Diagnostic Measure of Procrastination

Dr. Piers Steel
Scientific Stages of Development

1. **Identification and Measurement**: What is it and how can we identify it.

2. **Prediction and Description**: What is it associated with, how is it expressed, and what causes it.

3. **Prognosis and Diagnosis**: For specific individuals or situations, what are the causes and expected outcomes.

4. **Treatment and Control**: How can we best increase or decrease it under various conditions.
Procrastination Science is Progressing

• But we are almost finished laying the foundation
  – Still some fine-tuning what procrastination is and how to measure it

We have also made good progress towards prediction and description
The Field is Converging

Theoretical Convergence

INTREGRATING THEORIES OF MOTIVATION
PERSI STEEL
University of Calgary

CONNELL STEEL
University of Stirling

Program toward understanding human behavior has been facilitated by discipline-specific theorizing, dividing our efforts. Fortunately, these separate endeavors are converging and can be effectively translated. Together, the empirical and theoretical, they converge, enabling us to understand the entire spectrum of human behavior. This integration of human behavior is a large step toward solving many of our current challenges.

The field of economics, decision making, sociology, and psychology share a common desire to understand our human nature—both in our essential nature, disposition, or temperament. This extensive, multidisciplinary interest in explaining who we are reflects the enormous contributions of the scientists. In studies on behavior, theories of human nature have been used to explain relationships, lifestyles, and government—often successfully when tested on familiar subjects. On a smaller scale, theories of behavior, treatment, compensation, and selection are all dependent on theories of human behavior. Even in international studies, requiring knowledge of human behavior, each of these individual theories is part of a larger whole—human nature.

Ironically, our understanding of behavior has been impeded by the very same efforts of others. These efforts are to be understood within the different theories. But only one of these fields has a particular interpretation, but these are simple subcategories within each discipline. Psychology, for example, has the traditions of self-regulation, the development, and personality, with its own organizations, structures, and systems. These subcategories necessarily divide our efforts, limiting the domain to which we can apply them. This problem has been recognized and examined by many prominent researchers such as Bem, Duckworth, and others. The problem has recently been acknowledged and examined by many prominent researchers such as Bem, Duckworth, and others.

Empirical Convergence

The Nature of Procrastination: A Meta-Analytic and Theoretical Review
PERSI STEEL
University of Calgary

Procrastination is a prevalent and potentially harmful behavior that is not entirely understood. Because the research on procrastination, decision making, and empirical work is scattered, drawing upon conditional, decision making, and procrastination literature, a meta-analysis of procrastination is presented. The meta-analysis of procrastination is divided into two main sections: empirical and theoretical. The empirical section includes a review of published research, including self-report measures, procrastination, and situational factors. The theoretical section includes a review of published research, including self-regulation, decision making, and procrastination.

In conclusion, procrastination is a prevalent and potentially harmful behavior that is not entirely understood. Because the research on procrastination, decision making, and empirical work is scattered, drawing upon conditional, decision making, and procrastination literature, a meta-analysis of procrastination is presented. The meta-analysis of procrastination is divided into two main sections: empirical and theoretical. The empirical section includes a review of published research, including self-report measures, procrastination, and situational factors. The theoretical section includes a review of published research, including self-regulation, decision making, and procrastination.

Keywords: procrastination, motivational factor, psychological disorder, self-regulation, anxiety, depression, stress, self-efficacy, self-esteem, self-control, self-regulation, decision making, procrastination, meta-analysis.
Motivation and the Big Three

1. **Expectancy**: The Power of Belief & Positive Thinking

2. **Value**: The Power of Desire

3. **Delay**: The Power of Immediacy & Planning
Ceci n’est pas une pipe.
We Are of Two Minds

System 1: Limbic System

System 2: Prefrontal Cortex
Temptations (Immediate Alternatives)

Motivation

Present

Future

Deadline

Time

Low

High

Average Joe

Time Sensitive Tom
What Happens If We Change Expectancy or Value?

- **Time Sensitive Tom**
- **Average Joe**

Low to High Motivation Over Time:
- **Present**
- **Future**

Deadline Indicator
What We Need to Assess

• **Self-efficacy** tied to effort: Not just that I will succeed, but if I try, then I will succeed
  – “I can overcome difficulties with the necessary effort”

• **Value** tied to tasks, especially tedium or boring: Work isn’t rewarding
  – “My work activities seem pointless.”

• **Impulsiveness** in terms of temporal discounting, not sensation seeking.
  – “I choose smaller but more immediate pleasures over those larger but more delayed.”
A Diagnostic Test Based On This Model

Motivational Diagnostic Test

1. When I put in the hours, I am successful
2. Uninteresting work defeats me
3. I get into jams because I will get entangled by some temporarily delightful activity
4. When I apply myself, I see the results
5. I wish my job was enjoyable
6. I take on new tasks that seem fun at first without thinking through the repercussions
7. If I try hard enough, I will succeed
8. My work activities seem pointless
9. When a temptation is right before me, the craving can be intense
10. I am confident that my efforts will be rewarded
11. Work bores me
12. My actions and words satisfy my short-term pleasures rather than my long-term goals
13. I am persistent and resourceful

14. I lack enthusiasm to follow through with my responsibilities
15. When an attractive diversion comes my way, I am easily swayed
16. Whatever problems come my way, I will eventually rise above them
17. When a task is tedious, again and again I find myself pleasantly daydreaming rather than focusing
18. I have a hard time postponing pleasurable opportunities as they gradually drop up
19. I can overcome difficulties with the necessary effort
20. I don't find my work enjoyable
21. I choose smaller but more immediate pleasures over those larger but more delayed
22. Winning is within my control
23. If an activity is boring, my mind slips off to other diversions
24. It takes a lot for me to delay gratification

To score: add each of the following questions:
Expectancy = 1 + 4 + 7 + 10 + 13 + 15 + 18 + 22
Values = 2 + 5 + 8 + 11 + 14 + 17 + 20 + 23
Delay = 3 + 6 + 9 + 12 + 15 + 10 + 21 + 24
Expectancy Score

1. 8-25  Bottom 20%
2. 26-28
3. 29-31  Middle 20%
4. 32-33
5. 34-40  Top 20%
Value Score

1. 8-20  Bottom 20%
2. 21-24
3. 25-27  Middle 20%
4. 28-31
5. 32-40  Top 20%
Impulsiveness Score

1. 8-22  Bottom 20%
2. 23-26
3. 27-28  Middle 20%
4. 29-31
5. 32-40  Top 20%
Evaluation

- Based on 1082 Internet respondents

<table>
<thead>
<tr>
<th>Scale Reliability</th>
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<tbody>
<tr>
<td>Expectancy</td>
<td>.80</td>
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<tr>
<td>Value</td>
<td>.86</td>
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<tr>
<td>Impulsiveness</td>
<td>.84</td>
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Correlation Matrix

- Used the Irrational Procrastination Scale (Steel, 2010)

<table>
<thead>
<tr>
<th></th>
<th>Procrastination</th>
<th>Expectancy</th>
<th>Value (lack of)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expectancy</td>
<td>-.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value (lack of)</td>
<td>.58</td>
<td>-.31</td>
<td></td>
</tr>
<tr>
<td>Impulsiveness</td>
<td>.63</td>
<td>-.19</td>
<td>.56</td>
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## Regression Analysis

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>$R^2$</th>
<th>Probability</th>
</tr>
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<tbody>
<tr>
<td>Expectancy</td>
<td>.29</td>
<td>.08</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Plus Value</td>
<td>.60</td>
<td>.36</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Plus Impulsiveness</td>
<td>.70</td>
<td>.48</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Expectancy</td>
<td>Value</td>
<td>Impulse</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>If I try hard enough, I will succeed.</td>
<td>.723</td>
<td>-.133</td>
<td>-.002</td>
</tr>
<tr>
<td>When I apply myself, I see the results.</td>
<td>.675</td>
<td>-.055</td>
<td>.044</td>
</tr>
<tr>
<td>Whatever problems come my way, I will eventually rise above them.</td>
<td>.647</td>
<td>-.275</td>
<td>-.220</td>
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<tr>
<td>I can overcome difficulties with the necessary effort.</td>
<td>.631</td>
<td>-.261</td>
<td>-.261</td>
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<tr>
<td>Winning is within my control.</td>
<td>.614</td>
<td>-.164</td>
<td>-.118</td>
</tr>
<tr>
<td>When I put in the hours, I am successful.</td>
<td>.611</td>
<td>-.082</td>
<td>.016</td>
</tr>
<tr>
<td>I am persistent and resourceful.</td>
<td>.530</td>
<td>-.332</td>
<td>-.334</td>
</tr>
<tr>
<td>I am confident that my efforts will be rewarded.</td>
<td>.528</td>
<td>-.381</td>
<td>-.209</td>
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<tr>
<td>I believe that success is matter of when, not if.</td>
<td>.243</td>
<td>-.126</td>
<td>-.004</td>
</tr>
<tr>
<td>Expectancy</td>
<td>Value</td>
<td>Impulse</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>-------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>Work bores me.</td>
<td>-.222</td>
<td>.803</td>
<td>.464</td>
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<tr>
<td>I don't find my work enjoyable.</td>
<td>-.268</td>
<td>.803</td>
<td>.305</td>
</tr>
<tr>
<td>My work activities seem pointless.</td>
<td>-.306</td>
<td>.723</td>
<td>.345</td>
</tr>
<tr>
<td>I wish my job was enjoyable.</td>
<td>-.133</td>
<td>.667</td>
<td>.312</td>
</tr>
<tr>
<td>When a task is tedious, again and again I find myself pleasantly daydreaming rather than focusing.</td>
<td>-.085</td>
<td>.434</td>
<td>.666</td>
</tr>
<tr>
<td>If an activity is boring, my mind slips off onto other diversions.</td>
<td>-.103</td>
<td>.418</td>
<td>.652</td>
</tr>
<tr>
<td>I lack enthusiasm to follow through my responsibilities.</td>
<td>-.260</td>
<td>.560</td>
<td>.569</td>
</tr>
<tr>
<td>If I find a task unpleasant, I don’t have the energy to tackle it.</td>
<td>-.219</td>
<td>.456</td>
<td>.566</td>
</tr>
<tr>
<td>Uninteresting work defeats me.</td>
<td>-.095</td>
<td>.394</td>
<td>.451</td>
</tr>
<tr>
<td>Expectancy</td>
<td>Value</td>
<td>Impulse</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
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<td>---------</td>
<td></td>
</tr>
<tr>
<td>When an attractive diversion comes my way, I am easily swayed.</td>
<td>-.085</td>
<td>.312</td>
<td>.731</td>
</tr>
<tr>
<td>My actions and words satisfy my short-term pleasures rather than my long-term goals.</td>
<td>-.215</td>
<td>.333</td>
<td>.685</td>
</tr>
<tr>
<td>I have a hard time postponing pleasurable opportunities as they gradually crop up.</td>
<td>-.067</td>
<td>.257</td>
<td>.668</td>
</tr>
<tr>
<td>I choose smaller but more immediate pleasures over those larger but more delayed.</td>
<td>-.187</td>
<td>.296</td>
<td>.598</td>
</tr>
<tr>
<td>When a temptation is right before me, the craving can be intense.</td>
<td>-.017</td>
<td>.166</td>
<td>.588</td>
</tr>
<tr>
<td>I get into jams because I will get entranced by some temporarily delightful activity.</td>
<td>-.072</td>
<td>.288</td>
<td>.585</td>
</tr>
<tr>
<td>It takes a lot for me to delay gratification.</td>
<td>.219</td>
<td>-.077</td>
<td>.536</td>
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<tr>
<td>I take on new tasks that seem fun at first without thinking through the repercussions.</td>
<td>.190</td>
<td>-.002</td>
<td>.512</td>
</tr>
<tr>
<td>When I have an unpleasant task, how I react to it is decided on the spur of the moment.</td>
<td>.207</td>
<td>-.079</td>
<td>.459</td>
</tr>
</tbody>
</table>
Refinements

- If we make a pure value scale using just the four non-loading items, reliability is .84, it correlates at .91 with original scale, but we lose a few percents of predictive variance.
- Those cross-loading items provided some unique prediction and so are kept in.
- Dropped lowest loading item for all three scales.
Next Steps

• Having identified the major areas where people need assistance, we can target interventions based on specific weaknesses.

• For example, if someone scores low on the value scale then you would want to focus on this factor.
Time Shifting & Circadian Rhythms

Morning Larks

VS

Evening Owls
Just Four Hours of Peak Energy

- High alertness: 10:00
- Highest testosterone secretion: 10:00
- Bowel movement likely: 08:30
- Melatonin secretion stops: 07:30
- Sharpest rise in blood pressure: 06:45
- Lowest body temperature: 04:30
- Deepest sleep: 02:00
- Noon: 12:00
- Best coordination: 14:30
- Fastest reaction time: 15:30
- Greatest cardiovascular efficiency and muscle strength: 17:00
- 18:00: Highest blood pressure
- 19:00: Highest body temperature
- 21:00: Melatonin secretion starts
- 00:00: Midnight
- 22:30: Bowel movements suppressed
Continue to Refine Diagnostics

• Improved understanding of treatments will improve our diagnostic capability
  – Determine what techniques are already in people’s self-regulatory toolkit
  – Identify which techniques we should focus on providing (e.g., goal setting vs. stimulus control)