Approach Motivation

The theory of Achievement Motivation

Achievement Motivation: history

• Murray’s Explorations in Personality
• McClelland and the Need for Achievement
• Atkinson and theory of risk preference
  – Static
  – Dynamic
• Weiner and attribution theory
• Reinvigoration: Elliot and Thrash

Murray’s Explorations in Personality

• Intense study of small set of subjects from many different perspectives
• Conceptual identification of needs
• Development of Thematic Apperception Test
  – Needs driving perception and production

Need for Achievement

• Desire to approach problems involving challenge and effort
• Joy in success when overcoming obstacles
• Analogous to a hunger
• “The little engine that could”
  – “I think I can, I think I can, I think I can”

McClelland and Need for Achievement

• N-ach and the achievement of nations
• Cultures with a high need for achievement (rather than some other need) will strive to overcome obstacles (other nations?)
  – Greek civilization and Greek literature
  – N-ach in children’s primers and later economic growth
  – Teaching n-ach as a means for development

Issues in measurement

• Projective measurement
  – Can’t trust self reports of motivations
  – Ambiguous stimuli will lead to interpretations in terms of motives
  • Hunger and interpretation of ambiguous slides
  • Achievement and stories
  – “grubby graduate student” versus “professor”
Issues in measurement: II

• Weiner’s 3 points:
  – TAT is the best way to measure motivation
  – TAT is the worst way to measure motivation
  – People who use TAT believe 1, people who do not believe 2

Static theory of risk preference and achievement motivation

• Achievement motivation: the joy of success
• Approach motivation
• Atkinson’s theory of risk preference (1957, 1964)
  – An expectancy value theory of motivation
  – Compared to drive models of Hull, Spence
• Tendency to approach = Value * Expectancy
  Value = Motive * Incentive

Specific model for achievement

• Expectancy = subjective probability of success
• Motive = Individual’s need for achievement
• Incentive = difficulty = 1- probability of success
• Conclusion for achievement motivation
  – Ts = Ms * P_s * (1-P_s)
  – Implies that motivational strength is quadratic function of probability of success

Fear of Failure: the pain of failure

• Fear of failure -- test anxiety?
• Fear of failure and general avoidance motivation
• Specific assumptions for fear of failure
  – Expectancy of Failure = P_f = 1 - P_s
  – Motive to avoid Failure = fear of failure = M_f
  – Incentive to avoid failure = - easiness = - P_s
  – T_f = M_f * (P_f) * (1-P_s)
  – T = (Ms - Md) * (1-P_s) * (Ps)

Resultant Achievement Motivation

• Resultant tendency = tendency to engage in a task for success + tendency to avoid failing (negative) + extrinsic tendencies
  – T_r = T_s + T_f + T_ext
  – T_s = Ms * P_s * (1-P_s) + M_d * (1-P_s) * (-P_s)
  – T_f = (M_s - M_d) * (1-P_s) * (Ps)

Tendency by P_s by M_s and M_s

- Probability of success
- Tendency of success
- Tendency of avoidance
- Tendency of failure
Tests of original theory

- Motivation and risk preference: the ring toss
  - Hamilton
  - Heckhausen
  - Although inverted U, did not peak at .5 difficulty

Motivation, risk preference and persistence under failure

<table>
<thead>
<tr>
<th>Easy (p = .7)</th>
<th>Hard (p = .05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Nach (Low Maf)</td>
<td>6/8</td>
</tr>
<tr>
<td>Low Nach (High Maf)</td>
<td>3/9</td>
</tr>
</tbody>
</table>

Feather, 1964

Revisions to Atkinson Theory

- Raynor and the concept of future orientation
  - Life is not a ring toss - tasks are contingent
  - Probability of success at event, \( P_i = p_1 \cdot p_2 \cdots p_n \)
  - Consider a freshman starting psychology with \( p = .9 \)
    - Job  | tenure | full | grad | MA | PhD |
    - 9 | .81 | .73 | .66 | .59 | .53 | .48 | .43 | .39 |
  - Tendency to engage in a task = sum of tendencies for tasks contingent upon that task
    \[ T_{\text{rn}} = \sum (M_s - M_{\text{af}}) \cdot P_{\text{sic}} \cdot (1 - P_{\text{sic}}) + \text{Test} \]

Tendency by Ps by Ms and Maf: one trial

Contingent Paths: Preference as a function of probability 3 trials

Contingent Paths: Total Tendency for 3 trial path
Contingent paths: Evidence for Raynor’s hypothesis

<table>
<thead>
<tr>
<th>Study</th>
<th>Motive to achieve</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Importance to future</td>
<td>2.9</td>
<td>3.4</td>
</tr>
<tr>
<td>Study</td>
<td>High (major)</td>
<td>3.0</td>
<td>2.6</td>
</tr>
<tr>
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Implications of contingent paths

- High achievers should set distant goals
- Low achievers should set immediate goals
- Preferences for task difficulty should vary as a function of number of outcomes contingent upon particular task outcome

Further explorations: curvilinear models

- Does task performance vary as a curvilinear function of task difficulty?
- Is it overachievement or under performance?

Class Performance and Test Scores: A simple model

- Assume variation in ability 1-5
- Assume motivation in class varies 1-4
- Assume motivation in test situation = resting (class) + 1
- Assume efficiency varies as inverted U of motivation (max at 3)
- Assume test performance = ability * efficiency
- Assume cumulative performance = ability * efficiency * time spent

Class and Test Performance

<table>
<thead>
<tr>
<th>Motivation in class</th>
<th>Efficiency</th>
<th>Test performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>2</td>
<td>4</td>
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<td>9</td>
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<td>5</td>
<td>10</td>
<td>11</td>
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Test and Class Performance

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Dynamic theory of achievement

- Recognition of inertial properties of motivation
  - Motives persist until satisfied
  - Lewin and the “Herr Ober effect”
  - Zeigarnik and the motive for completion
    - Completed tasks
    - Uncompleted tasks

Trial to trial carryover effects

- Weiner and Schneider carryover and interpretation of success and failure
  - Success and failure on verbal learning tasks
  - Anxiety inhibits performance on hard tasks
  - Anxiety facilitates performance on easy task
  - $T_{res} = T_{app} - T_{avoid}$

Weiner and Schneider, 1971

Drive vs. Cognitive Theory

- Prior work using Drive Theory had suggested that high anxiety interferes with difficult but facilitates easy tasks.
  - (Very well established result with >25 replications)
  - Based upon Drive theory interpretation that Anxiety increases drive and that the Evoked response is a function of Drive X Habit
  - Assume that Easy $\Rightarrow$ Correct Response is dominant, Hard, $\Rightarrow$ incorrect Response is dominant
  - Typically use serial anticipation

Drive Theory Predictions

$\text{sEr} = \text{sHr} \times (\text{D} + \text{K})$

Weiner and Schneider, 1971

- Task: Learn 13 CVC trigrams
  - Easy List: high between item differentiation
    e.g. PAK, BIM, MOT
  - Difficult list: low between item differentiation
    e.g. HOV, VOV, RIV, MIV
  - Lists presented as serial anticipation (implicit feedback?)
  - Subjects were high and low resultant Achievement Motivation (Nach - Nat)
  - Feedback - list is (easy/hard) you are doing better/worse than others
Locke and Goal Setting

- Thorough review of goal setting effects:
  - The harder the goal, the higher the output
  - Hard tasks lead to more effort than easy tasks
- This is inconsistent with Achievement motivation theory that effort is greatest for moderately difficult tasks

Steps towards dynamics

- Effort on trial 1: $Ms-Ma*(Ps)*(1-Ps)$
- Effort on Trial 3 is a function of outcome of trial 2:
  - If success on trial 2, then effort $T3 = T1$
  - If failure on trial 2, then motivation from trial 2 carries over to trial 3: Effort $T3 = T3 + carryover$
  - Assume perfect carryover $T3 = T1*p + 2T1*(1-p)$

Revelle and Michaels: steps towards dynamics

- How to reconcile the simple try harder the harder the problem (goal setting, see Locke) model with Atkinson model
- Hard tasks take longer to complete and if there is carryover from trial to trial, then motivation should accumulate

Expected Effort as a function of trial and probability of success

<table>
<thead>
<tr>
<th>Trial 1</th>
<th>T1=p*(1-p)</th>
<th>p(success)=p</th>
<th>P(failure)=(1-p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial 2</td>
<td>T1</td>
<td>2 * T1</td>
<td></td>
</tr>
<tr>
<td>outcome</td>
<td>p(s)=p^2</td>
<td>f=s*(1-p)</td>
<td>S=(1-p)^2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F=(1-p)^2</td>
<td></td>
</tr>
<tr>
<td>Trial 3</td>
<td>T1</td>
<td>3 * T1</td>
<td>T1</td>
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Carryover (3 trials)
Perfect carryover 1-3 trials

What if there is less than perfect carry over from trial to trial?
- Motivation carries over from trial to trial, but some effort is expended so there is not perfect carryover.
- Consider 90, 80 and 70% carryover

Effort and consummation repeated trials

Dynamics of Action: Approach Atkinson and Birch, 1970
- Action Tendencies as latent needs
- Instigating forces -- situational stimulation and individual sensitivities
- Consummatory forces -- need satisfaction
- Change in action tendencies = f(instigating forces - consummatory forces)

Dynamics of Action
Atkinson and Birch, 1970
- Action Tendencies increase as a function of instigating forces, decrease as a function of action.
  - $dT = F$ (if not ongoing)
  - $dT = F - cT$ (if ongoing)
  - Stable state occurs when $dT = 0 \iff T=F/c$
- Actions with greatest action tendency will occur

Action tendencies over time
$F=1$ or $2$, $c=.1$ or $.2$
A dynamic dinner party

Incompatible actions over time
Lagged consummation

Incompatible Action tendencies
Ongoing decays

Incompatible actions over time,
the problem of “chatter”

Avoidance and Inhibitory
Motivation -- Negaction

- Negaction tendencies inhibit behavior
- Inhibitory forces increase negation
- Resistance forces decrease negation
- $Dn=I-rN \iff N \rightarrow I/r$ at limit

Inhibition and resultant action
tendencies

- Resultant action tendency $= T - N$
- Resultant action tendency will grow if not ongoing
- Example of bottled up action tendencies
  - A classroom with an authoritarian teacher
    - Strong inhibitory forces lower $Tr$ but not $T$
    - Release of inhibition releases “bottled up action tendency”
Inhibition and Delay of onset

The effect of "bottled up" action tendencies

Personality as rates of change in states

- What is stable is how rapidly one changes
- Sociability as rate of becoming sociable
- Anxiety as rate of change of becoming anxious
- Intelligence as rate of change in problem space
- Need achievement as rate of growth in approach motivation when faced with achievement goals

Personality as rates of change

- Growth rates, decay rates, inhibitory strengths
- Growth of tendency when stimulated
  - \( dTa = \) personality x situation
- Decay of \( Ta \) when ongoing
  - Adaptation rate?
- Strength of inhibitory processes

Revised Dynamics of Action

- Cues
- Action Tendencies
- Actions
- Cues elicit action Tendencies
- Tendencies strengthen actions
- Actions reduce Tendencies
- Decision rule is mutual inhibition

Cues, Tendencies, Action

Cues, Tendencies, Action
Compatible actions
Cues, Tendencies, Action
Incompatible actions

Computer simulations as formal theory

- Theory as a system of differential equations
- Simulations in terms of difference equations
- Predictions are consequences of the model and are not always obvious
- Computer simulations of the CTA model
  - Dynamic variables

Additional alternative formulations

- General recognition of two motivations, two types of behaviors, two outcomes
- Achievement motivation and approach
- Avoidance Motivation and withdrawal
- Promotion focus and approach
- Prevention focus and withdrawal
- Joy of gain, pain of loss

Attributions and cognition

- Information gained by success and failure
  - Success on hard tasks ⇒ high ability
  - Failure on easy tasks ⇒ low ability
- Stability of self estimates of ability
- Stability of estimates of task difficulty
- Tasks as ways of learning vs. ways of performing

 Elliot and Thrash, 2002