Construct Mixology
(Forming New Management Constructs by Combining Old Ones)

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Overview

• **Construct Mixology** (definitions)
• **Examples of Construct Mixology:**
  – Work Engagement - Org. Commitment
  – Core Self-Evaluations - Emotional Intelligence
• **Algebra of Composites**
• ‘Seven Cardinal Construct Domains in OB/HR’
• **Continuum of Mixology Practices**
• **Assumptions & Limitations**
Key Points

1) Researchers have been recycling old item content from classic domains in OB/HR, to form “new” combinations.

2) When this is done, it is more informative if the classic old concepts (and empirical findings regarding old concepts) are acknowledged.

3) Compound constructs tend to have high predictive utility.

4) If you look at item content and empirical overlap, the field of OB/HR has largely focused on a small set of ~7 broad construct domains.
Construct Mixology: Forming New Management Constructs by Combining Old Ones

Daniel A. Newman, David A. Harrison, Nichelle C. Carpenter & Shannon M. Rariden
Combining Old Constructs

• “Job satisfaction, organizational commitment, job involvement, and feelings of empowerment all can have relevance for the state engagement [i.e., work engagement] construct. The state engagement construct we have presented to this point in the review is thus a new blend of old wines with distinct characteristics and ‘feel.’”

  - Macey and Schneider (2008, p. 10),
  “The Meaning of Employee Engagement”

• “One of the differences between the natural and the social sciences is that in the natural sciences, each succeeding generation stands on the shoulders of those that have gone before, while in the social sciences, each generation steps in the faces of its predecessors.”

  - Zeaman (1959, p. 167),
  “Skinner’s Theory of Teaching Machines”
Definitions

• Construct Mixology – the practice of forming a new *compound construct* by combining items or measures sampled from existing *constituent construct* domains
Example:

**Compound Construct**
(e.g., Core Self-Evaluations)

- **Constituent Construct #1** (e.g., Self-Esteem)
- **Constituent Construct #2** (e.g., Self-Efficacy)
- **Constituent Construct #3** (e.g., Emot’l Stability)
- **Constituent Construct #4** (e.g., Locus of Control)
Construct Mixology

Related topics:

• Construct validation, discriminant validity (Cronbach & Meehl, 1955; Campbell & Fiske, 1959)

• Jangle fallacy (Kelley, 1927)

• Construct proliferation/redundancy (Bechtoldt, 1959; Campbell, 1960; Le, Schmidt, Harter, & Lauver, 2010)

• Hierarchical constructs (Cronbach & Gleser, 1957; Hulin & Humphreys, 1980; Crede & Harms, 2015; Johnson, Rosen, Chang, Djurdjevic, & Tiang, 2012; Judge & Kammeyer-Mueller, 2012)
Definitions

- **Construct** – “some postulated attribute of people” or of groups (Cronbach & Meehl, 1955, p. 283); also sometimes called a “concept”  
  [*Example: Self-esteem*]

- **Measure** – “an observed score gathered through self-report, interview, observation, or some other means” (DeVellis, 1991; Edwards & Bagozzi, 2000; Lord & Novick, 1968; Messick, 1995” (Edwards, 2003, p. 329)  
  [*Example: Rosenberg’s (1965) 10-item self-esteem scale*]
Definitions

• **Construct validity** – “the correspondence between a construct and a measure taken as evidence of the construct” (Cronbach & Meehl, 1955; Nunnally, 1978; Schwab, 1980)” (Edwards, 2003, p. 329).

**Empirical evidence:**

– Strong empirical relations between observed measures and postulated construct (e.g., factor loadings; convergent validity); and

– Relative weakness of relations between measures of postulated construct and other constructs (discriminant validity)
Definitions

• Construct domain – theoretical definition of the content area of a particular construct (Nunnally, 1970; Hinkin, 1995, p. 969; Schwab, 1980; Schriesheim et al., 1999); a verbal statement or ‘constitutive definition’ that outlines the nature of the construct. [Example: The construct domain of self-esteem has been defined as, “one’s overall sense of worthiness as a person” (Schmitt & Allik, 2005; Rosenberg, 1965)]

• Domain sampling – choosing particular items or measures from a universe of possible items, in order to represent a particular construct domain (Nunnally, 1970, p. 546)
Definitions

• **Compound construct** – a hypothetical concept composed by sampling items or measures from multiple, distinct construct domains [*Example: Core self-evaluations is a compound construct, made up of 4 constituent constructs: self-esteem, generalized self-efficacy, emotional stability, locus of control (Judge et al., 1998).]*

• **Constituent construct** - a hypothetical concept whose items have been combined with other, distinct concepts in the formation of a compound construct
Example:

Compound Construct
(e.g., Core Self-Evaluations)

Constituent Construct #1
(e.g., Self-Esteem)

Constituent Construct #2
(e.g., Self-Efficacy)

Constituent Construct #3
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**Q:** *Higher-order factor* or *Composite*?
Example:

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Raykov, 1997; Judge & Bono, 2001
Example:

Compound Construct (e.g., Core Self-Evaluations)

Constituent Construct #1 (e.g., Self-Esteem)

Constituent Construct #2 (e.g., Self-Efficacy)

Constituent Construct #3 (e.g., Emot’l Stability)

Constituent Construct #4 (e.g., Locus of Control)

Q: Higher-order factor or Composite?  
A: Basically same.
Higher order factor ≈ Composite

• A common factor from factor analysis is roughly equivalent to a composite formed by adding together items drawn from lower-order content domains [empirically]
Forming New Constructs

- **Original content**: New content domain
- **Opposite pole**: “job dissatisfaction”
- **New facet**: “informational justice”
- **Switching levels of analysis**: “justice climate”
- **Construct mixology**: drawing items from established content domains
Examples of Mixology

- Work Engagement
- Core Self-Evaluations
- Organizational Commitment
- Emotional Intelligence
- Work Withdrawal
Work Engagement

Table 1. Redundancy of work engagement items with items from well-known instruments

<table>
<thead>
<tr>
<th>Utrecht Work Engagement Scale (Schaufeli &amp; Bakker, 2003)</th>
<th>Similar item from a long-established scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>I find the work that I do full of meaning and purpose. (Dedication 1)</td>
<td>Organizational commitment (OCS; Meyer, Allen, &amp; Smith, 1993): This organization has a great deal of personal meaning for me.</td>
</tr>
<tr>
<td>I am enthusiastic about my job. (Dedication 2)</td>
<td>Job satisfaction (OJS; Brayfield &amp; Rothe, 1951): Most days I am enthusiastic about my work.</td>
</tr>
<tr>
<td>My job inspires me. (Dedication 3)</td>
<td>Job affect (JAS; Burke, Brief, George, Roberson, &amp; Webster, 1989): enthusiastic</td>
</tr>
<tr>
<td>I am proud of the work that I do. (Dedication 4)</td>
<td>Positive affect (PANAS; Watson, Clark, &amp; Tellegen, 1988): enthusiastic</td>
</tr>
<tr>
<td>To me, my job is challenging (Dedication 5)</td>
<td>Positive affect (PANAS; Watson et al.): inspired</td>
</tr>
<tr>
<td></td>
<td>Organizational commitment (OCQ; Mowday, Steers, &amp; Porter, 1979): This organization really inspires the very best in me in the way of job performance.</td>
</tr>
<tr>
<td></td>
<td>Organizational commitment (OCQ; Mowday et al.): I am proud to tell others that I am part of this organization.</td>
</tr>
<tr>
<td></td>
<td>Challenging (JDI; Smith et al., 1969)</td>
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# Work Engagement

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<tr>
<td><strong>Time flies when I am working.</strong> (Absorption 1)</td>
<td><strong>Job involvement (JIS; Lodahl &amp; Kejner, 1965): For me, mornings at work really fly by.</strong></td>
</tr>
<tr>
<td><strong>When I am working, I forget everything else around me.</strong> (Absorption 2)</td>
<td><strong>Job involvement (JIS; Lodahl &amp; Kejner): I live, eat, and breathe my job.</strong></td>
</tr>
<tr>
<td><strong>I feel happy when I am working intensely.</strong> (Absorption 3)</td>
<td><strong>Job satisfaction (OJS; Brayfield &amp; Rothe): I find real enjoyment in my work; I feel that I am happier in my work than most other people.</strong></td>
</tr>
<tr>
<td><strong>I am immersed in my work</strong> (Absorption 4)</td>
<td><strong>Work involvement (WIO; Kanungo, 1982): I like to be absorbed in my job most of the time.</strong></td>
</tr>
<tr>
<td><strong>I get carried away when I am working.</strong> (Absorption 5)</td>
<td><strong>Job involvement (JIS; Lodahl &amp; Kejner): I am very much involved personally in my work.</strong></td>
</tr>
<tr>
<td><strong>It is difficult to detach myself from my job.</strong> (Absorption 6)</td>
<td><strong>Job involvement (JIIQ; Kanungo): Most of my interests are centered around my job.</strong></td>
</tr>
<tr>
<td><strong>Job involvement (JIIQ; Kanungo): I usually feel detached from my job.</strong></td>
<td></td>
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<tr>
<td>At my work, I feel <strong>bursting with energy.</strong> (Vigor 1)</td>
<td>Job affect (JAS; Burke et al.): active, excited, enthusiastic, peppy, elated, jittery</td>
</tr>
<tr>
<td>At my job, I feel <strong>strong and vigorous</strong> (Vigor 2)</td>
<td>Positive affect (PANAS; Watson et al.): excited, enthusiastic, alert, attentive, jittery, active</td>
</tr>
<tr>
<td>When I get up in the morning, I feel like <strong>going to work.</strong> (Vigor 3)</td>
<td>Job affect (JAS; Burke et al.): <strong>strong, active, excited</strong> enthusiastic, peppy, elated, jittery</td>
</tr>
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<td>Positive affect (PANAS; Watson et al.): strong, excited, enthusiastic, alert, attentive, jittery, active</td>
</tr>
<tr>
<td></td>
<td>Job involvement (JIS; Lodahl &amp; Kejner): Quite often I <strong>feel like staying home from work</strong> instead of coming in; I usually show up for work a little early, to get things ready; Sometimes I lie awake at night thinking ahead to the next day’s work; I live, eat, and breathe my job; I’ll stay overtime to finish a job, even if I’m not paid for it; I would probably keep working even if I didn’t need the money.</td>
</tr>
</tbody>
</table>
### Work Engagement

#### Table 1. (continued)

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<th>Utrecht Work Engagement Scale (Schaufeli &amp; Bakker, 2003)</th>
<th>Similar item from a long-established scale</th>
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<tbody>
<tr>
<td>I can continue working for very long periods at a time. (Vigor 4)</td>
<td>Job involvement (JIS; Lodahl &amp; Kejner): I’ll stay overtime to finish a job, even if I’m not paid for it; I usually show up for work a little early</td>
</tr>
<tr>
<td>At my job, I am very resilient mentally. (Vigor 5)</td>
<td>Positive affect (PANAS; Watson et al.): strong, determined</td>
</tr>
<tr>
<td>At my work, I always persevere, even when things do not go well. (Vigor 6)</td>
<td>Job affect (JAS; Burke et al.): strong</td>
</tr>
<tr>
<td>Organizational commitment (OCQ; Mowday et al.): I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful; It would take very little change in my present circumstances to cause me to leave this organization. There’s not much to be gained by sticking with this organization indefinitely.</td>
<td></td>
</tr>
</tbody>
</table>

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Reverse scored. OCS = organizational commitment scale; OJS = overall job satisfaction scale; JAS = job affect scale; PANAS = positive and negative affect schedule; OCQ = organizational commitment questionnaire; JIS = job involvement scale; WIQ = work involvement questionnaire; JIQ = job involvement questionnaire.
Work Engagement

Items from the most popular measure of work engagement (UWES) appear to be sampled from these content domains:

- Job satisfaction/job affect
- Organizational commitment
- Job involvement
Higher-Order Job Attitude Factor, or ‘A-factor’

“Attitude-Engagement Model”

Newman, Joseph, & Hulin, 2010 (harmonic mean $N = 2,231$; RMSEA=.067; TLI=.94; CFI=.96; SRMR=.044); adapted from Harrison, Newman, & Roth, 2006
“Attitude-Engagement Model”

Newman, Joseph, & Hulin, 2010 (harmonic mean $N = 4,341$; RMSEA=.105; TLI=.96; CFI=.96; SRMR=.039); adapted from Harrison, Newman, & Roth, 2006
Introduction of Work Engagement Measure (UWES)


- Acknowledged Kahn (1990; 1992)
- Defined as “‘opposite’ of burnout” (p. 71)
- Introduced 3 dimensions: vigor, dedication, absorption
- Wrote 24 new items
- Collected data from 314 university students & 614 employees (all Spanish)
Introduction of Work Engagement Measure (UWES)

- Also administered 16-item burnout scale (MBI-GS; Schaufeli et al., 1996)
- Dropped 7 of 24 items to optimize subscale α’s
- Multigroup CFA on both samples together
  - 1 factor model: RMSEA=0.07; TLI=0.83; CFI=0.85
  - 3 factor model: RMSEA=0.05; TLI=0.88; CFI=0.88
- Latent factor corr’s varied from 0.8 to 1.0
- Engagement-burnout corr = -0.90 & -0.70 (2 samples)
Introduction of Work Engagement Measure (UWES)

How was potential redundancy addressed?

• **Job satisfaction**: not mentioned (ignored)

• **Job affect**: referred to engagement as an “affective-cognitive state” (p. 74); described the dedication facet as, “not only referring to a particular cognitive or belief state but including the affective dimension as well” (p. 75)

• **Org. commitment**: not mentioned (ignored)
Introduction of Work Engagement Measure (UWES)

- **Job involvement**: explicitly considered (but disavowed):

  “Instead of involvement we prefer to use the term dedication. Although, involvement – like dedication (see above) – is usually defined in terms of psychological identification with one’s work or one’s job (Kanungo, 1982; Lawler and Hall, 1970), whereby the latter goes one step beyond, both quantitatively as well as qualitatively. In a qualitative sense, dedication refers to a particularly strong involvement that goes one step further than the usual level of identification. In a qualitative sense, dedication has a wider scope by not only referring to a particular cognitive or belief state but including the affective dimension as well.” (pp. 74-75)
Core Self-Evaluations Measurement


- Judge et al. (1997; 1998) noted 4 fundamental evaluations about oneself that commonly predict job satisfaction, and specified that they reflect an underlying factor
- Defined as “attitudes toward the self” (p. 19)
- Used established measures where available:
  - Self-esteem (Rosenberg, 1965);
  - Neuroticism (Eysenck & Eysenck, 1968);
  - Locus of control (Levenson, 1981);
  - Self-efficacy (new 8-item measure)
Core Self-Evaluations Measurement


• CFA on 4 scale scores: self-esteem, self-efficacy, neuroticism, locus of control
  (3 samples, self- and peer-ratings):
  – All fit indices high (mean CFI = .99),
  – All factor loadings high (mean $\lambda = .72$)
Core Self-Evaluations
Measurement

• Erez & Judge (2001)
  – Estimated 2\textsuperscript{nd}-order factor model (CFA) that specified CSE as 2\textsuperscript{nd}-order factor (RMSEA=.09; TLI=.91)
  – ‘Usefulness analysis’ (Darington, 1990) showed
    (a) CSE factor predicted motivation & performance beyond each lower-order trait alone
    (b) Each lower-order trait did not predict beyond CSE
  – Specific validity analysis (Ree et al., 1994):
    • Regress motivation & performance onto 1\textsuperscript{st} Principal Component & the remaining orthogonal principal components (1\textsuperscript{st} principal component was statistically significant, others were not)
Core Self-Evaluations

Measurement

- Core Self-Evaluations is a compound construct formed by mixing together items measuring self-esteem, self-efficacy, neuroticism, and locus of control:
  - 4 lower-order traits load onto higher-order factor
  - Compound construct predicts outcomes beyond each lower-order constituent construct alone
How was potential redundancy addressed?

- **Self-esteem**: explicitly modeled (acknowledged)
- **Self-efficacy**: explicitly modeled (acknowledged)
- **Neuroticism**: explicitly modeled (acknowledged)
- **Locus of Control**: explicitly modeled (acknowledged)
Org. Commitment Measure (OCQ)


- Used data from 9 studies, 2,563 employees (dating back to Porter et al., 1974)
- Defined OC as “relative strength of an individual’s identification with and involvement in a particular organization” (p. 226)
- “reflecting a general affective response to the organization as a whole” (p. 226)
Org. Commitment Measure (OCQ)

- Described 3 dimensions: value congruence, willingness to exert effort, desire to remain
- Wrote 15 items
- EFA (on 6 samples) interpreted to suggest 1 factor (eigenvalues > 1.0) for the OCQ.

Bozeman & Perrewe (2001) gave CFA evidence that OCQ measures 2, strongly-related factors:
- **Turnover intentions** (6 items)
- **Value congruence** (9 items)
Org. Commitment Measure (OCQ)

- Turnover intentions/cognitions (6 items):
  - … accept almost any job assignment in order to keep working for this org.
  - … could just as well be working at a different org.
  - … take very little … to cause me to leave this org.
  - … to be gained by sticking w. this org. indefinitely
  - … best of all possible orgs. to work for
  - Deciding to work for this org. was a definite mistake on my part.
Org. Commitment Measure (OCQ)

• **Value congruence** (9 items) items on OCQ can be loosely interpreted as reflecting job satisfaction.

• Locke (1969) defined **job satisfaction** as, “the pleasurable emotional state resulting from the appraisal of one’s job as achieving or facilitating the achievement of one’s job values” (p. 316)
Org. Commitment Measure (OCQ)

- Example value congruence items from OCQ:
  - ... great organization to work for
  - ... my values and org.'s are very similar
  - ... proud to tell others I’m part of this org.
  - ... org. really inspires the very best in me
  - ... extremely glad that I chose this org.
  - ... agree with this org.'s policies

Tentatively supports interpretation that OCQ measures combination of turnover intentions and job satisfaction [org. satisfaction]
OCQ items (from Mowday, Steers, & Porter, 1979)

1. I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.
2. I talk up this organization to my friends as a great organization to work for.
3. I feel very little loyalty to this organization. (RS)
4. I would accept almost any type of job assignment in order to keep working for this organization.
5. I find that my values and the organization's values are very similar.
6. I am proud to tell others that I am part of this organization.
7. I could just as well be working for a different organization as long as the type of work was similar. (RS)
8. This organization really inspires the very best in me in the way of job performance.
9. It would take very little change in my present circumstances to cause me to leave this organization. (RS)
10. I am extremely glad that I chose this organization to work for over others I was considering at the time I joined.
11. There's not much to be gained by sticking with this organization indefinitely. (RS)
12. Often, I find it difficult to agree with this organization's policies on important matters relating to its employees. (RS)
13. I really care about the fate of this organization.
14. For me, this is the best of all possible organizations for which to work.
15. Deciding to work for this organization was a definite mistake on my part. (RS)
Org. Commitment Measure (OCQ)


How was potential redundancy addressed?

- **Turnover intentions**: Directly measured, shown to correlate with OCQ (mean $r = -.48$); interpreted as evidence of *convergent validity*

- **Job satisfaction**: Directly measured, shown to correlate with OCQ (mean $r = .57$); interpreted as evidence of *discriminant validity*
Org. Commitment Measure (OCQ)

• **Job satisfaction**: Directly measured, shown to correlate with OCQ (mean $r = .57$); interpreted as evidence of discriminant validity

• “The magnitude of these correlations, however, are clearly higher than might be desired to demonstrate conclusively discriminant validity, particularly when it is considered that correlations were calculated among instruments of less than perfect reliability,” (p. 237).
Org. Commitment Measure (OCQ)

- **Job satisfaction**: Disavowed on conceptual grounds

“As an attitude, commitment differs form the concept of job satisfaction in several ways. To begin with, commitment as a construct is more global, reflecting a general affective response to the organization as a whole. Job satisfaction, on the other hand, reflects one’s responses either to one’s job or to certain aspects of one’s job. Hence, commitment emphasizes attachment to the employing organization, including its goals and values, while satisfaction emphasizes the specific task environment … In addition, organizational commitment should be somewhat more stable over time than job satisfaction,” (p. 226).
Org. Commitment Measure (OCQ)

• Job satisfaction: Showed that OCQ predicts turnover, better than job satisfaction does

  - but Mowday et al. (1979) noted Hom, Katerberg, & Hulin’s (1978) finding that commitment does not predict turnover better than job satisfaction does, after turnover intentions were controlled
Org. Commitment Measure (OCQ)

- Taken together, results are consistent with the viewpoint that organizational commitment is a compound construct formed by mixing together value congruence/job satisfaction (9 items) and turnover intentions (6 items):
  - Convergent validity with turnover intentions
  - Even higher correlations with job satisfaction
  - Better predictive validity for turnover behavior than that found for job satisfaction alone
  - No predictive advantage over job satisfaction alone when turnover intentions are partialled out
Other Examples

• **Work withdrawal** is a compound construct formed by mixing together measures of absenteeism, lateness, and break-taking (Hanisch & Hulin, 1990; Lehman & Simpson, 1992)

• **Mixed Emotional Intelligence** is a compound construct formed by mixing together measures of self-efficacy, emotional stability, extraversion, self-rated performance, conscientiousness, agreeableness, & ability EI (Joseph, Jin, Newman, & O’Boyle, 2015; de Raad, 2005)
Algebra of Composites

• If I combine multiple variables ($x$'s) into an additive composite, I can calculate the correlation between that composite and an external variable ($y$):

\[
 r_{\text{composite}} = \frac{\bar{r}_{y,x_i}}{\sqrt{1 + (j - 1)\bar{r}_{x_i,x_j}}}/j
\]

(Nunnally, 1978)
Algebra of Composites

\[ r_{\text{composite}} = \frac{\bar{r}_{y,x_i}}{\sqrt{1 + (j - 1)\bar{r}_{x_i,x_j}} / j} \]

- I can use this formula to calculate the correlation between a new compound construct and an external variable \( y \), based on known correlations among the constituent constructs \( x \)'s and \( y \).
Algebra of Composites

• Consider compound construct C, created by combining 2 compound constructs (A + B)

\[ r_{yC} = \frac{j_a r_{YA} \sqrt{a'} + j_b r_{YB} \sqrt{b'}}{\sqrt{j_a^2 a' + j_b^2 b' + 2j_a j_b r_{AB} \sqrt{a'b'}}} \]

• \( j_a = \# \) items sampled from construct A
• \( r_{AB} = \) correlation between construct A and construct B
• Let \( a' = \left[ 1 + (j_a - 1)\bar{r}_{a_i,a_j} \right]/j_a \)
Algebra Example:

- $C_{\text{commit}} = 6A_{\text{turnover_intent}} + 9B_{\text{jobsat}}$
  
  (6 items from turnover intentions, 9 items from job satisfaction)

- $r_{\text{commit,turnover}} =$?
Algebra Example:

• $r_{commit,turnover} = ?$

• Assume we know correlations involving constituent constructs (Tett & Meyer, 1993, p. 271):
  - $r_{turnover_intent, jobsat} = -.48$
  - $r_{turnover_intent, turnover} = .28$
  - $r_{jobsat, turnover} = -.14$
  - $\bar{r}_{a_i,a_j} = \bar{r}_{b_i,b_j} = .4$

(estimated from $\alpha$; Meyer et al., 2002, p. 26)
Algebra Example:

- $r_{commit, turnover} = ?$

\[
r_{yc} = \frac{j_a r_{YA} \sqrt{a'} + j_b r_{YB} \sqrt{b'}}{\sqrt{j_a^2 a' + j_b^2 b' + 2 j_a j_b r_{AB} \sqrt{a'b'}}}
\]

\[
= \frac{6(0.28) \sqrt{\frac{[1+(6-1)4]}{6}} + 9(0.14) \sqrt{\frac{[1+(9-1)4]}{9}}}{\sqrt{6^2 \frac{[1+(6-1)4]}{6^2} + 9^2 \frac{[1+(9-1)4]}{9^2} + 2(6)(9)(0.48) \sqrt{\frac{[1+(6-1)4][1+(9-1)4]}{6 \cdot 9}}}}
\]

\[
= 0.23
\]
Algebra Example:

- Estimated $\hat{r}_{commit,turnover} = -.23$
  (based on formula)

- Actual $r_{commit,turnover} = -.24$
  (empirical estimate from meta-analysis of OCQ & turnover; Tett & Meyer, 1993, p. 274, $k=15; N=2,973$)
Algebra Example:

- Estimated $\hat{r}_{commit,turnover} = -0.23$
  (based on formula)

- Actual $r_{commit,turnover} = -0.24$
  (empirical estimate from meta-analysis of OCQ & turnover; Tett & Meyer, 1993, p. 274, $k = 15; N = 2,973$)
Algebra of Composites

• Correlation between compound construct (OCQ) and external variable (turnover), can already be estimated, based on known correlations involving constituent constructs.

• Position of a new compound construct in its nomological network can already be determined based on the older constituent constructs and the math alone (i.e., it is not a new substantive phenomenon; it’s a new mix of old phenomena)
(Point #1) A new compound construct is nothing more than a mechanical sum of its parts.

Forming a new compound construct does not reflect new empirical knowledge, but it can reflect a new configuration of old empirical knowledge (which can be a contribution).
Algebra of Composites

\[ r_{yc} = \frac{j_a r_{YA} \sqrt{a'} + j_b r_{YB} \sqrt{b'}}{\sqrt{j_a^2 a' + j_b^2 b' + 2j_a j_b r_{AB} \sqrt{a'b'}}} \]

• (Point #2) Composite correlations with \( y \) are typically larger than the average of constituent construct correlations with \( y \).

• In other words, compound constructs tend to exhibit higher predictive utility.
Algebra of Composites

- **Compound constructs** often exhibit higher predictive utility than their constituent constructs:
  - **Core self-evaluations** (with job perf.; Erez & Judge, 2001)
    - **Compound** $r = .44$; **Mean Constituent** $r = .27$
  - **Work engagement/A-factor** (with behavioral engagement; Harrison, Newman, & Roth, 2006; Newman, Joseph & Hulin, 2010)
    - **Compound** $r = .51$; **Mean Constituent** $r = .37$
  - **Emotional intelligence** (with job perf.; Joseph et al., 2015)
    - **Compound** $r = .29$; **Mean Constituent** $r = .22$
Algebra of Composites

- (Point #3): Compound constructs are a potentially attractive approach for managing theoretical redundancies and empirical overlaps among existing constructs.
  - Can acknowledge and leverage past research (without relabeling/reinventing the wheel)
  - Parsimony
Seven Cardinal Construct Domains

• If scholars sometimes recycle old constituent constructs, are there particular construct domains that tend to get sampled over and over again?

• What are the classic ingredients used in construct mixology in OB/HR?
Seven Cardinal Construct Domains

• Attempt to identify ‘Most Influential Constructs in OB/HR’:
  – Descriptive, retrospective account of ‘what we’ve been studying.’ Note: ‘most influential’ does not imply ‘most important’.
  – Focus primarily on micro-level constructs traditionally measured via surveys
  – Wanted a list of 30-or-so constructs that have been most influential in OB and HR scholarship over past 30 years, in terms of how often the constructs are featured in empirical research
Seven Cardinal Construct Domains

• Attempt to identify ‘Most Influential Constructs in OB/HR’:
  – Searched subject indices of popular textbooks in OB and HR (over 7,000 entries)
  – In recent 5-year period in AMJ and JAP, listed all constructs measured (over 500 journal articles)
  – Narrowed list to 137 candidate constructs that had any chance of being in the top 30 ‘most influential’
Seven Cardinal Construct Domains

- Attempt to identify ‘Most Influential Constructs in OB/HR’:
  - Citation Counts in AMJ: Searched 137 combinations of construct keywords, to see how many AMJ articles had cited each construct over the past 30 years
  - Surveyed all micro AMJ Editorial Board members ($N = 47$ responses; 36% response rate)
    “Which 10 (or more) of the constructs below do you think have been the most influential over the last 30 years?” and “Does the list of constructs below appear comprehensive?”
Seven Cardinal Construct Domains

- Attempt to identify ‘Most Influential Constructs in OB/HR’:
  - # of Citations in AMJ (past 30 years) and # Nominations from AMJ Editorial were correlated \( (r = .71) \)
  - To make the short list, we included any construct that met at least one of these criteria:
    - Received # AMJ Citations > 1 S.D. above mean (> 191)
    - Received 9 or more ‘most influential’ nominations from AMJ Editorial Board
  - Identified 26 ‘most influential’ constructs
“Most Influential Constructs in OB/HR”

(Newman et al., 2016)
Seven Cardinal Construct Domains

• From 26 ‘Most Influential Constructs in OB/HR’, how many underlying broad construct domains are there?

• From inspecting meta-analytic correlations among constructs (where available), tentatively identified 7 principal content domains (with large factor loadings of lower-order concepts onto the 7 broad domains)

• 19 of the 26 ‘most influential’ constructs could be mapped to the 7 broad domains
Seven Cardinal Construct Domains in OB/HR

Newman, Harrison, Carpenter, & Rariden, 2016
Seven Cardinal Construct Domains

• In the field of OB/HR, there exist at least seven broad construct domains than have been very influential in past research.

• When introducing a new construct, researchers should take notice of whether it is drawn from one or more of these domains (acknowledge redundancy, conceptual and empirical overlap).
Continuum of Mixology Practices

- **IGNORE**: Fail to mention that the constituent constructs exist.
- **DISAVOW**: Mention that the constituent constructs exist, but claim the compound construct has **discriminant validity**.
- **ACKNOWLEDGE**: Treat the constituent constructs as **constituent constructs**.
  - Theoretical or Rhetorical Argument
  - Predictive Utility/Incremental Validity
  - Factor Analysis

- **Factor Analysis**
  - Algebra of Composites: Estimate rel’ns w/ external variables
  - Greater predictive utility
- **Consider Cardinal Construct Domains**

Scientifically Stagnant → Continuum of Mixology Practices → Scientifically Progressive
Assumptions & Limitations

- Assumes no major item context effects (Harrison & McLaughlin, 1993)

- Correlations and hierarchical factor models can be biased by common method variance and halo error (Johnson, Rosen, & Djurdjevic, 2011; Viswesvaran, Schmidt, & Ones, 2005)

- Positive manifold can sometimes be interpreted as signaling a causal sequence, instead of a higher-order factor (Joseph & Newman, 2010)
Conclusions

• Do not ignore constituent constructs. A compound construct mixture can be new (and predict outcomes well), even if it comprises 100% recycled content.

• Resolve disagreements using data and factor analysis, not just rhetorical arguments, theoretical distinctions, and incremental validity.

• Past findings on constituent constructs should be discussed, using replication language. Don’t ignore seven cardinal construct domains.
Construct Mixology

Thank you.