SD 7843: Judgment and Decision Making

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Contents

1 Normative Approach

1.1 Course Introduction

- Reading: Dave Armstrong (A)
- Decision making is broken down into judgment and choice
- Judgment: an evaluation of something that is uncertain
- What makes it difficult? Randomness (aleatory uncertainty), incomplete knowledge (epistemic uncertainty)
- Choice: a selection between alternatives
- What makes it difficult? Tradeoffs among conflicting objectives
- Choice concerns our preferences or how much we value different outcomes
- Judgment concerns our beliefs about the probability of these outcomes
- Most decisions involve a combination of both
- In the short run, quality of outcome = quality of decision + luck
- In the long run, quality of outcome = quality of decision
- It is important to separate decision quality from outcome quality when dealing with hiring/firing, rewards/punishments, learning/prediction
- It is more or less difficult to judge the decision of others depending on the type of world we're in: easy in a highly deterministic world, difficult in a highly random world
- How do we study decision making?
  - Normative - how should decisions be made, how should you reason about a problem?
  - Descriptive - how do people make decisions, how do you reason about a problem?
  - Prescriptive - given the way people actually make decision differs from the way they should, how can we help people make better decisions?
- How Do We Study Decision Making?
  - We have limited cognitive resources
  - We often rely on intuitive short cuts (heuristics) to conserve these resources
  - These short cus are often invoked automatically and without our conscious knowledge
  - Sometimes these short cuts backfires, with predictable results (biases)
  - Goals: improve our own decision making, understand how others make decisions

1.2 Multiple Objectives

- Reading: G&W ch. 1 & 3 (up to section "Theoretical considerations")
- Elements of a Decision Problem
  - Alternatives: available choice options
  - Objectives: what really matters in this decision
  - Attributes: measures of how well/badly well each alternative meets each objective
- Generating a list of objectives: what do you really want/have to have? what do you really want to avoid/cannot accept? what are potential good consequences of this decision that you want to maximize? what are potential bad consequences of this decision that you want to minimize? what makes one alternative better than another?
- Most people concentrate on objectives that are tangible, quantitative and easy to evaluate; but not everything that can be counted counts and not everything that counts can be counted
- Means Objectives: valuable because they contribute towards some larger objective
- Fundamental Objectives: valuable in their own right
- Objectives can be organized into a hierarchy: to move upward in the hierarchy (toward fundamental objectives) - why is this important?; to move downward in the hierarchy (away from fundamental objectives) - how could you achieve this?
- A good list of objectives is:
  - Complete: includes everything that matters; if there were another means to minimize cost in this decision that we did not include, our list would not be complete
  - Controllable: includes only those things that can be influenced by the decision; if our list included means to minimize costs, but that were not affected by this decision, our list would not be controllable
  - Concise: there is no redundancy; if two of our means objects are measuring the same thing (or partially the same thing), then our list is not concise
  - Measurable: there is an attribute that can quantify how well an alternative meets each objective
- To measure if alternatives meet your objectives, assign some attributes to your objectives
- Lexicographic Choice Steps:
  1. Pick the most important choice
  2. Choose the alternative that has the best attribute on that objective
  3. If there is a tie, move on to the next most important objective, etc.

- The lexicographic choice approach only requires you to rank your objectives but not to make explicit tradeoffs
- But lexicographic strategies are non-compensatory: no matter how well an alternative does on one attribute, it cannot compensate for being worse on another attribute
- SMART - Simple Multi-Attribute Rating Technique
    1. Score each alternative on each objective
        (a) Assign a score of 100 to the best attribute value
        (b) Assign a score of 0 to the worst attribute value
        (c) Assign intermediate scores to the other attribute values - this is done by creating a value function: identify a midpoint that is halfway between the least-preferred and most-preferred attribute values and assign it a value of 50, then do the same for 25 and 75, then find scores for each intermediate value of the attribute
    2. Weigh each objective relative to each others
        (a) Construct hypothetical best and worst alternatives
        (b) Rank and assign weights to each objective based on the value of moving from the worst to the best attribute value
        (c) Normalize objective weights
    3. Multiply the scores by the objective weights and sum to provide each alternative with an overall weighted score
    4. Conduct sensitivity analysis on questionable assumptions

1.3 Uncertainty

- Reading: G&W ch. 5 & 6 [4 & 5 in old edition] (up to section "The axioms of utility")
- Assignment: HW #1
- The probability that an uncertain event results in a particular outcome is the relative frequency of that outcome in the long run
- Events A and B are mutually exclusive if either one can occur or the other can occur or neither can occur but not both

$$P(A \text{ and } B) = P(A) + P(B)$$

- Events A and B are not mutually exclusive if either one can occur or the other can occur or neither can occur or both can occur

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

- Two outcomes are independent if the occurrence of one does not impact the probability of the other
- The outcome that both event A and event B occur is called the joint outcome or intersection of outcomes A and B
- For independent outcomes,

$$P(A \text{ and } B) = P(A) \cdot P(B)$$

- A conditional probability is the probability of an outcome occurring given a separate outcome occurring
- For dependent outcomes,

$$P(A \text{ and } B) = P(A) \cdot P(B|A)$$

- The expected value of an uncertain prospect is the long run average value of that prospect
- Expected value is the probability weighted sum of the monetary outcomes
- Expected utility is the probability weighted sum of the utility of those outcomes
- A concave utility function implies risk aversion (CE ¡ EV); A linear utility function implies risk neutrality (CE = EV); a convex utility function implies risk seeking (CE ¿ EV)

1.4 Decision Trees

- Reading: G&W ch. 7 [6 in old edition] (up to section "Assessment of decision structure")
- Assignment: HW #2
- Decision trees are graphical representations of decision problems that involve: points at which a choice between several options must be made and points of uncertainty which may resolve themselves in one of several ways
- Decision trees can simplify seemingly complex problems with sequential decisions and dependent uncertainties
- Points at which a choice must be made are indicated by decision nodes; the branches from this node indicate each of the options that may be chosen
- Points at which an uncertainty is resolved are indicated by chance nodes; the branches from this node indicate each of the possible outcomes of the uncertainty
- A decision problem is laid out in a decision tree from left to right
- At the very left there is the root node, a decision representing the first choice that must be made
- On the far right are endpoints, all the possible outcomes from all combinations of choices and uncertainties
- The final elements are the probabilities for each branch of each chance node (the probabilities for its branches should sum to one)
- Decision trees are especially helpful when decision involve dependent uncertainties or sequential decisions
- A problem with a complex structure of nested if/then/else statements lends itself to the use of decision trees
- Decision Criterion: choose the alternative with the highest expected value (expected monetary value)
- Start from the right (the outcomes) and move left
- When a chance node is encountered, calculate the expected value of that node and replace the entire node with its expected value
- When a decision node is encountered, choose the branch with the highest expected value and replace the entire node with that branch

2 Descriptive Approach

2.1 Understanding Certainty I

- Reading: What's The Trouble? How Doctors Think (Groopman), Fear Factor (Sunstein)
- Assignment: Survey #1
- Intuition is associative: perceptual judgment (relative length/distance), social judgment, reading familiar text, solving familiar math problems, driving on a familiar road
- Reasoning is rule based: forming expectations about the future, planning, reading unfamiliar text, solving unfamiliar math problems, parking in a narrow road
- In making intuitive judgments about things that are unknown, we often rely on simplifying rules of thumb, called heuristics
- Judgments of distance are determined in part by its clarity - the more sharply the object is seen, the closer it appears to be
- Lots of other things may impact relative clarity that have nothing to do with distance - such as fog, cloud, dust storms
- If we rely on clarity as a cue to distance but fail to correct for other factors it will bias our judgment: over estimate distance on unusually foggy days, underestimate distance on unusually clear days
- In making judgments about unknowns ,we often rely heuristics that utilize readily available cues; this is generally useful because it
  - Exploits structures of environments (the association between cues and judgment targets)
  - Exploit what we have evolved to be good at (learning those associations)
- Two problems: we form judgments in contexts in which the learned associations are not appropriate; we do so automatically and unconsciously and thus may not realize they are inappropriate
- Relative judgment: is the height of Mt. Everest longer or shorter than x?
- Point estimate: what is your best estimate of the height of Mt. Everest?
- Anchoring and adjustment: begin with a salient starting point, or anchor and then adjust estimate in the direction we believe appropriate
- Is this a good heuristic? We may start with an anchor with little relevance to our judgment and tend to terminate that adjustment too soon (adjust insufficiently)
- We adjust until we are too uncertain of whether to continue

- Anchoring can lead us to:
  - Overestimate conjunctive probabilities: P(A and B) ¡ P(A) or P(A ¡ B) ¡ P(B)
  - Underestimate disjunctive probabilities: P(A or B) ¿ P(A) or P(A or B) ¿ P(B)
- When forming judgments, we rely on salient starting points
  - We typically adjust insufficiently, leaving residual influence
  - Those anchors may not be relevant to the judgment
- Availability: refers to the tendency to judge the likelihood of an event by the ease with which relevant examples come to bind
- Examples of availability include doctors making mistakes when their judgments about a patient are unconsciously influenced by the symptoms and illnesses of patients they have just seen
- Availability: try to bring examples/instances to mind, judge frequency/probability based on how easily that is done
- Biases occur when availability and frequency diverge
- When our emotions are engaged, our judgment gets even more muddled
- Vivid, dramatic images of harm can lead us to excessive fear of highly improbable risks whereas when we lack vivid images, we often treat the risk as if it were zero - the result is that we badly overestimate some risks and underestimate others
- We are more likely to overestimate the likelihood, frequency, and causal impact of things that spring to mind, especially things that have come to mind recently, are the focus of our attention and if they are very evocative/vivid/emotional
- Availability may generally be an acceptable strategy except when we have a biased sample in memory due to personal experience or biased reporting, the instances are extremely vivid or imaginable, similar instances have occurred recently or if the instances are described in an elaborated fashion
- Representativeness Error: doctors make such errors when their thinking is overly influenced by what is typically true; they fail to consider possibilities that contradict their mental templates of a disease
- When people are asked to judge the probability that an object or event A belongs to class or process B, probabilities are evaluated by the degree to which A is representative of B, that is, by the degree to which A is similar to our stereotype of B
- We often have to combine different pieces of information to form judgments, or have to update our existing judgments in light of new information

- Many problems have two types of information: individuating information specific to the thing being judged, background distributional information about the underlying category that thing belongs to
- We tend to overweigh the individuating information and neglect the base rate
- As the amount of detain in a scenario increases, its probability can only decrease steadily, but its representativeness and hence its apparent likelihood may increase
- Judgments of similarity don't have to follow the conjunction rule; using this heuristic can lead people to violate that rule

2.2 Understanding Certainty II

- Reading: Don't Blink! The Hazards of Confidence (Kahneman), The Odds of That (Belkin), Cancer Cluster Myth (Gawande)
- Assignment: Survey #2
- Anchoring: our final numerical estimates are often overly influenced by our starting point - if we start too high, we adjust towards the top of that range and stop; if we start too low, we adjust towards the bottom of that range and stop
- Availability: how likely/frequent something is, how easily can I bring examples to mind
- We overestimate the likelihood/frequency of things that we have recent experience with, are emotional or vivid, are over-reported, or are more specific
- Representativeness: how likely is it that an example belongs to a category, how similar is that example to our stereotype of that category
- Chance is streakier, lumpier, than we think
- Our intuitions about random chance do hold for larger samples but we overapply that intuition to include smaller samples where it doe not hold
- We believe that chance will correct itself after a streak
- It cannot be random, there must be a cause
- Lower sample size = greater variance (more dispersion around the average)
- Lower sample size = less reliable knowledge; more chance
- Var[performance] = Var[skill] + Var[luck]
- We underestimate the role of luck, we attribute variance in performance to differences in skill, people are insufficiently conservative (or regressive) when making predictions (expect the future to look like the past, largest errors in prediction for highest and lowest performers)
- Extremes often trigger action
- Extremes arise when both skill and luck align; skill persists but luck does not (on average)
- We believe in the law of small numbers because we expect the characteristics of small samples to resemble those of the population of underlying process: we don't collect enough data and we make overly confident influences
- We believe in the law of small numbers because we believe that random samples are smooth and balanced: we generate causal stories to explain noise, we predict that unbalanced and unsmooth processes will correct themselves

- We view human performance as largely non-random
- Extremes of luck (long strings of wins/losses) are seen as unlikely
- Three things:
  - Over-attribute outcomes to skill
  - Make overly extreme (non-regressive) predictions of the future
  - Identify mean-reversion as causal
- Chance is streakier and more powerful than we expect it to be chance does not correct itself
- Streakiness is inevitable and not necessarily evidence of cause
- Small sample sizes = more variability
- Extremes of performance are likely due, in part, to chance and are unlikely to be repeated

2.3 Overconfidence and Overoptimism

- Reading: Delusions of Success (Lovallo & Kahneman), The Overconfidence Problem in Forecasting (Thaler), Why Fact Don't Change Our Minds (Kolbert)
- Assignment: Survey #3
- A large majority of people believe they are:
  - Better, more skilled and more likely to succeed than they are (overestimation)
  - Better, more skilled and more likely to succeed than others (overplacement)
  - More likely than others to experience favorable life events and less likely to suffer negative ones (comparative optimism)
- We hope our conclusions are shaped on the basis of evidence - seek evidence on all sides of a question , evaluate that evidence as objectively as one can
- We do seek/shape evidence in support of a conclusion
- Whenever you reason about the world, you have choices about: what information to gather, how much attention to pay to it; how to interpret it
- Motivated reasoning = desire + ambiguity
- We apply different standards to claims that we like (can I believe it?) versus claims that we dislike (must I believe it?)
- Self-serving biases need not reflect conscious corruption, you cannot overcome unconscious biases by increasing punishments for biases or rewards for objectivity; rather, you need to decrease desire or ambiguity or both
- We explain away our failures and take credit for our successes
- Primary knowledge: how much do you know?
- Secondary knowledge: how much do you think you know?
- Whether you know a lot or a little about a subject, you are still responsible for knowing how much you don't know
- People's confidence intervals for their estimates of unknown quantities tend to be too narrow; we don't appreciate how much we don't know
- Two sources of overprecision: confirmation bias and hindsight bias
- When gathering information, we tend to make tests consistent with our working hypothesis
- Confirmation Bias

  - The mere consideration of certain hypotheses makes information that is consistent with these hypotheses more accessible to the mind
  - People selectively search for information that confirms the hypothesis that they have in mind
  - People interpret the information that they have in a way that is consistence with the hypothesis that they have in mind

- All of these give people an unreasonable assurance that their hypotheses are correct
- "I knew it all along" effect: we misremember our past predictions as being more in line with actual outcomes and thus more accurate; this leads to excessive confidence in our predictions
- Hindsight Bias: before an outcome occurs: role of uncertainty more salient; think about multiple possible choices; think about multiple possible causes
- After an outcome occurs: previously uncertain outcomes take on an air of inevitability; if something had to occur, its cause must be obvious and direct (it must have been knowable)
- Motivated Reasoning: we believe what we want to believe by applying different standards of evidence
- Confirmatory Reasoning: we selectively seek out and overweigh evidence consistence with the hypothesis we have in mind
- Hindsight Bias: we seek the past as being more predictable than it was; we see the future as more predictable that it is; we see ourselves as more accurate in our predictions than we are
- Consequences of Overconfidence: overtrading and planning fallacy
- People underestimate how long it will take them to complete tasks and how likely those tasks are to succeed, even when they know that such tasks usually run late or have often been unsuccessful in the past
- Causes
  - Confirmation Bias: we seek support for our initial view rather than look for disconfirming evidence
  - Hindsight Bias: we believe that the world is more predictable than it really is; we overestimate our ability to make predictions
  - Availability: we have difficulty imagining all the ways events can unfold and focus on the few that most readily come to mind
  - Anchoring: we anchor on our best forecast and adjust insufficiently to account for uncertainty

  - Representativeness: if a plan or project looks like past successes, we just it to be likely to succeed, ignoring base rates

- Counteract confirmation bias by engaging in counter argumentation
- Counteract hindsight bias by providing feedback
- Counteract anchoring by thinking about the reasons values will be extremely low or extremely high first, rather than starting from your best estimate
- Counteract availability bias by constructing fault trees
- Counteract representativeness by taking an outside view
- Overconfidence is bad when
  - Predicting or planning for the future
  - Deciding what to do
  - We need to be receptive to contrary evidence
  - Others' overconfidence persuades us
  - It leads us to pursue costly opportunities
- Overconfidence is good when
  - Trying to motivate ourselves or others
  - We are trying to be persuasive
- Decider versus Doer, Motivator or Implementer
  - When you are deciding, be realistic
  - When you are implementing, indulge in overconfidence when it is valuable to your performance or that of others

2.4 Group Judgment

- Reading: Mass Intelligence (Surowiecki), Making Dumb Groups Smarter (Sunstein & Hastie)
- Expertise: some members possess the right information
- A group is equivalent to their best member
- Aggregation: the group collectively possesses the right information
- Group performs better than the best member
- Synergy: information is more than the sum of its part
- Group performs better than an aggregate
- Deliberating groups tend to do better than their average members but not as well as their best members
- The performance of a group is a function of
  - Group potential: a baseline level of performance (statistically aggregated knowledge of all group members)
  - Effects of working together
    - Process Gains: synergistic aspects of a group of individuals working together
    - Process Losses: components that cause a group to perform at a level below its potential
- Process Gains
  - Synergy: a member uses information in a way that the original holder did not because that member has different information or skills
  - Error Catching: groups are better at catching errors than are the individuals who proposed ideas
  - Stimulation: working as part of a group may stimulate and encourage individuals to perform better
  - Learning: members may learn from and imitate more skilled members to improve performance
- Process Losses
  - Social Loafing: each individual is less"on the hook" when part of a larger group, less incentive to work hard towards group accuracy
  - Social Conformity: people will modify their opinion in the direction perceived to be consistent with opinions held by others in a group

  - Poor Information Sharing: groups often have more information than the collection of individual members if those members have non-overlapping information and share that information with the group
  - Difficulty Identifying Expertise: when opinions conflict, whose opinion to weigh more?

- Identifying Expertise

	General	Task Specific
Attribute	race, gender, age, attractiveness, height	tenure, certifications, degrees, job title, past task success
Behaviors	Accent, grammar, dress, poise	factual tone, fast/fluent speech, claiming expertise, citing facts

- It is hard to identify expertise - we mistake talkativeness / confidence / dominance with expertise; we are influenced by those we should ignore and ignore those we should be influenced by
- Groups are formed by people we know and like, those who are similar to us in background and those who are likely to get along
- We often form groups with an aim towards group cohesiveness sacrificing diversity of information
- Group Cohesion: enables action
  - Shared objectives
  - Efficiency - inducing norms (understood procedures, styles, expectations, etc.)
  - Fun
  - Trust
- Heterogeneity (diversity): enables accuracy
  - Diverse opinions, information, experience, values, etc
  - Increases variety of ideas when creativity is needed
  - In forecasting, yields offsetting mistakes
- Fundamental Tension: factors that increase cohesion can decrease diversity and vice-versa
- Ideal Group:
  - Cohesive on high-level goals, ideas, ethics, motivations and social relations
  - Diverse on deep levels (expertise, opinions, practical experience, etc.) in a context that enables dissenting opinions

- Group Polarization: opinions are not independence
- A group of diverse individuals has many heads while a group of similar individuals has one head; many heads is better than one head
- Social Conformity: caused by the desire to be liked and accepted
- Informational Conformity: caused by a desire to be correct
- Master Title: opinions are not shared
- Common information is likely to be shared first and most often; others with differing information conform to the group; others with differing information don't share it with the group
- Groups are overconfident; we think we've identified the expert and consensus is mistaken for accuracy
- A group is individuals who interact to come to a collective judgment (a statistical aggregation of individual judgments)
- Averaging expert opinions is often a way to elicit good information from a group of people
  - Averaging cancels out idiosyncratic errors
  - Averaging forecasts can do no worse than the average individual
  - Averaging forecasts can often improve upon the best individual
- Prices in a market convey information
- In prediction markets, you define an outcome and then invite people to buy/sell a contract based on that outcome
- Statistical integration often misses out on
  - You don't see peoples' reasoning
  - You can't assess expertise (may be better not to try)
  - Helps with idiosyncratic but not systematic bias
  - Requires diversity
- To improve group judgment: have everyone separately write down a prediction and their reasoning, then have a moderator read all responses and finally, let people come together to discuss
- Advantages
  - Anonymity: they don't know who we are, so we don't feel foolish; we don't know who they are so we won't be unduly inf;uenced
  - Simultaneous revealing of information: initially expressed views don't affect how other information is revealed

2.5 Psychology of Choice

- Reading: Reversals (Kahneman)
- Assignment: Survey #4
- Decision making can be broken down into judgment and choice
- What makes choosing difficult? We don't know how to evaluate some attributes; we don't know how to trade off across attribute; we worry about making a mistake
- We're not good at judging things in absolutes - we look for reference points which are malleable
- Some attributes are easier to judge in isolation than others - more readily evaluable attributes are given more weight, differs across single/joint valuations
- Option A is dominated by option B if: option B is at least as good as option on all attributes and option B is better than option A on at least one attribute
- The pain of a loss is often twice as great as the pleasure of a gain; we simply hate to lose - even small amounts
- Two important consequences of loss aversion: we are resistance to change (status-quo bias) and we (often foolishly) try to claw ourselves out of a hole (sunk cost effect)
- We should ignore sunk costs when making subsequent decisions about a possible course of action
- We often feel a need to continue persisting in the face of adversity out of hopes that it will allow us to recover those sunk costs
- Be careful not to consider expended resources (sunk costs) when making decisions

2.6 Intuition vs. Algorithms

- Reading: Noise (Kahneman, Rosenfield, Gandhi & Blaser), Conditions for Intuitive Expertise (Kahneman & Klein), Who's On First (Thaler & Sunstein)
- Goodness of fit is measured by correlation

$$y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \cdots + \varepsilon$$

- A zero means no correlation, weak predictor of actual outcome; a one means perfectly correlated, strong predictor of actual outcome
- We can be biased depending on if we are using the right variables, if we are weighing them incorrectly or if we are integrating them incorrectly
- To deal with noise, average across people (across-people noise) or bootstrapping (within-person noise)
- Bootstrapping: estimate a model of the expert's decisions - fit a model to the expert's decisions and use that model to replace the expert
- Models often outperform humans:
  - Bias: wrong variables, wrong weighting, wrong integration
  - Noise: incidental effects of tiredness, hunger, mood, cloudy weather, etc
  - Even models of humans (bootstrapping) outperform humans
  - Averages of multiple judges can also reduce noise
  - The magnitude and cost of noise can often be judged even if we can't determine bias

2.7 Improving Decision Making

- Reading: Before You Make That Big Decision... (Kahneman, Lovallo & Sibony), Choice Architecture (Thaler, Sunstein & Balz)
- To improve decision making, either change the individual by improving our intuitive system (training) or invoke our reasoning system (cognitive strategies and rules/models) or change the environment by introducing mandates/bans, economic incentives or nudges
- Process of Learning from Experience: make a decision, observe the outcome (was it successful?), avoid repeating mistakes, try to replicate successes
- Learning from experience requires: that the same (or similar) decision be repeated over and over again and that we receive accurate and timely feedback about the quality of our decisions
- Unfortunately, the real world often does not provide us with these things:
  - Decisions are often unique and not repeated
  - There is often a delay between actions and their outcomes
  - Most outcomes are the result of many different decisions
  - There is variability in the environment that can add noise to our feedback
  - We may not receive feedback on what might have happened had we decided differently
- We generate too few objectives / hypotheses / alternatives because of
  - Shallow thinking: putting in too little effort and stopping early
  - Narrow thinkingL focusing attention on only one category of objectives / hypotheses / alternatives
- "Five Whys" routine can force a deeper search (drill down) for hypotheses
- Asking "why" will lead you to what you really care: your fundamental objectives
- Asking "how" will lead you to: your means objectives
- We more readily think of facts, experiences and arguments that support a current hypothesis more than readily than those that refute it (confirmation bias)
- Have people start from opposite propositions when collecting information
- People discount statistical information in favor of highly descriptive individual accounts (inside view)
- Solution: generate a "reference class" of similar cases and objects; implement procedures that emphasize base rates (prior probabilities) of success or failure

- We attribute success/failures to the quality of the decision rather than to external factors such as luck
- We reward/blame others for outcomes that may have largely been due to random chance (hindsight bias: once the outcome occurs, the role of randomness is discounted)
- Solutions: document decision processes and underlying assumptions, so the quality of the decision process can be evaluated independently of the quality of the decision outcome
- People have undue confidence in their conclusions
- Build in corrections for overconfidence and create detailed work plans
- Create overly narrow confidence intervals, start with extremes and think about time unpacking
- When you are not paid for your performance, there is intrinsic motivation within the individual to enjoy the task/challenge and want to show that you can do well
- When adding a small financial incentive, there is more motivation to do better
- Without financial incentives, how hard should I work to make myself feel good about my performance?
- With financial incentives, how hard should I work in order to earn $x?
- The motivation to arrive on time when there is no penalty for being late is social norms; it is rude to impose on others
- When adding financial incentive to social norms, it does not change behavior and does the opposite of what is set out to be stopped
- Without financial incentives, is it worth the inconvenience of arriving on time to avoid being rude?
- With financial incentives, is it worth the inconvenience of arriving on time to avoid paying $x?
- Where is no payment for blood donation, you have selfless motivation (it is good to help others in need) and selfish motivation (it is good to look like someone who helps other)
- Shifts Focus
  - Difficult to hold different rationales for a behavior in your mind at once
  - Money is very salient and tends to push out other reasons to engage in the behavior
- Information

  - A small reward tells us that the behavior is not valuable
  - A small punishment tells us that the behavior is not that bad
- Changing the nature of social interaction
  - Many of our interactions are based on mutually cooperating, following norms, reciprocating
  - Other interactions are based purely on economic exchange
  - Introducing a reward/punishment changes the "rules of the game"
- Choice Architecture: the context in which people make decisions
- Defaults work due to psychological reasons:
  - Risk/loss aversion (leads to inaction)
  - Regret (more potential regret from an action than an inaction)
  - Lack of reasons for making an active choice
  - Procrastination
- Defaults also work due to belief-based reasons:
  - Recommendations (that's what policy makers are recommending)
  - Social norms (that's what everyone does)
  - Prescriptive norms (that's the right decision)
- If you want someone to do something; make it easy; if you don't want someone to do something, make it hard
- Simplification: provide information, display information simply and graphically, provide clear feedback and consider the scale/units that information is provided in
- When you want people to behave the way others do, provide a descriptive norm
- To make the effect of the norm stronger, make it more specific (and personal)
- When you want people to behave differently from others, also provide an injunctive norm
- When self-control is likely to be an issue in the future, get people to precommit to a behavior ahead of time
- If precommitment isn't feasible, get them to express an intention ahead of time
- Even better if the intention is specific and focuses on how the behavior will get done
- Nudges
  - Default rules: what happens if no decision is made

- Convenience: make desirable behaviors easy, make undesirable behaviors hard
- Simplification: making information readily available / interpretable
- Disclosure and self-disclosure: making clear the consequences of future choices, providing feedback on the consequences of past choices
- Social norms: what others are doing, what others believe
- Pre-commitment strategies and eliciting intention: forced planning, prospective decision making