Quiz 1

Question 1: See the question in Section 1, labeled "Example 1: Two Decisions with Gains and Losses" (repeated here).

You were invited to make two decisions, to which many people select outcomes A & D. Which axiom does the A-D error reflect?

Axiom 1: Dominance The "Dominance" axiom is violated when individuals make a combination of selections that lead to a "dominated" (i.e., inferior) set of outcomes. When people select options "A" and "D", the result is a set of outcomes that are worse, in all cases, than the outcomes in the combination of "B" and "C". Hence the B-C combination *dominates* the A-D combination.

Axiom 2: Invariance The "Invariance" axiom is violated when individuals make different choices between two options that have identical outcomes, depending on how the options are presented. In this situation, the two decisions have *different* outcomes, so there cannot be an invariance violation

Axiom 3: Independence The "Independence" axiom is violated when individuals change their selection between options 1 and 2, following the addition of a third option (even though that third option is not selected).

Question 2: Choosing vs. Pricing reflects which of the following?

Axiom 1: Dominance The "Dominance" axiom is violated when individuals choose an option (or combination of options) that is worse in all cases than some other option that was also available. This is not applicable to a situation in which an individual is either making a choice, or determining how much they are willing to pay.

Axiom 2: Invariance It is understood that we may make different selections between options, depending on whether we are asked how much we will *pay* for them, versus simply choosing between them. This violates the "Invariance" axiom, as we appear to flip our preferences, by showing willingness to pay a higher price for an option that we deemed less attractive when asked simply to choose.

Axiom 3: Independence The "Independence" axiom is violated when individuals change their selection between options following the addition of a new but irrelevant third option. That is not applicable in this case

Question 3: Allais Paradox: Which axiom does the Allais Paradox appear to conflict with?

Axiom 1: Dominance In the Allais paradox, there are no "dominant" or "dominated" outcomes, so this axiom is not relevant here.

Axiom 2: Invariance In the Allais paradox, the two sets of options are not identical, so the "Invariance" axiom cannot apply here.

Axiom 3: Independence In the Allais paradox, many individuals switch from Choice A to Choice D, following the subtraction of indentical amounts between the two Choices. This violates the "Independence" axiom.

Question 4

For many years—for so long, in fact, that he practically forgot that he had them—Mr. Duke has owned $20,000 worth of shares in a certain company. One day he remembers them and considers whether he should sell them. He notes that they have exactly maintained their value over the years, so he decides to hold onto them.

A few months later, the company unexpectedly fails, and his shares are no longer worth anything. Mr. Duke realizes that he has lost $20,000.

His friend Mr. Brown has also owned shares worth $20,000 in a company; and he, too, has almost forgotten that he possessed them. One day, he remembers the shares and considers whether to keep or sell them. He notes that they have maintained their value throughout the years, so he decides to convert them to cash. A few months later, the company whose shares he had sold unexpectedly markets a new product, and the value of its shares doubles. Mr. Brown realizes that he has $20,000 less than he might have had if he had just held onto the shares he had owned for so many years.

Both men started in the same position, and both came to the same conclusion (ending up $20,000 poorer), but they feel different levels of regret. Most people would argue that Mr. Brown feels a stronger sense of regret than Mr. Duke. If so, which of the following best explain his greater disappointment?

(a) The Disposition Effect The Disposition Effect is defined as our tendency to be risk averse over gains, but risk seeking over losses. For both Mr Brown and Mr Duke, losses are involved so the Disposition Effect does not apply here.

(b) Omission Bias Omission bias is characterized by our tendency to feel worse about negative outcomes that resulted from action vs inaction. Mr Brown carried out an *action* (he sold the shares), while Mr Duke did nothing. Thus, despite the fact that their financial loss ($20,000) is equivalent, Omission Bias suggests that Mr Brown felt worse.

(c) Risk Aversion Risk Aversion is characterized by a tendency to prefer the "sure thing" vs the risky gamble with the same expected outcome. In the context of Risk Aversion, one might argue that Mr Duke would feel worse, since he held onto risky shares rather than converting them to hard cash (as Mr Brown did). Thus Risk Aversion cannot explain why Mr Brown would feel worse than Mr Duke.

(d) Loss Aversion Loss Aversion is characterized by feeling worse about losses than one feels good about similar sized gains. Since the scenario in this question is just about losses, Loss Aversion is not applicable in this case.

Question 5

Suppose that Mr. K buys 1,000 shares in a software company at $25 / share. The company is currently attracting considerable media attention for its new accounting software, a highly touted product that is expected to become the industry standard, with considerable improvements in both efficiency and ease of use.

Mr. K is an accountant who also has considerable expertise in evaluating accounting software options. He read all of the software company's advance information on the new package and carried out his own extensive research prior to buying the shares. Within two weeks of his purchase, the shares are up to $30, and Mr. K is tempted to sell them. He decides to hold on, however, as the industry excitement about the new software is increasing as the release date approaches. The shares continue to appreciate until there begin to be whispers about a serious bug in the software. In the weeks coming up to the release date, the company's share price becomes increasingly volatile, as rumors and counter-rumors abound. The company's share price falls below $30, and then below $25. Occasionally some positive stories on social media cause brief bounces in the price, but Mr. K is becoming increasingly pessimistic about the product. The shares are currently trading at $20. Although Mr. K now believes that the product will fail, he decides to hold onto the shares in the hope that a new rumor will bounce the price up to $25 so that he can sell.

Which Prospect Theory feature best explains Mr. K's behavior during the time that he has owned these shares?

(a) Risk aversion over gains Risk aversion over gains is the tendency to sell a position that has made money, rather than holding onto it for potential future gains. Mr K does not sell his shares when they are doing well. Hence risk aversion over gains cannot be the relevant feature here.

(b) Risk seeking over losses Risk seeking over losses is the tendency to hold onto losing positions, in the hope that the price will go back up to the original purchase price. That is exactly what is motivating Mr K in this case!

(c) Loss aversion Loss Aversion is characterized by feeling worse about losses than one feels good about similar sized gains. In this scenario, Mr K is not thinking about gains vs losses, so Loss Aversion is not applicable.

Question 6

Think about the visual illusion in which three triangles somehow became *four* triangles without any alterations to the physical page. Suppose we compare this visual distortion to the way in which we sometimes "distort" rational decision-making by violating the Axioms. For which Axiom could this visual illusion serve as a metaphor?

Axiom 1: Dominance There are no outcomes to compare here; so dominance is not relevant

Axiom 2: Invariance A violation of the Invariance axiom involves "flipping" preferences between options on the basis of how these options are presented. There is no change in preference here, so invariance is not relevant.

Axiom 3: Independence The fourth triangle "appears" as a result of three new "irrelevant" shapes (the three incomplete circles). This is similar to the Independence axiom, in which the introduction of apparently irrelevant alternatives can change our view.

Question 7

Let's assume we all have preferences that are consistent with Prospect Theory. Suppose also that we could select whether our salaries are paid on a weekly basis or a monthly basis. Which alternative would we pick, assuming that the total monthly salary is the same as the sum of the weekly payments? Ignore the impact of extra interest that we could earn in our bank accounts if we were paid on a more frequent basis.

(a) Weekly Risk aversion over gains implies that receiving multiple partial payments of a particular amount of money will, cumulatively, give us more satisfaction than receiving a one-time payment of the full amount.
(b) Monthly Risk aversion over gains implies that receiving multiple partial payments of a particular dollar amount will, cumulatively, give us more satisfaction than receiving a one-time payment of the full amount.

[Note: the explanation for both the correct choice and the incorrect choice is intentionally the same.]

Question 8

Now suppose you have the option to pay your utility bills on an annual rather than a monthly basis. Assume that you have enough money in the bank that you could pay the annual bill (which is simply the sum of all of your monthly bills) without running an overdraft or taking out a loan. If your choices are consistent with Prospect Theory preferences, would you choose to do so? Once again, ignore the impact of any interest that you would earn (or forego).

(a) Monthly Risk seeking over losses implies that having to make multiple partial payments of a particular dollar amount will, cumulatively, be more painful than a one-time payment of the full amount.
(b) Annually Risk seeking over losses implies that having to make multiple partial payments of a particular dollar amount will, cumulatively, be more painful than a one-time payment of the full amount.

[Note: the explanation for both the correct choice and the incorrect choice is intentionally the same.]

Question 9

In Section 2, you were introduced to the Disposition Effect, which highlights the way in which many people's preferences "flip" from Decision A to Decision D—even though A & C are identical, as are B & D. Which of the following aspects of Prospect Theory help(s) to explain this violation of the Invariance Axiom? There may be more than one correct answer.

(a) Risk aversion over gains
(b) Risk seeking over losses
(c) Loss aversion

If students answer (c), they should receive the following text: "Loss Aversion means that we tend to feel worse about a particular sized loss than we feel good over the same size gain. Since Game 1 has only gains, and Game 2 has only losses, Loss Aversion is not applicable here."

If students answer only (a) they should receive the following text: "Risk aversion over gains can explain why people often choose A rather than B in Game 1, but it tells us nothing about people's choices in Game 2.

If students answer only (b) they should receive the following text: "Risk seeking over losses can explain why people often choose D rather than C in Game 2, but it tells us nothing about people's choices in Game 1.

Question 10

Suppose there are two investors: Michael and Steve. Both have pension funds, into which they deposit money each month from their paychecks. Both are in their early 30s, and anticipate retiring at around age 65. Neither anticipates withdrawing any money from his pension fund prior to retirement.

Michael watches his pension fund closely, looking each week at whether has gone up or down in value. On a week to week basis, the US equity markets are down almost as often as they are up. Steve, on the other hand, only checks the value of his pension fund once every five years or so. On a five-year basis, the US equity markets are down less than 10% of the time.

Michael's pension fund money is all in bonds, while Steve's is all in equities. Which single feature of Prospect Theory provides the best explanation for the two men's different portfolio allocations?

(a) Risk aversion over gains Risk aversion over gains may explain why Michael's pension fund is all in bonds, but it cannot explain why Steve's is all in (riskier) equities.
(b) Risk seeking over losses Risk seeking over losses cannot explain why Michael's pension fund is all in bonds *or* why Steve's is all in equities.
(c) Loss aversion Loss aversion is characterized by feeling worse for losses than feeling good about similar-sized gains. Since Michael watches his pension fund closely, he experiences approximately an equal quantity of gains vs losses, and feels worse about the losses. Hence he chooses to invest in a portfolio that almost never goes down (but doesn't go up much either). Steve, on the other hand, is not troubled by loss aversion, since on a 5 year basis, equities very rarely show a loss.

Question 11: [note: no explanations for this one – it's pretty straightforward.]

Assume an investor recently purchased shares in Dynamo Products (a hypothetical company) at $60 per share. Shares are now at $40. See the three attached Prospect Theory value functions. [*Insert Quiz1_Q11 here*]. Which of these value functions correctly reflects the investor's value function assuming:

(a) The investor has updated his refence point for the price of the Dynamo shares?
(b) The investor has *not* updated his reference point?

1. Value Function A reflects that the investor *has* updated his reference point, while Value Function B reflects that the investor has *not* updated his reference point

2. Value Function A reflects that the investor *has* updated his reference point, while Value Function C reflects that the investor has *not* updated his reference point

3. Value Function B reflects that the investor *has* updated his reference point, while Value Function A reflects that the investor has *not* updated his reference point

4. Value Function B reflects that the investor *has* updated his reference point, while Value Function C reflects that the investor has *not* updated his reference point

5. Value Function C reflects that the investor *has* updated his reference point, while Value Function A reflects that the investor has *not* updated his reference point

6. Value Function C reflects that the investor *has* updated his reference point, while Value Function C reflects that the investor has *not* updated his reference point

Question 12:

Why do people like to go to all-inclusive resorts, where you pay the entire cost upfront, and don't have to pay for individual meals, drinks, activities etc., even though they know they will probably end up paying more for the all-inclusive than if they went to a regular resort?

1. Risk Aversion This situation does not involve selecting between options that have the same expected value but different levels of risk, so Risk Aversion is not applicable in this context
2. Risk Seeking This situation does not involve selecting between options (potential losses) that have the same expected value but different levels of risk, so Risk Seeking is not applicable in this context
3. Loss Aversion We prefer to make one large, one-time payment than lots of small ones, even if the sum of the combination of smaller purchases may be greater than the one-time payment. This is Loss Aversion!
4. Moving Reference Points Not applicable in this context.