

TEMPORAL MEDIATION OF UNCERTAINTY WITHIN ENTREPRENEURIAL OPPORTUNITY EVALUATION

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Limited research within entrepreneurship is available on how time affects entrepreneurs' decision-making. We try to bridge this gap by understanding how temporal factors affect opportunity evaluation and how they affect uncertainty. Basing our hypotheses on Construal Level Theory, we ran two experiments and found that individuals modify their evaluation of the same opportunity when evaluating a distant future versus a near future event. Opportunities in the near future are more highly evaluated than distant future opportunities. Moreover, we demonstrate experimentally that uncertainty affects opportunity evaluation.

Keywords: Construal Level Theory; entrepreneurship; opportunity evaluation; opportunity exploitation; temporal distance; uncertainty.

1. Introduction

Opportunity evaluation is inextricably linked to entrepreneurship (Dimov, 2010; Haynie *et al.*, 2009; McMullen and Dimov, 2013; McMullen and Shepherd, 2006; Shane and Venkataraman, 2000; Wood and McKelvie, 2015), and has given rise to significant research addressing how the different characteristics of entrepreneurs affect the evaluation of opportunities (Shepherd *et al.*, 2015). Research has shown that differences in human capital (Davidsson and Honig, 2003) and differences in emotional responses affect opportunity evaluation (Welppe *et al.*, 2012). Past studies also revealed how the perception of the environment and uncertainty affect decisions surrounding entrepreneurial opportunity (McKelvie *et al.*, 2011). Prior research that has specifically focused on uncertainty, which is ever-present in entrepreneurship, shows how this impedes action (McKelvie *et al.*, 2011).

However, “we know very little about how evaluations and decisions within individuals change over time” (Shepherd *et al.*, 2015). Until recently, scholars have “taken a static perspective that largely ignores the possibility that entrepreneurs’ opportunity-related decision policies can change over time” (Shepherd *et al.*, 2015). The future-orientated nature of opportunity evaluation (Wood and Mckelvie, 2015) inherently associates temporal aspects with decision-making. For this reason, it is surprising that after a review of 602 articles, Shepherd *et al.* (2015) found few results of temporal considerations on opportunity evaluation. Therefore, they called for more research on how time may affect an entrepreneur’s view of an opportunity. Moreover, no research has been found regarding the potential temporal mediation of uncertainty within entrepreneurial opportunity evaluation.

A way to bridge this gap in research is by understanding how temporal aspects may alter the evaluation of the exact same opportunity. In developing our hypothesis on how temporal distance and uncertainty may mediate opportunity evaluation, we make use of Construal Level Theory (CLT). This theory describes how concretely or abstractly future events are considered depending on temporal distance (Lieberman *et al.*, 2007; Trope and Liberman, 2000; 2003),

We conducted two experiments to answer our hypothesis. Study one employed two within-subject vignettes, showing the same opportunity but varying the temporal distance. Study two used a two-by-two within-subject vignette design, again showing the exact same opportunity but changing the temporal distance and the perspective of opportunity from first person to third person with the aim of removing response uncertainty (Milliken, 1987).

The results of Study One show there is a significant difference in the evaluation of an opportunity when varying temporal distance. The findings demonstrate that temporal changes affect the attractiveness and likelihood of exploitation of the exact same entrepreneurial opportunity. Findings from Study Two reveal that response uncertainty affects the likelihood of exploitation, thus establishing there is an influence of uncertainty on the likelihood of opportunity exploitation.

This paper contributes to entrepreneurial opportunity evaluation research by extending the limited research that considers the temporal aspects of opportunity evaluation (Tumasjan *et al.*, 2013). It demonstrates that opportunity evaluation is not static regarding temporal distance and that temporal aspects alter how we evaluate the exact same opportunity. We also introduce the temporal consideration into the uncertainty construct within the scope of entrepreneurial opportunity evaluation. Finally, we answer the call from Shepherd *et al.* (2015) to focus on how time may influence the evaluation of an opportunity.

2. Theory Development

The following section develops a theoretical underpinning for the research study. We first examine the concept of entrepreneurial opportunity evaluation and demonstrate a limited body of research that considers temporal aspects. Thereafter, we introduce a second construct of uncertainty and discuss its role in opportunity evaluation.

2.1. Opportunity evaluation

Although entrepreneurial activity is indelibly linked to opportunity evaluation (Dimov, 2010; Haynie *et al.*, 2009; McMullen and Dimov, 2013; McMullen and Shepherd, 2006; Shane and Venkataraman, 2000; Wood and Mckelvie, 2015), Wood and Mckelvie (2015) note that authors inconsistently define the phenomenon of opportunity evaluation. When it has been defined, a few central concepts persist (Dimov, 2010; Haynie *et al.*, 2009; Mitchell and Shepherd, 2010). First, it is suggested that opportunity evaluation is a mental process (Forlani *et al.*, 2002; Forlani and Mullins, 2000; Tumasjan *et al.*, 2013) and that “the use of terms such as discern, confidence, judgment and assessment all point to the notion that opportunity evaluation happens in the minds of entrepreneurs” (Wood and Mckelvie, 2015). Second, it is suggested that opportunity evaluation is future-orientated (Wood and Mckelvie, 2015).

The future-orientation of opportunity evaluation inherently associates the process with uncertainty (McMullen and Shepherd, 2006) and doubt (Lipshitz and Strauss, 1997; McKelvie *et al.*, 2011), because the mental simulation requires an individual to make predictions of possible outcomes (Wood and Mckelvie, 2015). Moreover, the word “future” also introduces the concept of time, and entrepreneurship is a process that occurs over time (Lichtenstein *et al.*, 2006; McMullen and Dimov, 2013).

Entrepreneurial opportunity is defined as a “future situation which is deemed desirable and feasible” (Stevenson and Jarillo, 1990). Desirability is the end state of a venture and feasibility is the effort required to reach that end state (Trobe and Liberman, 2003; Tumasjan *et al.*, 2013). A more concrete example of this would be: a highly desirable opportunity would have a high potential for profit (Tumasjan *et al.*, 2013) and a highly feasible opportunity would be where there is no competition in the market (Tumasjan *et al.*, 2013).

Opportunity evaluation has been extensively researched (Hansen *et al.*, 2016; Haynie *et al.*, 2009; Shepherd *et al.*, 2015; Welpe *et al.*, 2012), especially using the feasibility and desirability constructs (Krueger, 2009; Tumasjan *et al.*, 2013). Haynie *et al.* (2009) showed that high feasibility and high desirability had a positive and significant effect on opportunity evaluation. Mitchell and Shepherd (2010), in their hypothetical scenario experiment, suggested that desirability and feasibility played an equal role in opportunity evaluation. Wood and Williams (2014) showed that the evaluation process is rule-based around feasibility and desirability factors, and that entrepreneurs evaluate opportunities systematically.

However, all these studies failed to consider temporal factors or, simply put, how the same opportunity might be evaluated at different points in time. There is an implicit assumption that the outcomes of opportunity evaluation are static (Shepherd *et al.*, 2015) and will not change over time. It is rarely the case that exploitation occurs immediately after evaluation (Tumasjan *et al.*, 2013). Moreover, to this shortcoming, entrepreneurship is a process rather than a once-off event (McMullen and Dimov, 2013) and entrepreneurial opportunity evaluation is a relativistic concept, meaning it may vary over time as desires change and as individual perception of their own competencies varies (Stevenson and Jarillo, 1990; 2007). Thus, ignoring time suggests a significant limitation on the research.

This is further highlighted by Shepherd, Williams and Patzelt (2015) in their review of entrepreneurial decision-making. They state that “previous work has predominantly taken a static perspective that largely ignores the possibility that entrepreneurs’ opportunity-related decision policies can change over time...we know very little about how evaluations and decisions within individuals change over time” (Shepherd *et al.*, 2015). This has led to their call for more research on the role of time in the opportunity evaluation process.

From a theoretical perspective, a theory without temporal considerations cannot be considered as complete (Gielnik *et al.*, 2014; Zaheer *et al.*, 1999). Further to the review done by Shepherd, Williams and Patzelt (2015), when looking at how a pattern of events unfolds, we need to be informed about the start time (Mitchell and James, 2011). When events occur, there is a time lag that must be considered during which things may change and vary (Mitchell and James, 2011). Numerous variables are involved in opportunity evaluation (Shepherd *et al.*, 2015). If a lag is too big, a variable might wear off and allow another variable to come into play (Mitchell and James, 2011).

2.2. Temporal considerations

Studies related to time-dependent changes in preferences aim to understand the discounting effect of time on those preferences (Trope and Liberman, 2000). A feature of these studies is the attractiveness of opportunities, where “the value of outcomes is generally discounted (diminished) over time, but negative outcomes undergo steeper time-discounting than do positive features. This valence-dependent time-discounting hypothesis thus predicts that temporal distance will increase attractiveness of activities” (Trope and Liberman, 2000), where temporal distance is understood as the time distance between the present and the future (Tumasjan *et al.*, 2013). Within the opportunity evaluation context, the present refers to the moment when one is evaluating the opportunity and the future to when one would exploit the opportunity.

2.2.1. Construal level theory

CLT relates an individual’s psychological distance to how concretely or abstractly the individual would consider an event or situation (Liberman *et al.*, 2007; Trope and Liberman, 2000; 2003). Psychological distance may be temporal, spatial, social or hypothetical (Trope and Liberman, 2010) and the terms “concretely” and “abstractly” may be substituted with “high-level information” and “low-level information” (Trope and Liberman, 2010). CLT proposes that the further the psychological distance, the more abstractly one would consider an event (Trope and Liberman, 2003).

As further explanation, for a longer temporal distance (a form of psychological distance), one would consider the event more abstractly (Trope and Liberman, 2010). Conversely, for a shorter temporal distance, an individual would consider the event more concretely. Therefore, CLT may offer a perspective or explanation on how temporal distances may affect opportunity evaluation.

Eyal *et al.* (2004), basing their research on CLT, found that “pros” are a higher-level construal and “cons” a lower-level construal. Therefore, when forming intentions far in the future, the pros would be a more salient consideration and closer to action or exploitation, while cons would be more strongly considered. This can be further explicated through CLT by considering that “desirability considerations thus constitute high-level construals of actions, whereas feasibility considerations constitute low-level construals of actions” (Trope and Liberman, 2003).

Using this conceptualization, Tumasjan *et al.* (2013) showed that during entrepreneurial opportunity evaluation, desirability considerations are stronger when action was further away (a high temporal distance). Also, feasibility considerations are more strongly considered when there is a short temporal gap (Tumasjan *et al.*, 2013). What is significant in this research is the insertion of temporal aspects, which showed that feasibility and desirability are not consistently considered. This is in contrast to Mitchell and Shepherd (2010), who stated that neither desirability nor feasibility plays a more important role. A more accurate wording of this might suggest that both these constructs, feasibility and desirability, play an important role, but at different points in time. Time or temporal distance acts as a moderator of desirability and feasibility (Tumasjan *et al.*, 2013).

As discussed, CLT proposes the increase in high-level information (e.g. beliefs and trends) and the decrease in low-level information (e.g. specific irregular outcomes and tasks) with a distant temporal distance (Trope and Liberman, 2010). With these two processes concurrently in play, the consideration of uncertainty may be underweighted because more uncertainty is associated with low-level and concrete considerations (Trope and Liberman, 2010). Thus, CLT also offers a view on how temporal distances may affect a potential entrepreneur’s perception of uncertainty.

2.3. Uncertainty

Given the unpredictable nature of entrepreneurship, uncertainty is ever-present (McKelvie *et al.*, 2011). McMullen and Shepherd (2006) state that “uncertainty constitutes a conceptual cornerstone for most theories of the entrepreneur” because judgment requires a decision about action and evaluating a possible and unknowable future.

However, different conceptualizations of the word “uncertainty” exist among authors (Duncan, 1972; Lawrence and Lorsch, 1967; Lipshitz and Strauss, 1997; Schmidt and Cummings, 1976). Specifically, within entrepreneurship, there is a concern regarding a single understanding of uncertainty. The reason for this is the entrepreneurial environment is considered and described by many as ambiguous, dynamic, risky or turbulent where these terms can be seen as being synonymous to uncertainty (McKelvie *et al.*, 2011).

To focus the current study, Milliken’s (1987) conceptualization of uncertainty will be used, namely state, effect and response uncertainty. Here, state uncertainty is the inability to predict how the external environment is changing; effect uncertainty is the inability to predict how the external environment will affect the firm and response uncertainty is the inability to predict how the external environment will respond to one’s actions (Milliken, 1987).

McKelvie *et al.* (2011) examined how Millikin's (1987) different constructs affect entrepreneurs and found that response uncertainty has the most influence on a potential entrepreneur's actions, with higher response uncertainty inhibiting action. This is supported by McMullen and Shepherd (2006) who, in their presentation of a conceptual model of entrepreneurial action, associated state and effect uncertainty more closely with opportunity identification and response uncertainty to opportunity evaluation.

Further to this, it is response uncertainty that takes an opportunity from a third-person opportunity to a first-person opportunity, from where the entrepreneur may decide to exploit the entrepreneurial opportunity (McMullen and Shepherd, 2006). A third-person opportunity is a potential opportunity for someone in the marketplace and a first-person opportunity is an entrepreneurial opportunity for the entrepreneur themselves (McMullen and Shepherd, 2006).

It is accepted that uncertainty, specifically response uncertainty, inhibits entrepreneurial action (Autio *et al.*, 2013; McKelvie *et al.*, 2011; Wiklund *et al.*, 2017), because of poorer evaluation of an entrepreneurial opportunity in the face of uncertainty (Keh *et al.*, 2002). Further, a reduction in uncertainty will trigger entrepreneurial action (Autio *et al.*, 2013; McMullen and Shepherd, 2006). However, similar to opportunity evaluation, no research has been found to show how uncertainty is mediated by temporal aspects nor how uncertainty is perceived when the time to exploit the opportunity is in the distant future as opposed to the near future. Without this understanding of temporal considerations, our understanding of the influence of response uncertainty on opportunity is limited (Zaheer *et al.*, 1999).

CLT offers a perspective on how temporal distance may alter uncertainty considerations, by its potential underweighting of uncertainty (Trope and Liberman, 2010). CLT proposes that as time to exploitation decreases (a shorter temporal distance), individuals start considering the lower-level construals and think more concretely about actions, thus in turn provoking higher perception of uncertainty.

2.4. Theory development summary

Research on opportunity evaluation has converged on a small number of consistencies, namely that it is a mental process, it is future-orientated and it uses perception of feasibility and the perception of desirability as constructs (Keh *et al.*, 2002; Tumasjan *et al.*, 2013; Wood and McKelvie, 2015). Prior studies looked at how entrepreneurs differ from one another and took a static view of the evaluation process (Shepherd *et al.*, 2015).

Another static perspective taken within entrepreneurial opportunity evaluation pertains to the uncertainty construct, which is ever-present in entrepreneurship (McKelvie *et al.*, 2011). It is accepted that response uncertainty has a significant effect on potential entrepreneurs (Autio *et al.*, 2013; Haynie *et al.*, 2009; McKelvie *et al.*, 2011), with increased perception of uncertainty creating a poorer evaluation of an entrepreneurial opportunity (Keh *et al.*, 2002) and impeding action on the part of the entrepreneur (Autio *et al.*, 2013).

CLT offers a theoretical underpinning that may allow us to bridge the gap between temporal factors and their effect on the perception of uncertainty within entrepreneurial opportunity evaluation (Trope and Liberman, 2003). CLT was used to show that two key constructs of opportunity evaluation—desirability and feasibility (Krueger, 2009)—are moderated by temporal distance (Tumasjan *et al.*, 2013). CLT also offers an explanation around how the underweighting of the perception of uncertainty may be present at different temporal distances (Trope and Liberman, 2010).

3. Hypothesis Development

3.1. Study one

Time-discounting “predicts that temporal distance will increase the value of options that are associated with both positive and negative outcomes” (Trope and Liberman); however, the discount is steeper for negative events (Trope and Liberman, 2003). As such, an opportunity in which exploitation is in the distant future should be more highly evaluated.

CLT states that when time to an action nears, one perceives the action differently (Trope and Liberman, 2003). When closer to an action, a person considers the act more concretely and when further away more abstractly (Trope and Liberman, 2003). This change in mental perception of events may alter an opportunity’s attractiveness, more specifically in the mind of the potential entrepreneur. As one gets closer to action, one might find an opportunity that was originally attractive now less attractive and may prevent action.

Hypothesis 1: *A potential entrepreneur’s evaluation of the attractiveness of an opportunity will decrease in the near future as opposed to the distant future.*

Opportunity evaluation and exploitation are closely aligned, and where an opportunity is more highly evaluated from an attractiveness perspective, it should correlate to a higher likelihood of willingness or desire to exploit (Tumasjan *et al.*, 2013). However, there is a distinction between them, whether in discussion of the process of entrepreneurship (Shane and Venkataraman, 2000) or when different models of entrepreneurship are proposed (McMullen and Shepherd, 2006). Thus, we added a second hypothesis with the assumption that the likelihood of exploitation will follow the same trend as opportunity evaluation.

Hypothesis 2: *A potential entrepreneur’s likelihood of opportunity exploitation will decrease in the near future as opposed to the distant future.*

3.2. Study two

Another construct that has been shown to impede entrepreneurial action is uncertainty (McKelvie *et al.*, 2011). No research has been found to show how uncertainty varies with temporal distance within entrepreneurship. CLT proposes the modification of perception of events, depending on temporal distance to action, by modifying the consideration of

feasibility and desirability at different temporal stages and underweighting uncertainty (Trope and Liberman, 2010; Tumasjan *et al.*, 2013). With a shorter temporal distance, feasibility is considered more significantly (Tumasjan *et al.*, 2013). As events are also considered more concretely (Trope and Liberman, 2010), we hypothesize that the consideration of uncertainty would be higher with a shorter temporal distance, which would in turn reduce the evaluation of an entrepreneurial opportunity (Keh *et al.*, 2002). Changing the perspective from first person to third person allows control of response uncertainty (McMullen and Shepherd, 2006), which is the most impactful form of uncertainty on the impediment to likelihood of exploitation (McKelvie *et al.*, 2011). We aim to demonstrate the effect of temporal distance on opportunity evaluation, on the attractiveness of the opportunity and on the likelihood of exploitation, where response uncertainty is present and where it is not.

Hypothesis 3: *A potential entrepreneur's opportunity evaluation will have a larger decrease in an opportunity's attractiveness in the first person when moving from a distant to near future, as opposed to the change in evaluation from a third-person perspective when moving from a distant to near future because of the response uncertainty considerations.*

Hypothesis 4: *A potential entrepreneur's likelihood of opportunity exploitation will have a larger decrease in the first person when from a distant to near future, as opposed to a change in evaluation from a third-person perspective when moving from a distant to a near future because of the response uncertainty considerations.*

4. Methodology

4.1. Research design

One experiment was run for both studies, making use of a within-subjects design vignette. A vignette study was seen as favorable because these produce a more valid and reliable measure from respondents (Alexander and Becker, 1978), overcoming well-known internal validity weaknesses associated with surveys (Evans *et al.*, 2015). Moreover, vignettes negate investigative bias, prompting bias, over specificity and misinterpretation by providing a standardized situation to all participants (Evans *et al.*, 2015; Schoenberg and Ravdal, 2000).

The decision of a within-subjects design allowed for the comparison of the difference in respondents' results and removed any variation that may occur between respondents (Keller and Warrack, 1997). That is, any participant who evaluated a situation as a 5 then 4 on a Likert scale would have the same difference in evaluation as a respondent who selected 4 then 3. Moreover, a within-subjects design was chosen over a between-subjects design, which is rare (Atzmüller and Steiner, 2010) because of the measurement problems the different vignettes present different contexts (Atzmüller and Steiner, 2010; Birnbaum, 1999).

Finally, the use of vignettes offered a mechanism of mimicking the mental simulation involved with opportunity evaluation (Wood and McKelvie, 2015). This was achieved by

Table 1. Summary of the four vignettes used with the summary.

HFHD		HFHD	
A	Near temporal distance	B	Distant temporal distance
	First-person perspective		First-person perspective
C	Near temporal distance	D	Distant temporal distance
	Third-person perspective		Third-person perspective

allowing full contextual control and presenting the explanatory and contextual factors to each participant, thus offering a more realistic scenario to present to participants (Atzmüller and Steiner, 2010; Tumasjan *et al.*, 2013).

Each statement within the vignette was carefully constructed and keywords were highlighted to emphasize concepts and place the participant in a specific mind frame. The vignettes described an entrepreneurial opportunity with both high feasibility and high desirability (HFHD) and were then varied on a 2×2 scale, adjusting temporal distance for near versus far and first-person versus third-person evaluation (Table 1). Hypotheses 1 and 2 used vignette A and B from Table 1 and Hypotheses 3 and 4 used vignettes A, B, C and D from Table 1.

As previously stated, each text component of the vignette was carefully constructed to place the participant in a specific mental frame. The construction of these components is discussed in the following sections.

4.1.1. Temporal aspects

In a study on time frames and future temporal depths, it was found that entrepreneurs perceived the short-term, medium-term and long-term future as one month, six months and three years, respectively (Bluedorn and Martin, 2008). Various temporal distances have been used in previous research. Freitas *et al.* (2008) in their study on voting used “today, right now” and “two years from now.” Borovoi, Liberman and Trope (2010) operationalized it as immediately versus a year from now, while Tumasjan *et al.* (2013) used one month from now versus one year from now.

The temporal aspects chosen were one month and one year in advance, for the near and distant future, respectively. This was decided upon because the temporal distances are far apart enough to separate in the concept of near versus distant, with one year in between the six months medium-term and three years long-term (Bluedorn and Martin, 2008). Second, exact time frames are offered to prevent different participants from interpreting temporal distance differently. Third, the near temporal distance of one month seemed more realistic within this scenario than the “immediately” or “right now” (i.e. you hear about an opportunity and you start exploiting it the same day) and is in line with entrepreneurs’ understanding of short term (Bluedorn and Martin, 2008). Finally, it is in line with other research that looked at similar constructs and will thus allow for the comparison of results (Tumasjan *et al.*, 2013).

4.1.2. *Feasibility and desirability*

Desirability refers to the end state of a venture, where feasibility refers to how much effort will be required to reach that end state (Trope and Liberman, 2003). Desirability could be seen as the “why” and feasibility as the “how” (Trope and Liberman, 2003). As such, an opportunity with high potential for profit (desirability) and no competition (feasibility) would be evaluated as an attractive opportunity (Tumasjan *et al.*, 2013).

In line with this conceptualization, the manipulation and operationalizing of feasibility and desirability constructs were adapted from Tumasjan *et al.* (2013), which used means-related constructs for feasibility (level of competition and amount of seed capital required) and ends-related conditions for desirability (potential for profit and attractiveness of the product). For high desirability, both potential for profit and product attractiveness were high. Similarly, for high feasibility the target market situation had low competition and the amount of founder’s seed capital required was low.

4.1.3. *Evaluation and exploitation*

Evaluation of an opportunity regarding its attractiveness was assessed using a three-item, seven-point Likert scale questionnaire adapted by Tumasjan *et al.* (2013) from Sporrle, Breugst and Welpé (2009). The questions asked were as follows.

- How would you evaluate the attractiveness of this opportunity?
- How appealing is this opportunity in your personal opinion?
- How far do you consider this opportunity to be an attractive alternative to a non-entrepreneurial occupation?

To test for exploitation intentions, the following three questions, adapted from Sporrle *et al.* (2009), were asked:

- How strong is your tendency to exploit this opportunity as a co-founder?
- How worthwhile do you think it is to exploit this opportunity as a co-founder?
- How likely is it that you would exploit this opportunity by engaging as a co-founder?

Each question was modified for the third-person vignettes from the perspective of someone asking for their advice on whether they should exploit the opportunity. Seven-point scales were chosen for a number of reasons. First, because seven is an odd number, it has a middle point that is seen as neutral from the participant’s perception (Colman *et al.*, 1997). Second, Miller (1956) argued that a participant is limited or constrained to seven items they can consider at a point in time. Finally, a seven-point Likert scale captures more variance than a five-point Likert scale (Colman *et al.*, 1997).

4.1.4. *First-person vs third-person perspective*

In their model of uncertainty, McMullen and Shepherd (2006) discussed the role of entrepreneurship and the effect of response uncertainty. Response uncertainty is that which prevents a third-person opportunity from becoming a first-person opportunity (Milliken, 1987).

That is to say, it prevents a potential entrepreneur from exploiting an opportunity identified and assumes it is more an opportunity for another individual. Furthermore, response uncertainty may decrease the evaluation of an opportunity (Keh *et al.*, 2002).

As such, proposing evaluation of a third-person opportunity should remove the response uncertainty perceived by the individual because it is not the participant who needs to act. The vignettes are thus constructed in the first person, where the participant is asked to participate as a co-founder and third person where the participant is asked for advice from a friend but is not involved in exploiting the opportunity.

4.2. Sampling and data collection

The sampling methodology was convenience sampling from a large portion of MBA students. This is in line with existing research that used MBA students as a reflective sample of entrepreneurs (Chye Koh, 1996; Karim and Chittipaka, 2016; Wilson *et al.*, 2007a; Zhao *et al.*, 2005). University students are more likely to identify entrepreneurial opportunities and venture into it (Ucbasaran *et al.*, 2008) within a shorter time frame when compared to others (Wilson *et al.*, 2007a). Formal tertiary education has a positive effect on the intention to initiate entrepreneurial activity (Zhao *et al.*, 2005). Moreover, formal learning is significantly and positively related to entrepreneurial self-efficacy (Zhao *et al.*, 2005), which is in turn related to entrepreneurial intentions (Zhao *et al.*, 2005). Finally, previous research that has piloted studies on tertiary education students and then moved over to entrepreneurs for a replicated study has shown that the outcomes did not change (Tumasjan *et al.*, 2013).

4.3. Tooling

All analysis was done within the scripting language R v3.5.1 (R Core Team, 2018). The additional packages not in the core library included Lavaan v0.6.2 (Rosseel, 2012), psy v1.1 (Falissard, 2012), psych v1.8.4 (Revelle, 2018), GPArotation v2014.11.1 (Bernaards and I. Jennrich, 2005).

5. Results

5.1. Study one

5.1.1. Construct validation

There were 97 respondents in the survey. Removing the participants who did not answer all the questions left 75 respondents ($n = 75$). To confirm the data loaded onto the correct constructs, Exploratory Factor Analysis (EFA) was performed. Varimax rotation was used for the EFA because it is considered the superior rotational method (Hair *et al.*, 2013). To ensure an EFA was appropriate, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy (MSA) ($MSA = 0.89$) and the Bartlett Test of Sphericity (BTOS) ($p = 0.00$) were applied. Both values indicated that factor analysis was appropriate (Hair *et al.*, 2013).

The results of the EFA and the Latent Root Criterion, using the Eigen value of 1 rule (Hair *et al.*, 2013) indicated one construct should be extracted for the six questions

used (three for evaluation and three for exploitation). Moreover, the one latent variable accounted for 81.90 percent of the variance.

Although two constructs (evaluation of the attractiveness and likelihood of exploitation) were initially considered, the outcome of the single construct is not unexpected because the two are closely linked (Tumasjan *et al.*, 2013). However, when using the Latent Root Criterion with less than twenty variables, there is a tendency for too few constructs to be extracted (Hair *et al.*, 2013).

To confirm the EFA results, Confirmatory Factor Analysis (CFA) was performed to test the single-factor and two-factor model. The results for the single-factor model [$\chi^2[9.00] = 40.83, p = 0.00$; CFI: 0.97; SRMR: 0.02; RMSEA: 0.15] showed a less favorable fit when compared to the two-factor model [$\chi^2[8.00] = 14.14, p = 0.08$; CFI: 0.99; SRMR: 0.02; RMSEA: 0.07]; moreover, all fit values were acceptable for the two-factor model (Hair *et al.*, 2013; Hu and Bentler, 1999). The Cronbach alpha values for evaluation and exploitation were 0.88 and 0.94, respectively. Convergent validity of the two-factor model is further confirmed with the Average Variance Extracted (AVE) [AVE = 0.85 and 0.75] and Composite Reliability (CR) [CR = 0.95 and 0.90], which fall in line with accepted values (Hair *et al.*, 2013). Discriminant validity was checked by comparing the AVE to the squared correlation of the latent variables (SQ = 0.86) (Fornell and Larcker, 1981). The AVE value is slightly high to test and speaks to the EFA results. Finally, nomological validity is acceptable with both latent variables correlating with each other as expected (Hair *et al.*, 2013; Tumasjan *et al.*, 2013).

5.1.2. Results

The first experiment used two of the four vignettes, the first person near and first person distant temporal distance scenarios (A and B from Table 1). The group statistics can be seen in Table 2. The table shows the difference in outcomes of opportunity evaluation on the attractiveness of an opportunity and the likelihood of exploitation, both measured on a 7-point Likert scale. In terms of the mean, the attractiveness of an opportunity is higher in the near future than it is in the distant future. Similarly, the likelihood of exploitation is higher in the near future compared to the distant future.

5.1.3. Statistical analysis

To test for any significant difference between distant and near opportunities, a dependent t-test was run. The one benefit of using a dependent t-test is that it eliminates the differences

Table 2. Group Statistics of Study One.

	Near		Distant		Paired <i>t</i> -test
	Mean	Std Deviation	Mean	Std Deviation	
Evaluation	5.52	1.11	4.81	1.46	0.00
Exploitation	5.56	1.1	4.62	1.41	0.00

between participants by looking at only the difference of a single participant (Keller and Warrack, 1997). Normality of the differences ($\Delta = \text{distant} - \text{near}$) (Black, 2012; Keller and Warrack, 1997) was tested with the Shapiro-Wilk test (H_0 : data follows a normal distribution) with a significance level 0.05 ($\alpha = 0.05$; $p \geq 0.05$ accept H_0), which gave $p(\text{exploitation}) = 0.05$ and $p(\text{evaluation}) = 0.29$. As such, we could not reject the null hypothesis and assumed a normal distribution.

The results of the dependent t -test are $p(\text{evaluation}) = 0.00$ and $p(\text{exploitation}) = 0.00$. Thus, the null hypothesis ($H_0: \mu_1 - \mu_2 = 0$) is rejected, and the mean difference between near and distant evaluation is not 0. Moreover, an upper-tailed t -test was also run to confirm the directionality, for $\mu_{\text{near}} > \mu_{\text{distant}}$ $p(\text{evaluation}) = 0.00$ and $p(\text{exploitation}) = 0.00$ and in reverse for $\mu_{\text{near}} < \mu_{\text{distant}}$ $p(\text{evaluation}) = 1$ and $p(\text{exploitation}) = 1$, thus near distance evaluation is significantly greater.

The Shapiro-Wilk test for evaluation gave a result of $p = 0.05$, which is as an edge case and, depending on the significance level chosen, would change the outcomes of the test. As such, we also ran a non-parametric Wilcoxon signed-rank test ($p(\text{evaluation}) = 0.00$ and $p(\text{exploitation}) = 0.00$) to further validate the results. The skewness is most likely the cause of the breach of normality (skewness = 0.08); however, we did not take out the outliers because they could be meaningful.

5.2. Study two

The second study looked at the change in evaluation between distant and near temporal distances for a first-person perspective and third-person perspective. Four vignettes were used, changing the temporal distance (near vs distant) and changing the point of view (first person vs third person), which resulted in the following four scenarios: first person near, first person distant, third-person near and third-person distant. Each scenario was accompanied by HFHD opportunity.

5.2.1. Construct validation

The same procedure was followed as in study one. An EFA was used to validate the dependent variable (KMO MSA = 0.89; BTOS $p = 0.00$). Exploitation was limited to two questions because the third question was not transferable, logically, to the third-person perspective. The latent root criteria followed the same results as study one, indicating that only one construct should be extracted. To compare the two-factor and one-factor model, a CFA was performed on both constructs. The two-factor model again provided a better fit [$\chi^2[4.00] = 8.65$, $p = 0.07$; CFI: 1.00; SRMR: 0.01; RMSEA: 0.06] than the one-factor model [$\chi^2[5.00] = 51.75$, $p = 0.00$; CFI: 0.97; SRMR: 0.02; RMSEA: 0.18], thus the two-factor model was used again. Cronbach alpha values for evaluation and exploitation were 0.92 and 0.94, respectively. Convergent validity calculations were also acceptable [AVE = 0.89 and 0.79] [CR = 0.94 and 0.92] according to Hair *et al.* (2013). Discriminant validity had similar concerns as discussed in study one (SC=0.89). Finally, nomological validity seems appropriate when inspecting the SC.

Table 3. Group Statistics of Study Two.

	1 st Person				Wilcoxon Signed-rank test <i>t</i> -test
	Near		Distant		
	Mean	Std Deviation	Mean	Std Deviation	
Evaluation	5.52	1.11	4.81	1.46	0.00
Exploitation	5.59	1.07	4.71	1.40	0.00
	3 rd Person				
Evaluation	5.44	1.11	4.47	1.55	0.00
Exploitation	5.61	1.13	4.21	1.54	0.00

5.2.2. Results

Both in the third-person perspective and the first-person perspective, the opportunity evaluation was more attractive in the near future than in the distant future, with the first-person perspective rating it higher in both instances. The likelihood of opportunity exploitation followed a similar trend, with near future resulting in higher evaluation. However, in the third person the likelihood of exploitation was higher than the first person in the near future and lower in the distant future (see Table 3).

5.2.3. Statistical analysis

Similar to the first study, the data was tested for normality with the Shapiro-Wilk test (H_0 : data follows a normal distribution) and with a significance level 0.05 ($\alpha = 0.05$). Not all the variables followed a normal distribution. The data was transformed using Tukey’s Transformation Ladder and each variable was able to pass the Shapiro-Wilk test ($p > 0.05$). However, no single value of lambda could be found that could accommodate all the distributions and, because the data was being compared, we could not transform the values differently and then compare them because this would invalidate the results.

Thus, to confirm that both scenarios (first person and third person) exhibited a change between near and distant temporal distances, a non-parametric test was used, namely the Wilcoxon signed-rank test. Both scenarios were rejected (see Table 3); that is, there was a significant difference for both first and third person. Similar to study one, we performed an upper-tailed *t*-test, again giving $p = 0$ for $\mu_{near} > \mu_{distant}$.

6. Discussion

This research was designed to understand the effect that temporal distance may have on how a potential entrepreneur evaluates an opportunity and how it may change with varying temporal distances. Furthermore, the research examined the possible causes of the hypothesized changes in evaluation at different temporal stages. Basing the hypothesis on CLT, we predicted that — because of the more concrete consideration of events with shorter

temporal distance — the perception of uncertainty would rise and reduce the attractiveness of the opportunity and likelihood of exploitation.

6.1. Study one

The results show there is a significant difference in opportunity evaluation and the likelihood of opportunity exploitation between temporal distances. This change is in line with previous studies (Frederick *et al.*, 2002; Liberman *et al.*, 2002; Trope and Liberman, 2003; Tumasjan *et al.*, 2013). What is surprising, however, is that the change is in the opposite direction than hypothesized. Entrepreneurial opportunities were more attractive in the near future than the distant future.

A possible explanation for this could be taken from Hyperbolic Discount Theory (HDT) (Frederick *et al.*, 2002; Laibson, 1997), which suggests people discount the positive outcomes of distant events, choosing a near-term shorter win. Therefore, the same opportunity is less attractive in the distant temporal scenario when compared to the near temporal distance.

This may apply to the scenario at hand where an entrepreneurial opportunity that may be exciting (highly desirable) and presented as easily executable (highly feasible) is discounted because of its distant temporal distance. Here, the gratification and payback of the results are too far away; therefore, the attractiveness of the opportunity is reduced and the likelihood of exploitation is decreased.

This explanation might fall short of using the HDT in the mathematical extreme of a hyperbola (Rubinstein, 2003). We do not claim that the discounting is hyperbolic in nature, which mathematically would show an extreme difference in evaluation but rather that there is a discounting effect, potentially a constant or linear discounting effect. However, multiple temporal data points would be required to establish a statement on the nature of the mathematical function.

Another explanation for the result might speak to the claim that feasibility and desirability are equally important (Mitchell and Shepherd, 2010). Earlier, in the theory development, we restated the claim by Mitchell and Shepherd (2010), using findings from Tumasjan *et al.* (2013) to say that both feasibility and desirability play an *equally* important role but at different points in time, and time or temporal distance acts as a moderator of desirability and feasibility. After our findings, we would rather state that both feasibility and desirability play an important role (not equally) and are mediated by temporal distance. However, in comparison, feasibility has a higher influence on opportunity evaluation.

This is in direct contrast to Mitchell and Shepherd's (2010) claim that both are equally considered. If both are equal, the result in the evaluation in the near and far distances would have been equal. However, we have shown that the near evaluation is higher and, as such, feasibility considerations have higher weighting on opportunity evaluation and exploitation than desirability considerations. Potentially, if temporal aspects had no effect on the evaluation of an entrepreneurial opportunity, this statement might hold. However, our findings when combined with Tumasjan *et al.* (2013) research would suggest that feasibility has a bigger effect on opportunity evaluation.

6.2. Study two

For study two, we were guided by the model proposed by McMullen and Shepherd (2006) and, more specifically, around their discussion of response uncertainty in the transition between a third-person opportunity to a first-person opportunity. We intended to see how the change between temporal distances differed between a first-person perspective and a third-person perspective. Knowing that the presence of response uncertainty results in reducing the evaluation of an opportunity (Keh *et al.*, 2002) and decreases the likelihood of exploitation (Autio *et al.*, 2013; McKelvie *et al.*, 2011; Wiklund *et al.*, 2017), we expected the decrease in evaluation to be less with a third-person perspective.

Post the results of the first study, our expectations changed for the results of the second study. With the expectation that the near future evaluation would increase on both accounts, we expected to see a higher increase for third-person perspective.

For opportunity evaluation regarding the attractiveness of the opportunity, the first-person results were higher for the near and distant temporal distances. However, regarding the likelihood of exploitation, the order reversed more likely in the first person with distant temporal distance. For near temporal distance, the third-person perspective (recommendation to exploit) was higher. This is in line with our adjusted expectation, post study one, that the uncertainty perceived with closer temporal distance reduced the likelihood of exploitation when compared to the first-person perspective. This is because of leaving the opportunity in the third person; thus the consideration of response uncertainty is removed (McMullen and Shepherd, 2006).

The results may be extrapolated to other fields of study within entrepreneurship, namely the intention-action gap (Van Gelderen *et al.*, 2015), where potential entrepreneurs form the intentions to act but never cross the intention-action gap. The results of this study may explain this phenomenon, namely potential entrepreneurs may form intentions in the distant future. However, when they get closer to action, their level of the perception of uncertainty rises (because of the lower-level information considerations as proposed by CLT) (Trope and Liberman, 2010). This uncertainty impedes or rather blocks action on their intentions from the potential entrepreneur (Autio *et al.*, 2013; McKelvie *et al.*, 2011).

A reason for no change in the opportunity evaluation might be that the attractiveness of the opportunity remains the same but the uncertainty associated with action, and more specifically exploitation (Autio *et al.*, 2013), reverses the order. This shows we still perceive the opportunity as attractive but are less likely to exploit it. It also speaks to the separation of the two constructs used (opportunity evaluation regarding the attractiveness of the opportunity and the evaluation regarding exploitation and the likelihood of exploitation).

6.3. Contributions

We contribute to theory in a number of ways. First, by expanding the limited research in opportunity evaluation regarding temporal considerations (Tumasjan *et al.*, 2013), we show that temporal distances affect how an opportunity may be evaluated. The same opportunity

is not equally attractive in the near and distant temporal distances. Opportunities are more highly evaluated in exploitation and evaluation in the near future than in the distant future.

Second, we answer a call by Shepherd *et al.* (2015) to move away from the static perspective of opportunity evaluation and research how the evaluation of opportunities may change over time. We show that opportunities being evaluated in the distant future are not evaluated as positively as opportunities in the near future, offering two possible explanations.

Third, we intended to see how a third-person perspective changes the evaluation of an opportunity with the expectation that the uncertainty perceived may increase when viewed from a first-person perspective. The opportunity evaluation on the attractiveness of the opportunity when changed to third person had no visible differentiation when compared to first person.

These theoretical contributions have a broader application and implication; temporal considerations are not restricted to entrepreneurship. Similar issues regarding temporal distance and its effect on decision making, team actions and investment strategy can be found across a wide range of social, management and science disciplines (see for example: Abrantes *et al.*, 2018; Marques-Quinteiro *et al.*, 2019).

7. Implications for Practice

There are a few key learnings that could be extracted for practice. First, we give insight into entrepreneurs who, if they identify an opportunity they wish to exploit in the distant future, might be aware they are not evaluating the opportunity as favorably as they would have if they had intentions to exploit the opportunity in the near future. With knowledge of this, they could adjust their perception of the opportunity. The reverse also holds, namely that opportunities being evaluated for near temporal exploitation may seem more attractive. This may (if there was a threshold for action) cause these individuals to act when from a rational perspective they would not act on the opportunity. Understanding one's subjective or non-rational perception of events may aid potential entrepreneurs in debiasing future evaluations of different opportunities.

The change in perspective also offers great insight for all those involved in entrepreneurship and the funding thereof. If a funder (i.e., a third-person perspective) were to evaluate the opportunity a potential entrepreneur was presenting, they would be aware any potential entrepreneur would evaluate the opportunity more highly than the funder who would have the third-person perspective. They would also be aware that, depending on the temporal distance for exploitation, either the funder would be more inclined to execute (near future) or the potential entrepreneur would be more likely to wish to execute the entrepreneurial opportunity (distant future).

A similar reasoning holds for the potential entrepreneur asking for advice from others. They are aware they would evaluate the attractiveness of the opportunity more highly and would not receive as positive feedback as they would expect. For exploitation, they might falsely interpret the recommendation to exploit, because any distant temporal opportunities would be less likely recommended and near future opportunities more highly recommended.

8. Limitations and Further Research

As with any study, there are limitations and this study is no exception. First, the vignettes were not randomized. Although all the surveys were shown to all participants, the order of the vignettes presented were in the same static order, which could have introduced order bias.

Study two required the use of non-parametric tests, which are not as effective as parametric tests (Black, 2012; Keller and Warrack, 1997). The different result sets could be transformed to meet normality criteria; however, there was no common lambda coefficient in the Tukey Ladder Transformation technique that allowed transformation of all the values. These two limitations lead to the first recommendation for future research, namely to repeat the study first randomizing the vignettes to remove any potential order bias, and gathering more responses, which would lead to a more normal distribution (Black, 2012; Keller and Warrack, 1997).

A second limitation is that the data was gathered among MBA students.^a Although reasoning was provided earlier as to why this was deemed appropriate, a more targeted approach could be used to survey potential entrepreneurs who are not studying. However, this is in itself a significant challenge because answering the question of who would be a potential entrepreneur will lead to a future researcher looking at probabilities and asking who is most likely to become an entrepreneur. After research, this might lead them back to tertiary-educated or MBA students (Ucbasaran *et al.*, 2008; Wilson *et al.*, 2007b; Zhao *et al.*, 2005).

We have identified that an opportunity is evaluated differently at different stages. However, our research does not indicate if there potentially is a correct evaluation. Is the distant future evaluation or the near future evaluation the “correct” evaluation? Future research may look at establishing an anchor in the evaluation and may determine whether the distant temporal evaluation is undervalued or whether the near temporal distance opportunity is overvalued.

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^aIt should be noted that the study was conducted with South African MBA students; these students all have a minimum of five year’s work experience and are thus more similar in life orientation to a potential entrepreneur who is seeking and evaluating opportunity.

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