

WHY MIGHT NOVICE ENTREPRENEURS ACCEPT
INCREASED RISK BY BECOMING PORTFOLIO
ENTREPRENEURS?

By

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Abstract: The present research explored the relationship between loss aversion, based on prospect theory, and the diversification decision resulting in portfolio entrepreneurship. Specifically, where an entrepreneur is currently operating one small business, and is presented with the opportunity to simultaneously operate a second small business, do the tenets of prospect theory have an observable and significant effect on that decision? Further, the present research suggests an entrepreneur's individual characteristics will moderate the effect of loss aversion on the diversification decision; specifically, four aspects of human capital: General human capital, specific human capital, psychic income and switching costs. To that end, the present research conducted a survey-based, conjoint experiment with a sample pool of entrepreneurs. Having conducted the experiment, data was analyzed in an effort to observe the effects of loss aversion on the diversification decision as well as moderating effects of the entrepreneurial human capital on loss aversion.

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CHAPTER I

INTRODUCTION

OVERVIEW

Rosa (1998) and Rosa and Scott (1999) observed that entrepreneurs who maintain two or more small businesses are more likely to be successful than entrepreneurs who maintain only one small business. Called portfolio entrepreneurs, the propensity of multiple business owners to sustain their entrepreneurial endeavors, broadly speaking, is due to the positive effects of diversification; specifically, the efficiencies gained through shared resources (Baert, Meuleman, Debruyne & Wright, 2016). Extant literature, however, suggest it takes eight to thirteen years for a firm to develop the resource necessary for sustainable diversification of an entrepreneurial portfolio of companies (Baptista, Karaoz & Leitao, 2019; McDougall, Colvin, Robinson & Herron, 1994; Rutherford, Tocher, Pollack, & Coombes, 2016). Prior to acquiring the necessary resources, diversifying into a second small business frequently results in failure (Baptista et al., 2019). Yet, it is the case that entrepreneurs do diversify into a second small business prior to accumulating the necessary resources. (Baptista et al., 2019).

According to Baptista et al. (2019), rather than diversifying into a second small business as a form of expansion and stability, an entrepreneur who perceives potential failure, may assume greater risk by investing in a second small business. The

hope being that a second venture will be successful and allow the original business to regain its financial footing. Thus, leading to Baptista et al.'s (2019) conclusion that transitioning to portfolio entrepreneurship, "in the first years is likely to be more of a necessity associated with risk reduction ... than a growth strategy" (p. 118). While Baptista et al. (2019) suggests early portfolio entrepreneurship is a means of risk reduction, prospect theory suggests that it is actually the risk seeking side effect of loss aversion.

Proposed as an alternative to utility theory, prospect theory describes the process by which an individual makes decisions under risk (Kahneman & Tversky, 1979, 1984; Tversky & Kahneman, 1991, 1992). The central tenet of prospect theory is that a loss takes a greater psychological toll than a gain of equivalent value (Kahneman & Tversky, 1979). The increased psychological strain of a loss versus a gain results in loss aversion. Loss aversion is a cognitive bias in which individuals will seek to avoid losses even where there is a probability of a gain of equivalent value. Loss aversion results in both risk aversion and risk seeking decision making. Where an individual has gained something of value, they will become risk averse and take fewer risks in an effort to avoid the pain of losing that which they have gained. Where an individual has lost something of value, they will become risk seeking and accept increased risk in an effort to recuperate their loss and allay the pain the loss has inflicted (Tversky & Kahneman, 1991). Whether or not an individual perceives a loss or a gain in value is dependent on their relative position to a key reference point (Kahneman & Tversky, 1979).

An individual's key reference point is "fully determined by the expectations a person held in the recent past" (Koszegi & Rabin, 2006, p. 1141); that is, the key reference point is

a person's aspirations, goals, or even their perceived status quo, at the very moment prior to being faced with a risky decision. A person will then make a risky decision based on the possible magnitude of change from that reference point and not the objective value of the outcome. An individual's relative position to their key reference point also determines if they currently perceive themselves in a position of loss or gain. Take for instance an entrepreneur whose key reference point is fixed to their business' annual revenue goals. This entrepreneur will perceive a loss if the business does not meet those revenue goals, even when the business is objectively successful. The entrepreneur may then take greater risks in an attempt to increase revenue and reach their goals.

While an entrepreneur may make risky decisions based on their relative position to their reference point, their human capital characteristics will affect the degree of influence loss aversion exerts on the entrepreneur's decisions (Gimeno, Folta, Cooper, & Woo, 1997). For instance, an entrepreneur with high general human capital, low specific human capital, low switching costs and low psychic income has greater opportunities outside of entrepreneurship, and less emotional investment to the organization. The entrepreneur will, therefore, likely exit entrepreneurship rather than accept additional risk to save the organization. Conversely a person with low general human capital, high specific human capital, high switching costs and high psychic income perceive fewer opportunities outside of entrepreneurship, and have a greater emotional investment in the organization. When they perceive a loss, this entrepreneur will, therefore, likely accept significant risk to keep the organization solvent.

While there is a vast literature on loss aversion and reference based decision making (e.g., Kahneman, Knetsch, & Thaler, 1990, 1991; Samuelson & Zeckhauser, 1988;

Thaler, 1980a; Thaler & Johnson, 1990), and entrepreneurial human capital (e.g., Alvarez & Barney, 2007; Marvel, 2013; Ardichvili, Cardozo, & Ray, 2003; Shane, 2000; Ucbasaran, Wright, Westhead, & Busenitz, 2003), only a few articles have applied loss aversion to entrepreneurial decision making. Koudstaal, Sloof and Praag (2016), for instance, observed that entrepreneurs are more loss averse than managers. Hsu, Wiklund and Cotton (2019), observed that after exiting entrepreneurship, the former entrepreneur's reference point had a significant effect on their decision to reenter entrepreneurship. Hack, von Bieberstein and Kraiczy (2016), observed that not only did the, "reference point [have] a significant impact on new venture creation and entrepreneurial intention", entrepreneurs tend to be more aspirational which results in a higher reference point and increased loss aversion (p. 458). This research project expands on this literature through an examination of the effects of loss aversion on entrepreneurial decision making in an effort to explore the degree to which reference points influence a novice entrepreneur's decision to become a portfolio entrepreneur.

PROBLEM STATEMENT AND RESEARCH QUESTIONS

Approximately 20% of small businesses fail in their first year, with only half surviving five years, and one-third surviving past ten years (SBA, 2018a). Given the sheer likelihood of failure why would any rational person embark on an entrepreneurial path; more specifically, if already on that path, why might a novice entrepreneur accept increased risk by becoming a portfolio entrepreneur? As a research question, this inquiry is quite broad. To focus the present research, I further decompose this research question into two more focused inquiries:

1. Is a novice entrepreneur more likely to start a second business if they perceive their current venture as a loss?
2. Does the entrepreneur's human capital moderate their likelihood of starting a second business when they perceived their current venture as a loss?

To test these research questions, I employed a survey-based metric conjoint experiment (Louviere, 1988). Metric conjoint analysis has been employed in the small but growing literature on the application of prospect theory to entrepreneurial decision making (e.g., Barbosa, Fayolle, & Smith, 2019; Hack, et al., 2016; Holland & Shepherd, 2013; Hsu et al., 2019; Koudstaal et al., 2016). A conjoint experiment is valuable in decision-based research as it allows the researcher to examine the variable interactions at the exact point the decision is made (Lohrke, Holloway, & Wolley, 2010; Shepherd & Zacharakis, 1997). A conjoint experiment first presents the subject with a hypothetical scenario. Subjects are then asked to respond to a series of hypothetical choice questions in the context of that hypothetical scenario. Each question contains a set of decision attributes such as probability and outcome (Hanisch & Rau, 2014; Louviere, 1988; Priem & Harrison, 1994). The subject's responses to the choice questions is the dependent variable and a measure of the respondent's decision (Lohrke, Holloway, & Wolley, 2010; Shepherd & Zacharakis, 1997).

CONTRIBUTIONS OF THE PRESENT RESEARCH

In all, 182 entrepreneurs participated in the experiment. The entrepreneurs were randomly divided into three groups: Loss, gain and control. Using a modified version of a conjoint experiment conducted by Holland and Shepherd (2013), each group was presented with a different scenario to fix their reference point. The loss group was asked

to imagine their business had suffered a financial loss; the gain group was asked to imagine their business had experienced a financial gain; and, the control group was not presented a hypothetical scenario. The experiment then presented the entrepreneurs with four choice questions related to exploiting a second small business opportunity. Responses to these questions measured the direct effect of loss aversion on the decision to diversify into a second small business.

After conducting the experiment, I employed a one-way ANOVA to determine if the treatment groups had responded differently to the choice questions. A between group difference would either confirm or refute my first research question. Unfortunately, the ANOVA did not show a significant difference between the responses of the treatment groups ($F(2, 179) = 0.06, p = 0.94$). Based on the entrepreneurs' responses to the choice questions, I concluded that an entrepreneur having recently experienced a loss or a gain has no effect on their willingness to accept additional risk.

Participants in the experiment also responded to a series of questions related to their human capital characteristics. These measures were intended to explore the moderating effect of the entrepreneurs' human capital on the diversification decision. Unfortunately, due to the lack of significant results of the main effect, an examination of the moderating effects of the entrepreneurs' human capital could not be conducted.

Based on the above conclusion, my research adds to entrepreneurship theory by further illuminating the heuristic, cognitive and decision-making process of the entrepreneur and their actions under uncertain conditions (Ucbasaran, Westhead & Wright, 2001, p. 70). There is a vast literature examining entrepreneurs in an effort to better understand their decision-making process (e.g., Baron, 2008; Busenitz & Barney,

1997; Lee & Venkataraman, 2006; Sarasvathy, 2001). As well as a contemporary literature discussing an entrepreneur's decision to persist or exit their entrepreneurial endeavors (e.g., DeTienne, Shepherd & De Castro, 2008; DeTienne & Chirico, 2013; Holland & Shepherd, 2011). Yet, despite the evidence that many entrepreneurs fail due to premature diversification, there has been little research into the decision-making process of the novice entrepreneur accepting additional risk by starting a second business (Baptista et al., 2019; Kutzewski, Bahlmann & Stam, 2020). The present research has contributed to the conversation by exploring this gap in the literature.

MANUSCRIPT FORMAT

The remainder of this manuscript is formatted as follows: Chapter two is a review of the relevant literature of the primary subjects; specifically, prospect theory, portfolio entrepreneurship, and entrepreneurial human capital. For prospect theory, I discuss the fundamentals of prospect theory and the formation of an individual's key reference point. I then discuss how an entrepreneur's relative position to their key reference point induces loss aversion, resulting in risk seeking behavior (Kahneman & Tversky, 1979). Following the discussion on prospect theory, I briefly discuss the fundamentals of entrepreneurship as primer for an orientation to the types of entrepreneurship: Nascent, novice, habitual, and the subsets of habitual: Serial and portfolio. This section is followed by a discussion of entrepreneur's human capital characteristics.

Chapter two continues with a discussion of the scant literature applying prospect theory to entrepreneurial decision making. This discussion includes the entrepreneur's reference point formation and the addition of two reference points in the decision-making process. I then discuss the effect of individual human capital on these reference points

(Gimeno et al., 1997). Chapter two concludes by summarizing the previously discussed literature into a logical argument and hypotheses in an effort to address the present research questions.

Following a review of the relevant literature, Chapter three described the methods with which I acquired and analyzed data. Because the data were collected via an experiment, I begin Chapter three with a discussion of the ecological validity of experiments in portfolio entrepreneurship research. Chapter three continues with a description of the conjoint experiment, the sample pool, and the analytic techniques employed to examine the results of the experiment. The manuscript concludes by presenting the results of my research as well as a discussion of the results.

CHAPTER II

LITERATURE REVIEW

OVERVIEW

Drawing on prospect theory, the intent of my research was to explore whether a novice entrepreneur might be more likely to start a second business if they perceive their current venture as a loss. The central tenant of prospect theory is that losses inflict a greater psychological toll than a gain of equivalent value (Kahneman & Tversky, 1979, 1984; Tversky & Kahneman, 1991, 1992). Whether an outcome is perceived as a loss or gain depends on the individual's relative position to a key reference point. Where an outcome falls above the reference point, the individual perceives a gain and tends to take fewer risks in an effort to preserve their current fortune. Where an outcome falls below the key reference point, the individual perceives a loss and tends to seek risk in an effort to regain their losses (Kahneman & Tversky, 1979, 1984; Tversky & Kahneman, 1991, 1992). The following literature review establishes a theoretic foundation wherein the diversification decision can be explored in accordance with the tenants of prospect theory.

After establishing the theoretic foundation, I then discuss entrepreneurship and types of entrepreneurs resulting in definitions of the entrepreneur and entrepreneurship specific to this research. This chapter continues with a discussion of the small but

growing literature applying prospect theory to entrepreneurship and a discussion of how an entrepreneur's individual characteristics might influence the entrepreneur's decision making. The chapter concludes with hypothesis development and a theoretical model.

PROSPECT THEORY

In 1979, Daniel Kahneman and Amos Tversky proposed prospect theory as a scheme for the examination of decision making under risk. According to Kahneman and Tversky (1979), a person faced with a decision involving risk is choosing, "between prospects or gambles" (p. 263). The "prospect" represents the utility gain or loss of the outcome of the decision. The "gamble" is the probability of the outcome of the decision. Prospect theory's central precept posits that a loss takes a greater psychological toll on an individual than a gain of equivalent value. Further, where a person has experienced a loss, they will take increased risks in an effort avoid the pain of additional losses. Until the introduction of prospect theory, utility theory was the accepted theory through which researchers viewed risk-laden decision making (Friedman & Savage, 1948; Keeney & Raiffa, 1976).

According to utility theory, individuals make decisions under risk based on a comparison of the prospects and gambles, while including the cumulative utility of the outcome in combination with the existing utility of all assets in the individual's possession. Utility theory stipulates: The expectation of the decision under risk is $U(w + x_1, p_1; \dots; w + x_n, p_n) > u(w)$; where, the cumulative utility of all prospects is denoted by U , exiting assets are denoted by w , the potential gain or loss of a prospect is denoted by x , utility is denoted by u , and the probably of the outcome of a decision is denoted by p , with $p_1 + p_n = 1$ (Friedman & Savage, 1948; Keeney & Raiffa, 1976). Utility theory further

hypothesizes that people are generally risk averse; that is, where the outcomes of two prospects are equal, individuals will choose the less risky gamble. For example, assume an individual is faced with a choice problem where $p_1 > p_2$ and $u(x_1) = u(x_2)$. When choosing between $p_1u(x_1)$ and $p_2u(x_2)$, utility theory assumes an individual will choose $p_1u(x_1)$ as it has a higher probability of yielding the same outcome as the other prospect (Gerber & Pafum, 1998; Markowitz, 1952; von Neumann & Morgenstern, 1944; Pratt, 1964). Utility theory, however, does not account for an individual's need to maximize the utility of an outcome (Kahneman & Snell, 1990; Tversky & Kahneman, 1991). As Kahneman and Tversky (1979) observed, where a person is faced with a risky decision, they tend to violate the tenants of expected utility theory in an effort to avoid losses rather than to avoid risk.

Kahneman and Tversky (1979) theorize the perceived utility of an outcome is based on the person's subjective measurement relative to their status quo rather than an objective measure of cumulative, current utility. This is due to an individual's tendency to evaluate that which they perceive as a function of the change rather than final utility after that change. Where expected utility theory assumes one bases their decision making on the decision's aggregate outcome, prospect theory assumes the decision maker assigns a value to the change brought about by the decision. The perceived magnitude of the change is measured in the proportion of change from a key reference point the decision maker assigns based on their current status.

The key reference point is wholly subjective, and was originally defined by Kahneman and Tversky (1979), as person's "status quo" (p. 277). The key reference point is the neutral starting point from which the magnitude of a change is measured. It is

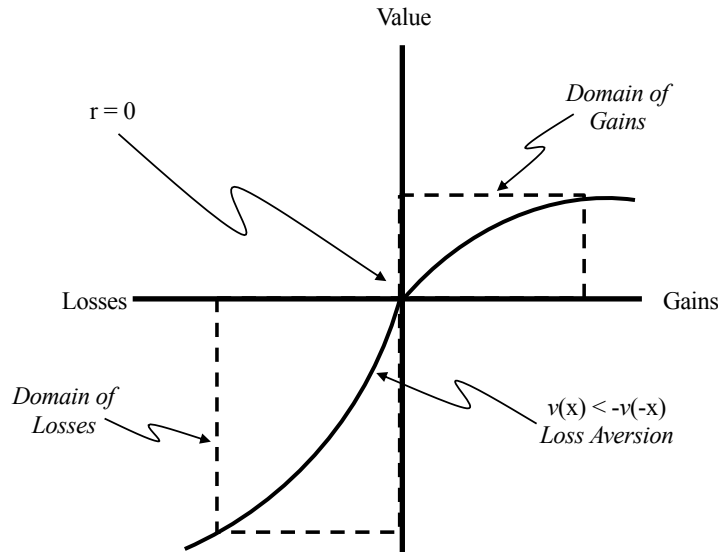
represented as r where $r = 0$. Where an individual feels they have fallen below their key reference point, they perceive a loss; where they feel they are above their key reference point they perceive a gain. These perceptive states are labeled “domain of losses” and “domain of gains” respectively (Kahneman & Tversky, 1979, p. 269). Kahneman and Tversky (1979), use the examples of temperature, light and sound. For instance, an office worker might step from their building into the sunlight and think it is bright compared to the florescent light of their normal day; whereas, that same sunlight is the status quo for a construction worker. While the amount of light shining on both the office worker and the construction worker is equal, the office worker perceives it as dramatic change from their status quo.

In entrepreneurial terms, the key reference point might be the entrepreneur’s current revenue. If revenue decreases, the entrepreneur will code that change as a loss. Even if the business is still profitable, the entrepreneur will perceive a loss due to the magnitude of change from their status quo and not the utility of an outcome once integrated into current assets. As an individual’s status quo is the starting point from which they perceive the magnitude of change of a gain or a loss, the magnitude of change from the neutral reference point is the value function.

The value function replaces utility theory’s utility function (Thaler & Johnson, 1990). Where v denotes the value function, $v(x)$ is the perceived value of a prospect and not the base utility of the prospect (Kahneman & Tversky, 1979). A change in welfare from the reference point is more perceptible where the magnitude of the change is closer in value to the reference point. Called “diminishing sensitivity”, the curve of the value function both above and below the reference point decreases the greater the distance from the reference

point; thus, the less marginal value of the loss or gain the further from the reference point (p. 278). Kahneman and Tversky (1979) characterized it as, “easier to discriminate between the change of 3° and the change of 6° in room temperature, than it is to discriminate between a change of 13° and the change of 16°” (p. 278). Diminishing sensitivity results in a value function that is concave above the reference point, in the domain of gains, and convex below the reference point, in the domain of loss. See Figure 1 below for a graphic representation.

Figure 1: Hypothetical Value Function. Adapted from Kahneman & Tversky (1979)



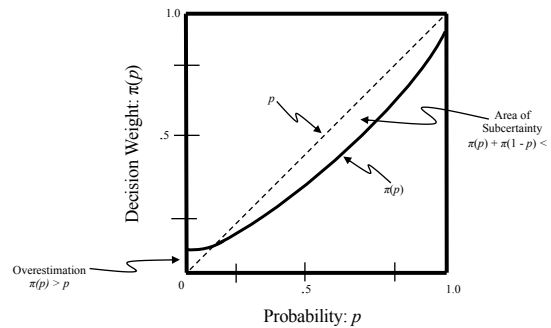
The value function above and below the reference point are both steepest near the reference point; however, the value function for losses is steeper than the value function for gains i.e. people have a stronger reaction to negative change than they do to positive change even where the magnitude of the change is equal (Kahneman & Tversky, 1979). Where the magnitude of change represents the value of a prospect x , then $v(x) < -v(-x)$ (Kahneman & Tversky, 1979; Thaler & Johnson, 1990). The value function also illustrates the central tenant of prospect theory that, “losses loom larger than gains”

(Kahneman & Tversky, 1979, p. 279). Specifically, an individual experiences nearly twice the negative emotional response to a change of welfare below the reference point, compared to an equal change above the reference point (Tversky & Kahneman, 1991). The looming nature of a loss causes individuals to apply a weighting function to probabilities of outcomes such that they perceive the probability to be less than it actually is in an effort to reduce the desirability of a gamble and avoid the possible negative outcome of that gamble.

The weighting function represents the perceived probability of an event occurring based on the desirability of the outcome of the event. Where π denotes the weighting function, $\pi(p)$ is the weighted probability of an event occurring based on the subject's perceived psychological impact of the event, not simply the actual probability (Kahneman & Tversky, 1979). Kahneman and Tversky (1979) observed individuals tend to perceive the cumulative probability of two outcomes as less than 1 i.e. $\pi(p) + \pi(1 - p) < 1$. Kahneman and Tversky called this property "subcertainty" (p. 281). The effects of subcertainty can be seen in terms of the domain of gains and the domain of losses. A graphic representation of subcertainty can be seen in Figure 2.

Figure 2: Hypothetical Weighting Function.

Adapted from Kahneman and Tversky (1979)



For instance, where an individual perceives themselves below their key reference point they are in the domain of losses. While perceiving this loss, they are presented with two prospects. Each prospect carries a probability of gain and a probability of loss. Based on subcertainty, an individual who currently perceives a loss will view the risk of further loss as lower than the actual probability, and be more likely to accept the additional risk i.e. $\pi(p)v(x) > \pi(p)-v(-x)$. Additionally, where an individual perceives themselves above their key reference point they are in the domain of gains. While perceiving this gain, they are presented with two prospects. Each prospect carries a probability of gain and a probability of loss. Based on subcertainty, an individual who currently perceives a gain will view the chance of further gain as lower than the actual probability, and be less likely to accept the additional risk i.e. $\pi(p)v(x) < \pi(p)-v(-x)$ (Kahneman & Tversky, 1979).

Where probabilities are extremely low, individuals tend to overweight their likelihood i.e. $\pi(p) > p$ (Kahneman & Tversky, 1979). The overweighting of extremely low probability provides an explanation for purchase of insurance or the participation in the lottery. For instance, it is very unlikely a person's home will burn down; however, the impact of that event is strong enough that most homeowners perceive the probability as greater than it is. To hedge against the weighted probability, homeowners typically chose to sustain a small loss now in the form of an insurance premium, rather than risk a total loss should the house burn down. The same holds true for lotteries. The odds of winning any state lottery are extremely low; however, the desire for a financial windfall is so great, people overweight the actual probability. They are then willing to accept a small

loss now and purchase a ticket, believing there is a reasonable probability of a financial windfall.

Table 1 below summarizes the notation related to prospect theory discussed in this chapter.

Table: 1 Prospect Theory Notation Table

Notation	Description
x_n	The “prospect”: The value of the gain or loss of an individual’s decision.
p_n	The “gamble”: The probability a decision will result in a given outcome.
$r = 0$	Key reference point from which gains and losses are measured.
$v(x)$	Value function: The perceived value of a prospect and not the base utility of the prospect
$\pi(p)$	Weighting function: The weighted probability of an event occurring based on the subject’s perceived psychological impact of the event, not simply the actual probability
$\pi(p) + \pi(1 - p) < 1.$	Subcertainty: Individuals tend to underestimate the probably of events occurring in moderate to high probability outcomes.
$\pi(p) > p$	Overweighting: Individuals perceive increased likelihood of events with extremely low probabilities.
$v(x) < -v(-x)$	Loss Aversion: A loss will take a greater psychological toll than a gain of equivalent value.

As previously discussed, individuals perceive a greater psychological strain with a loss as compared to a gain of the same value. This psychosocial strain has been shown to induce “loss aversion” (Kahneman & Tversky, 1979, 1984; Tversky & Kahneman, 1991, 1992). Where an individual experiences the psychological strain of loss to a greater degree than an equivalent gain, they become increasingly averse to experiencing continued loss and will accept increased risk in the hopes of recovering that loss. The effect of loss

aversion has been substantiated through several observations, to include the “endowment effect” (Kahneman, Knetsch, & Thaler, 1990, 1991; Thaler, 1980a) and “status quo bias” (Samuelson & Zeckhauser, 1988).

The endowment effect proposes the utility of a valued good is less when that good is received than when that good is given up (Thaler, 1980a). The most common illustration of the endowment effect is based in the original experiment conducted by Kahneman, Knetsch, and Thaler (1990). In their experiment, students in one group were given a coffee mug. This group was then told they have the option to sell the mug. A second group of students, who were aware of the other student’s coffee mug, were told they have the choice to either receiving a mug or a sum of money. The first group was then asked to write down at what price they would sell their mug. The second group was asked to write down the amount of money they would chose over receiving a mug.

Two seemingly different groups, one group has been endowed with a mug, and one has not been endowed with a mug. Both have been asked to give the coffee mug a dollar value. Individuals in both groups will make a choice and will receive either a mug or their perceived value of that mug. While the outcome for all individuals is effectively equal, those who have a mug will experience a loss if they exchange it for cash, and those who chose the mug over cash will experience a gain (Kahneman et al., 1990). Loss aversion, therefore, suggests those endowed with the mug will place a higher value on the mug in an effort to allay the pain of the loss to give up the mug (Tversky & Kahneman, 1991). Indeed, those endowed with a mug valued the mug at approximately \$7. Those who did not currently have ownership of a mug, conversely, valued the mug at approximately \$3. (Kahneman et al., 1990, 1991).

The coffee mug experiment illustrates a bias induced by loss aversion, the “status quo bias” (Samuelson & Zeckhauser, 1988). The status quo bias is aptly named as it simply reflects the common bias to choose the status quo when presented alternatives. Knetsch (1989) conducted an experiment on the endowment effect and asymmetric preference and clearly illustrated the status quo bias. Knetsch gave one group of subjects a mug and another group a bar of chocolate. The two items were of approximately equal value, and by handing the items out at random, they accounted for any specific preferences toward the mug or the chocolate. Both groups were then asked if they would like to trade the mug for the chocolate and vice versa. 89% of the subjects retained their initial endowment of the mug, and 90% of the subjects retained their initial endowment of chocolate. Where the two items are of approximately equal value, and personal preference was accounted for by randomization, nearly all participants preferred the status quo over experiencing the loss of their item.

In terms of loss aversion, each subject arrived at the experiment with an existing status quo. This status quo represents their reference point where $r = 0$. They were all then endowed with a mug (x) or chocolate (y). Having received something of value, participants now perceive themselves as above their reference point and in the domain of gains $r = 0 + v(x)$ or $r = 0 + v(y)$. Participants were unwilling to trade their endowment for an endowment of equal value because they would first need to lose their initial endowment. According to prospect theory, the loss of the initial endowment will take a greater psychological toll than can be offset by the positive effects of receiving the new endowment. That is, $v(x) > -v(-x) + v(y)$ in spite of $x = y$.

The problem arises, however, when individuals experience loss and fail to adjust their perception of the status quo to their new position. As Kahneman and Tversky (1979) observed, “a person who has not made peace with his losses is likely to accept gamble that would be unacceptable to him otherwise” (p. 287). To illustrate this idea, Kahneman and Tversky employ the example of an entrepreneur who has recently lost \$2,000 ($r = 0 - \$2,000$). After experiencing this loss, the entrepreneur is faced with two choices: One choice will result in a guaranteed gain of \$1,000; the alternative choice has a 50% probability of a \$2,000 gain and a 50% probability of no gain. The expected utility of both choices is equal at \$1,000; according to utility theory, this entrepreneur should be averse to asymmetric gambles ($\$1,000(1) = \$2,000(.5) + \$0(.5)$) and simply accept the guaranteed gain of \$1,000 ($r = 0 + \$1,000$). Having experienced the recent loss, however, the entrepreneur perceives themselves as \$2,000 below their reference point. Having not adapted their reference point to account for the \$2,000 loss, the entrepreneur now sees any gain as a reduction in that loss and not as an actual gain. Therefore, the entrepreneur will likely not see this as a choice between a guaranteed gain of \$1,000 versus a possible gain of \$1,000, but rather as a choice between recovering all of their loss (2,000, .50) or recovering half of their loss (\$1,000, 1). Because the entrepreneur did not adapt their status quo to account for the loss, the entrepreneur will negatively translate the choice problem (1979). Having suffered a loss, the entrepreneur becomes risk seeking and will risk the guaranteed gain of \$1,000 in the hope of regaining ground toward their reference point, (Thaler & Johnson, 1990).

THE ENTREPRENEUR

To date, there is no universally agreed upon definition of entrepreneurship (e.g., Garner, 1988; Low & MacMillan, 1988; Shane & Venkataraman, 2000). Attempts to define the entrepreneur began at least as early as the 1920s in economics. Knight (1921), for instance, suggested, the entrepreneur is the primary mover of an economy. Where, “[t]he supply of entrepreneur qualities in society is one of the chief factors in determining the number and size of its productive units” (p. 283). Following Knight, Joseph Schumpeter (1942), in his seminal work, “Capitalism, Socialism, and Democracy”, described the role of the entrepreneur as,

... to reform or revolutionize the pattern of production by exploiting an invention or, more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way, by opening up a new source of supply of materials or a new outlet for products, by reorganizing an industry and so on (p. 47).

In using words such as, “exploiting”, “possibility”, and “new”, Schumpeter (1942) began to define the core characteristics of what an entrepreneur is. That is to say, Schumpeter’s (1942) entrepreneur was a person who disrupted the existing status quo, or balance of the market economy, by accepting risk and exploiting an environment to create something new.

Three decades later, Kirzner (1973) challenged Schumpeter’s model of the entrepreneur. Rather than pushing an economy to grow through disruption as Schumpeter’s entrepreneur did, Kirzner proposed that the entrepreneur was the necessary entity by which an economy moves toward equilibrium. Kirzner’s entrepreneur did this

by increasing competition through innovation (1973, 1999). Kirzner's (1973) entrepreneur was more "alert" to problems within a chaotic economy. Identification and then exploitation of the opportunities presented by these economic problems is a critical part of the entrepreneurial process (Ardichvili, Cardozo & Ray, 2003; Shane & Venkataraman 2001).

Two decades after Kirzner (1973), Gartner (1988) viewed the outcome of this entrepreneurial process as the formation of a new business entity. Gartner (1988) clearly stated, "Entrepreneurship is the creation of organizations" and "[w]hat differentiates entrepreneurs from non-entrepreneurs is that entrepreneurs create organizations, while non-entrepreneurs do not" (p. 11). Gartner did not, however, offer this declarative statement as a definition of entrepreneurship or the entrepreneur. Rather, Gartner's intent was to state that the only true measure of the entrepreneur is "what the entrepreneur does, not who the entrepreneur is" (p. 21). Gartner saw the entrepreneur as a necessary but not sufficient component of entrepreneurship. Gartnerian entrepreneurship, then, could be defined as a process (effectuation, causation, etc.) by which the entrepreneur (human capital, social capital, biographic characteristics, demographic characteristics, etc.) in a specific context (resources, risks, probabilities, expected outcomes, etc.) results in new business formation (binary outcome) to address an identified problem within an economy.

Assuming the outcome of new business formation is the consistent measure of entrepreneurship, and the entrepreneur is necessary for the creation of those businesses (Gartner, 1988; Low & MacMillan, 1988; Vesper, 1980), the entrepreneur can be seen as inextricable from, but not equal to, the new business (Sarasvathy, 2004). Rather, the new

firm is created by the entrepreneur based on the overall context and the entrepreneur's individual characteristics (Gartner, 1989). The present research, therefore, assumes new venture creation is the outcome of entrepreneurial endeavors, where the individual entrepreneur and the context of the situation necessarily influence that outcome. The present research, therefore, defines entrepreneurship as the creation of a new business by an entrepreneur; and, the present research defines an entrepreneur as an individual who has created a new business venture based on the entrepreneur's individual characteristics and the context of the situation.

Types of entrepreneurship

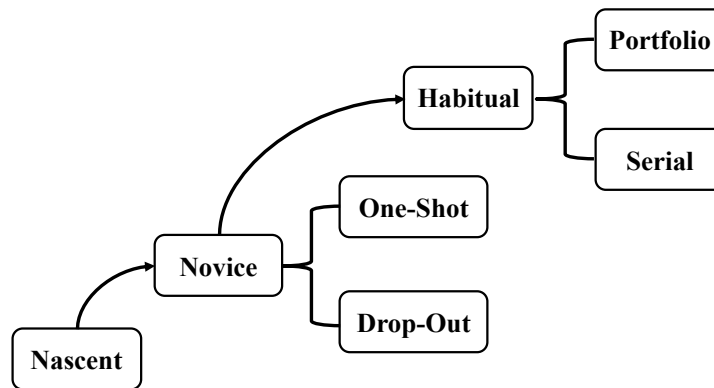
The 1990s, saw an increase in research which differentiates between single business owners and entrepreneurs who engage in "multiplicity" (MacMillan & Katz, 1992). Briley and Westhead (1993) for instance, identified significant differences between two types of entrepreneurs: Novice and habitual. A "novice" is generally defined as an entrepreneur who engages in only one entrepreneurial endeavor, and "habitual" generally refers to an entrepreneur who engages in multiple entrepreneurial endeavors.

Hall (1995) expanded on "multiplicity" by adding a third category of entrepreneur: Nascent. Nascent entrepreneurs are those who have identified an opportunity, but had yet to exploit the opportunity; novice entrepreneurs as those who have identified and exploited one opportunity; and habitual entrepreneurs as those who have identified and exploited many opportunities. A novice entrepreneur may remain novice so long as their business remains solvent and engage in no other entrepreneurial endeavors. They are "one-shot" entrepreneurs (MacMillin, 1986). Novice entrepreneurs might also exit or "drop out" of entrepreneurship. This can occur when an entrepreneur sells their company

or their company becomes insolvent. An entrepreneur might remain a drop out or one-shot entrepreneur or they might reenter entrepreneurship thus becoming habitual entrepreneurs.

Habitual entrepreneurs are then broken into two subcategories: serial and portfolio (Hall, 1995; Westhead & Wright; 1998). A serial entrepreneur is a habitual entrepreneur who identifies and exploits an opportunity then divests of that opportunity before moving on to exploit another opportunity. A portfolio entrepreneur is a habitual entrepreneur who does not divest of all or any of the previous small businesses before engaging in an additional business, thus simultaneously maintaining a portfolio of two or more entrepreneurial endeavors (Hall, 1995; Westhead & Wright; 1998). Figure 3 below illustrates the potential career paths of an entrepreneur.

Figure 3: Types of Entrepreneurship



The idea of a nascent entrepreneur accounts for entrepreneurial intent (Hsu, et al., 2016; Katz & Gartner, 1998). The nascent entrepreneur is an individual who has not yet engaged with entrepreneurship and may never engage in entrepreneurship; however, a nascent entrepreneur has demonstrated some form of intent to engage in an entrepreneurial venture. Katz and Gartner (1998) suggest indicators of entrepreneurial intent might include: Subscribing to periodicals related to entrepreneurship; joining

entrepreneurship clubs; participation in organizations such as the Small Business Administration; participation in entrepreneurship conferences, and so on.

McGee, Peterson, Mueller, and Sequeira (2009) observed a positive relationship between Entrepreneurial Self Efficacy (ESE) and nascent entrepreneurship. Where a non-entrepreneur has a high ESE, they are definitionally nascent enraptures due to their intent or interest to engage in entrepreneurship. Souitaris, Zerbinati, and Al-Laham (2007) observed an increase in interest and intent toward self-employment in students after completing a college course in entrepreneurship. Consistent with Souitaris et al. (2007), in their experiment, Hsu, Wiklund and Cotton (2017) found that entrepreneurship students in their experiment on ESE had a mean ESE of 4.7 out of 7 indicating greater than neutral intent to engage in entrepreneurship.

Where the nescient entrepreneur is defined by their intent to engage in entrepreneurship, a novice entrepreneur may best be defined by their past experience. Following Donckels, Dupont and Michael (1987), Briley and Westhead (1993) defined the novice entrepreneur as a person who at the time they create a new business had, “no previous experience of founding a business” (p. 40). This definition follows this manuscript’s definition of entrepreneurship in that it is based on a binary outcome: a business was created or a business was not created. For a novice entrepreneur, at the moment that business is created, they are simply defined by whether or not they have started a business previously. MacMillian (1986) was critical of the study of novice entrepreneurs. He suggested starting only one business was not sufficient for an entrepreneur to “develop an experience curve with respect to the problems and processes involved in starting a new business” (p. 242). MacMillian (1986) suggested a novice

entrepreneur's experience was limited, and created erroneous data. MacMillian (1986) challenged academics to study only habitual entrepreneurs as only they had navigated the trials of business startup enough times to truly understand the entrepreneurial phenomena.

Habitual entrepreneurs are those who have created more than one business. Termed "business generators" by MacMillian (1986), these entrepreneurs create multiple business ventures. MacMillian theorized that a "business generator" starts a business then becomes bored with the success of that business and moves on to another endeavor. Hall (1995) later defined two types of habitual entrepreneur: Serial and portfolio. A serial entrepreneur creates a business, then divests of the business prior to starting another one; a portfolio entrepreneur maintains more than one business simultaneously.

Westhead and Wright (1998) defined serial entrepreneurs as, "those who sell their original business but at a later date inherit, establish, and/or purchase another business" (p. 176). Serial entrepreneurs tend to be more concerned with achievement and recognition. Once the business they create reaches an objective, they tend to divest of the business and move on to the next endeavor. Because serial entrepreneurs are achievement oriented, they tend to have a specific growth point in mind, and their businesses tend to be less complex at the time of exit. They tend to grow a business to a manageable size and then divest of the business. This is in contrast to a portfolio entrepreneur's businesses which are allowed to grow over longer periods of time (1998).

Portfolio entrepreneurship

Rosa and Scott (1999) described portfolio entrepreneurs as maintaining clusters of small businesses. Carter and Ram (2003) defined the portfolio entrepreneur, "as an individual simultaneously owning and engaging in a portfolio of entrepreneurial

interests” (p. 374). Kutzewski, Bahlmann, and Stam (2020) described it as, “the underlying process of ambidexterity, as the simultaneous exploration and exploitation of new business opportunities, in an entrepreneurial context” (p. 40). These definitions all adequately describe the portfolio entrepreneur phenomena; however, they lack the specificity required for the present research. For instance, Rosa and Scott’s (1999) small businesses clusters do not rule out family businesses or entrepreneurial teams. Neither family businesses or entrepreneurial teams, are consistent this manuscript’s intent to examine the decision of an individual entrepreneur to transition from novice to portfolio entrepreneurship. Carter and Ram’s (2003) “portfolio of entrepreneurial interests” might require a caveat stipulating the distinction between “portfolio” in the context of financial theories and “portfolio” in the context of entrepreneurship; as Parker (2014) points out, while there is some overlap in reasoning, “investment theories [do] not treat entrepreneurial opportunities or occupational choices” (p. 890).

While I favor the coherent nature of Kutzewski et al.’s (2020) definition, it is applicable to both the first diversification event as well as subsequent diversification events. That is, it applies to the transition of a novice entrepreneur to portfolio entrepreneurship as well as the existing portfolio entrepreneur’s “underlying process” (p. 40). Therefore, the present research will adopt Westhead and Wright’s (1998) definition of the portfolio entrepreneur as one who “retains his/her original business and inherits, establishes, and/or purchases another business” (p. 176). The Westhead and Wright (1998) definition is applicable to the present research as it speaks directly to the individual “his/her”, novice entrepreneur “original business” transitioning to portfolio entrepreneur through the ownership “inherits, establishes, and/or purchases” of a formally

established “business”. This definition is consistent with my definition of the novice entrepreneur and entrepreneurship. The definition is also consistent with the intent of the present research which is to examine the individual, novice entrepreneur’s original diversification decision. This definition is also consistent with extant research on the antecedents of portfolio entrepreneurship, which has primarily focused on the individual entrepreneur as the unit of measure (Kutzewski, et al., 2020). Rosa (1998) for instance, examined the, “motives, strategies, and practices” of individual entrepreneurs in the context of habitual entrepreneurship (p. 43).

Rosa and Scott (1999) observed that portfolio entrepreneurs are more likely to be successful than entrepreneurs who maintain only one small business. Parker (2014) further suggested, “...portfolio entrepreneurs seem to run a disproportionate number of fast-growing businesses and are responsible for substantial value creation” (p. 888). The propensity of portfolio entrepreneurs to be more successful, broadly speaking, is due to the positive effects of diversification; specifically, the efficiencies gained through shared resources (Baert, C., Meuleman, M., Debruyne, M., & Wright, M., 2016). Beyond financial and tangible resources, the individual entrepreneur’s general and specific human capital increase efficiency of an entrepreneurial portfolio. This entrepreneur’s ability to orchestrate resources in reaction to market conditions lead to the efficiencies gained in a portfolio of entrepreneurial endeavors (Baptista et al., 2019).

Entrepreneurial Capital

Rosa (2006) suggested the maintenance of a portfolio of business requires “entrepreneurial capital” or the ability to “habitually create and manage a succession of businesses and bring about entrepreneurial renewal” (p. 14). Entrepreneurial capital

represents the intangible, non-financial capital required to sustain an entrepreneurial endeavor. Accordingly, the present research will define entrepreneurial capital as a combination of the individual entrepreneur's human capital characteristics.

Developed by Schultz (1961) and Becker (1964), human capital theory is of specific interest to the study of entrepreneurship (e.g., Ardichvili, Cardozo, & Ray, 2003; Shane, 2000). Human capital is a critical component of the opportunity identification (e.g., Alvarez & Barney, 2007; Marvel, 2013; Ucbasaran, Wright, Westhead, & Busenitz, 2003) and exploitation process (e.g., Bruns, Holland, Shepherd, & Wiklund, 2008; Ucbasaran, Westhead & Wright, 2003). New and small business success has also been linked to past entrepreneurial experience (e.g., Bradley, McMullen, Artz, & Simiyu, 2012; Corbett, Neck, & DeTienne, 2007). Small business owner's human capital characteristics have also been used to explore the firm's performance and survival thresholds (e.g., Gimeno et al., 1997, Ucbasaran et al., 2003; Wiklund & Shepherd, 2008), as well as entrepreneurial exit (e.g., Bates 1990; 1995; Gimeno et al., 1997, Preisendorfer & Voss 1990).

In their critical review, Marvel, Davis and Sproul (2016) identified 344 individual human capital constructs in entrepreneurship literature. The most common human capital constructs in the entrepreneurship literature were work experience, education and previous entrepreneurial experience. Work experience and education are categorized as general human capital (Becker, 1994). Previous entrepreneurial experience is categorized as specific human capital (1994). Demographic constructs such as if their parents were entrepreneurs, age, and gender were also observed (Marvel, et al., 2016).

The entrepreneur's general human capital characteristics play a significant role as antecedent to entrepreneurial action (Kutzewski et al., 2020). Indeed, effectual logic dictates that entrepreneurs tend to apply resources they have available when creating new ventures, (to include human capital) rather than focusing on the outcome or business to be created (Sarasvathy, 2001). For instance, researchers have observed that entrepreneurs who maintain a portfolio of businesses tend to have a higher education than entrepreneurs who maintain only one business (Kolvereid & Bullvag 1993; Wiklund & Shepherd, 2008). Researchers have also observed an entrepreneur's overall cognitive capability increases the likelihood of diversification (Baron, 1998; Kutzewski et al., 2020). Additionally, Ucbasaran, Westhead, & Wright (2008) proposed that an entrepreneur's human capital is critical to their individual entrepreneurial process. Habitual entrepreneurs specifically rely on heuristics (a form of human capital based on past experience) to make complex decisions (2008). To that point, Westhead, Ucbasaran, Wright, & Binks (2005) observed habitual entrepreneurs tended to have had more previous employment experience than other types of entrepreneurs.

Specific human capital in the form of entrepreneurial experience has been linked directly to firm performance (Bradley et al., 2012; Corbett et al., 2007). Entrepreneurial experience results in the understanding of the interactions between economic markets, customers, customer problems, channels, and future opportunities (Marvel et al., 2016; Shane 2000). This experience results in knowledge, skills and abilities directly related to a specific industry, market, entrepreneurial endeavor. Entrepreneurial experience is typically specific to one context and is generally less valuable in other contexts such as

employment or entrepreneurship in another industry or region (Markman & Baron, 2003).

Specific human capital also serves as antecedent to portfolio entrepreneurship. Specific human capital is similar to the entrepreneur's general human capital, but differs in that it is applicable only to the context of the specific business (Gimeno et al., 1997). As discussed earlier in this chapter, Gimeno et al. (1997) defined specific human capital as, "an entrepreneur's knowledge of customers, suppliers, products, and services within the context of [a specific] venture" (p. 757). Westhead and Wright (1998), for instance, observed novice entrepreneurs tend to start businesses in the same industry as their current profession. This indicates specific human capital provides an advantage in their current industry, as well as a restriction to opportunity due to the specificity of their past entrepreneurial experience.

Empirical research of entrepreneurial human capital has focused primarily on the direct effect of human capital on different dependent variables. Marvel et al. (2016) for instance, reviewed 109 articles from top entrepreneurship journals and observed few instances exploring moderating effects of human capital characteristics. Examples include the moderating effect of social capital (Bhagavatula, Elfring, van Tilburg, & van de Bunt, 2010), and gender (Manolova, Carter, Manev, & Gyoshev, 2007). The scarcity of research regarding the moderating effect of human capital prompted the present research's inquiry on the interactive nature the entrepreneur's human capital characteristics.

ENTREPRENEURSHIP AND PROSPECT THEORY

Risk and uncertainty in decision making has been a central theme in entrepreneurship research (e.g., Alvarez, & Barney, 2005; Butler, Doktor, & Lins, 2010; Hmieleski, Carr, & Baron, 2015; Jalonen, 2012; Korsgaard, Berglund, Thrane, & Blenker, 2015; Mahnke, Venzin, & Zahra, 2007; Matthews, & Scott, 1995; McKelvie, Haynie, & Gustavsson, 2011; McMullen, & Shepherd, 2006; von Gelderen, Frese, & Thurik, 2000). There is, however, scant literature exploring entrepreneurship in the context of prospect theory. Some of the few examples include: Stewart and Roth (2001) applied prospect theory and found that entrepreneurs are more risk seeking than managers; and, entrepreneurs who were focused on profit and growth are more risk seeking than income-oriented entrepreneurs. Holm, Opper, & Nee, (2013), applied prospect theory's principle of subcertainty and observed entrepreneurs will accept more strategic risk (competitive risk) than non-strategic risk (luck). Finally, Hsu, Wiklund and Cotton (2016) found that entrepreneurial self-efficacy moderates the direct effect between prospect theory's principle of loss aversion and an entrepreneur's intent to reenter entrepreneurship. Morgan and Sisak (2016) proposed that entrepreneurs with a high reference point increase investment proportionate to their increase in loss aversion and entrepreneurs with a low reference point decrease investment proportionate to their decrease in loss aversion; thus, substantiating risk seeking behavior in poor performing entrepreneurial endeavors. In their "lab-in-the-field" experiment, Koudstall, Sloof and van Praag (2016) found that entrepreneurs see themselves as risk takers even though they are actually only more risk seeking than managers in the lower degrees of loss aversion. Expanding on the entrepreneur's perceptions, Barbosa et al. (2019) found that an entrepreneur's perception

of risk fully mediated an entrepreneur's entry decision. But, the entrepreneur's reference point did not affect entrepreneurial confidence.

Entrepreneurial Reference Points

While the literature applying prospect theory to entrepreneurship is limited, there is a literature applying Kahneman and Tversky's (1979) key reference point to the entrepreneur's decision-making process. Kahneman and Tversky defined the reference point as a person's financial status quo (1979). The subjectivity of the reference point, however, allows for its movement relative to external factors and not just the individual's status quo. Rather than representing a subject's status quo, a reference point might alternatively be fixed by their aspiration or desire (Koszegi & Rabin, 2006; Lee & Venkataraman, 2006). For instance, where someone's reference point might represent their current wealth, social status or professional achievements, a reference point might alternatively represent the desired amount of future wealth or social status. An entrepreneur then perceives gains or losses based on a reference point which may be higher than their current status quo.

Redefining the key reference point as a form of aspiration, goal or desire is consistent with extant literature on reference dependent decisions. Koszegi and Rabin (2006), for instance, defined the reference point as, "endogenous expectations" as they are "fully determined by the expectations a person held in the recent past" (p. 1141). March and Shapira (1987) also referred to the key reference point as, "an aspiration level or 'target'" (p. 1409). DeTienne, Shepherd & De Castro (2008) referred to the reference point as an "aspiration level" (p. 529). Lee and Venkataraman (2006) labeled the reference point the aspiration vector (AV), and described it as, "formed from the human, intellectual, and

social capital of an individual” (p. 108). Consistent with the aforementioned work on prospect theory and entrepreneurship, Lee and Venkataraman (2006) proposed research regarding opportunity exploitation should focus on the AV (key reference point).

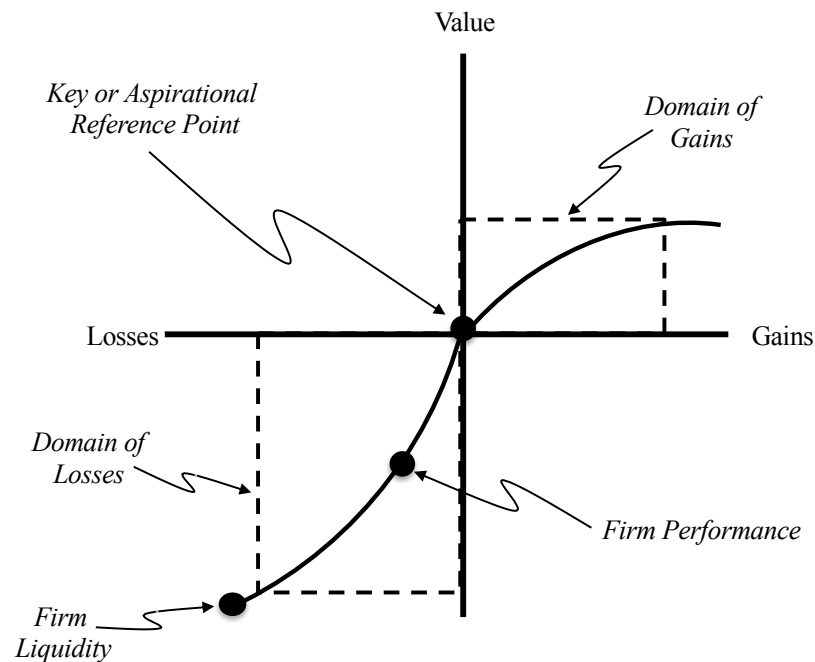
Extant literature has proposed that entrepreneurs tend to set more aspirational reference points (Barbosa, et al., 2019; Baron, 2004; Koudstaal et al., 2016). Because entrepreneurs tend to frame their reference point based on their expectations, and these expectations are often higher than most individual’s aspirations, entrepreneurs more frequently perceive themselves in the domain of loss. Even where an entrepreneur is experiencing objective success, this success might not meet the aspirations they fixed in their own mind. Entrepreneurs, therefore, tend to frame decisions from a position of loss, which results in risk seeking choices (Hack et al., 2016). In spite of the entrepreneur’s generally higher reference point, there are situations where the entrepreneur’s reference point can be negatively representational (Kahneman & Tversky, 1979). Kahneman and Tversky use the example of an entrepreneur, who in a down economy is doing well relative to other entrepreneurs. When that entrepreneur suffers a loss, they may not perceive it as a loss because, relative to other entrepreneurs, they are still doing well.

March and Shapira (1987) expanded the concept of reference dependent decision making by suggesting additional reference points. In addition to the key (aspirational) reference point, March and Shapira suggest decisions under risk are made relative to the firm’s “performance or position (e.g. profit, sales)”, as well as the point of firm survival (firm liquidity) (p. 1409-1410). Figure 4 is representation of Kahneman and Tversky’s (1979) hypothetical value function, including March and Shapira’s (1987) additional reference points. The aspiration point and survival point provide boundary conditions to

prospect theory's domain of loss. The perception of the firm's performance relative to the survival and aspiration points affect the degree of loss aversion a manager feels.

Specifically, and consistent with prospect theory, March and Shapira (1987) observed that managers are more risk seeking when performance falls below aspiration point.

Figure 4: Hypothetical Value Function. Adapted from Kahneman & Tversky (1979), Including Additional Reference Points (March & Shapira, 1987)



Miller and Chen (2004) conducted an empirical examination of March and Shapira's reference points. Using a conjoint experiment, they observed that as managers perceived a shift in performance from the aspiration point toward the survival point, and vice versa, they place more emphasis on the approaching respective point. For instance, managers will accept more risk as a firm approaches bankruptcy and will progressively accept less risk as firm performance improves. Holland and Shepherd (2013), also conducting a conjoint experiment and observed the same phenomena in entrepreneurs. They described the decisions made near the aspiration point as having "low adversity", and resulted in

less risk seeking decisions. Conversely, decisions made near the survival point were exposed to “high adversity” and resulted in increased risk seeking. Additionally, Holland and Shepherd (2013) observed entrepreneurs put less weight on probability in high adversity than low adversity and base their decisions on the “desirability” of the outcomes.

Performance Thresholds

Threshold theory and the persistence literature have expanded on reference dependent decisions. Gimeno et al. (1997), proposed that, “organizations have different required thresholds of performance, and survival (or exit) is determined by whether performance falls above (or below) the threshold” (p. 774). Performance thresholds can be viewed as “[t]he choice of whether to continue with a struggling venture or to exit the business” (Holland & Shepherd, 2013, p. 337). Where firm performance has fallen below the entrepreneur’s aspiration point, persisting with the endeavor carries with it the possibility of regaining the losses, and moving closer to the aspiration point. Persisting with the endeavor also carries the possibility of additional losses and moving further from the aspiration point and closer to the survival point. However, should the entrepreneur decide to exit the business, they may perceive it as a loss if the entrepreneurs did not achieve their goals. Rather than accept a certain loss, prospect theory suggests the entrepreneur is more likely to accept the risk of additional losses (Holland & Shepherd, 2013; Tversky & Kahneman, 1991).

While the verbiage of threshold theory differs from prospect theory, performance thresholds are directly comparable to the entrepreneurial reference points (Gimeno et al., 1997). Particularly where a firm is represented by an individual, such as an entrepreneur,

the firm's threshold of performance is equivalent to Kahneman and Tversky's key reference point (1997). To further illustrate the point, the performance thresholds in Gimeno et al.'s above quote can be substituted with entrepreneurial reference points: "organizations have different required [reference points], and [firm survival] (or exit) is determined by whether [firm performance] falls above (or below) the [key reference point]" (p. 774). A lexicon summarizing the various entrepreneurial reference points can be found in Table 2 at the end of this section.

While "performance threshold" and "reference point" can be used interchangeably, threshold theory and the persistence literature has observed that the threshold of performance (key reference point) vary between enterprises and are driven by the characteristics of the individual entrepreneur (Gimeno et al, 1997). Specifically, the entrepreneur's general human capital, specific human capital, psychic income and switching costs (1997). These four aspects effect the entrepreneur's performance threshold in different ways (Gimeno et al, 1997: Holland & Shepherd, 2013).

Gimeno et al. (1997) defined general human capital in terms of education and work experience. They observed that years of formal education were useful across numerous occupations and offered the entrepreneurs alternatives to persistence. Work experience also offered entrepreneurs alternatives to persistence. Particularly where the work experience involved managerial and supervisory experience, the entrepreneurs had increased value outside of the firm and therefore less reason to accept the risk and persist with the failing firm.

Antithetical to general human capital, specific human capital is capital valuable to the firm and is less valuable outside of the firm. Gimeno et al. (1997) defined specific human

capital as the, “entrepreneur’s knowledge of customers, suppliers, products and services within the context of the venture” (p. 771). While these characteristics are valuable if not necessary to the venture, they are only transferable to similar ventures and similar positions. Therefore, the more specific human capital the entrepreneur possesses in the context of a firm, the more likely they are to persist in spite of poor performance.

The next human capital trait discussed by Gimeno et al. (1997) is psychic income. Psychic income defines the level of psychological commitment an entrepreneur has to the firm. Psychic income is related to the non-financial rewards the entrepreneur gains from self-employment and autonomy. Where an entrepreneur has a strong psychological commitment to the firm, they are more likely to accept the firm’s lower performance and persist (Gimeno et al, 1997).

The final human capital trait discussed by Gimeno et al. (1997) is switching cost. Switching costs are the additional costs an entrepreneur will incur should they decide to switch from their current occupation. Switching costs are related to the cost of searching for alternative occupations, onboarding or retraining in a new occupation, psychic strain of the change, as well as any literal financial costs such as additional education or relocation. Switching cost can be directly related to an individual’s age (1997). Older employees tend to take longer to find employment as employers prefer candidates they can invest in over time (Bortnick & Ports, 1993; Gimeno et al., 1997). The entrepreneur who decides not to persist in a failing firm will incur these switching costs. Because switching costs increase concurrent with age, older entrepreneurs were more likely to persist with their business even when they perceive they are below their key reference point (Gimeno et al, 1997).

Gimeo et al.'s (1997) observations were consistent with human capital theory; however, they are unique in that human capital theory traditionally applied only economic logic as a foundation for discussing the individual decision making (Becker, 1964). That is, human capital theory traditionally considered only the financial outcome of a decision, where threshold theory accounted for non-financial returns. Finally, while the human capital literature has discussed entrepreneurial decision making, it has focused on entrepreneurial entry, not persistence or exit which are the decisions faced by existing entrepreneurs (Bates, 1995; Evans & Jovanovic, 1989; Evans & Leighton, 1989). Therefore, rather than examining the entrepreneur's characteristics strictly in the context of human capital theory, this research project will view the entrepreneur's human capital characteristics in the context of their effect on the performance threshold vis-à-vis threshold theory.

Table 2: Entrepreneurial Reference Point Lexicon

Article (Chronological)	Reference Point
Kahneman & Tversky (1979)	-Key reference point defined as an individual's financial status quo
March & Shapira (1987)	-Key reference point defined as "an aspiration level or 'target'" - Firm performance identified as a second reference point - Firm survival (or firm liquidity) identified as a third reference point
Gimeo et al. (1997)	-Threshold of performance synonymous with the key reference point -Firm threshold performance synonymous with firm performance -Survival threshold synonymous with firm survival (or firm liquidity)
Lee & Venkataraman (2006)	-Aspiration Vector (AV) synonymous with the key reference point

	-Market Offering Vector (MOV): “economic, social, and psychosocial dimensions” of occupational opportunities
Koszegi & Rabin (2006)	-Key reference point: “fully determined by the expectations a person held in the recent past”
DeTienne et al. (2008)	-Key reference point defined as “an aspiration level”
Holland & Shepherd (2013)	-Aspiration point synonymous with the key reference point -Survival point synonymous with firm survival (or firm liquidity) - Loss aversion was described as “low adversity” where the entrepreneur was below, but near their key reference point; and, “high adversity” where the entrepreneur was below their key reference point but closer to the survival point

HYPOTHESIS DEVELOPMENT

As discussed in this chapter, the present research defines entrepreneurship as the creation of a new business by an entrepreneur; and, the present research defines an entrepreneur as an individual who has created a new business venture based on the entrepreneur’s individual characteristics and the context of the situation. Because the present research is concerned with the transition of an entrepreneur from novice entrepreneur to portfolio entrepreneur, I also find it pertinent to reiterate the definitions of novice entrepreneur and portfolio entrepreneur prior to hypothesis development.

Therefore, the present research defines a novice entrepreneur as a person who at the time they create a new business had, “no previous experience of founding a business” (Briley & Westhead, 1993, p. 40); and, the present research follows Westhead and Wright’s (1998) definition of a portfolio entrepreneur as an entrepreneur who, “retains his/her original business and inherits, establishes, and/or purchases another business” (p. 176).

The objective of the present research was to explore the novice entrepreneur’s decision to diversify their small business portfolio and join the ranks of the portfolio

entrepreneur. I explored the diversification decision in the context of prospect theory in an effort to determine if loss aversion contributed to the diversification decision. I further examined how the individual entrepreneur's general human capital, specific human capital, psychic income, and switching costs influence the diversification decision.

Loss Aversion and the Diversification Decision

Approximately 20% of small businesses fail in their first year, with only half surviving five years, and one-third surviving past ten years (SBA, 2018a). Further, extant literature suggest it takes eight to thirteen years for a firm to develop the resource necessary for sustainable diversification of an entrepreneurial portfolio (Baptista, Karaoz & Leitao, 2019; McDougall, Colvin, Robinson & Herron, 1994; Rutherford, Tocher, Pollack, & Coombes, 2016). In spite of the odds of establishing a successful business, nearly 800,000 new business are formed in the U.S. each year (Bureau of Labor and Statistics, 2020). Some of these new businesses are launched by novice entrepreneurs attempting to diversify their portfolios by starting a second small business while maintaining their original small business (Baptista et al., 2019; Parker, 2014; Westhead et al., 2005b; Westhead & Wright, 1998).

According to prospect theory, when faced with a risky decision, an entrepreneur will make that decision based on their position relative to a key reference point (Kahneman & Tversky, 1979). Where an entrepreneur perceives their current state as below that reference point, they become loss averse and increasingly willing to accept greater risk in an effort to reach their reference point. Extant literature defines the key reference point as the entrepreneur's most recent aspirations or goals (Detienne et al., 2008; Koszegi & Rabin, 2006; Lee & Venkatararman, 2006; March & Shapira, 1987).

Specifically, where an entrepreneur's performance has fallen short of their aspirations, prospect theory dictates they will take increasingly greater risk in an effort to regain lost ground and achieve their goals (Thaler & Johnson, 1990). Morgan and Sisak (2016) proposed that entrepreneurs with a high reference point increase investment proportionate to their increase in loss aversion; while entrepreneurs with a low reference point decrease investment proportionate to their decrease in loss aversion. Thus, substantiating risk seeking behavior in poor performing entrepreneurial endeavors. Simon, Houghton and Savelli (2003) observed that entrepreneurs below their reference point (less satisfied) will expand into less familiar and more risky (due to resources) products and industries. They further observed, this additional risk and resource strain results in less success continuing to push the entrepreneur below their reference point. Finally, entrepreneurs tend to set more aspirational reference points and continue to set higher aspiration points even when they fail to achieve their previous aspirations (Barbosa, Fayolle, and Smith, 2019; Baron, 2004; Koudstaal, et al., 2016). The net result is that entrepreneurs tend to have a greater degree of loss aversion and tend to remain loss averse even where others might perceive success.

Therefore, where an entrepreneur who currently perceives their business is performing below their expectations, and they are presented with an additional entrepreneurial opportunity, the increase in loss aversion will result in an increase in the likelihood that the entrepreneur will accept the risk and chose to exploit that the second opportunity.

Hypothesis 1: Higher levels of loss aversion are positively associated with the probability of diversifying.

Entrepreneurial Capital

Where the aforementioned entrepreneur perceives their current business as underperforming, and they are presented with the opportunity to exploit a second small business concurrent with their first, their general human capital, specific human capital, psychic income and switching costs will moderate the effect of loss aversion on their decision to exploit the second opportunity (Gimeno et al, 1997: Holland & Shepherd, 2013).

An entrepreneur's level of education, field of study, years of managerial and supervisory experience are the most common measures of general human capital. (Becker, 1994; Marvel, Davis and Sproul, 2016). General human capital is a critical component of the entrepreneurial process (Ucbasaran, et al., 2008). For instance, entrepreneurs with a higher education are more capable of processing new information and recognizing opportunity (Wiklund & Shepherd, 2008). Conversely, as an entrepreneur's general human capital increases, so do the entrepreneur's opportunities outside of entrepreneurship (Gimeno et al., 1997). An entrepreneur's field of study, for instance, might be extremely valuable to an employer. Whereas, the entrepreneur's field of study might become diluted by the day-to-day responsibilities of small business ownership. A chemist, for example, can produce a great deal of value in an employer's laboratory when compared to the time the chemist might spend completing mundane administrative task such as monthly payroll in a small business.

An entrepreneur's ability to manage systems and lead people are clearly valuable in the small business setting. As the entrepreneur's managerial and supervisory experience increase, however, the individual becomes increasingly valuable to outside employers

(Gimeno et al., 1997). General human capital characteristics such as managerial and supervisory experience are transferable across all entrepreneurship and employment settings. As the entrepreneur's general human capital increases, the more opportunities the entrepreneur has outside of entrepreneurship. Specifically, where an entrepreneur has fallen below their key reference point, and is presented with a second business opportunity, the increase in risk seeking behavior will be moderated by their general human capital. An entrepreneur with high general human capital be less risk seeking as opportunities outside of entrepreneurship reduce the willingness to "double down" on a second entrepreneurial endeavor. Conversely, an entrepreneur with low general human capital might not perceive an alternative to entrepreneurship. When they perceive a loss and are presented a second, risky opportunity they become more willing to accept the increased risk. Without viable alternatives, the entrepreneur becomes more likely to take the risky opportunity in an effort to regain their position and continue their entrepreneurial path.

Hypothesis 2: General human capital will moderate the relationship between loss aversion and the probability of diversifying, such that general human capital will suppress this relationship.

Specific human capital is similar to the entrepreneur's general human capital, but differs in that it is applicable only to the context of the specific business (Gimeno et al., 1997). Unlike general human capital, specific human capital is less transferable outside of the entrepreneurial endeavor. As an entrepreneur's specific human capital increases, their alternatives to entrepreneurship decrease; however, the entrepreneur's confidence and ability to improve firm performance increase (Bradley et al., 2012; Corbett et al., 2007).

Therefore, an entrepreneur with high specific human capital might overweight their actual probability of succeeding with the second entrepreneurial opportunity ($\pi(p) > p$) (Kahneman & Tversky, 1979). Conversely, an entrepreneur with low specific human capital might lack the confidence and ability to improve firm performance. This entrepreneur will become subcertainty of their actual probability of succeeding with the second entrepreneurial opportunity ($\pi(p) < p$). When they perceive a loss and are presented a second, risky opportunity an entrepreneur with high specific human capital will become more willing to accept the increased risk. Their knowledge of customers, suppliers, products and services in their entrepreneurial context increases their perceived likelihood of success such that the probability of failure appears less than it actually is (Gimeno et al., 1997).

Hypothesis 3: Specific human capital will moderate the relationship between loss aversion and the probability of diversifying, such that it will magnify this relationship.

Psychic income will also moderate the effects of loss aversion on the diversification decision. Psychic income is the aggregate of all non-economic gains the entrepreneur derives from the ventures. Psychic income includes their personal satisfaction from entrepreneurship, the autonomy it provides, and personal attachments the entrepreneur has to their ventures (Gimeno et al., 1997). Where an entrepreneur has high psychic income, they will go to greater lengths to preserve their endeavor and the lifestyle they have become psychologically attached to. Where that entrepreneur perceives a loss, and is presented with a second opportunity, high psychic income will increase the entrepreneur's willingness to accept risk in an effort to preserve the venture. Due to the

increased psychic income an entrepreneur is more committed to seeing the venture succeed and will accepted increased risk in pursuit of that success.

Hypothesis 4: Psychic income will moderate the relationship between loss aversion and the probability of diversifying, such that it will magnify this relationship.

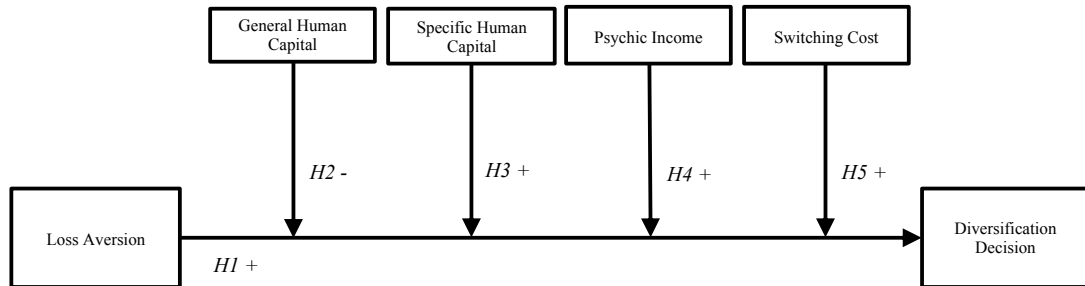
Finally, the probably an entrepreneur will accept the risk of exploiting a second opportunity when they perceive their current position as a loss will be moderated by their switching costs. The entrepreneur's switching costs represent the aggregate difficulty for the entrepreneur to change from their current endeavor to an alternative (Gimeno et al., 1997). Switching costs might include: The time it will take the entrepreneur to find an alternative to entrepreneurship; any training that might be associated with that alternative; any actual monetary costs which are associated with the change such as relocation, training, periods of unemployment, etc. (1997). As the entrepreneur's switching costs increase, they become more determined to preserve their entrepreneurial endeavors as the difficulty to transition to an alternative also increases (Gimeno et al., 1997; Holland & Shepherd, 2013). Where an entrepreneur has high switching costs, they will go to greater lengths to preserve their current endeavor due to the cost of transitioning to an alternative. An increase in the entrepreneur's switching cost represents the difficulty in finding or adjusting to employment outside of entrepreneurship; therefore, the entrepreneur will accept more risk in an effort to sustain the entrepreneurial endeavor.

Hypothesis 5: Switching cost will moderate the relationship between loss aversion and the probability of diversifying, such that it will magnify this relationship.

Based on the above, five hypotheses, I present the following theoretical model.

Theoretical Model

Figure 5: Theoretical Model



CHAPTER III

METHODOLOGY

RESEARCH DESIGN

The present research was conducted in three phases: 1) Ecological Validity; 2) Pilot Testing; and 3) Study Experiment. In phase I, I conducted a qualitative, survey-based interview of portfolio entrepreneurs to establish ecological validity for the experiment in phase III. Ecological validity is an assessment of how accurately the experiment embodies the real-world conditions it is simulating (Bronfenbrenner, 1977; Schmuckler, 2001). Ecologic validity is necessary to ensure the experiment's measures accurately represent the decision the entrepreneur would make in a non-hypothetical situation. In the second phase, I conducted a series of pilot studies to establish the validity of the choice questions and hypothetical scenarios presented to each treatment group in the phase three experiment. Finally, in the third phase, I conducted the primary study using a survey-based conjoint experiment. Table 3 below presents a brief overview of study design, methods, sample, objective, analysis, and outcome of each of the three phases.

Table 3: Research Design Phases

PHASE 1: Ecological Validity	
Study Design	Qualitative
Methods	Survey-based interview
Sample	27 Portfolio Entrepreneurs
Objective	Establish ecological validity
Analysis	Coding of key words and statements
Outcome	Key words and statements indicate entrepreneurs make decisions based on their perceived position relative to a key reference point.

Table 3: Research Design Phases (Continued)

PHASE 2: Pilot Tests		
	Pilot Test 1-3	Pilot Tests 4-6
Study Design	Quantitative	Quantitative
Methods	Survey-based experiment	Survey-based experiment
Sample	30 MTurk workers	30 MTurk workers
Objective	Validate measure of dependent variable	Validate treatment scenarios
Analysis	One-way repeated measures ANOVA	Paired Sample 2-Sided t-Test
Outcome	Initial within group responses indicated subjects did not respond to the varying degree of risk posed by each choice question. Attributes of the choice questions were redesigned such that the degree of risk for each question was more intuitive. By the third pilot, the comparison of means for each choice question showed respondents were responding appropriately to the degree of risk related to each question.	Initial responses between treatment groups lacked significant variance. Increased emphasis on personal financial responsibility for outcome improved results. Presenting treatment scenarios via a video with graphic representations of the scenario showed increased variation between treatment groups.

Table 3: Research Design Phases (Continued)

PHASE 3: Study Experiment	
Study Design	Quantitative
Methods	Survey-based experiment
Sample	134 MTurk Workers & 48 LinkedIn Users
Objective	Test Hypotheses
Analysis	One-Way ANOVA and Welch's Test
Outcome	Between treatment group variation in the dependent variable was not significant. I concluded that an entrepreneur having recently experienced a loss or a gain has no effect on their willingness to accept additional risk. Because hypothesis 1, the direct effect, was not supported, moderating effects could not be tested.

ECOLOGICAL VALIDITY

The intent of phase I of the present research was to establish ecological validity for the experiment in phase III. As previously discussed, the experiment is commonly used as the instrument through which loss aversion in entrepreneurs is observed. The relationship, “between real-world phenomena and the investigation of these phenomena in experimental contexts” is called ecological validity (Schmuckler, 2001). Where an experiment is ecologically valid, the methods employed in the experiment are accurately representative of the subject’s natural environment; therefore, the outcome observations are applicable to the real-world environment the researcher is attempting to investigate. To ensure experiments are ecological valid, researchers must design their experiment with three considerations in mind: Nature of the setting; nature of the stimuli; nature of the response (2001).

When considering the nature of the setting, a researcher is ensuring the environment of the experiment is consistent with the actual pattern of the subject's life (Brunswik, 1943). For instance, Hack et al., (2016) and Hsu et al., (2019) employed experiments where the subject first reads a scenario. Hsu et al.'s scenario began, "statistics show that more than 50% of university students reported a need for an on-campus dollar store" (p. 41). Hsu et al.'s experiment was designed to test the effect of loss aversion in entrepreneurial reentry decisions. It might appear ecologically invalid to set the context of the scenario at a university where presumably only a small percent of entrepreneurs will relate to the context. However, Hsu et al. (2019) were using a sample pool of university students who they had defined as nascent entrepreneurs due the fact that they had taken an entrepreneurship class. Framing the scenario as an entrepreneurial opportunity in the context of the student's environment (the university) represents ecological validity as it frames the experiment in the context of the subject's day to day life.

Second, the researcher should consider the nature of the stimuli when designing an experiment (Schmuckler, 2001). Gibson and Spelke (1983) described stimuli as the facets in our environment which, "require and receive [our] attention" (p. 14). In an experiment, the stimuli that requires the attention of the subject is wholly artificial. Therefore, an ecologically valid experiment will, "consist of information that is temporally and spatially extended and often multimodal as well" (Schmuckler, 2001, p. 422). This can be exceptionally difficult when designing an experiment where the required stimuli is an actual financial loss. Koudstaal et al., (2016) for instance, measured loss aversion in subjects using a Multiple Price List (MPL). The MPL presented the subject a series of

monetary gain and loss choices based on probability of each outcome (2016). The concern here is whether or not the experiment is ecologically valid when the stimuli (gain or loss of an amount of money) may not induce the real-life fear or anticipation of an actual loss or gain.

Third, a researcher needs to consider the nature of the subject's response to the experiment; specifically, is the response to the context and stimuli "natural [to] and representative" of the subject's real environment (Schmuckler, 2001, p. 423). The response in Hack et al.'s (2016) experiment, for instance was "new venture creation" (p. 451). Because it is impractical to create an actual new venture as part of a research experiment, Hack et al. (2016) measured whether or not the subjects had previously created a new venture. They then compared the subject's response to their individual characteristics related to the research's independent variables.

A final consideration of ecological validity is the degree to which violations of ecologic validity actually degrade the representative nature of the experiment results. A close enough examination of any experiment will likely reveal violations of ecologic validity. Ecologic validity, therefore should serve to guide experimental design. Where the precepts of ecological validity have been considered in an experiment, the experiment will generally produce results which more accurately translate to real world contexts (Schmuckler, 2001). Ecologic validity, therefore, is a tool used to improve experimental design; as opposed to a test used to dismiss research results.

Establishing Ecological Validity

In an effort to explore the ecological validity of this research project, I first engaged portfolio entrepreneurs via an online interview. The interview followed a cadence

employed by Rosa (1998) and Rosa and Scott (1999b) as they developed case studies through interviews with habitual entrepreneurs. The intent of the interviews was to form an exploratory case study. An exploratory case study allowed me to engage entrepreneurs directly in an effort to gain insight into the “why” and “how” of the diversification decision (Myers, 2013). Only entrepreneurs have the specialized and unique experience to illuminate the context of the diversification decision.

The participants were told that their information will be kept strictly confidential and that the purpose of the interview was strictly academic. The informants provided consent for the interviews. The informants were then given a brief overview of the research intent. Following the administrative dialog, general basic biographic and human capital data was gathered from the participants. Next, informants were asked to compile a “genealogy” of the businesses they have established (Rosa, 1998). As Rosa (1998) observed, it may be difficult for the entrepreneur to recall specific details of a genealogy that spanned years or decades; therefore, the informants were prompted to provide the genealogy to the best of their ability. The genealogy will consist of information related to each business such as industry, funding, year started/stopped, number of employees, and perception of performance. The respondents were asked to provide this information for up to three businesses in their portfolio. They were then asked if they were involved in more than three businesses, but not to provide data related to the additional businesses. The instrument can be reviewed in detail in Appendix C: Ecological Validity Online Interview.

Having completed the portfolio genealogy, informants were asked to respond to the following expository questions adapted from Dimov (2011, p. 75).

1. Having already started your first venture, how did you come up with the idea for your second or subsequent ventures?
2. Having already started your first venture, why were you prompted to act on the second or subsequent ventures?
3. Having already started your first venture, why are some venture ideas more likely to be acted upon?

Dimov (2011) developed the first two questions as a means of examining the “opportunity as happening” (p. 64). Dimov (2011) suggested that the inception of a new venture is an, “open-ended, retractable process, dependent on the actions that entrepreneurs take and their momentary consequences” (p. 62). Due to the organic nature of this process, the events which occur at the inception of a new venture often cannot be connected to observable measures available after a venture is created.

The third question was designed to examine the “opportunity as expressed in actions” (Dimov, 2011, p. 75). Dimov, similarly, referred to the idea that what is observable and measurable as an outcome is not necessarily explanatory of an entrepreneur’s individual process leading up to taking action. Asking these questions prompts the entrepreneur to reflect on and articulate the intangible quantities of new venture creation, which can then be analyzed qualitatively. These three questions were pertinent to establishing ecological validity as they encourage the informant to discuss how their endeavors were identified as well as when or why they chose to act on those opportunities. The expository responses were then analyzed in an effort to identify indicators of loss aversion in relationship to the identification and exploitation of the second venture (i.e. the transition

to portfolio entrepreneurship). The results of the qualitative analysis can then be used to guide the development of an ecologically valid experiment.

Our informant sample was identified in two stages: The initial attempt to recruit informants was through a public posting on LinkedIn.com. The author then sent direct messages to individuals in the author’s LinkedIn network who the author knew met the definition of portfolio entrepreneur. Approximately 30 direct messages were sent to portfolio entrepreneurs on LinkedIn resulting in ten completed online interviews. Second, a request for informants was posted on Facebook via a paid promotion.

After removing incomplete interviews as well as responses from novice and serial entrepreneurs, a total of 27 interviews were determined to be adequate for this study.

Informants took an average of less than 12 minutes to complete the interview.

Demographic and human capital data can be found in Table 4.

Table 4: Demographic and Human Capital Data

Categories	Mean	(SD)	N	(%)
Age	43	(12)		
Gender				
Male			18	(66)
Female			9	(33)
Education	4yrs	(2yrs)		
High school			4	(15)
Some college			4	(15)
Associate degree			0	(0)
Bachelor’s degree			9	(33)
Master’s degree			6	(22)
MBA			3	(11)
PhD			1	(4)
Experience				
Professional	10yrs	(7yrs)		
Entrepreneurial	12yrs	(10yrs)		

A portfolio entrepreneur is defined as an entrepreneur who is simultaneously involved in two or more endeavors; therefore, to explore the contextual validity of portfolio entrepreneurship, all 27 informants were, or had previously been, simultaneously involved with at least two businesses. Nine of the 27 were involved in three endeavors, and three informants were involved in a fourth business. Table 5 below shows the combined genealogy of the entrepreneurs' portfolios.

Table 5: Combined Genealogy of the Entrepreneurs' Portfolios

Portfolio Characteristics	N	(%)
Portfolio Size		
Operated one business	27	(100)
Operated two businesses	27	(100)
Operated three businesses	9	(33)
Operated four businesses	3	(11)
In the same/adjacent industry as previous business or profession		
First business	14	(52)
Second business	13	(48)
Third business	3	(11)
Started within 50 miles of the previous business		
First business	-	-
Second business	18	(67)
Third business	5	(19)
Began as a micro business (0-10 employees)¹		
First business	24	(89)
Second business	22	(81)
Third business	7	(26)

¹ According to the U.S. International Trade Commission, 80% of small businesses are “nonemployers” (USITC, 2010); however, my online interview categorized small business size in accordance with The Organization for Economic Co-operation and Development (OECD) descriptions. According to the OECD, a micro business is one with “less than 10” employees (2020). Respondents were not given the opportunity to describe their venture as a “nonemployer”. It is therefore possible, that when our respondents described their business as having “less than 10” employees, 80% of them in fact meant “no employees”. This distinction does not change the definition of a portfolio entrepreneurs; however, should future research use employee growth as a primary measure of firm performance (Rosa et al., 1996), not distinguishing between “nonemployer” and micro businesses may create a large number of false positives where the “nonemployer” firms were never intended to grow with employees.

Table 5: Combined Genealogy of the Entrepreneurs' Portfolios (continued)

Currently a micro business or was a micro business at the time the business was exited		
First business	19	(70)
Second business	21	(78)
Third business	9	(33)
Average age of respondent's businesses in years		
First business	9	(33)
Second business	5	(19)
Third business	4	(15)
	Mean	SD
The average respondent's perception of the health of their portfolio at time the next business was started where: 1 = "imminent failure", 4 = "sustainable", 7 = "successful"		
First business	-	-
Second business	4.7	1.3
Third business	4.9	1.5

As previously discussed, the informants were asked to respond to three expository questions adapted from Dimov (2011). Asking these questions prompts the entrepreneur to reflect on and articulate the intangible quantities of new venture creation, which can then be analyzed qualitatively. These questions were designed to encourage the informant to discuss how their endeavors were identified as well as when or why they chose to act on those opportunities. Coding of the expository portions of the online interview were conducted using Byrman's (2006) four stage approach: First, read and make notes; second, read again and mark text; third, read again and code for themes; fourth, relate general theoretical ideas to the coded text (2006). Table 6, below contains a summary of identified themes, keywords and quotes.²

² Note that inter-coder reliability was not established. The qualitative data was coded, and is presented here, having been reviewed only by the author. Without establishing inter-coder reliability, the actual degree to which portfolio entrepreneurs depend on their reference point to make decisions under risk cannot be fully understood.

Table 6: Analysis of Expository Responses

Theme	Keywords	Quotes
Opportunity Identification	Need	It was a parallel industry that we were able to identify a gap and capabilities that were needed so we strived to fill those I saw a need in the first venture, [and a] customer set that we were not meeting Followed the needs of our customer base Realizing a need Saw a need Need expressed from customers
	Relatedness	I consider what I might leverage from the first and what would mutually aid the other Adjacent business Related opportunities Related idea
Opportunity Exploitation	Aspiration	Desire to build entrepreneurship
	Growth	Confidence and momentum Successful and lucrative More successful Scale and grow Growth opportunity Continue to grow Increase business of the main business
	Income	Revenue Extra income Significant financial opportunity Make more money Extra income Financial stability
Opportunity Selection	Experience	Confidence to dare More realistic about the effort and opportunity Due to experience After learning from mistakes Existing potential Practice I had some business background Experienced success Decades of experience Been successful in the past

In addition to demographic and human capital data related to portfolio entrepreneurs, the present research provided some generalizable characteristics of portfolio entrepreneurs. For instance, generally, most portfolio entrepreneurs start their first business in an industry related to their current profession. With each subsequent endeavor, however, they tended to diversify away from their original industry. Endeavors tended not to be geographically diverse and remained within 50 miles of each other. Endeavors within the observed entrepreneurial portfolios tended to be micro business with less than 50 employees. Finally, portfolio entrepreneurs tended to view the overall financial health of their portfolios as above “sustainable”.

The intent of this study was to explore the ecological validity of the application of prospect theory to portfolio entrepreneurship in experimental research. Consistent with extant theory and research, the qualitative data gathered for this study does support reference point formation as a significant factor in an entrepreneur’s decision to become involved in additional entrepreneurial endeavors. Phrases such as: “desire to build entrepreneurship”; “confidence and momentum”; “successful and lucrative”; “more successful”, suggest the portfolio entrepreneurs were motivated by a goal which they have yet to achieve. This is consistent with Hack et al.’s (2016) finding that entrepreneurs tend to set higher and higher reference points which more or less results in a constant state loss aversion. Additionally, phrases such as: “extra income”; “make more money”; “significant financial opportunity”, hint at a fear that their current financial status may not “feel” sufficient (domain of loss) and that having more will remove this fear (domain of gains). Finally, phrases such as: “Due to experience”; “After learning from mistakes”; “experienced success”; “decades of experience”; “been successful in the past” show that

the portfolio entrepreneurs are aware of their past experience when faced with a risky choice, and measure their response to that choice in relation to that past experience.

Where the entrepreneur's reference point is based on an expectation or aspiration which the entrepreneur held in their immediate past, most of the portfolio entrepreneurs expressed some form of aspiration related to why they chose to embark on additional endeavors.

These observations lend support to the use of experiments wherein an entrepreneur is presented a scenario which sets their reference point prior to making a decision under risk. The results of this qualitative inquiry into the ecological validity of experiments in portfolio entrepreneurship research appear consistent with extant theory and research. Scenario based experiments demonstrate characteristics of ecological validity as they appear consistent with how portfolio entrepreneurs make decisions in real life.

EXPERIMENT DESIGN

Having established the ecological validity of scenario-based experiments in reference dependent decision making, I employed a metric conjoint experiment to test my hypothesis (Louviere, 1988). Metric conjoint analysis has widely been applied to marketing and management research to examine decision making for practical business applications (e.g., Green & Srinivasan, 1990; Hanisch and Rau, 2014; Priem & Harrison, 1994; Priem, Ndofofor & Voges, 2004; Shepherd, 2011; Shepherd & Zacharakis, 1997). Similar experiments have also been used in the small but growing literature on the application of prospect theory to entrepreneurial decision making (e.g., Barbosa et al., 2019; Hack et al., 2016; Holland & Shepherd, 2013; Hsu et al., 2019; Koudstaal et al., 2016).

A metric conjoint experiment first presents the subject with a hypothetical scenario. Subjects are then asked to respond to a series of hypothetical choice questions in the context of that hypothetical scenario. Each question contains a set of decision attributes such as probability and outcome (Hanisch & Rau, 2014; Louviere, 1988; Priem & Harrison, 1994). The subject's response is rated on a Likert scale ranging from low to high. (Mitchell & Shepherd, 2010; Shepherd & Zacharakis, 1997). The subject's response to the choice questions is the dependent variable. Gathering respondent's choices in this manner allows the researcher to examine the variable interactions at the exact point the decision is made (Lohrke, Holloway, & Wolley, 2010; Shepherd & Zacharakis, 1997).

Designing a conjoint experiment consists of a four-part framework (Hanisch & Rau, 2014). The framework begins by identifying the outcome decision and the related decision attributes. Then, scenarios are developed for the experiment, and the sample size is determined. Finally, the appropriate statistical method of analysis is determined. While this framework was followed in the development of my experiment, the steps in the framework are presented here in the order they were carried during the experiment. Specifically, I first discuss data collection procedures, then participants, sample size, hypothetical scenario, choice questions, decision outcome, and moderators. The chapter concludes with a discussion of data preparation and data analysis.

Procedures

Data collection procedures for this research project were approved by Oklahoma State University's Institutional Review Board (IRB). Table 7 outlines IRB approvals related to this dissertation.

Table 7: Institutional Review Board Approval

Application Number	Proposal Title	Research Instrument	Approval Date
IRB-20-478	A MICROPROCESSORIAL EXPLORATION OF PORTFOLIO ENTREPRENEURSHIP	Ecological Validity Online Interview	October 23, 2020
IRB-21-278	WHY MIGHT NOVICE ENTREPRENEURS ACCEPT INCREASED RISK BY BECOMING PORTFOLIO ENTREPRENEURS?	Survey-Based Experiment	June 29, 2021
IRB-21-278 (Modification)	WHY MIGHT NOVICE ENTREPRENEURS ACCEPT INCREASED RISK BY BECOMING PORTFOLIO ENTREPRENEURS?	Modification: Expanded sample pool and incentive	September 29, 2021

IRB approval letters can be reviewed in APPENDIX D: IRB-20-478 Approval Letter, APPENDIX E: IRB-21-278 Approval Letter, and APPENDIX F: IRB-21-278 Modification Approval Letter.

Data was collected via a survey-based, metric conjoint experiment (Koudstall, et al., 2016). The instrument was constructed and hosted online using Qualtrics. The instrument was accessed by participants via an anonymous hyper link. Informed consent was received electronically from each participant at the beginning of the experiment. The instrument consisted of one, two-minute-long video and a total of twenty-one questions. The instrument can be reviewed in detail in APPENDIX G: Survey Based Experiment.

Participation in the survey-based experiment was incentivized. After completing the survey, respondents were asked if they would like to participate in a drawing for a fifty-dollar Amazon gift card. If they elected not to participate they were taken to the end of the survey. If they elected to participate, they were taken to a separate, Qualtrics-based

survey. The second survey asked the respondents to provide their name and email address. After data collection was closed, I randomly selected two email addresses. A fifty-dollar Amazon gift card was sent electronically to each of the two email addresses.

Sample Size Determination

Generally, 50 respondents per treatment group are considered sufficient for a metric conjoint experiment (Shepherd & Zacharakris, 1997). The low sample size is due to the number of data points generated by decision scenarios. Metric conjoint experiments can have as many as 32 decision scenarios. Where there are 32 decision scenarios, 50 respondents would generate 1750 data points. The present research contained four decision scenarios, and three treatment groups; therefore, 150 total respondents (50 respondents per treatment) will yield 200 data points per treatment group. Unlike a traditional conjoint experiment, however, responses to the four choice questions in the present experiment will be combined into a single measure of risk. Therefore, each respondent will yield only one data point. A G*Power analysis indicated 150 respondents (150 data points) across three groups (two degrees of freedom) will result in with an effect size of 0.3, an alpha significance level of 0.05, and a power (1-beta error prob) of 0.92 (Faul, Erdfelder, Buchner, & Lang, 2009). In an effort to reach a minimum power of 0.80, I sought a minimum sample size of 108 respondents randomly divided into the three treatments (2009).

Participants

Data were collected from entrepreneurs, across two sample pools. The first sample pool consisted of Amazon Mechanical Turk (MTurk) workers. MTurk workers were accessed via CloudResearch, formerly known as TurkPrime. Participants were recruited

form CloudResearch's primary sample pool using the survey description, "Have you ever started a business? Do you live in the USA? If yes, you qualify for this fast 10-minute study." After excluding computer-generated and erroneous responses, the MTurk sample pool included N=134 total entrepreneurs. Of the respondents, 75 were novice, 26 were serial entrepreneurs and 33 were portfolio entrepreneurs. Ages ranged from 20 to 68 with a mean age of 40 (SD = 11.4). 51 (38%) of the respondents were female and 83 (62%) were male. A sample size of N=134 yielded effect size $f = 0.3$, an alpha significance level of 0.05, and a power (1-beta error prob) of 0.88 (Faul, et al., 2009).

Subjects in the second sample pool were recruited to via LinkedIn.com. Using my personal LinkedIn account, I searched the term "entrepreneur". I then individually direct messaged 422 LinkedIn members who were self-reported entrepreneurs and who had not blocked unsolicited direct messages. Because respondents in the ecological validity study were recruited directly from LinkedIn members with whom I was directly connected, subjects for this study were only recruited if they were second and third degree LinkedIn connections. This served to minimize overlap in the sample pools; though, due to the anonymity of the research, overlap could not be ruled out. After excluding computer-generated and erroneous responses, the LinkedIn sample pool included N=48 total entrepreneurs, 17 were novice entrepreneurs, 5 were serial entrepreneurs and 26 were portfolio entrepreneurs. Ages ranged from 22 to 71 with a mean of 47 (SD = 12.6). 10 (21%) of the respondents were female and 38 (79%) were male. A sample size of N=48 yielded an effect size $f = 0.3$, and an alpha significance level of 0.05, and a power (1-beta error prob) of 0.44 (Faul, et al., 2009).

Hypothetical Scenario

After consenting to participate in my research project, subjects were randomly divided into three groups: Domain of losses treatment, domain of gains treatment, and a control group. All three groups were then presented the same introduction statement to the hypothetical scenario. The introduction statement instructed the respondents to imagine they were the proprietors of a hypothetical small business. Respondents were then presented a hypothetical scenario specific to their treatment group. The intent of the hypothetical scenario was to fix the respondent's reference point such that they perceived either a financial gain or a financial loss relative to their hypothetical small business.

The magnitude of change from the subject's reference point for a financial gain or financial loss was fixed at either a \$100,000 or -\$100,000 respectively. This figure was based on a median annual income of small business owners in the United States; which, in 2016, was just over \$50,000 (SBA, 2018b). Setting the magnitude of change relative to twice the median income was intended to frame the subject's reference point relative to the subject's actual experience (Thaler, 1980b).

To frame the subject's reference point such that the subjects perceived either a gain or a loss, I employed a modified version of the statement from Holland and Shepherd (2013). In their conjoint experiment on persistence decisions, Holland and Shepherd (2013) used this statement to frame "high adversity" and "low adversity". They defined high and low adversity as firm performance above or below Kahneman and Tversky's (1979) reference point. Holland and Shepherd's (2013) high and low adversity construct is directly analogous to the domain of gain and domain of losses respectively, therefore their framing effect is an appropriate and tested instrument for the present research.

Respondents in the domain of gains treatment group were presented the following scenario:

Over the last year, your business generated \$100,000 in revenue above the average for your industry. An objective evaluation of the business suggests that there is a high likelihood that the business will continue to be viable for the foreseeable future. At that time, you discover or are presented with an additional business opportunity (Holland & Shepherd, 2013, p. 344).

Respondents in the domain of losses treatment group were presented the following scenario:

Over the last year, your business fell \$100,000 in revenue below the average for your industry. An objective evaluation of the business suggests that there is a low likelihood that the business will continue to be viable in the foreseeable future. At that time, you discover or are presented with an additional business opportunity (Holland & Shepherd, 2013, p. 344-345).

Respondents in the control group were only presented the introduction statement and no hypothetical treatment scenario.

For the initial research design, subjects read both the introduction and the hypothetical scenario statements prior to moving on to the choice questions. Initial pilot testing showed insufficient within-group variance between the choice questions (see Table 3: Research Design Phases for a summary of pilot testing). Following the initial pilot tests, a video was created to decrease the respondents' fatigue from reading the text. The video contained brief instructions regarding the survey-based experiment and the hypothetical scenario. Personal sentiment was also added to the introduction statement to

increase the impact of the hypothetical scenario. The revised introduction statement still asked the respondents to imagine they are the proprietors of a hypothetical small business, and added,

Imagine you have been in business for about one year. You have put together a great group of employees who work hard and are counting on you for their financial security. Remember, because you are the only owner of this small business, you made an initial personal investment and are personally responsible for the business financially. If the business earns money, you have more money personally, if the business loses money you must supplement the business with personal savings or take on personal debt.

An animated graphic was also added to the introduction and hypothetical scenario videos. The animated graphic was a visual representation of the gain or loss of \$100,000 stemming from a central point. The central point represented the respondent's key reference point. A red or green line moving either further above or further below the key reference point represented the magnitude of change as a loss or gain of \$100,000. A screenshot of this graphic can be found in APPENDIX H: Animated Graphic Depiction of Magnitude of Change Away from Key Reference Point.

Based on the use of the video, the instructions to respondents, the increased emphasis on personal financial responsibility, and the animated graphic, an ANOVA of the results of the final pilot study showed increased between group variance. The increase in variance was not significant; however, this may have been due to the small sample size (n=10 for each treatment group). Due to the increase in variance between treatment

groups, the video-based instrument was deemed sufficient and was employed for final data collection in phase 3.

Decision Attributes and Choice Questions

After reviewing the hypothetical scenario, the subjects were asked to respond to a series of choice questions. The choice questions contained decision attributes related to the hypothetical business opportunity mentioned in the scenario. The two decision attributes were: Potential financial gain resulting from the decision, or potential financial loss resulting from the decision. The two attributes were presented across two levels: High probability for the gain or loss to occur, and low probability for the gain or loss to occur. Given the two decision attributes across two levels, a factorial design was used to determine the maximum number of possible choice combinations to be presented to the subject. Illustrated in Table 8 below, there were four (2^2) possible combinations for this conjoint analysis.

Table 8: Factorial Design

		Attributes	
		Financial Gain	Financial Loss
Levels	High Probability	<i>Profile 1</i>	<i>Profile 4</i>
	Low Probability	<i>Profile 2</i>	<i>Profile 3</i>

The choice combinations are referred to as “profiles” in a conjoint experiment (Shepherd & Zacharakis, 1997). The four profiles illustrated in Table 8 are labeled and listed in order of least risk to most risk, or most desirable (positive) outcome to least desirable (negative) outcome, and are articulated as:

Profile 1: High probability the outcome is a financial gain.

Profile 2: Low probability the outcome is a financial gain.

Profile 3: Low probability the outcome is a financial loss.

Profile 4: High probability the outcome is a financial loss.

Choice questions were then created from these four profiles. First, profiles were paired to create gambles where there is both a known probability of gaining a dollar amount and a known probability of losing a dollar amount. (Kahneman & Tversky, 1979, 1984). For instance, profiles 1 and 3 were combined to create choice question 1 where the opportunity has a, “high probability the outcome is a financial gain and a low probability the outcome is a financial loss”.

Second, percentages were determined to quantify the probability of loss or gain. The probabilities 60% versus 40% were used during phase one pilot testing. The results showed little within group variability between the four choice questions. As Kahneman and Tversky (1984) observed, the degree of difference in risk between 60% versus 40% appears to have, “exceeded [the subject’s] ability of intuitive computation” (p. 344). In an effort to increase the intuitive appearance of the amount of risk related to the choice questions, I conducted pilot tests placing the percentages at 70% versus 30%. Within group responses based on this pilot study showed an increase in mean difference between the revised choice question.

Dollar amounts were then determined to quantify the potential losses or gains. The dollar values of \$100,000 and \$50,000 were chosen based on their magnitude of change from the reference point fixed by the hypothetical scenario. For subjects in the domain of gains treatment a loss of \$100,000 (\$50,000) represents a total (partial) loss of their

current endowment and a return to (toward) the status quo. For subjects in the domain of losses treatment, a gain of \$100,000 (\$50,000) represents full (partial) recovery from their losses and a return to (toward) their status quo (Thaler & Johnson, 1990). Further, because these dollar amounts were equal to 1 and .5 the magnitude of change from the reference point, they were intuitive and allowed the subjects to quickly assess the utility of the outcome.

Finally, the above percentage of probability and a dollar value of gain or loss were added to the choice questions. The questions were structured to represent an increasing degree of risk based on the total utility of the combination of quantifiable attributes i.e. choice question 1 has a total utility of \$55,000 and question 4 has a total utility of -\$55,000. The final choice questions are listed in table 9 below.

Table 9: Choice Questions

Choice Question	Choice Question Text	Total Utility
1	The additional business opportunity has a 70% probability of gaining \$100,000, and a 30% probability of losing \$50,000.	\$55,000
2	The additional business opportunity has a 30% probability of losing \$100,000, and a 70% probability of gaining \$50,000.	\$5,000
3	The additional business opportunity has a 30% probability of gaining \$100,000, and a 70% probability of losing \$50,000.	-\$5,000
4	The additional business opportunity has a 70% probability of losing \$100,000, and a 30% probability of gaining \$50,000.	-\$55,000

The four choice questions were shown to respondents in random order to avoid order effects.

Outcome Decision

Conjoint experiments are designed to examine decision outcomes, where the decision outcome is the dependent variable. Therefore, the dependent variable, in the present

research is an entrepreneur's decision exploit a second opportunity while maintaining their original business. To measure the dependent variable, respondents watched the aforementioned video and were shown each of the four choice questions. After reviewing each choice question, the subjects were asked, "While maintaining your current business, how likely are you to exploit the new business opportunity?". Subjects then rated their response to this question on a seven-point Likert scale where "1" is "not likely" to exploit the new business opportunity, "4" is "moderately likely" to exploit the new business opportunity, and "7" is "very likely" to exploit the new business opportunity.

Moderators

Having responded to the four choice questions, subjects provided data related to the moderating variables. Moderating variables in this study were related to the entrepreneur's human capital characteristics. Specifically: General human capital, specific human capital, psychic Income and switching cost. Measures of moderating variables followed those employed by Gimeno et al. (1997).

General human capital was measured in terms of education and professional experience. To measure education, respondents were asked how many years of formal education they had completed beyond high school. The respondents' professional experience was a combination of their years of professional experience and their level of management experience. To quantify professional experience, respondents were first asked for their total years of professional experience. They were then asked whether their highest level of management experience achieved was, supervised managers, supervised others, managed own business, or supervised no one (Gimeno et al., 1997).

Psychic income is comprised of intrinsic motivation and if the entrepreneur's parents owned a business. First, respondents were asked "Did your parents own a business?". Entrepreneurs have been shown to have an increased psychic attachment to entrepreneurship where their parents have owned a business (Bruderl, Preisendorfer & Ziegler, 1992; Evans & Leighton, 1989; Gimeno et al., 1997). To measure intrinsic motivation, respondents were asked "What is your most important goal in starting a new venture?". Subjects chose between five responses to this question. Intrinsic motivation was represented by the responses, "to let you do the kind of work you wanted to do" and "avoid working for others". Subjects were considered extrinsically motivated where they responded, "to make more money than you would otherwise" or "to build a successful organization". Where subjects responded "other", they were assumed to be neutrally intrinsically and extrinsically motivated (Gimeno et al., 1997).

To measure specific human capital, respondents were asked to rank their knowledge of customers, supplier, and product on a five-point Likert scale. Knowledge of customers, supplier, and product is specific only to the entrepreneurs' existing business context. This knowledge is difficult to transfer to alternate contexts and is less valuable in other contexts (Gimeno et al., 1997).

As discussed in chapter two of this manuscript, an entrepreneur's switching costs increase concurrent with age. Therefore, a respondent's age served as proxy for switching cost in this study (Gimeno et al, 1997).

DATA PREPARATION

Data were collected from two sample pools: LinkedIn sample and MTurk sample. The LinkedIn sample pool refers to the responses received from contacts on the social

networking site for professionals, LinkedIn.com. MTurk refers to responses collected via a batch published to Amazon's Mechanical Turk. Both samples of response data were reviewed for computer-generated responses and erroneous data. Data were then coded and transformed. Finally, the samples were pooled in preparation for analysis.

Data Review

A review for computer-generated responses followed procedures outlined by Storozuk, Ashley, Delage & Maloney (2020) and Teitcher, Bockting, Bauermeister, Hoefler, Miner, & Klitzman (2015). Computer-generated responses, also known as "bots", are computer programs designed to respond to online surveys. The bots are sophisticated and capable of circumventing bot protection algorithms (Meier & Cuneo, 2019). The result of bot responses are normally distributed responses across data sets. To identify and remove the automated responses I first reviewed respondent's names and email addresses for anomalies. Responses associated with names or email addresses containing symbols such as "Terry†C†Simmons" were removed. Email addresses that did not correspond to their respective names such as, "Terry Simmons" with the email address, "Jake.johnson@email.com" were also removed.

I then reviewed the data for anomalies in response times and duration. Responses appearing in a series at intervals that appear automated were removed e.g. a series of 40 responses where a new response started every two seconds. I then compared the respondent's age versus their years of work experience. Responses were removed if their years of work experience was greater than their age. Responses were also removed where the difference between their years of work experience and age was unreasonably small, such as a 40 year old who has 35 years of work experience. At no time were the

dependent variable data reviewed as part of the automated response identification process. These methods reduced the LinkedIn sample pool from 541 responses to 57 responses and the MTurk sample pool from 205 responses to 157 responses. The dramatic reduction in responses from the linkedIn sample pool was the result of persistent automated responses to a survey link posted publicly on LinkedIn.

After removing the automated responses, a listwise review of the data was conducted to remove any incomplete responses, or other anomalies which might skew the data (Nakagawa, 2015). Subjects who responded “no” when asked, “have you ever started a business” did not meet the definition of “entrepreneur” outlined in Chapter II and were subsequently removed. Strait-line responses were then removed. Finally, any responses which did not include a response to all four choice questions, or were missing more than two values throughout the entire survey were removed (Yujin, Dykema, & Stevenson, 2018). These methods reduced the LinkedIn sample pool from 57 responses to 48 responses and the MTurk sample pool from 157 responses to 134 responses. Once the final response set was determined, missing responses were identified. There were six missing response for the education (EDU) variable in the MTurk sample and one in the LinkedIn sample; these missing responses were imputed using the mean of their respective columns.

At the conclusion of the data review process, the data sets were combined into a single pool of 182 responses. A post hoc G*Power analysis indicated 182 respondents across three groups (two degrees of freedom) has a power of $1 - \beta = 0.96$ with an effect size of $f = 0.3$, and a significance level of $\alpha = 0.05$ (Faul, et al., 2009).

Data Transformation

After pooling the two samples, data were transformed in preparation for analysis. What follows is a summation of the data transformation into their respective variables. The section concludes with a summary of the variables in Table 10: Variable Summary.

Treatment Groups (GRP): Treatment groups were dummy coded creating two additional columns: GRP_Gain where gain was coded as 1 and loss and control were coded as 0; GRP_Loss where loss was coded as 1 and gain and control were coded as 0.

Diversification Decision (RISK): The diversification decision represents the subject's willingness to accept the additional risk exploiting a second identified opportunity. The Diversification Decision variable was created by summing the individual participant's responses to the four choice questions. As each response ranged from 1 to 7, the cumulative Diversification Decision variable ranges from 4 to 28. A cumulative Diversification Decision score of 4 represents the lowest willingness to accept additional risk of diversifying into a second small business and a score of 28 represents the highest willingness to accept the additional risk.

Education (EDU): The number of years of education a respondent completed after high school was coded on a distribution from 0 to 1. Each respondent was assigned a ratio based the percent of other respondents with a lower education level (Gimeno et al., 1997).

Professional Experience (WRK): Professional experience was measured as total years of professional experience and did not require transformation.

Management Experience (MGT): To quantify management experience, respondents were asked, "whether their highest level of management experience achieved was,

‘supervised managers’, ‘supervised others’, ‘managed own business’, or ‘supervised no one’. The first three choices were coded as 1 indicating managerial experience, and 0 where ‘supervised no one’ was chosen (Gimeno et al., 1997).

Specific Human Capital (S_HC): To measure specific human capital, respondents were asked to rank their knowledge of customers, supplier, and product on a five-point Likert scale. Following Gimeno et al. (1997), responses to these scales were combined, resulting in a Cronbach’s alpha of 0.872. The result is the moderating variable “specific human capital” ranging from 0 to 1 (1997).

Entrepreneurial Parents (P_ENT): If a respondent indicated their parents were entrepreneurs, the response was dummy coded as 1; where they indicated their parents were not entrepreneurs, the response was dummy coded as 0.

Intrinsic Motivation (I_MTV): The respondents were asked “What is your most important goal in starting a new venture?”. Where the respondent answered, “to let you do the kind of work you wanted to do” or “avoid working for others”, intrinsic motivation was coded as 1. Where the respondent answered, “to make more money than you would otherwise” or “to build a successful organization” intrinsic motivation was coded as -1. Where the respondent answered “other” it was coded as 0 (Gimeno et al., 1997).

Age (AGE): Age did not require transformation.

Entrepreneurial status (ENT_S): Respondents were first asked if they had started at least one small business. Participants who responded in the negative were directed to the end of the survey. Participants who responded in the affirmative, were then asked two additional questions to further characterize their entrepreneurial experience: Have you started more than one small business? and Have you been involved in two or more small

businesses at the same time? Where a participant responded “no” to both of these questions they were categorized as a “novice entrepreneur”. Where they responded “yes” to the second question and “no” to the third question, they were classified as a “serial entrepreneur”. Where they responded “yes” to the third question, the respondent was classified as a “portfolio entrepreneur”. As the focus of this study was the transition to portfolio entrepreneurship, types of entrepreneurs were divided into two groups, entrepreneurs who are not portfolio entrepreneurs, dummy coded as 0, and entrepreneurs who are portfolio entrepreneurs, dummy coded as 1.

Risk and COVID-19 (CVD): Respondents were asked about their risk tolerance prior to the COVID-19 pandemic versus their current level of risk tolerance. Responses indicating the subject was more willing to take risks now than prior to the pandemic were coded 1; responses indicating the subject was less willing to take risks now than prior to the pandemic were coded -1; responses indicating the subject was neither more or less willing to take risks now than prior to the pandemic were coded 0.

All numeric variables were then mean centered. Interaction variables were created for all moderator and control variables by multiplying them by GRP_Gain and GRP_Loss.

Table 10: Variable Summary

Label	Variable & Measures	Coding
GRP	Loss Aversion (Treatment Groups)	
GRP_Gain	Domain of Gains	Dummy
GRP_Loss	Domain of Losses	
GRP_Cnt	Control	
RISK	Diversification Decision (Dependent Variable) Degree of willingness to accept additional risk ranging from 4 to 28 where 4 is low willingness and 28 is high willingness	4 - 28
EDU	General Human Capital Percent of subjects with lower education	Percent
WRK	Professional Experience	Years

MGT	Management Experience Yes / No	1 / 0
S_HC	Specific Human Capital Knowledge of customers, suppliers, products combined into one variable (Cronbach Alpha = 0.872)	0.00
P_ENT	Psychic Income Parents were entrepreneurs Yes / No	1 / 0
I_MTV	If subject was intrinsically motivated	1
	If subject was extrinsically motivated	-1
	If subject was other motivated	0
AGE	Switching Cost Defined as a person's age	Years

Statistical Method of Analysis

Initial data analysis focused on the dependent variable, the diversification decision (RISK). To that end, I conducted an examination of the between group mean differences. After conducting a one-way ANOVA I also conducted a Welch's test. The one-way ANOVA is a traditional test for the comparison of means; the Welch's t test was also employed as it is robust against unequal sample sizes, unequal variance, and skewed data (Derrick, Toher, & White, 2016). The intent of the between group mean difference tests was to identify significant differences between the mean results of the diversification decision, between each of the three treatments (Loss, Gain, Control). After an examination of the direct effect on the dependent variable, I employed path analysis in an effort to examine the moderating effects of the four variables on the direct effect. Data analysis was conducted using IBM SPSS Statistics version 27.

CHAPTER IV

RESULTS

OVERVIEW

In Chapter II I proposed five hypotheses: one direct effect and four moderating effects. Hypothesis one, the direct effect, is founded on prospect theory and suggests that an entrepreneur who has suffered a financial loss will be more willing to accept greater risk by diversifying into a second small business while maintaining their original business, than an entrepreneur who has experienced a financial gain. Hypotheses two through four suggested an entrepreneur's various human capital characteristics moderate this direct effect. Specifically, hypothesis two suggested the direct effect of a financial loss (GRP_Loss) on the entrepreneur's willingness to diversify into a second small business (RISK) depends on: the entrepreneur's level of general human capital, measured as education (EDU), professional experience (WRK), and management experience (MGT) such that the effect of GRP_Loss on RISK is weaker when EDU, WRK, and MGT higher. Hypothesis three suggested the direct effect depends on: the entrepreneur's level of specific human capital (S_HC), such that the effect of GRP_Loss on RISK is stronger when S_HC is higher. Hypothesis four suggested the direct effect depends on: the entrepreneur's level of psychic income, measured as the entrepreneur's intrinsic motivation (I_MTV) and if their parents were entrepreneurs (P_ENT), such that the effect

of GRP_Loss on RISK is stronger when I_MTV and P_ENT are higher. Hypothesis five suggested the direct effect depends on: the entrepreneur's switching cost (AGE), such that the effect of GRP_Loss on RISK is stronger when AGE is higher.

To test these hypotheses, subjects were randomly assigned to one of three treatment groups: loss, gain, and control. The subjects then responded to four choice questions. The four choice questions represented increasing risk based on the total utility of the outcome of the scenario, where choice question 1 represented the lowest risk and question 4 represented the highest risk. The choice questions were ranked on a Likert scale from 1 to 7, with 1 representing a low willingness to choose the option and 7 representing a high willingness to choose that option. The responses of the four questions were then combined into a single dependent variable (RISK) ranging from 4 to 28 where 4 represents a low overall willingness to accept the risk of exploiting the second small business and 28 represents a high overall willingness to accept the risk of exploiting the second small business. To test the moderating effects outlined in hypotheses two through four, entrepreneurs were asked a series of questions related to their various human capital characteristics. The instrument can be viewed in detail in Appendix G: Survey Based Experiment.

After preparing the subject's response data for analysis, descriptive statics as well as parametric and non-parametric correlation tables were created. Table 11: Descriptive Statics and Pearson Correlations, below show the descriptive statistics and Pearson correlations between the treatment groups and moderators. Results of the Non-parametric Spearman's rho and Kendall's tau_b correlations can be found in Appendix I: Descriptive and Non-Parametric Correlation Tables.

Table 11: Descriptive Statics and Pearson Correlations

Variable	N	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
Gain Treatment Group	55	12.85	4.77	1												
Control Treatment Group	57	13.04	3.53	-0.444**	1											
Loss Treatment Group	70	12.8	3.48	-0.520**	-0.534**	1										
Combined Value of all 4 Choice Questions	182	12.89	3.91	0.046	0.008	0.025	-0.018	1								
Years of Education After High School	182	0.361	0.27	0.047	-0.081	0.033	0.043	0.159*	1							
Years of Work Experience	182	20.46	11.87	-0.062	0.096	-0.033	-0.038	-0.205**	0.172*	1						
Has Management Experience	182	0.88	0.32	-0.069	-0.085	0.146*	0.089	0.043	0.182*	0.241**	1					
Specific Human Capital	182	0.810	0.13	-0.047	0.064	-0.017	-0.204**	0.086	0.117	-0.044	-0.11	1				
Parents Were Entrepreneurs	182	0.32	0.47	0.055	-0.008	-0.044	-0.044	0.021	0.046	-0.198**	0.071	-0.118	1			
Intrinsic Motivation	182	0.08	0.98	0.011	-0.085	0.071	-0.176*	0.002	0.931**	0.164*	0.323**	-0.003	-0.003	1		
Switching Cost	182	41.76	12.17	0.104	-0.086	-0.016	0.115	0.148*	-0.016	0.001	0.032	0.184*	0.057	1		
Are Portfolio Entrepreneurs	182	0.40	0.49	0.065	-0.078	0.013	-0.183*	0.046	-0.047	0.001	0.063	-0.069	-0.103	-0.031	1	
Gender	182	0.34	0.47	0.01	0.058	-0.064	0.051	0.108	-0.071	-0.072	0.003	-0.001	0.083	-0.022	-0.194**	1
Post COVID Risk Tolerance	182	0.15	0.66	0.01	0.058	-0.064	0.051	0.108	-0.071	-0.072	0.003	-0.001	0.031	-0.032	-0.018	0.046

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

A review for multivariate outliers in the data set was conducted using Cook's Distance (1977). No influential outliers were identified. A scatter plot for Cook's Distance can be reviewed in Appendix J: Multivariate Outliers.

Data was tested for normalcy, skewness and kurtosis. A Shapiro-Wilk test for normality indicated that none of the variables were normally distributed. Most of the variables showed signs of skewness with significance levels greater than $p > 1.96$. A visual inspection of the histograms, however, showed these results were due to sealing effects and the limited range of values in the variables. The data was determined to be fit for analysis (Cramer, & Howitt, 2004). Statistics and histograms of the test can be viewed in Appendix K: Assumptions.

HYPOTHESIS TEST

A visual review of the subject's responses was initially supportive of hypothesis 1. The loss group had the highest willingness to accept the additional risk (RISK) with a mean score of 13.04 (SD = 3.53). The gain group was slightly less willing (M = 12.85, SD = 4.79) to accept the increased risk than the loss group; and, the control group was the least willing (M = 12.80, SD = 3.48) to accept the increased risk. As indicated by the standard deviations of the responses, however, a one-way ANOVA did not show a significant effect of the treatment groups on RISK where $F(2, 179) = 0.06, p = 0.94$. The Welch test was consistent with finding of the ANOVA with $F(2, 111.63) = 0.07, p = 0.93$. The ANOVA and the Welch test did not show a significant difference between the responses of the three treatment groups.

In an effort to explore the lack of significance related to hypothesis 1, I reviewed the validity of the treatment scenarios and four choice questions. After responding to the four

choice questions, subjects responded to an attention check. Respondents were asked if the small business in their hypothetical scenario had “lost \$100,000 in revenue” for the loss treatment or, “generated \$100,000 in excess revenue” for the gain treatment. Respondents who failed this attention check were deemed to have not retained the information presented in the scenario; therefore, their responses to the four choice questions were not representative of the treatments (Ejelov & Luke, 2019; Haslam & McGraty, 2019).

After responding to the attention check, respondents were given a manipulation check. Respondents in the gain treatment were asked if they had, “perceived a gain” based on the scenario. Respondents in the loss treatment were asked if they had “perceived a loss” based on the scenario. Where a subject responded “no” to this question, I concluded the treatment had not affected them to such an extent that they responded to the choice questions in the context of the treatment scenario. Where a subject responded “yes” to these questions, I concluded the respondent was able to engage with the treatment, and had responded to the choice question in the context of their respective hypothetical scenario (Ejelov & Luke, 2019; Haslam & McGraty, 2019). All “no” responses were removed from the sample pool. A total of 19 respondents failed the attention or manipulation checks and had been removed from the final sample prior to this analysis.

In addition to the manipulation and attention checks, I reviewed the responses to the individual choice questions prior to the responses being combined into a single risk quotient. The four choice questions presented an increasing degree of risk; where, choice question one presented the least risk and choice question four presented the most risk. The questions were presented to the respondents in random order to prevent order effects.

As outlined in Table 12, below, subjects responded to the four choice questions appropriately based on the degree of risk each question proposed; specifically, respondents were more willing to accept the risk posed in choice question one than the risk in choice question two and so on.

Table 12: Descriptive Statistics for Individual Choice Questions

Treatment	N	Choice Question 1		Choice Question 2		Choice Question 3		Choice Question 4	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Loss	57	5.51	1.18	3.77	1.43	2.14	1.14	1.61	1.15
Gain	55	5.07	1.44	3.31	1.77	2.55	1.60	1.93	1.26
Control	70	5.16	1.25	3.36	1.52	2.56	1.39	1.75	1.15

The lack of power, due to the sample size, may have also contributed to the lack of significant findings related to hypothesis 1. As discussed earlier, the four choice questions were combined into a single risk quotient for each respondent. With 182 total respondents, across three groups (two degrees of freedom), a G*Power analysis indicated a power of $1 - \beta = 0.96$ with an effect size of $f = 0.3$, and a significance level of $\alpha = 0.05$ (Faul, et al., 2009). Because the four questions were of ascending levels of risk, their raw scores could not be compared as they would traditionally have been in a conjoint experiment. By mean centering the responses to each choice question, however, the responses could be compared regardless of their individual representation of proposed risk. After mean centering the responses of the individual choice questions, the full factorial design resulted in 728 ($N=182*4$) data points. With 728 data points, a G*Power analysis indicated a power of $1 - \beta = 1.0$ with an effect size of $f = 0.3$, and a significance level of $\alpha = 0.05$ (Faul, et al., 2009).

Based on the increased power of the full data set, I conducted a one-way ANOVA and Welch test. Reinforcing the results of the previous analysis, the ANOVA did not

show a significant effect of the treatment groups on the entrepreneurs' willingness to accept additional risk with $F(2, 725) = 0.12, p = 0.88$. The Welch test was again consistent with finding of the ANOVA with $F(2, 464) = 0.14, p = 0.87$.

REGRESSION MODELING

Because the direct effect was not significant, I could not test hypotheses two through five. Hypotheses two through five included the moderating effects of general human capital, specific human capital, psychic income, and switching costs on the direct effect. I did, however, continue with a regression analysis of the moderator variables in an effort to explore how the entrepreneurs' various human capital characteristics might affect their decision making. To that end I created three regression models: The first model regressed the dependent variable (RISK) onto the treatment groups; the second model included the treatment groups and the direct effect of the mean centered human capital variables; the third model included the treatment groups, the direct effect of the mean centered human capital variables, and the interaction terms.

Model one was consistent with the ANOVA and Welch test. The regression indicated the treatment groups explained 0.1% variance in the outcome variable RISK ($R^2 = 0.01, F(2, 179) = 0.59, p > 0.05$). The second model, which added the direct effect the entrepreneurs' human capital, explained 14% of the variance in the outcome variable RISK ($R^2 = 0.14, F(12, 169) = 2.36, p < 0.05$). The change in predictive value from model one to model two was also significant $F(20, 169) = 2.82, p < 0.05$. The third model then added the interaction effects of the entrepreneurs' human capital. Model three explained 21% of the variance in the outcome variable RISK ($R^2 = 0.21, F(26, 155) = 1.60, p < 0.05$). The change in predictive value from model two to model three was not

significant $F(14, 155) = 0.95, p > 0.05$). A detailed summary of the results of the three models can be found in Appendix L: Regression Model Summary.

The results of the three models reinforce the lack of significance on the dependent variable by the treatment groups. Because there was no significant variance between the treatment groups, the treatment groups and their interaction effects should, and do, provide little predictive power of the dependent variable. Model two, however, was significant and predicted 14% of the variance in the outcome variable. This indicated a direct relationship between the entrepreneurs' human capital and the entrepreneurs' willingness to accept additional risk by exploiting a second business opportunity. Based on this indication, I regressed the dependent variable on the entrepreneurs' human capital characteristics individually; I also individually regressed the dependent variable on to the control variables, Entrepreneurial Status (ENT_S), and Risk and COVID-19 (CVD).

General Human Capital: The direct effect of the three general human capital characteristics, education (EDU), professional experience (WRK), and management experience (MGT), explained 7% of the variance in the outcome variable RISK ($R^2 = 0.07, F(3, 178) = 4.22, p < 0.05$). Overall, general human capital is not a good predictor of the entrepreneurs' willingness to accept additional risk by exploiting a second business opportunity where EDU ($\beta = 1.94, p > 0.05$), MGT ($\beta = -0.07, p < 0.05$), and WRK ($\beta = 0.70, p > 0.05$).

Specific Human Capital: The direct effect of specific human capital (S_HC), explained 0.00% of the variance in the outcome variable RISK ($R^2 = 0.00, F(1, 180) = 0.26, p > 0.05$). Specific human capital is not a good predictor of the entrepreneurs'

willingness to accept additional risk by exploiting a second business opportunity ($\beta = -1.12, p > 0.05$).

Psychic Income: The direct effect of the two measures of psychic, intrinsic motivation (I_MTV), and parents owning a business (P_ENT), explained 5% of the variance in the outcome variable RISK ($R^2 = 0.05, F(2, 179) = 4.29, p < 0.05$). Psychic income, specifically I_MTV, is a good predictor of the entrepreneurs' willingness to accept additional risk by exploiting a second business opportunity where P_ENT ($\beta = 0.55, p > 0.05$) and I_MTV ($\beta = -0.78, p < 0.05$).

Switching Costs: The direct effect of switching cost (AGE), explained 3% of the variance in the outcome variable RISK ($R^2 = 0.03, F(1, 180) = 5.74, p < 0.05$). Switching cost is a good predictor of the entrepreneurs' willingness to accept additional risk by exploiting a second business opportunity ($\beta = -0.06, p < 0.05$).

Entrepreneurial Status: The direct effect of whether an entrepreneur is a portfolio entrepreneur or a novice/serial entrepreneur (ENT_S), explained 1% of the variance in the outcome variable RISK ($R^2 = 0.01, F(1, 180) = 2.41, p > 0.05$). entrepreneurial status is not a good predictor of the entrepreneurs' willingness to accept additional risk by exploiting a second business opportunity ($\beta = 0.92, p > 0.05$).

Risk and COVID-19: The direct effect of the entrepreneurs' willingness to accept more or less risk now, than prior to the COVID-19 pandemic (CVD), explained 0.00% of the variance in the outcome variable RISK ($R^2 = 0.00, F(1, 180) = 0.47, p > 0.05$). Post COVID risk perception is not a good predictor of the entrepreneurs' willingness to accept additional risk by exploiting a second business opportunity ($\beta = 0.30, p > 0.05$).

Gender: The direct effect of the entrepreneurs' gender (GEN), explained 3% of the variance in the outcome variable RISK ($R^2 = 0.03$, $F(1, 180) = 6.23$, $p < 0.05$). Gender is a good predictor of the entrepreneurs' willingness to accept additional risk by exploiting a second business opportunity ($\beta = -1.51$, $p < 0.05$). Gender was dummy coded 1=Female, and 0=Male, therefore the results of this regression analysis are reflective of female responses.

CHAPTER V

DISCUSSION

OVERVIEW

The goal of this dissertation was to gain a better understanding of why an entrepreneur might accept additional risk by exploiting a second business opportunity while maintaining their original business. To accomplish this goal, I proposed two specific research questions:

1. Is a novice entrepreneur more likely to start a second business if they perceive their current venture as a loss?
2. Does the entrepreneur's human capital moderate their likelihood of starting a second business when they perceived their current venture as a loss?

To address these questions, I developed five hypotheses: One direct effect and four moderating effects. I then designed and conducted, an ecologically valid, survey based, metric conjoint experiment in the context of prospect theory. In all, 182 entrepreneurs participated in the experiment. This chapter begins with a discussion of the overall results of the experiment. I then discuss the contributions of my research to entrepreneurship theory and prospect theory, as well as its implications for practitioners. The chapter closes with a review of the limitations of my research and suggestions for future research.

DISCUSSION

Based on the first research question, I developed hypothesis 1. Hypothesis 1 served as the only direct effect in my theoretical model. Hypothesis 1 proposed, an entrepreneur who has experienced a financial loss will be more willing to accept greater risk by diversifying into a second small business while maintaining their original business, than an entrepreneur who has experienced a financial gain. According to prospect theory, whether an individual perceives a gain or a loss depends on their relative position to a key reference point. Therefore, the independent variable in the model was the entrepreneurs' current position relative to their key reference point. To set the entrepreneurs' position either below (domain of losses) or above (domain of gains) their reference point, the experiment began by randomly dividing the subjects into three treatment groups: Loss, gain, and control. Each treatment group was then shown a video instructing them to imagine the current state of their small business as either above their projected revenue for the previous year for gains, or below their projected revenue for the previous year for losses. Control group participants were not given a hypothetical scenario.

Setting the financial performance of their hypothetical business as either a loss or a gain, the subjects were presented a series of choice questions. The subjects' responses to the choice questions were the dependent variable in the theoretical model. The choice questions represent the diversification decision i.e. the entrepreneurs' willingness on a scale from 1 to 7 to accept additional risk and diversify their entrepreneurial portfolio by exploiting a second small business. Responses to the four choice questions were then combined to create a single measure from 4 to 28 where 4 indicates the lowest willingness to accept the increased risk through diversification and 28 indicates the

highest wiliness to accept the increased risk through diversification. As proposed in hypothesis one, the expectation was that the loss treatment group would respond to the choice questions with a greater willingness to exploit the second small business than those in the gain or control groups.

In an effort to confirm or refute a significant difference between the treatment groups, I examined the combined choice question responses using a one-way ANOVA. The ANOVA did not show a significant difference between the responses of the treatment groups ($F(2, 179) = 0.06, p = 0.94$). In an effort to increase the power of the analysis, I also conducted an ANOVA of the individual responses to the four choice questions rather than the combined, single measure of risk. The results of this test reinforced the results of the first ANOVA ($F(2, 725) = 0.12, p = 0.88$). In both instances I conducted Welch's tests which were consistent with the results of the ANOVAs with $F(2, 111.63) = 0.073, p = 0.93$ and $F(2, 464) = 0.14, p = 0.87$ respectively. Based on the entrepreneurs' responses to the choice questions, and having removed all responses where the subject failed the manipulation or attention checks, I concluded that, having recently experienced a loss or a gain has no effect on an entrepreneur's willingness to accept additional risk by diversifying into a second small business.

My conclusion supports the theoretical proposition of Parker (2014). Parker (2014) proposed a theoretical model which suggests moderate risk aversion is associated with portfolio entrepreneurship and that portfolio entrepreneurs are more risk averse than serial entrepreneurs. Parker (2014) points out that this seems counter intuitive, when observing archetypical portfolio entrepreneurs such as Richard Branson who appear to take great risk with their endeavors. However, established entrepreneurs, such as

Branson, who have the resources to sustain a diversification strategy, tend to be moderately risk-averse, and willing to exploit calculated risks in an effort to, “trade up the risk-return frontier and achieve major success” (Parker, 2014). These observations are also consistent with those of Koudstall, et al. (2016) who observed that, although entrepreneurs see themselves as risk takers, they are actually only more risk seeking in the lower degrees of loss aversion.

My conclusion, however, is inconsistent with the observations of Hack et al. (2016) who observed that risk seeking increases the probability of new venture creation. Further, that this risk seeking is the result of entrepreneurs setting higher reference points than non-entrepreneurs which induces a sort of constant state of loss aversion (Hack et al., 2016). Further, Barbosa et al. (2019) observed that reference point formation was critical in the entrepreneur’s assessment of risk. Additionally, Barbosa et al. (2019) observed that perceived risk and probability of success were directly related to the joining an entrepreneurial endeavor. Where new venture creation or joining an entrepreneurial endeavor is the result of a novice entrepreneur transitioning to portfolio entrepreneurship, my conclusion is inconsistent with Hack et al. (2016) and Barbosa et al. (2019).

While my conclusion is consistent with the observations of Parker (2014) and Koudstall, et al. (2016) and is inconsistent with those of Barbosa et al. (2019) and Hack et al. (2016) I note only these four article due to their methodological similarity to the present research. There is, in fact, an exhaustive literature on the risk preferences of entrepreneurs (e.g. Bouchouicha, & Vieider, 2019; Chanda & Unel, 2021; Hsieh, Parker, & van Praag, 2017; Koudstaal, et al., 2016). As well as a breadth of literature discussing entrepreneurs’ overconfidence resulting risk seeking behavior (e.g., Barbosa et al., 2019;

Camerer & Lovallo, 1999; Moore, Oesch, & Zietsma, 2007; Busenitz, 1999; Busenitz & Barney, 1997). There is also an extensive body of work investigating the rationality of the entrepreneurs' decision making and their use of cognitive heuristics (e.g. Goldstein & Hogarth, 1997; Manimala, 1992; Palich & Bagby, 1995; Shepherd, Williams, & Patzelt, 2015; Zhang & Cueto, 2017). This range of high-quality, empirical literature exploring the decision-making processes of entrepreneurs speaks to the complexity of the entrepreneur's decision-making process.

I believe the lack of a direct effect of loss aversion on the diversification decision in my research is consistent with the mixed results of an exhaustive literature attempting to explain the self-selection of entrepreneurs into entrepreneurship; or, in the case of my research, the decision to self-select a second time and transition from novice to portfolio entrepreneurship. Much like the aforementioned research, my research was dependent on a specific context, with fixed attributes, employed in an experiment which attempted to remove ambiguity (therefore flexibility) for the respondent. I would suggest that the entrepreneurial decision-making process may be too complicated to study with the application of any sort of isolation or control. My research, for instance, only allowed for the examination of two decision attributes (financial gain and financial loss), across two levels (high probability and low probability). Researchers should consider expanding the lens through which they are viewing the entrepreneur and the antecedents to the entrepreneur's decisions. Rather than controlled experiments observing a single decision based on a few interactions, to truly understand the entrepreneur researchers may need to include, not control for, the density of the entrepreneur's entire ecosystem. This might require resource-intensive, mixed method studies; studies comprised of qualitative

engagements, quantitative contextual data, and in-field observation all surrounding the same sample of entrepreneurs. Through such a wide aperture, researchers might better observe the heuristics, biases, information asymmetric and “private knowledge” which coalesce in to a signal entrepreneurial decision (Barbosa et al., 2019).

Finally, due to the lack of significance of the direct effect, I was unable to test the remaining four hypotheses related to the moderating effects of human capital on the decision to diversify into a second small business. However, post hoc testing did show general human capital had a direct effect on the diversification decision. General human capital was measured as years of education beyond high school, years of professional experience, and management experience. A regression model indicated these characteristics explained 7% of the variance in the outcome variable RISK ($R^2 = 0.07$, $F(3, 178) = 4.22$, $p < 0.05$). Where RISK was the entrepreneur’s willingness to accept increased risk by diversifying their entrepreneurial portfolio. Individual correlation coefficients further show that education has a strong positive effect on the diversification decision ($\beta = 1.94$, $p > 0.05$), and work experience had negative effect on the diversification decision ($\beta = 0.70$, $p > 0.05$). However, neither of these effects were significant. Years of management experience did have a significant negative effect on the diversification decision, however the effect was small ($\beta = -0.07$, $p < 0.05$).

CONTRIBUTIONS TO THEORY

Entrepreneurship Research

The present research contributes to entrepreneurship research through an examination of the heuristic, cognitive and decision-making process of the entrepreneur and their actions under uncertain conditions (Ucbasaran, Westhead & Wright, 2001). There is a

vast literature examining entrepreneurs in an effort to better understand their decision-making process (e.g., Baron; 2008; Busenitz & Barney, 1997; Lee & Venkataraman, 2006; Sarasvathy, 2001). As well as a contemporary literature discussing an entrepreneur's decision to persist or exit their entrepreneurial endeavors (e.g., DeTienne, et al., 2008; DeTienne & Chirico, 2013; Holland & Shepherd, 2011). There has, however, been little research into the decision-making process of the novice entrepreneur accepting additional risk by starting a second business (Baptista et al., 2019; Kutzewski et al. 2020). The present research adds to this discussion through an examination of the entrepreneur's willingness to accept the additional risk by diversifying their entrepreneurial portfolio.

Based on the outcome of hypothesis 1 and a post-hoc review of the data, I concluded that an entrepreneur having recently experienced a loss or a gain has no effect on their willingness to accept additional risk by exploiting a second small business; thus, ruling out the influence of risk seeking behavior on the diversification decision in entrepreneurs. This conclusion will allow entrepreneurship researchers to focus on other potential causes of the diversification decision. A better understanding the relationship between why and when entrepreneurs diversify, and the outcome of that decision, might allow researchers to develop a model for sustainable diversification strategies in entrepreneurship. Such a model might guide entrepreneurs and potentially prevent ill-timed or unsustainable diversification.

Prospect Theory

To date, little research has been conducted exploring entrepreneurial decision making in the context of prospect theory (e.g., Koudstal, et al., 2016; Hsu, et al., 2019; Hack, et

al., 2016). The present research applied prospect theory as a means to examine the entrepreneur at the point the diversification decision is made. Specifically, does loss aversion increase risk seeking behavior in entrepreneurs who have recently experienced a loss to such an extent that they are more likely to accept additional risk by exploiting a second small business, versus an entrepreneur who has recently experienced a gain.

According to prospect theory, whether an individual perceives a gain or a loss depends on their relative position to a key reference point (Kahneman & Tversky, 1979); and, that the entrepreneur's reference point is based on an expectation or aspiration which the entrepreneur held in their immediate past (Koszegi & Rabin, 2006). Extant researcher on prospect theory frequently employ an experiment wherein the subject reads a scenario and is then presented a series of choices (e.g., Arkes, Hirshleifer, Jiang, & Lim, 2008; Bogliacino and Gallo, 2015; Koudstaal et al., 2016; Hack et al., 2019; Hsu et al., 2019). The scenario sets the subject's reference point, thus placing the subject in the domain of gains or losses. Prior to conducting an experiment based on the formation of an entrepreneur's reference point, I conducted a qualitative inquiry into the ecological validity of such an experiment.

The qualitative inquiry consisted of an online interview with 27 portfolio entrepreneurs. In addition to completing a genealogy of their entrepreneurial portfolios, the entrepreneurs were presented three expository questions. These questions, adapted from Dimov (2011), prompted the portfolio entrepreneurs to explore the cognitive processes related to their transition to portfolio entrepreneurship. The entrepreneurs' responses included phrases such as, "desire to build" and "successful and lucrative". These comments suggest the portfolio entrepreneurs form their reference point based on

aspirations; and, phrases such as, “make more money” and “significant financial opportunity”, hint at a fear that their current financial status may be subjectively insufficient (domain of loss) and that having subjectively sufficient financial means might remove this fear (domain of gains).

These observations lend support to the use of experiments related to prospect theory wherein a subject is presented a scenario which sets their reference point prior to making a decision under risk. Fixing a subject’s reference point based on a hypothetical scenario, therefore, demonstrate characteristics of ecological validity as they appear consistent with how individuals might make real-life decisions based on their relative position to a key reference point. These qualitative observations are consistent with extant theory, and reinforce the use of reference depended experiments in prospect theory research (e.g., Koudstaal et al., 2016; Hack et al., 2019; Hsu et al., 2019).

PRACTICAL IMPLICATIONS

As discussed earlier in this manuscript, approximately 20% of small businesses fail in their first year, with only half surviving five years, and one-third surviving past ten years (SBA, 2018a). Further, extant literature suggest it takes eight to thirteen years for a firm to develop the resources necessary for sustainable diversification of an entrepreneurial portfolio (Baptista, Karaoz & Leitao, 2019; McDougall, Colvin, Robinson & Herron, 1994; Rutherford, Tocher, Pollack, & Coombes, 2016). In spite of the odds of establishing a successful business, nearly 800,000 new business are formed in the U.S. each year (Bureau of Labor and Statistics, 2020); and, in spite of this increased risk of establish a small business, novice entrepreneurs do diversify their portfolios by starting a second small business while maintaining their original small business (Baptista et al.,

2019; Parker, 2014; Westhead et al., 2005b; Westhead & Wright, 1998). Having concluded that loss aversion does not induce a greater degree of risk seeking behavior in entrepreneurs who have recently experienced a loss versus entrepreneurs who have recently experienced a gain, industry can better educate entrepreneurs to assess the diversification decision based on overall resource availability rather than discussing the acceptance of increased risk as a response to loss aversion (Baptista et al., 2019).

Research based education related to the transition to portfolio entrepreneurship might enable entrepreneurs to continue to exploit the small windows of opportunity without accepting unnecessary risk. Having ruled out loss aversion as an influence on the diversification decision, institutions and organizations might develop training programs for entrepreneurs which are related to the known contributors to sustainable entrepreneurship. Specifically, training programs might provide specific, resource-based milestones which have been observed to increase the chances of successful diversification (Baptista et al., 2019). Armed with proper metrics, when an entrepreneur is faced with a diversification decision, they can objectively assess the financial position of their current endeavor and diversify only where the prospect appears sustainable.

LIMITATIONS AND FUTURE RESEARCH

In consideration of the contributions made by this research, the research is not without limitations. As discussed in chapter three, the use of reference point formation is an ecologically valid method for conducting experiments related to entrepreneurial decision making. One limitation of my research may have been the employment of a specific dollar figure in the formation of that reference point. For instance, the experiment conducted in support of the present research closely mirrored the

methodology employed by Holland and Shepherd (2013). Their experiment, however, did not include a specific dollar amount while fixing the subject's key reference point.

Rather than employ a specific dollar figure, Holland and Shepherd (2013) couched gains or losses in terms of "high" and "low". Where my experiment instructed respondents to imagine, "your business generated \$100,000 in revenue", Holland and Shepherd (2013) suggested the respondent imagine their hypothetical endeavor would, "make substantially more money" (p. 343). By not fixing the subjects reference point to a specific dollar amount, the respondents were able to imagine an amount of money that was "substantial" relative to their own experiences. Conversely, by stating a specific dollar amount, my experiment removed such subjectivity. While the dollar figure of \$100,000 was chosen because it is twice the average annual salary of an entrepreneur in the United States, this dollar figure may not be "substantial" to a large parentage of respondents (SBA, 2018b). For instance, after completing the survey, one of the respondents contacted me and commented that \$100,000 is irrelevant; and, that they are only concern with dollar values in the hundreds of millions.³ Therefore, fixing the respondents' reference point to a specific dollar amount may have limited some of the subjects' responses due to an inappropriate magnitude of change from their reference point.

Due to the limitations of simulating complex financial losses and gains, future research might consider using alternatives to experiments in an effort investigate risk seeking behavior at the point of entrepreneurial diversification. For instance, Gomez-

³ According to their LinkedIn.com profile, the individual who provided this feedback is a venture investor and has a PhD from a top-tier university in the eastern United States.

Mejia, L. R., Haynes, K. T., Nunez-Nickel, M., Jacobson, K. J. L., & Moyano-Fuentes, J. (2007) employed a measure of performance variation as a proxy for my independent variable, loss aversion.

Consistent with prospect theory, Gomez-Mejia et al. (2007) observed that firms are, “loss averse when it comes to threats ... even if this means accepting a greater performance hazard” (p. 107) Further that, “organizations tend to initiate searches for alternative strategies or routines (what we call venturing risks) when their performance falls below their target or ‘aspirational’ level” (p. 112). Gomez-Mejia et al. measure “venturing risks”, or risk seeking behavior, through a calculation of the coefficient of variation; specifically, they divide the standard deviation of each firm’s actual production, by the standard deviation of the average of the production in like firms. They observed an inverse coloration between the probably of firm failure and the firm’s coefficient of variation; that is, firms which are more likely to fail will have a lower coefficient of variation, and therefore are more risk seeking. While Gomez-Mejia et al. were studying risks related socioeconomic wealth in family firms, they point out that similar measures of performance variance as a proxy for loss aversion has been used in several empirical studies (e.g., Bowman, 1982; 1984; Fiegenbaum, 1990; Fiegenbaum and Thomas, 1986).

Future research might identify archival data sets sufficient to calculate the firm’s coefficient of variation. The firm’s coefficient of variation can then be correlated to a diversification event undertaken by the entrepreneur. This, of course, assumes an archival data set, or the combination of several archival data sets, contains both the data required to calculate the coefficient of variation and some measure of entrepreneurial

diversification. Should the data exist, it will circumvent the current limitations of experimental research of the effects of loss aversion on the diversification decision in small firms.

CONCLUSION

The outcome of my research did not provide evidence that an entrepreneur whose business is underperforming is more likely to engage in portfolio entrepreneurship than an entrepreneur whose business is performing well. Rather, based on the results of a metric conjoint experiment consisting of responses from 182 entrepreneurs, I concluded that having recently experienced a loss or a gain has no effect on an entrepreneur's willingness to accept additional risk. Specifically, an entrepreneur is equally as likely to transition from novice to portfolio entrepreneurship when their business is underperforming as they are when their business is performing well. Due to the lack of significance in this direct effect, I was unable to test the remaining four hypotheses related to the moderating effects of human capital on the decision to diversify into a second small business.

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APPENDICES

APPENDIX A:

Applicable literature on Entrepreneurship & Prospect Theory,
 Entrepreneurial Reference Point, &
 Entrepreneurial Threshold of Performance

Article	Key Findings	Methodology
Barbosa, Fayolle, & Smith (2019)	-Perceived risk fully mediated reference points and the entrepreneurial entry decision -Reference point does not affect entrepreneurial confidence	Experiment
Baron (2004)	-Entrepreneurs set higher reference points resulting, therefore frame context as loss not gain, and become risk seeking	Theoretical
DeTienne, Shepherd & De Castro (2008)	-Entrepreneurs escalate their commitment to a failing strategy -Where a firm underperforms, entrepreneurs base persistence on available resources, “personal investment, personal options, collective efficacy, and previous organization success”. -Entrepreneurs’ heterogeneous extrinsic motivation has a strong effect on persistence.	Conjoint analysis
DeTienne & Cardon (2012)	-General and specific human capital have a significant effect on the entrepreneur’s exit strategies.	ANOVA
Gimeno, Folta, Cooper & Woo (1997)	-“organizations have different required thresholds of performance, and survival (or exit) is determined by whether performance falls above (or below) the threshold” -“In small and new ventures, the threshold of performance, is fundamentally influenced by	Censored regression (tobit) model; grouped data regression

	human capital characteristics of the entrepreneur”	
Hack et al. (2016)	-Entrepreneurs set higher reference points resulting, therefore frame context as loss not gain, and become risk seeking -Risk seeking increases the probability of new venture creation	Experiment
Holland & Shepherd (2013)	-Nearing the aspiration point is “low adversity” -Nearing the survival point is “high adversity” -Entrepreneurs put less weight on probity in high adversity than low adversity and base their decision on “desirability” of the outcomes	Conjoint analysis
Holm, Opper & Nee (2013)	-Entrepreneurs will accept more strategic risk (competitive risk) than non-strategic risk (luck)	Multiple price list
Hsu et al. (2016)	-Found few articles applying prospect theory to entrepreneurship -ESE moderates the direct effect between loss aversion and entrepreneurial reentry such that it overrides the framing effect	Experiment
Koudstall, Sloof & van Pragg (2016)	-“ Koudstall -in-the-field” experiment -Entrepreneurs see themselves as risk takers -Entrepreneurs are actually only more risk seeking in the lower degrees of loss aversion	Between-subjects WTA/WTP
Lee & Venkataraman (2006)	-Aspiration Vector (AV) comprised of human and social capital -Market Offering Vector (MOV) “economic, social, and psychosocial dimensions” of occupational opportunities -Entrepreneurial entry occurs when the MOV offers lower probability of success and satisfaction (reaching their AV) than employment	Theoretical
Ma, Mattingly, Kushev, Ahuja, Manikas (2018)	-Firm specific threshold attributes are weighted in the following order: expected financial return, probability of expected financial outcomes, expected non-financial benefits, expected switching cost -Entrepreneurs in family businesses are more aware of the non-financial influences of persistence than non-family entrepreneurs.	Conjoint analysis
March & Shapira (1987)	-Additional reference points -“performance or position (e.g. profit, liquidity, sales)”	Qualitative: Interviews

	<ul style="list-style-type: none"> -“aspiration level or ‘target’” of performance e.g. key reference point -Firm survival -Managers are more risk seeking when performance falls below aspiration point -Managers will not take risk that will risk firm insolvency 	
Miller & Chen (2004)	<ul style="list-style-type: none"> -Empirical test of March & Shapira (1987) -Risk seeking increases as a manager moves from the aspiration point toward the survival points -Managers shift focus to aspiration point as firm performance improves. -Managers will accept more risk as a firm approach’s bankruptcy. -Managers will accept less risk as firm performance improves. 	Regression analysis
Morgan & Sisak (2016)	<ul style="list-style-type: none"> -High loss aversion discourages entrepreneurial entry -Entrepreneurs with a high reference point increase investment proportionate to their increase in loss aversion - Entrepreneurs with a low reference point decrease investment proportionate to their increase in loss aversion 	Theoretical
Stewart & Roth (2001)	<ul style="list-style-type: none"> -Entrepreneurs are more risk seeking than managers -Entrepreneurs focused on profit and growth are more risk seeking than income-oriented entrepreneurs 	Schmidt-Hunter approach to meta-analysis
Simon, Houghton & Savelli (2003)	<ul style="list-style-type: none"> -Entrepreneurs below their reference point (less satisfied) will expand into less familiar and more risky (due to resources) products and industries -The additional risk and resource strain results in less success continuing to push the entrepreneur below their reference point 	Regression analysis
Symeonidou, DeTienne, Chiroco (Forthcoming)	<ul style="list-style-type: none"> -Family firms with lower performance thresholds are less likely to exit -Human capital increases performance threshold -Higher firm performance threshold is equitable to an individual being above near or above their key reference point 	Longitudinal

APPENDIX B:

Applicable Literature on Portfolio Entrepreneurship

Article (Chronological)	Key Findings	Methodology
Alsos & Carter (2006)	-Entities within a portfolio exchange resources -New venture performance dependent on receiving financial (or physical) and specific human capital	ANOVA
Alsos & Kolvereid (1998)	-Portfolio entrepreneurs were more successful than serial or novice entrepreneurs	ANOVA
Baert, Meuleman, Debruyne & Wright (2016)	-Sharing resources across the portfolio results in efficiency	Longitudinal single-case study
Birley & Westhead (1993)	-Habitual entrepreneurs are younger when they start their first business -Tend to seek and have role models -Financed via family and friend networks	Exploratory analysis: 't' and chi-square tests
Carter (2001)	- Portfolio entrepreneurs tend to have higher human capital - Portfolio entrepreneurs tend to be more cognizant of customer needs	Univariate analysis: Chi square ANOVA
Carter & Ram (2003)	-Literature review -Defined the portfolio entrepreneur, "as an individual simultaneously owning and engaging in a portfolio of entrepreneurial interests"	Theoretical
Carter, Tagg & Dimitratos (2004)	-Multiple income sources are common among entrepreneurship -entrepreneurs engaged in portfolio entrepreneurs in an effort to increase income or to survive -Portfolio entrepreneurship is used as a survival mechanism	Latent Class Analysis (LCA)
Cruz & Justo (2017)	-Loss aversion educes risk seeking behavior in entrepreneurs	Logistic Regressions
Hall (1995)	-Nascent entrepreneurs want to start a business -Novice entrepreneurs have one business -Habitual entrepreneurs keep starting businesses -Habitual entrepreneurs are either serial (close one business before moving on to the next one)	Theoretical

	or portfolio (maintain two or more businesses simultaneously)	
Kolvereid & Bullvag (1993)	-Constrained growth results in creating more businesses -Habitual entrepreneurs are more resourceful -Habitual entrepreneurs tend to start second business in more complex environments	SARIE II Questionnaire: 't' and chi-square tests
Kolvereid & Bullvag (1993)	-Constrained growth results in creating more businesses -Habitual entrepreneurs are more resourceful -Habitual entrepreneurs tend to start second business in more complex environments	SARIE II Questionnaire: 't' and chi-square tests
Kutzewski et al. (2020)	-Literature review -Temporal model of: Antecedents, mechanisms, and outcomes of portfolio entrepreneurship	Multilevel literature review
MacMillian and Katz (1992)	-Coined "multiplicity" -"Entrepreneurial events can be obscured by the noise caused by an individual's or firm's simultaneous involvement in multiple entrepreneurial activities (multiplicity)"	Theoretical
Parker (2014)	-"Occupational choice-theoretic framework" -Novice entrepreneurs are risk averse -Serial entrepreneurs are risk tolerant -Portfolio entrepreneurs are moderately risk tolerant individuals	Theoretical
Rosa (1998)	-Entrepreneurial portfolios tend to be complex (diversified) - Portfolio entrepreneurs tend to involve partnerships	Qualitative: Case study
Rosa & Scott (1999a)	- Ownership of many small businesses is related to performance of portfolio as a whole -Related diversification was most profitable -Struggling entrepreneurs tended to seek out new opportunity -Successful entrepreneurs tended to allow chance to present new opportunities	Triangulation study between three data sets
Rosa & Scott (1999b)	- Habitual entrepreneurs found across industries - Habitual entrepreneurs' businesses share resources	Case Study
Ucbasaran et al. (2003)	-Specific human capital tended to result in greater resource acquisition in habitual entrepreneurship -Increased human capital based on experience resulted in increased assets and fewer liabilities	Case Study

Westhead & Wright (1998)	-Serial and portfolio entrepreneurs are not homogenous -Portfolio entrepreneurs are more likely to use outside financing	Chi-square and one-way ANOVA
Westhead et al. (2005a)	-Portfolio entrepreneurs leverage their specific, general, and social capital to identify additional opportunities -Portfolio entrepreneurs have higher specific human capital related to customer understanding -Portfolio entrepreneurs are more adept at identifying opportunities -Portfolio entrepreneurs more frequently remove money from their businesses	Univariate analysis
Westhead et al. (2005b)	-Portfolio entrepreneurs take on more equity partners -Portfolio entrepreneurs perceive themselves as more creative	Mann-Whitney U-test
Westhead et al. (2005c)	- Portfolio entrepreneurs have more diverse previous business experience - Portfolio entrepreneurs were motivated by challenge not the actual benefits of the outcome -Portfolio entrepreneurs are able to acquire more start-up capital -Portfolio entrepreneurs focus on business organization and operation -Portfolio entrepreneurs grow businesses faster	Univariate analysis
Wiklund & Shepherd (2008)	-Portfolio entrepreneurs are higher educated -Portfolio entrepreneurs have higher social capital -Portfolio entrepreneurs have higher human capital	Regression

APPENDIX C:

Ecological Validity Online Interview

First, informants will first provide basic biographic data.

Question	Response	Format
Age	Numeric	Drop Down
Gender	Male Female	Drop Down

Human capital data will then be gathered from the participants.

Question	Response	Format
Total years of professional experience	Numeric	Drop Down
Total years of experience as an entrepreneur	Numeric	Drop Down
Level of education	high school, some college, associate degree, bachelor's degree, master's degree, MBA, PhD	Drop Down
Primary field of study	Informants will choose: not applicable, other or from a list of fields of study classified by the National Center for Education Statistics (NCES, 2000).	Drop Down

Next, informants will be asked to compile a “genealogy” of the businesses they have established (Rosa, 1998).

Question	Response	Format
Venture	First, Second, Third, etc.	Autogenerated
Geographic region	Approximate distance from original venture (select 0-50 for original venture): 0-50 miles, 51-100, 101-500 miles, 501-1000, 1001-3000, International “No Response”	Drop Down
Industry	List using NAICs and the text description for each NAIC. “No Response”	Drop Down
Was this venture	started, acquired, or inherited “No Response”	Drop Down
How was this venture funded?	Personal investment, personal loan, commercial loan, equity financing, government program, other. “No Response”	Drop Down

Year started, acquired, or inherited:	Four-digit year “No Response”	Drop Down
At the time you acted on this venture, how would you describe the collective financial health of your other ventures.	Likert from one (1) to seven (7) where one represents, “imminent failure”; five (5) represents, “sustainable”; and, seven represents, “successful”. “No Response”	Likert
Number of employees (to include part time and casual) at the end of the first year. ⁴	Less than 10, 10 to 49, 50 to 249 250 or more ⁵ “No Response”	Drop Down
Number of employees at the end of the second year.	Less than 10, 10 to 49, 50 to 249 250 or more “No Response”	Drop Down
Number of employees at the time the business was exited, sold, dissolved, bankrupted, etc.	Less than 10, 10 to 49, 50 to 249 250 or more “No Response”	Drop Down
Year exited, sold, dissolved, bankrupted, etc.	Four-digit year Write, “0000” for businesses you are still affiliated with. “No Response”	Fill-in Numeric

Having completed the genealogy of businesses, informants will be asked to respond to the following expository questions:⁶

1. Having already started your first venture, how did you come up with the idea for your second or subsequent ventures?
2. Having already started your first venture, why were you prompted to act on the second or subsequent ventures?
3. Having already started your first venture, why are some venture ideas more likely to be acted upon?

⁴ Rosa et al. (1996), used growth of employees as a primary measure of firm permanence; employee growth was calculated by subtracting the total employees at the end of the first year from the current number of employees in firms greater than two years old.

⁵ The number of employees for micro, small, medium, and large enterprises respectively, as defined by the OECD (2020).

⁶ Participants were not required to respond to the questions before moving forward.

APPENDIX D:

IRB-20-478 Approval Letter



Oklahoma State University Institutional Review Board

Date: 10/23/2020
Application Number: IRB-20-478
Proposal Title: A Microprocessorial Exploration of
Portfolio Entrepreneurship

Principal Investigator: Jeffrey Mader
Co-Investigator(s): Jeffrey Mader
Faculty Adviser: Matt w Rutherford
Project Coordinator:
Research Assistant(s):

Processed as: Exempt
Exempt Category:

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,
Oklahoma State University IRB

APPENDIX E:

IRB-21-278 Approval Letter



Oklahoma State University Institutional Review Board

Date: 06/29/2021
Application Number: IRB-21-278
Proposal Title: WHY MIGHT NOVICE ENTREPRENEURS ACCEPT INCREASED RISK BY BECOMING PORTFOLIO ENTREPRENEURS?

Principal Investigator: Jeffrey Mader
Co-Investigator(s):
Faculty Adviser: Matt w Rutherford
Project Coordinator:
Research Assistant(s):

Processed as: Exempt
Exempt Category:

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,
Oklahoma State University IRB

APPENDIX F:

IRB-21-278 Modification Approval Letter



Oklahoma State University Institutional Review Board

Application Number: IRB-21-278
Proposal Title: WHY MIGHT NOVICE ENTREPRENEURS ACCEPT INCREASED RISK BY BECOMING PORTFOLIO ENTREPRENEURS?

Principal Investigator: Jeffrey Mader
Co-Investigator(s):
Faculty Adviser: Matt w Rutherford
Project Coordinator:
Research Assistant(s):

Status Recommended by Reviewer(s): Approved
Study Review Level: Exempt
Modification Approval Date: 09/09/2021

The modification of the IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46. The original expiration date of the protocol has not changed.

Modifications Approved:

Modifications Approved: Add drawing as a form of compensation, 3x \$50 Amazon gift cards.

Rewording some of the survey questions.

Adding recruitment from Social Media and via outside institutions which may include but may not be limited to: Virginia Commonwealth University, Richmond University, Idaho State University, North Carolina State University.

Add additional undergrad and graduate participants

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved.
2. Submit a status report to the IRB when requested
3. Promptly report to the IRB any harm experienced by a participant that is both unanticipated and related per IRB policy.
4. Maintain accurate and complete study records for evaluation by the OSU IRB and, if applicable, inspection by regulatory agencies and/or the study sponsor.
5. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Sincerely,

Oklahoma State University IRB
223 Scott Hall, Stillwater, OK 74078
Website: <https://irb.okstate.edu/>
Ph. 405-744-3377 | Fax. 405-744-4335 | irb@okstate.edu

APPENDIX G:

Survey Based Experiment

First, subjects will complete the exclusion criteria.

Question	Response	Format
Have you started at least one small business?	Yes/No	Radio button
Have you started more than one small business?	Yes/No	Radio button
Have you been involved in two or more small businesses at the same time?	Yes/No	Radio button

Second, subjects will provide basic biographic data.

Question	Response	Format
How old were you on your last birthday?	Numeric	Slider
To which gender identity do you most identify?	Female Male Transgender Female Transgender Male Not listed Prefer not to respond	Radio button

Third, subjects will be randomly assigned to one of three treatment groups, and be presented with the scenario for their respective treatment group.

Treatment Group	Scenario
Domain of gain	Over the last year, your business generated \$100,000 in revenue above the average for your industry. An objective evaluation of the business suggests that there is a high likelihood that the business will continue to be viable for the foreseeable future. At that time, you discover or are presented with an additional business opportunity.
Domain of loss	Over the last year, your business fell \$100,000 in revenue below the average for your industry. An objective evaluation of the business suggests that there is a low likelihood that the business will continue to be viable in the foreseeable future. At that time, you discover or are presented with an additional business opportunity.
Un-prompted scenario	Subjects will not be shown a scenario and will immediately begin the addressing the decision criteria.

Fourth, subject will be prompted to respond to the following four choice questions presented in random order.

Decision Criteria	Response
<p>If the additional business opportunity has a 70% probability of gaining \$100,000 and has a 30% probability of losing \$50,000</p> <p>how likely are you to exploit the new business while maintaining your current business?</p>	<p>Seven-point Likert scale:</p> <p>“1” is “not likely” to exploit the new business opportunity</p> <p>“4” is “moderately likely” to exploit the new business opportunity</p> <p>“7” is “very likely” to exploit the new business opportunity</p>
<p>If the additional business opportunity has a 70% probability of gaining \$50,000 and has a 30% probability of losing \$100,000</p> <p>how likely are you to exploit the new business while maintaining your current business?</p>	
<p>If the additional business opportunity has a 30% probability of gaining \$100,000 and has a 70% probability of losing \$50,000</p> <p>how likely are you to exploit the new business while maintaining your current business?</p>	
<p>If the additional business opportunity has a 30% probability of gaining \$50,000 and has a 70% probability of losing \$100,000</p> <p>how likely are you to exploit the new business while maintaining your current business?</p>	

Fifth, subjects in the domain of gain and domain of loss treatment groups will be presented the following manipulation check.

Question	Response	Format
<p>In the hypothetical scenario you were presented, your business' revenue was</p>	<p>-lower than the industry average.</p> <p>-higher than the industry average.</p>	Radio button
<p>Did you perceive the scenario as a gain (or loss)?</p>	Yes/No	Radio button

All subjects will be presented the following question about COVID-19.

Question	Response	Format
Prior to the COVID-19 pandemic, were you	-less willing to take risks than you are now? -more willing to take risks than you are now? -neither more or less willing to take risks than you are now?	Radio button

Finally, subjects will respond to the measures of the moderating variables.

General human capital:

Question	Response	Format
How many years of formal education did you complete after high school?	Numeric range from 0 to 15	Slider
Primary field of study	Informants will choose: not applicable, other or from a list of fields of study classified by the National Center for Education Statistics (NCES, 2000).	Drop down
Total years of professional experience	Numeric	Drop down
What is the highest level of managerial experience you have achieved?	-“Supervised managers” -“Supervised others” -“Supervised no one” (Gimeno et al., 1997)	Radio button

Psychic income:

Question	Response	Format
Did your parents own a business?	Yes/No	Radio button
What is your most important goal in starting a new business?	-“To let you do the kind of work you wanted to do” -“Avoid working with others” -“To make more money than you would otherwise” -“To build a successful organization” -“Other” (Gimeno et al., 1997)	Radio button

Specific Human Capital:

Question	Response	
Within the context of your current business, how would you describe your knowledge of your customers?	Seven-point Likert scale: “1” is “not knowledgeable” “5” is “adequately knowledgeable” “7” is “very knowledgeable”	
Within the context of your current business, how would you describe your knowledge of your suppliers?		
Within the context of your current business, how would you describe your knowledge of your products?		

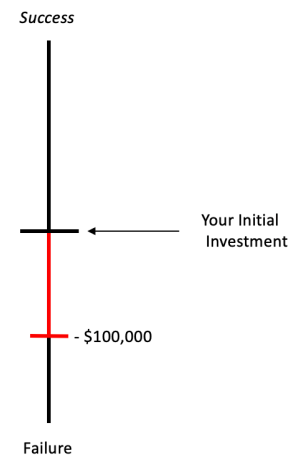
APPENDIX H:

Animated Graphic Depiction of Magnitude of Change Away from Key Reference Point

Magnitude of change into the domain of losses, shown to the subjects in domain of losses
treatment group:



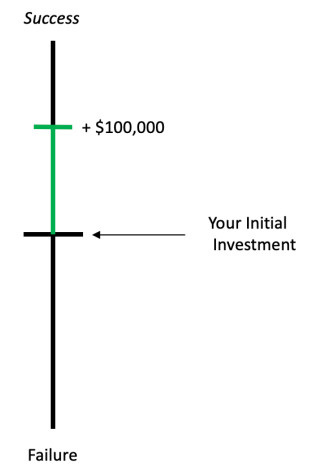
Your Small Business



Magnitude of change into the domain of gains, shown to the subjects in domain of gains
treatment group:



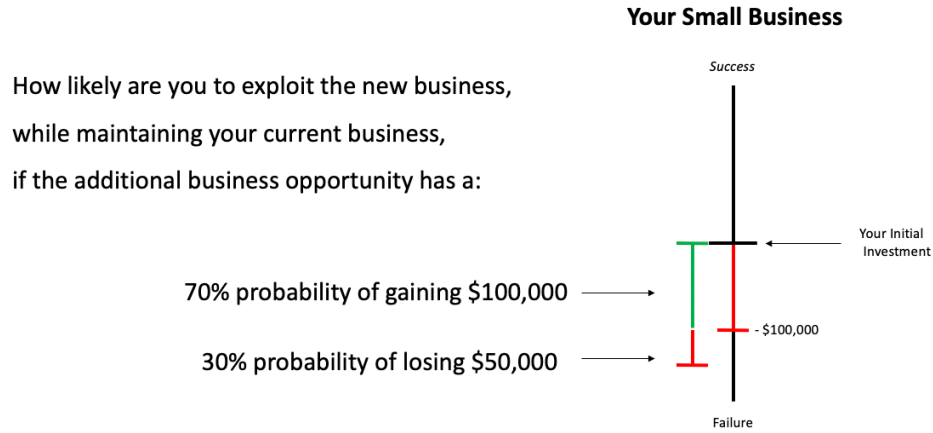
Your Small Business



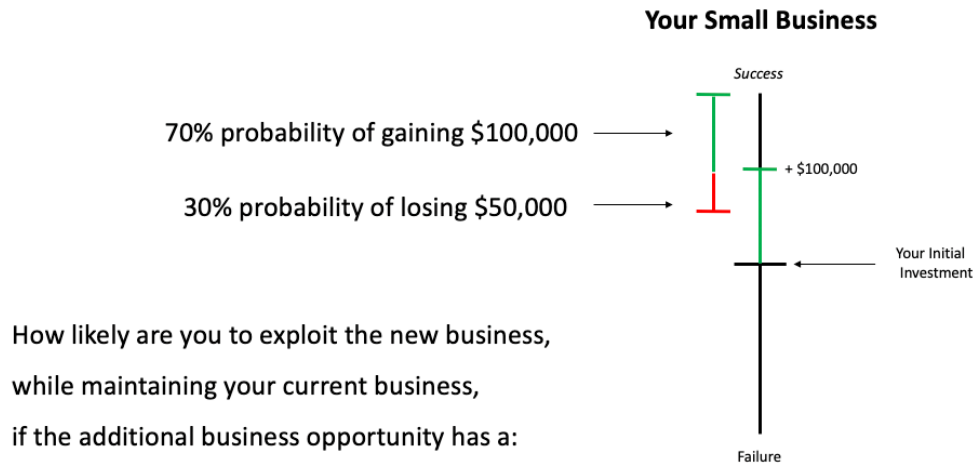
APPENDIX H (Continued):

Example Graphic Depiction of Choice Questions

Choice question 1 presented to domain of losses treatment:



Choice question 1 presented to domain of gains treatment:



Appendix I:

Descriptives, Pearson and Non-Parametric Correlation Tables

<u>Descriptive Statistics</u>			
Variable	N	Mean	SD
Gain Treatment Group	55	12.85	4.77
Control Treatment Group	57	13.04	3.53
Loss Treatment Group	70	12.8	3.48
Combined Value of all 4 Choice Questions	182	12.89	3.91
Education	182	0.361	0.27
Years of Work Experience	182	20.46	11.87
Has Management Experience	182	0.88	0.32
Specific Human Capital	182	0.810	0.13
Parents Were Entrepreneurs	182	0.32	0.47
Intrinsic Motivation	182	0.08	0.98
Switching Cost	182	41.76	12.17
Are Portfolio Entrepreneurs	182	0.40	0.49
Gender	182	0.34	0.47
Post COVID Risk Tolerance	182	0.15	0.66

<u>Pearson Correlations</u>													
Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Gain Treatment Group	1												
Control Treatment Group	-.444**	1											
Loss Treatment Group	-.520**	-.534**	1										
Combined Value of all 4 Choice Questions	-0.006	0.025	-0.018	1									
Education	0.046	0.008	-0.051	.159*	1								
Years of Work Experience	0.047	-0.081	0.033	-.205**	-0.067	1							
Has Management Experience	-0.062	0.096	-0.033	0.043	.172*	.182*	1						
Specific Human Capital	-0.069	-0.085	.146*	-0.038	0.117	.341**	.241**	1					
Parents Were Entrepreneurs	-0.047	0.064	-0.017	0.089	0.086	-0.002	-0.044	-0.11	1				
Intrinsic Motivation	0.055	-0.008	-0.044	-.204**	0.021	0.046	-.198**	0.071	-0.118	1			
Switching Cost	0.011	-0.085	0.071	-.176*	0.002	.931**	.164*	.323**	-0.003	0.057	1		
Are Portfolio Entrepreneurs	0.104	-0.086	-0.016	0.115	.148*	-0.016	0.116	0.032	.184*	-0.103	-0.031	1	
Gender	0.065	-0.078	0.013	-.183*	0.046	-0.047	0.001	0.063	-0.069	0.083	-0.022	-.194**	1
Post COVID Risk Tolerance	0.01	0.058	-0.064	0.051	0.108	-0.071	-0.072	0.003	-0.001	0.031	-0.032	-0.018	0.046

<u>Kendall's tau_b</u>													
Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Gain Treatment Group	1												
Control Treatment Group	-.444**	1											
Loss Treatment Group	-.520**	-.534**	1										
Combined Value of all 4 Choice Questions	-0.03	0.043	-0.012	1									
Education	0.054	0.009	-0.06	.123*	1								
Years of Work Experience	0.039	-0.043	0.004	-.151**	-0.06	1							
Has Management Experience	-0.062	0.096	-0.033	0.065	.145*	.153*	1						
Specific Human Capital	-0.038	-0.081	0.113	-0.01	0.089	.255**	.196**	1					
Parents Were Entrepreneurs	-0.047	0.064	-0.017	0.084	0.039	-0.02	-0.044	-0.104	1				
Intrinsic Motivation	0.056	-0.009	-0.044	-.167**	0.004	0.055	-.196**	0.062	-0.116	1			
Switching Cost	0.02	-0.052	0.03	-.132*	-0.021	.802**	.133*	.230**	-0.01	0.071	1		
Are Portfolio Entrepreneurs	0.104	-0.086	-0.016	0.068	0.064	-0.012	0.116	0.026	.184*	-0.103	-0.034	1	
Gender	0.065	-0.078	0.013	-.134*	0.068	-0.056	0.001	0.038	-0.069	0.081	-0.04	-.194**	1
Post COVID Risk Tolerance	0.012	0.057	-0.065	0.07	0.084	-0.069	-0.063	0.008	0.002	0.023	-0.036	-0.019	0.053

<u>Spearman's rho</u>													
Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Gain Treatment Group	1												
Control Treatment Group	-.444**	1											
Loss Treatment Group	-.520**	-.534**	1										
Combined Value of all 4 Choice Questions	-0.036	0.051	-0.015	1									
Education	0.062	0.01	-0.069	.170*	1								
Years of Work Experience	0.047	-0.051	0.005	-.212**	-0.081	1							
Has Management Experience	-0.062	0.096	-0.033	0.077	.167*	.184*	1						
Specific Human Capital	-0.044	-0.094	0.131	-0.018	0.119	.350**	.228**	1					
Parents Were Entrepreneurs	-0.047	0.064	-0.017	0.099	0.044	-0.024	-0.044	-0.121	1				
Intrinsic Motivation	0.057	-0.009	-0.045	-.201**	0.004	0.07	-.199**	0.074	-0.118	1			
Switching Cost	0.024	-0.062	0.037	-.186*	-0.027	.929**	.161*	.319**	-0.012	0.09	1		
Are Portfolio Entrepreneurs	0.104	-0.086	-0.016	0.08	0.074	-0.014	0.116	0.031	.184*	-0.105	-0.041	1	
Gender	0.065	-0.078	0.013	-.158*	0.078	-0.068	0.001	0.045	-0.069	0.082	-0.048	-.194**	1
Post COVID Risk Tolerance	0.012	0.06	-0.069	0.089	0.103	-0.089	-0.066	0.011	0.002	0.024	-0.047	-0.02	0.055

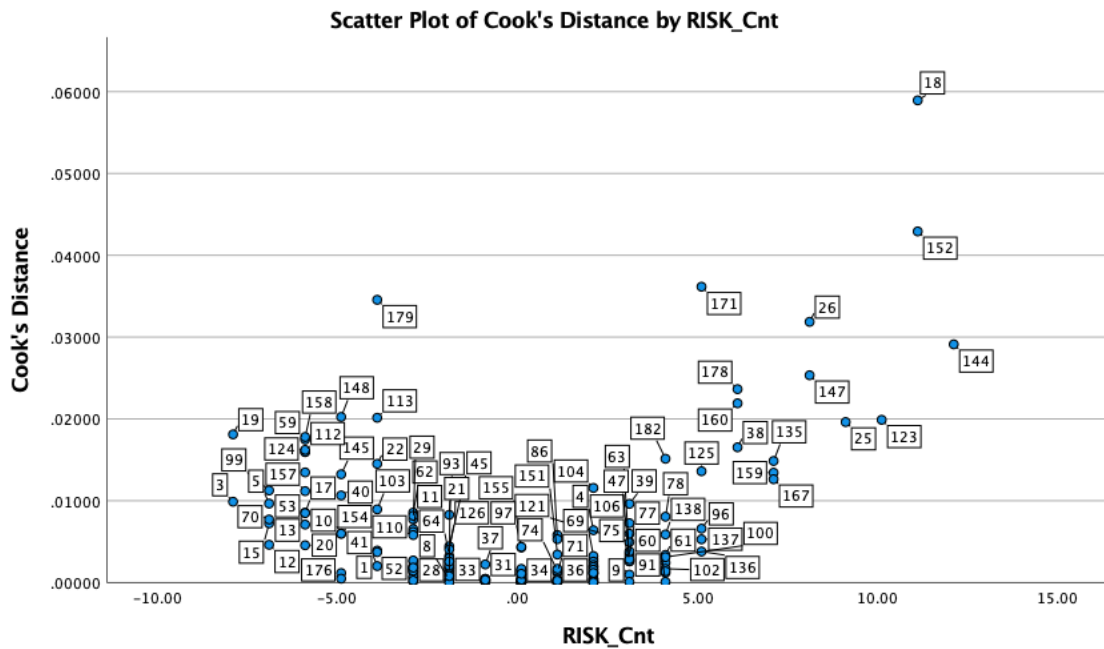
** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Appendix J:

Multivariate Outliers

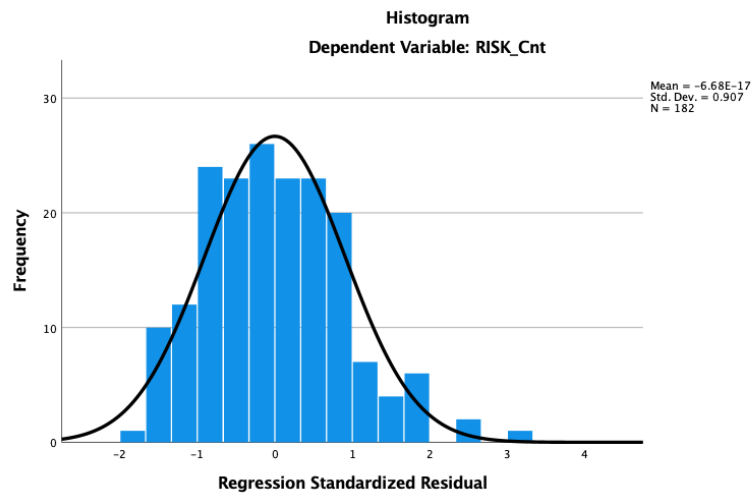
A review for multivariate outliers in the data set was conducted using Cook's Distance (1977). No influential outliers were identified. A scatter plot for Cook's Distance is presented below.



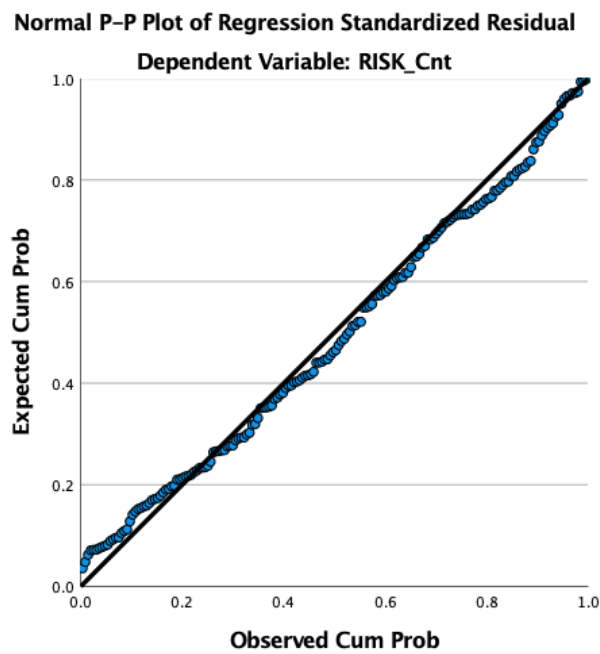
Appendix K:

Assumptions

The distribution of the standardized residuals is normally distributed though there are small violations (slight skew) but well within reasonable limits for analysis.



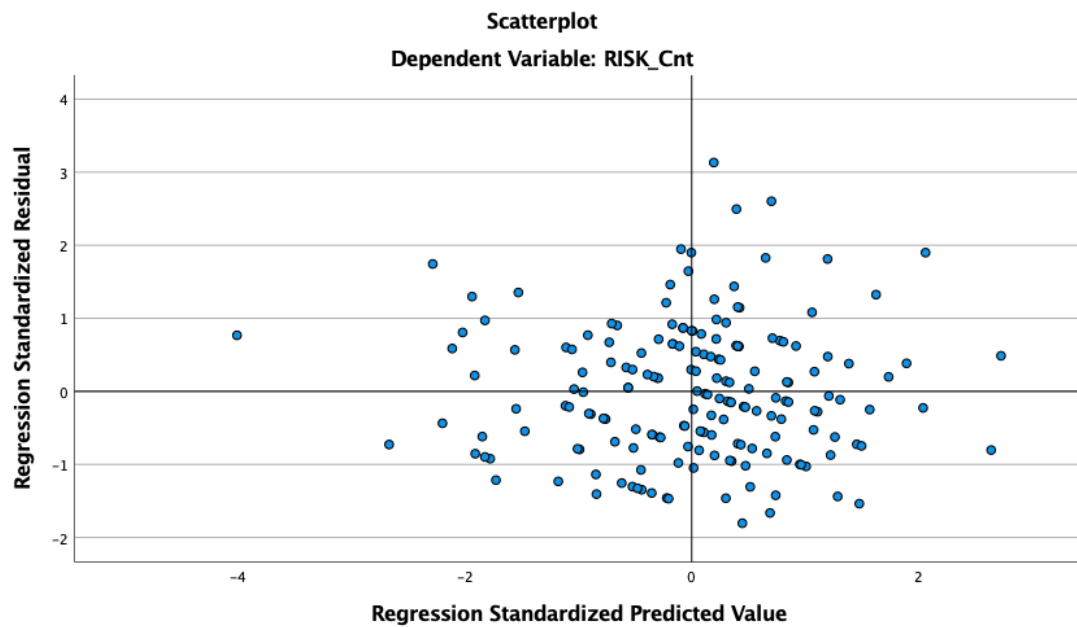
The P-P plot shows residuals are generally consistent with probability. There are slight violations, but they are well within reason for analysis.



Appendix K (Continued):

Assumptions

The scatterplot shows some heteroskedasticity, as the right top and bottom quadrant are tighter than the left top and bottom, but only very little. To the extent there are violations of heteroskedasticity, they are not so dramatic as to affect the analysis.



Appendix L:

Regression Model Summary

Model Summary Dependent Variable: Risk_Cnt

						<u>Change Statistics</u>			Sig. F Change
	R	R Sqr.	Adj R Sqr.	Std. Err.	R Square Change Statistic	F Change	df1	df2	
Model 1	0.026	0.001	-0.011	3.93094	0.001	0.059	2	179	0.942
Model 2	0.379	0.144	0.083	3.74518	0.143	2.82	10	169	0.003
Model 3	0.46	0.211	0.079	3.75313	0.068	0.949	14	155	0.508

Model 1 Predictors: (Constant), GRP_Loss, GRP_Gain
 Model 2 Predictors: (Constant), GRP_Loss, GRP_Gain, EDU_Cnt, I_MTV, AGE_Cnt, GEN, CVD, P_ENT, ENT_S, MGT, S_HC_C
 Model 3 Predictors: (Constant), GRP_Loss, GRP_Gain, EDU_Cnt, I_MTV, AGE_Cnt, GEN, CVD, P_ENT, ENT_S, MGT, S_HC_C

Coefficients

		<u>Unstandardized Coefficients</u>		<u>Standardized Coefficients</u>		t	Sig.
		B	Std. Error	Beta			
<u>Model 1</u>	(Constant)	-0.09	0.47			-0.19	0.85
Treatment	GRP_Gain	0.06	0.71	0.01		0.08	0.94
	GRP_Cont	0.24	0.70	0.03		0.34	0.74
<u>Model 2</u>	(Constant)	0.07	1.01			0.07	0.95
Treatment	GRP_Gain	0.24	0.70	0.03		0.35	0.73
	GRP_Loss	0.04	0.69	0.00		0.05	0.96
General Human Capital	EDU_Cnt	1.85	1.09	0.13		1.70	0.09
	WRK_Cnt	-0.10	0.07	-0.31		-1.50	0.14
	MGT	0.20	0.96	0.02		0.21	0.83
Specific Human Capital	S_HC_Cnt	1.34	2.35	0.05		0.57	0.57
Psychic Income	P_ENT	0.38	0.62	0.05		0.61	0.54
	I_MTV	-0.71	0.30	-0.18		-2.38	0.02
Switching Cost	AGE_Cnt	0.03	0.07	0.10		0.50	0.62
Control Variables	ENT_S	0.21	0.61	0.03		0.35	0.73
	GEN	-1.52	0.61	-0.18		-2.49	0.01
	CVD	0.20	0.43	0.03		0.47	0.64

Appendix L (Continued):

Regression Model Summary

Coefficients (Continued)

		<u>Unstandardized</u>		<u>Standardized</u>		
		<u>Coefficients</u>		<u>Coefficients</u>		
		B	Std. Error	Beta	t	Sig.
Model 3	(Constant)	-0.38	1.46		-0.26	0.80
Treatment	GRP_Gain	0.37	2.13	0.04	0.17	0.86
	GRP_Loss	1.52	2.56	0.18	0.60	0.55
General	EDU_Cnt	1.80	1.71	0.13	1.05	0.30
Human	WRK_Cnt	0.05	0.10	0.15	0.49	0.63
Capital	MGT	0.80	1.47	0.07	0.55	0.59
Specific						
Human	S_HC_Cnt	-2.21	4.40	-0.08	-0.50	0.62
Capital						
Psychic	P_ENT	0.14	1.03	0.02	0.13	0.89
Income	I_MTV	-0.48	0.50	-0.12	-0.97	0.33
Switching						
Cost	AGE_Cnt	-0.08	0.09	-0.26	-0.88	0.38
Control						
Variables	ENT_S	0.19	0.63	0.02	0.30	0.76
	GEN	-1.45	0.63	-0.18	-2.31	0.02
	CVD	0.31	0.44	0.05	0.70	0.49
General	EDU_Cnt_G	-0.42	2.85	-0.02	-0.15	0.88
Human	WRK_Cnt_C	-0.51	0.18	-0.89	-2.90	0.00
Capital	MGT_Gain	-0.18	2.24	-0.02	-0.08	0.94
Psychic	P_ENT_Gair	0.82	1.61	0.06	0.51	0.61
Income	I_MTV_Gair	-0.47	0.74	-0.07	-0.63	0.53
Switching						
Cost	AGE_Cnt_G	0.45	0.18	0.77	2.57	0.01
General	EDU_Cnt_Lr	-0.69	2.58	-0.03	-0.27	0.79
Human	WRK_Cnt_L	-0.16	0.18	-0.22	-0.86	0.39
Capital	MGT_Loss	-1.97	2.55	-0.23	-0.77	0.44
Specific						
Human	S_HC_Cnt_I	3.37	6.01	0.07	0.56	0.58
Capital						
Psychic	P_ENT_Loss	0.68	1.48	0.06	0.46	0.65
Income	I_MTV_Los	-0.23	0.73	-0.03	-0.32	0.75
Switching						
Cost	AGE_Cnt_Lr	0.10	0.16	0.15	0.60	0.55
Specific						
Human	S_HC_Cnt_C	4.34	6.18	0.09	0.70	0.48
Capital						

a Dependent Variable: RISK

VITA

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