MOBC Research Highlights Reel

Featuring

Moderated Mediation

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Mechanisms of Behavior Change Satellites
New Orleans, LA
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But Moderated Mediation is a delicate and powerful...

...thing to create
...often difficult to find
Starring As

The Regression Example: Change Talk

The Systematic Review Example: Mechanisms of College Interventions

The Precision Medicine Example: Genetics
Under What Conditions? Therapist and Client Characteristics Moderate the Role of Change Talk in Brief Motivational Intervention

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Study Method

- **Design:** Observational ratings of single session BMI.
- **Sample:** 174 non-treatment-seeking young men with hazardous drinking from the intervention arm of a RCT.
- **Measures:** MISC used for therapist speech (MICO, MIIN) and strength of client change talk; 3-month alcohol use.
- **Analyses:** Tests of conditional indirect effects using the PROCESS macro for SPSS (Hayes, 2013).
- **Moderators:** therapist MI experience and gender; clients’ alcohol severity and readiness to change.

Figure 1. Mediation model. Solid lines indicate statistically significant links. All models adjusted for Drinking composite at baseline. SE = standard error; CI = confidence interval; MICO = MI-consistent behaviors; CT = change talk. N = 174.

*Figure 2. Moderation on the a path.* Predicted values for Change talk strength at the 10th (23), 25th (31), 50th (47), 75th (67), and 90th (85) percentiles of the independent variable (MI-consistent behaviors frequency). The covariates in the model were set to their sample means when deriving the predicted values.
Study Results, key findings

- Moderated mediation shed light on the initial negative finding for mediation.
- MICO was related to CT for therapists who had more experience (3+ years of MI) and for clients with more alcohol use (AUDIT-C > 9).
- Findings speak to conditions under which BMI may be more or less effective and underscore the value of moderated mediation analysis.

Interventions to reduce college student drinking: State of the evidence for mechanisms of behavior change

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HIGHLIGHTS

- A systematic review examined support for mediation in college drinking interventions.
- Twenty-two mediators were examined in 61 trials.
- Descriptive norms consistently mediated intervention efficacy.
- Motivation to change consistently failed to mediate intervention efficacy.
- Only descriptive norms partially met criteria for serving as a mechanism of change.
Study Design

- **Design:** Systematic Review
- **Sample:** 61 randomized clinical trials of Brief Interventions for College Student drinking
- **22 potential mediators of intervention efficacy**
- **Analyses framed mediation path effects as Implementation Success/Failure and Theory Success/Failure**
- **Moderation considered via study characteristics that may vary a/b-path effect magnitude.**

Study Results, key findings

- **Strongest Support for Descriptive Norms**
  - 25 of 39 mediation tests supported
  - $a$-path more typically unsupported, implementation
  - $a$-path supported most when norms were locally calibrated, gender specific, and BMI face to face
  - $b$-path most often supported for consumption over consequences

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Study Results, key findings

- **Mixed Support for Protective Strategies**
  - 6 of 12 mediation tests supported
  - $a$-path more typically unsupported, implementation
  - $a$-path supported most when PBS feedback given
  - $b$-path most often tested and supported for consumption

Study Results, key findings

- **Outcome Expectancies**
  - 4 of 10 mediation tests supported
  - Social Expectancies most often supported
  - \(a\)-path more typically unsupported, implementation
  - \(b\)-path most often supported for consumption over consequences

Study Results, key findings

- **Self Efficacy**
  - 3 of 5 mediation tests supported
  - 1 study no $a$-path, implementation
  - 1 study no $b$-path, theory

- **Mental Health or Emotion**
  - 2 of 4 mediation tests supported
  - 2 studies no $a$-path, implementation

The arc and conclusion

- Mediation is hard to find.
- In these studies, $a$-path less often supported than $b$-path.
- Considering characteristics (clinical, methodological) can often reveal reasons for implementation/theory success and failure.
- While moderated-mediation is difficult to find, with a large enough sample of similar studies and variability to detect, meta-analysis may be a very useful approach.
From genetic studies to precision medicine in alcohol dependence
Yan Sun\textsuperscript{a}, Yan Zhang\textsuperscript{a}, Fan Wang\textsuperscript{d}, Yankun Sun\textsuperscript{a}, Jie Shi\textsuperscript{a,e,f,g,*} and Lin Lu\textsuperscript{a,b,c,e,*}

Genetic factors contribute to more than 50\% of the variation in the vulnerability to alcohol dependence (AD). Although significant advances have been made in medications for AD, these medications do not work for all people. Precise tailoring of medicinal strategies for individual alcoholic patients is needed to achieve optimal outcomes. This review updates the most promising information on genetic variants toward more precise treatment for AD that could ultimately improve clinical management and interventions. Behavioural Pharmacology 27:87–99

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Review Paper

- Summarizes genetic candidates for precision medicine in alcohol dependence.
- Provides accessible overview of empirical evidence on:
  - Alcohol metabolism enzymes (e.g. ADH, ALDH)
  - Opioidergic genes (e.g., OPRM1, OPRD1)
  - Dopaminergic genes (e.g., DRD4, DBH)
  - Serotonergic genes (e.g., 5-HTTLPR)
  - Glutamatergic genes (e.g., GRIN2B, GRIK1)
  - GABAergic genes (e.g., GABRA2)


Table 1  Predictive patterns of effects of candidate genes on each stage of alcohol dependence and treatment efficacy

<table>
<thead>
<tr>
<th>Candidate gene polymorphisms</th>
<th>Promising variant</th>
<th>Effects on alcohol dependence</th>
<th>Effects on treatment efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADH1B (ADH1B<em>1, ADH1B</em>2, and ADH1B*3)</td>
<td>ADH1B*2</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>ALDH2 (ALDH2<em>1 and ALDH2</em>2)</td>
<td>ALDH2*2</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>OPRM1 rs1799971 (A/G)</td>
<td>G</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>DAT1/SLC6A3 rs28363170 (A9/A10)</td>
<td>A9</td>
<td>↑</td>
<td>N.S.</td>
</tr>
<tr>
<td>DRD2/ANKK1 rs1800497 (C/T)</td>
<td>T</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>DRD4 exon 3 VNTR</td>
<td>Short forms (2–5 VNTRs)</td>
<td>Controversial</td>
<td>N.S.</td>
</tr>
<tr>
<td>DBH rs1611115 (T/C)</td>
<td>T</td>
<td>↑</td>
<td>Controversial</td>
</tr>
<tr>
<td>5-HTTLPR (S/L)</td>
<td>S</td>
<td>↑</td>
<td>Controversial</td>
</tr>
<tr>
<td>GRIK1 rs2832407 (A/C)</td>
<td>C</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
<tr>
<td>GABRA2 rs279858 (A/G)</td>
<td>G</td>
<td>↑</td>
<td>Controversial</td>
</tr>
<tr>
<td>MAOA VNTR (3, 3.5, 4, or 5 copies)</td>
<td>Low-activity alleles (3 and 5 copies)</td>
<td>↑</td>
<td>Controversial</td>
</tr>
<tr>
<td>COMT rs4680 (G/A)</td>
<td>G</td>
<td>Controversial</td>
<td>N.S.</td>
</tr>
<tr>
<td>BDNF rs6265 (G/A)</td>
<td>A</td>
<td>↑</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

↓, decrease; ↑, increase; N.S., not specified.
Evidence is accumulating that genetic variations can predict differential response to pharmacotherapies for alcohol dependence.

Limited yet promising evidence suggests that response to behavioral therapy may be moderated by genetic variations (e.g., serotonergic gene).

Genetic factors will likely play an important role in the application of precision medicine to AUD.

Future research can examine genetic variations using the framework of moderated mediation analyses.
The End
