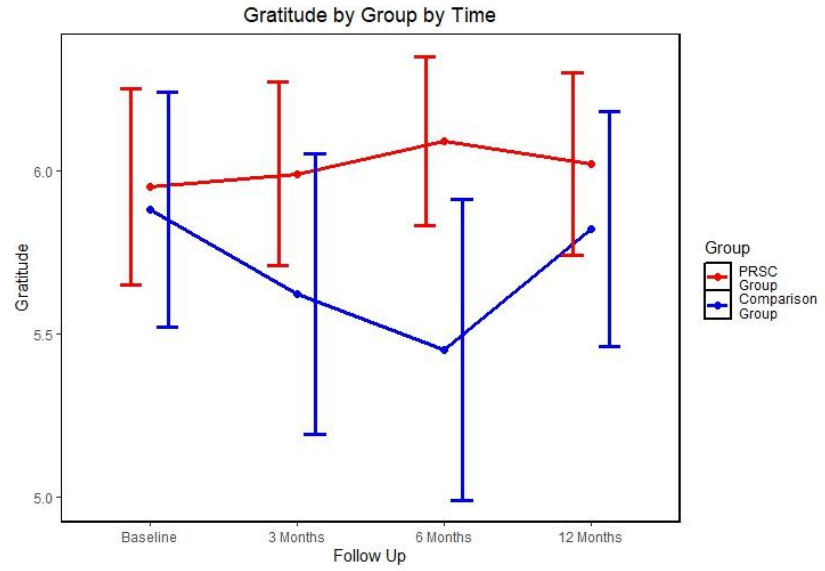
Double Employment Rates



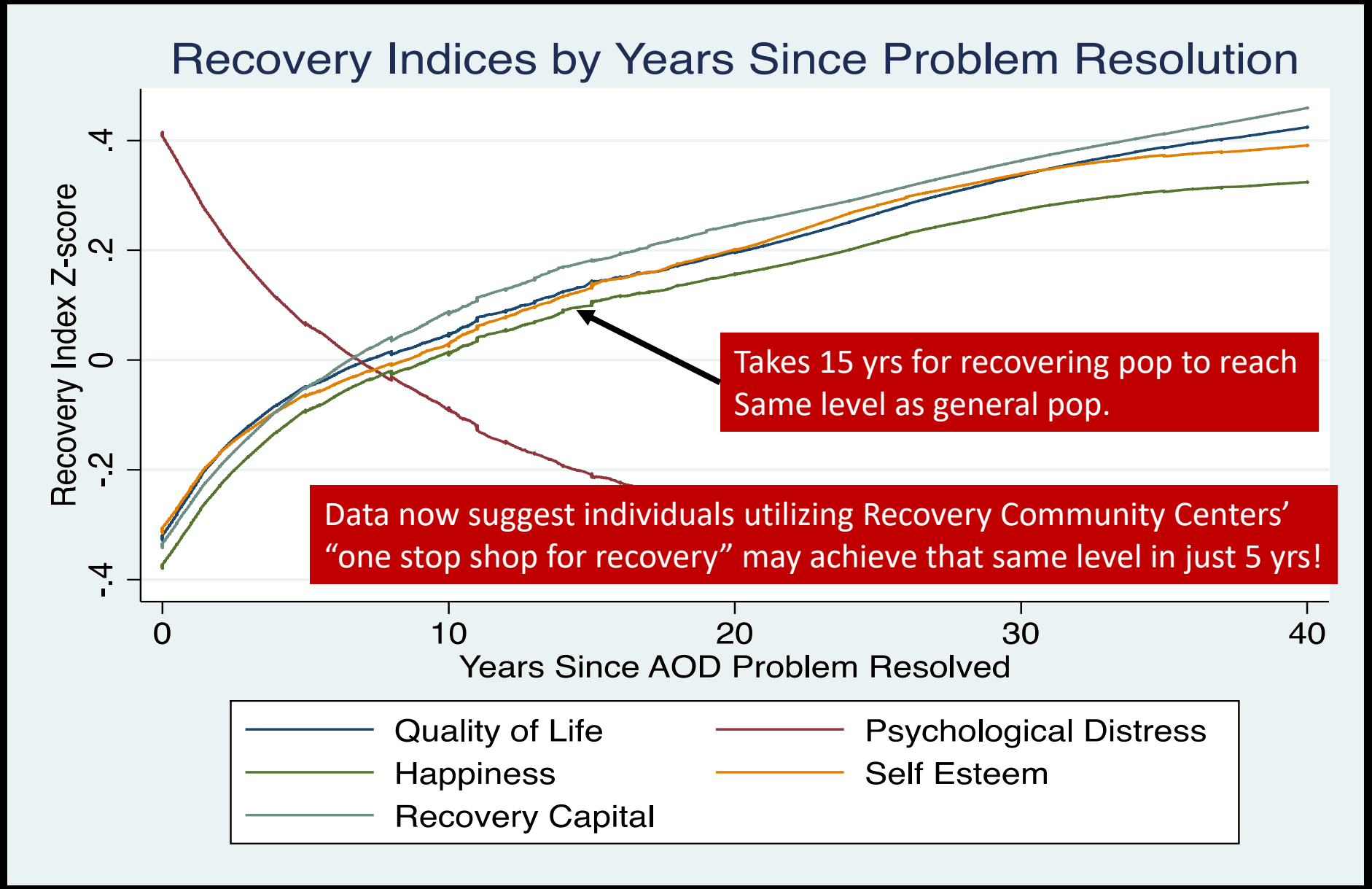
Higher Recovery Capital Rates



Greater Gratitude



40-Year Time Frame of Recovery Trajectories



National Recovery Study (NRS) N=2,002

Kelly et al, 2018; *Beyond Abstinence; Alcoholism: Clinical Experimental Research*

Recovery Support Services "Big 5" Clinical, Public Health, and Public Safety Benefits …

- Sustained and stable remission rates 
- Overdose and infectious disease transmission 
- Expensive medical service usage (ED, overnight hosp. stays) 
- Arrests and legal costs 
- Employment rates 

Connecting the Dots

Toward a Recovery-Oriented System of Care (ROSC)

A ROSC is a coordinated network of treatment and community-based services and supports that is person-centered and builds on the strengths and resiliencies of individuals, families, and communities to help achieve remission and improved health, wellness, and quality of life for those with or at risk of alcohol and drug problems

Thank you for your attention!

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