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 over coming 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
  - Contrasted 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

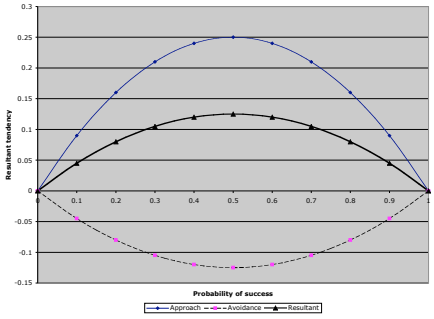
Fear of Failure: the pain of failure

- Fear of failure -- test anxiety?
- Fear of failure and general avoidance motivation
- Specific assumptions for fear of failure
  - Expectancy of Failure = $P_f = 1-_{Ps}$
  - Motive to avoid Failure = fear of failure = M_{af}
  - Incentive to avoid failure = - easiness = - P_s
  - $T_{af} = M_{af} * (P_f) *(-P_s) = M_{af} * (1-P_s) * (-P_s)$

Resultant Achievement Motivation

- Resultant tendency = tendency to engage in a task for success + tendency to avoid failing (negative) + extrinsic tendencies
- $T_r = T_s + T_{af} + T_{ext}$
- $T_r = M_s * P_s * (1-P_s) + M_{af} *(1-P_s) * (-P_s)$
- $T_r = (M_s-M_{af}) * (1-P_s)*(P_s)$

Tendency by Ps by Ms and Maf



Tests of original theory

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

Motivation, risk preference and persistence under failure

	Easy (p = .7)	Hard (p = .05)
High Nach (Low Maf)	6/8	2/9
Low Nach (High Maf)	3/9	6/8

Feather, 1964

Revisions to Atkinson Theory

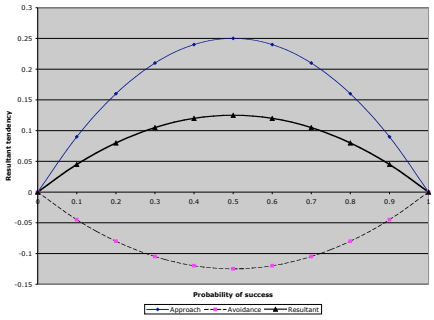
- Raynor and the concept of future orientation
  - Life is not a ring toss - tasks are contingent
  - Probability of success at event$_i$ = $\Pi p_i = p_1 * p_2 \cdots p_n$
  - Consider a freshman starting psychology with p = .9

• 110	201 job	205 tenure	215 full	301	398	grad	MA	PhD
• .9	.81	.73	.66	.59	.53	.48	.43	.39
	.35	.31	.27					

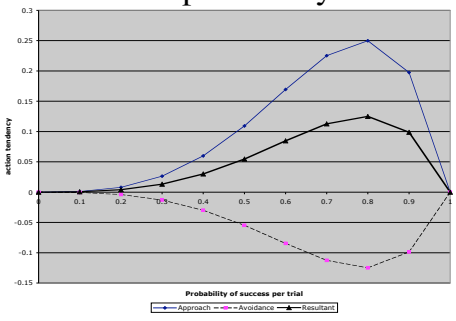
  - Tendency to engage in a task = sum of tendencies for tasks contingent upon that task

$$T_{rn} = \sum(M_s - M_{af}) * P_{sic} * (1 - P_{sic}) + T_{ext}$$

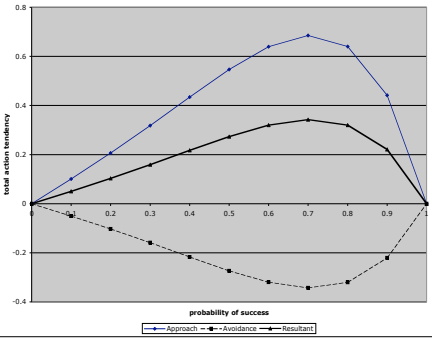
Tendency by Ps by Ms and Maf: one trial



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

Study1		Motive to achieve	Low	High
Importance to future				
	High (major)		2.9	3.4
	Low (distro)		3.0	2.6
Study 2	High		3.0	3.5
	Low		3.4	3.4

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

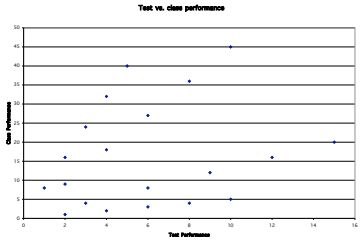
Further explorations: curvilinear models

- 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



Test and Class Performance

Ability	Motivation in Class	Test	Efficiency in class	on test	Time Spent	Performance On test	in class2
1	1	2	1	2	1	2	1
2	1	2	1	2	1	4	2
3	1	2	1	2	1	6	3
4	1	2	1	2	1	8	4
5	1	2	1	2	1	10	5
1	2	3	2	3	2	3	4
2	2	3	2	3	2	6	8
3	2	3	2	3	2	9	12
4	2	3	2	3	2	12	16
5	2	3	2	3	2	15	20
1	3	4	3	2	3	2	9
2	3	4	3	2	3	4	18
3	3	4	3	2	3	6	27
4	3	4	3	2	3	8	36
5	3	4	3	2	3	10	45
1	4	5	2	1	4	1	8
2	4	5	2	1	4	2	16
3	4	5	2	1	4	3	24
4	4	5	2	1	4	4	32
5	4	5	2	1	4	5	40

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

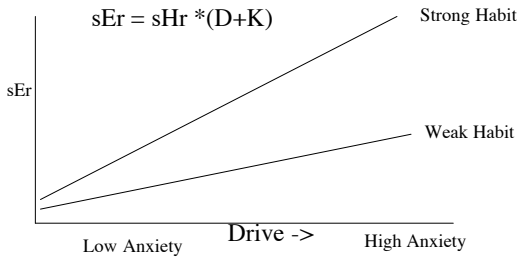
Trial to trial carryover effects

- 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 => Correct Response is dominant, Hard, => incorrect Response is dominant
  - Typically use serial anticipation

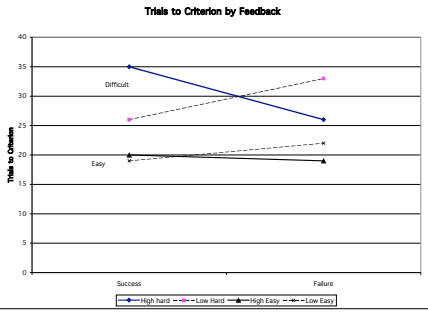
Drive Theory Predictions



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 - Naf)
  Feedback - list is (easy/hard) you are doing better/worse than others

Weiner and Schneider, 1971



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

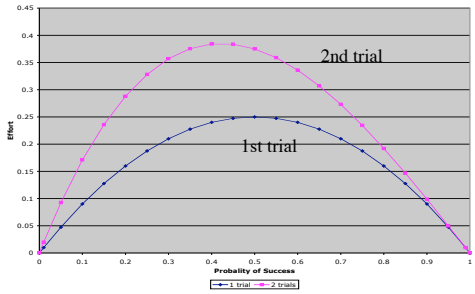
Revelle and Michaels: steps towards dynamics

- 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

Steps towards dynamics

- Effort on trial 1: Ms-Maf*(Ps)*(1-Ps)
- Effort on Trial 2 is a function of outcome of trial 1:
  - If success on trial 1, then effort T2 = T1
  - If failure on trial 2, then motivation from trial 1 carries over to trial 2: Effort T2 = T1 + carryover
  - Assume perfect carryover T2 = T1*p + 2T1*(1-p)

Expected Effort as a function of trial and probability of success



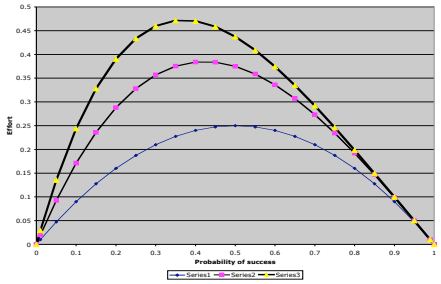
Steps towards dynamics

- Effort on trial 1: Ms-Maf*(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

Carryover (3 trials)

Trial 1		T1=p*(1-p)			
outcome		p(success)=p		P(failure)=(1-p)	
Trial 2		T1		2* T1	
outcome		$p(s)=p^2$	f=p*(1-p)	S=(1-p)*p	F= $(1-p)^2$
Trial 3		T1	2* T1	T1	3* T1

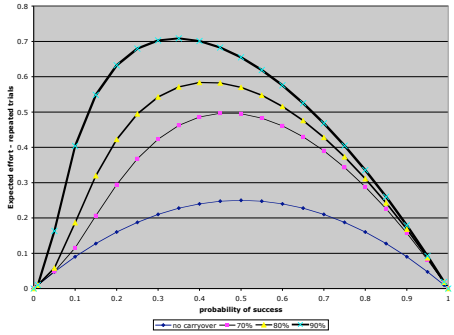
Perfect carryover 1-3 trials



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



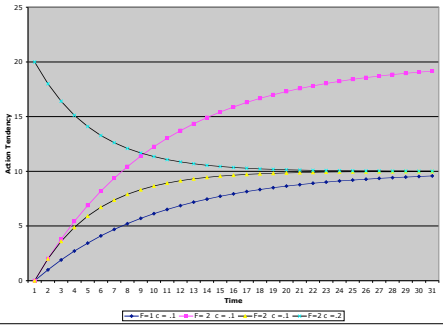
Dynamics of Action: Approach Atkinson and Birch, 1970

- 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)

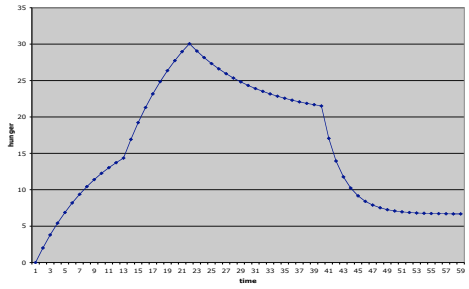
Dynamics of Action Atkinson and Birch, 1970

- 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 <=> T=F/c
- Actions with greatest action tendency will occur

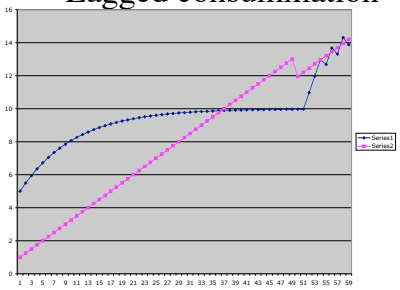
Action tendencies over time F=1 or 2, c = .1 or .2



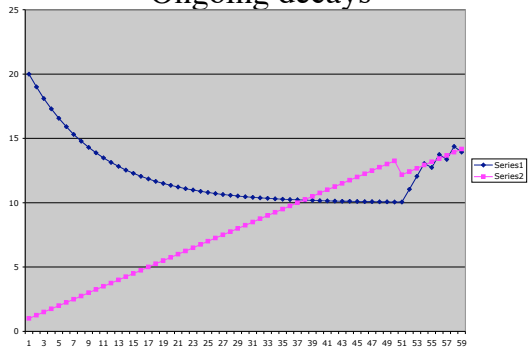
A dynamic dinner party



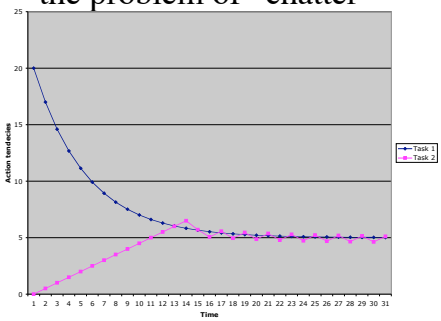
Incompatible actions over time Lagged consummation



Incompatible Action tendencies Ongoing decays



Incompatible actions over time, the problem of "chatter"



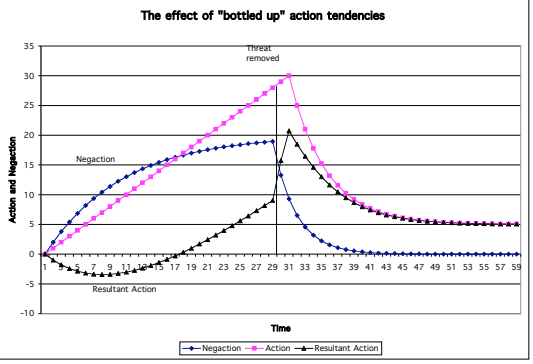
Avoidance and Inhibitory Motivation -- Negaction

- Negaction tendencies inhibit behavior
- Inhibitory forces increase negaction
- Resistance forces decrease negaction
- Dn=I-rN <=> N -> 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



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

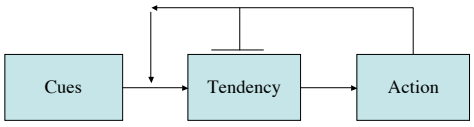
Personality as rates of change

- 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

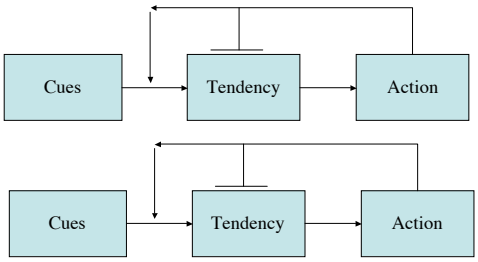
Revised Dynamics of Action

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

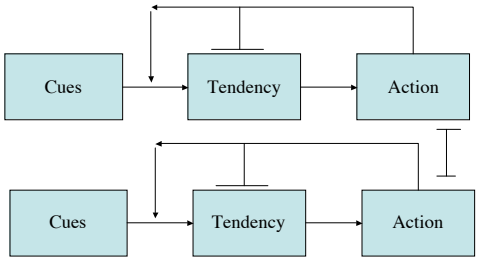
Cues, Tendencies, Action



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