The Importance of Hope and Coping in Addiction Recovery:

A Neuroscience Perspective

Spencer D. Bradshaw, PhD
Gratitude

“A Core Experience of ‘Spirituality’”
The Institute for the Study of Addiction, Recovery, & Families

The Center for Family Systems Research & Intervention
The Center for Collegiate Recovery Communities

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Center for Addiction Recovery Research
Acknowledgements

Mentors

Dr. Sterling T. Shumway
Dr. Jared P. Dempsey

Collaborators

Dr. Kitty S. Harris
Dr. Thomas G. Kimball

Lab Team:

Hannah Wilhite
Alison Wagner
Samantha Curtis

Mazie Zielinski
Tramel Pennie
Caleb Herrera

Von Poll
Ryan Burden
Kaitlin George
The Reward Circuit

Image from: http://brainstates.org/tag/addiction/
Functional near infrared spectroscopy as a potential biological assessment of addiction recovery: preliminary findings

Jared P. Dempsey, PhD, Kitty S. Harris, PhD, Sterling T. Shumway, PhD, Thomas G. Kimball, PhD, J. Caleb Herrera, Cynthia Dsauza, PhD, and Spencer Bradshaw, PhD
Sterling T. Shumway & Thomas G. Kimball

- *Hope*
- *Healthy Coping*
- *Achievement and Accomplishment*
- *Capacity for Meaningful Relationships*
- *Positive Identity*
- *Reclamation of Agency*
Hope: A Reawakening after despair; the Ability to expect with greater confidence

- A moment of clarity
- A lifetime of clarity

(Shumway & Kimball)

- Hope amidst the black hole of addiction
- Receivers vs. Givers of Hope

(from the Research)

- The belief that it is possible for things to get better
What Does the Research Say?

- Hope at onset leads to better wellbeing, coping, and regulation of emotional distress during 12 weeks of therapy
  
  (Irving et al., 1998)

- Hope partially mediates the relationship between craving and readiness to change
  
  (Bradshaw, Shumway, Wang, & Harris, 2014)

- Hope is positively associated with:
  - entering treatment
  - abstinence during sober living, and completion of aftercare
  - Outpatient treatment outcomes
  - Abstinence length and Quality of life

  (Jackson, Wernicke, & Haaga, 2003)
  (Strack, Carver, & Blaney, 1987)
  (Sowards, O’Boyle, & Weissman, 2006)
  (Carvajal, Clair, Nash, & Evans, 1998)
Healthy Coping Skills:  The Development of Effective Skills to Manage the Pain and Stress of Life

Learning to cope in a more healthy way is where all the theories and process discussions about addiction and recovery are applied on a practical level. This is where the “pedal hits the metal” or “the rubber meets the road.” Recovery cannot be done while residing in the cheap seats. It takes hard work, changes in behavior, resolve, long-term effort, faith, and renewed relationships. Each requires you to be an active participant in the process of recovery. We know for certain that unless you find better ways to cope, you will soon be using again or engaging in other addictive behaviors.

(Six Essentials, p. 33)
Healthy Coping Skills: The Development of Effective Skills to Manage the Pain and Stress of Life

- Both **internally** and an **externally** you must learn to:
  - Manage Yourself
  - Manage Stress Reaction
  - Manage Stress Levels

**Inside:**
- first 3 steps of recovery
- Self-forgiveness
- Healing from Shame (Feeling wrong for the right reasons)

*May first be done through connections with other people.*

*Lazarus & Folkman’s (1984) problem focused vs. emotion focused coping*  
(see Majer, Droge, & Jason, 2012).
Dr. Shumway’s Advice

Unhealthy Coping Strategies

- Anger
- Lying
- Manipulation
- Guilt
- Blaming
- Hiding
- Escaping
- Denial
- Rationalizing

Dr. Kimball’s Advice

- Meditation
- Deep Breathing
- Music
- Journaling
- Meetings
- Education
- Prayer
- Asking for help
- Exercise
- 12-steps
What Does the Research Say?

- Coping is important with respect to 12-month treatment outcomes:
  - Decrease in Avoidance coping ~ fewer alcohol problems
  - Increase in Approach coping ~ fewer alcohol problems

(Chung, Langenbuchen, Labouvie, Pandina, & Moos, 2001)
Can we see validity that hope and coping associate with changes in the brain — through neuro-scientific research?
Participants

• Original Sample: 22 people

• Final Sample: 16 people
  • Excluded 4 due to greater issues with opiate use than alcohol use (one was currently using opiates)
  • Excluded 1 due to blowing a .02 on the day of participation
  • Excluded 1 due to report of dependence and it not meeting criteria.

• Of those 16:

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<th>Mean</th>
<th>Min</th>
<th>Max</th>
<th>SD</th>
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<tr>
<td>Age when first Drunk</td>
<td>14.94</td>
<td>11</td>
<td>18</td>
<td>1.61</td>
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<tr>
<td>Years of Drinking</td>
<td>8.28</td>
<td>1.16</td>
<td>23.33</td>
<td>6.3</td>
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<tr>
<td>Years Sober</td>
<td>3.1</td>
<td>.12</td>
<td>9.57</td>
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<td>Gender</td>
<td>4 (25%)</td>
<td>12 (75%)</td>
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Hope and Coping in Recovery Measure (HCRM)

(Shumway et al., 2014)

Hope Items:
• The future appears bright to me
• I have a reason for living
• Things are looking up
• I see a purpose for my life
• I will never get better

Coping Items:
• I can deal with the problems that arise in my life
• I reach out to others in times of need
• I am becoming competent in my day-to-day functioning
• I am capable of completing things I begin
• I see and act on healthy choices
**HCRM Results:**

Range (5 – 30)
- 5 = highest hope and coping
- 30 = lowest hope and coping

**Hope and Coping Total:** $M = 17$

**Hope:** $M = 8$

**Coping:** $M = 9$
Functional Near Infrared Spectroscopy (fNIR)

Electromyography (EMG)

Galvanic Skin Response (GSR)

Electrocardiogram (EKG)

MacLean’s “Triune Brain”

Neomammalian Complex

Paleomammalian Complex

Reptilian Complex

(MacLean, 1990)
## Results

### Correlations

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<tr>
<td>Hope</td>
<td>-.052</td>
<td>-.272</td>
<td>.058</td>
<td>-.164</td>
<td>-.122</td>
<td>-.197</td>
<td>-.457</td>
<td>-.310</td>
<td>-.402</td>
<td>-.229</td>
<td>-.310</td>
<td>-.245</td>
<td>.177</td>
<td>-.220</td>
<td>-.324</td>
<td>-.342</td>
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<td>Coping</td>
<td>-.332</td>
<td>-.481</td>
<td>-.367</td>
<td>-.341</td>
<td>-.423</td>
<td>-.505*</td>
<td>-.592**</td>
<td>-.676***</td>
<td>-.674***</td>
<td>-.498*</td>
<td>-.548*</td>
<td>-.500*</td>
<td>.060</td>
<td>-.493</td>
<td>-.328</td>
<td>-.428</td>
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**Notes:**  *<.05  **<.025  ***<.01
Frontopolar/Dorsomedial Region

Highest Executive Functioning

Cognitive Branching  (Greene, Nystrom, Engell, & Darley, 2004)

Future Thinking  (Greene, Nystrom, Engell, & Darley, 2004)

Altruistic Behavior  (Watz, Zaki, & Mitchell, 2012)

Left Medial Prefrontal Cortex (Optodes 7, 8):

An area previously found to be involved with:

• Moral Judgment  (Greene, Nystrom, Engell, & Darley, 2004)
• Working Memory (and Goal-Oriented Behavior)  (du Boisgueheneuc et al., 2006)
• Self-Referential Activity  (Gusnard, Akbudak, Shulman, & Raichle, 2001)
Difference in brain activation on optodes 7, 8, and 9 between the “Hi-Copers” and “Low-Copers”. Activation shown is unique activation for “Hi-Copers” after subtracting activation for the “Low-Copers”.
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Affective Modulation of Startle

![Graph 1: Hope vs. STL_alcMneut_TMP](chart1.png)

![Graph 2: Coping vs. STL_alcMneut_TMP](chart2.png)
Conclusion

Coping in recovery associates with activation in the frontal-polar region of the prefrontal cortex of the brain, areas of the brain involving:

- Cognitive Branching
- Working Memory
- Goal-Oriented Behavior
- Moral Judgement
- Future Thinking
- Self-Reflection

These Areas of the Brain are not expected to be associated with active addiction thinking!
Conclusion

Affective Modulation of Startle

Evidence may suggest possibility that increased hope and healthy coping allow recovering addicts to begin to once again have expected and appropriate emotional reactions to various emotional cues!
Clinical Implications

Were one to embark on the road to reductionism, psychology would be reduced to biology, biology to chemistry, and chemistry to physics, with the final stop in atomic particles. Neither atomic particles, chemistry, nor biology will provide the psychological laws of human behavior” (Bandura, 1989, p. 1182)

**Physiology**: The mechanics of the parts
**Psychology**: The experience of the whole

**Purpose**: ??

**So what about:**

*Psychology*
*Spirituality*
*The Self*

Agency – being a self-directed organism
Additional Thoughts

• Coping is not only CBT training. Experiential and relationship therapies may also lead to coping
  
  (Litt, Kadden, Kabela, & Cooney, 2003)

• Being associated “categorically” with AA leads to increased coping that aids ongoing recovery.

  (Majer, Droege, & Jason, 2012)
Other Considerations and Future Directions

• Coping is important for family members also!  
  (Moore, Biegel, & McMahon, 2011)

• Longitudinal Models of Coping

• Does Gender Moderate the relationship between coping and frontal cortex activity.
References


