

**PERCEIVED PSYCHOLOGICAL DISTANCE, CONSTRUAL PROCESSES, AND
ABSTRACTNESS OF ENTREPRENEURIAL ACTION**

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Executive Summary

At least since Kirzner (1980) argued that entrepreneurship depends in part upon perception, the role of perception in relation to entrepreneurial action has been under scrutiny (Casson, 1982; Corman et al, 1988; Gaglio and Katz, 2001; Krueger and colleagues, 1993a,b, 1994a,b, 2000; McGrath and MacMillan, 1992; Palich and Bagby, 1995; Sarasvathy, et al., 1998; Simon et al., 2000, 2002; and others). Thus, the unbundling of both perception (i.e., which perceptions lead to action?), and entrepreneurial action (which actions relate to a given set of perceptions?) has been an ongoing task, with each improvement in explanation prompting an even better one (e.g. Baucus et al., 2014; Lerner et al., 2018; Van Gelderen et al., 2015). It is within this dynamic research context that we have conducted a study that fills the gap needed to connect specific perceptions of entrepreneurs (in particular, those perceptions that distinguish perceived psychological distance); to specific entrepreneurial action (particularly types of entrepreneurial action that may be expected based upon their level of abstractness).

In our research we use construal level theory (CLT—as further explained below) as the theoretical mechanism to explain the connection of perception to action, to answer the research question: To what extent is the abstractness of entrepreneurial action (from primarily “thinking” to primarily “doing”) related to the perception of psychological distance? We suggest that a targeted application of CLT can help to answer this research question; and thereby can advance entrepreneurial action research, practice, and pedagogy by showing, in particular, that the apparently implicit relationship between entrepreneurial perception and entrepreneurial action may actually be quite explicit, when abstractness of action is seen as a construal-mechanism-based function of psychological distance.

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We reason that psychological distance, an entrepreneur's perception of "near or far" with respect to a goal (Trope & Liberman, 2010; Wilson et al. 2013), is an especially useful form of perception to investigate, because CLT suggests that perceived proximity (proximate = near; distal = far) results in construals: personal comprehensions, interpretations evaluations, and regulation of observations about the social environment (Trope & Liberman, 2010); which then shape the types of entrepreneurial action that range on an abstractness continuum from primarily thinking (most-abstract), to primarily doing (most-concrete). The perception/action implicitness gap needs to be narrowed, because a great many theoretical and practical problems arise due to the implicit vs. explicit linkage between individual perception and entrepreneurial action such as prematurely plunging into a venture, rashly recoiling from the risk, or precipitately pivoting away from an idea.

We develop and test hypotheses based upon the literature-to-date suggestion that psychological distance and entrepreneurial action abstractness are likely to be positively related: specifically, that over time, high temporal, spatial, social, and hypotheticality psychological distance are related to higher abstractness of action (in four-levels: (1) thinking, (2) thinking-about doing, (3) doing-to-inform thinking, and (4) doing). Based on longitudinal data from 350 entrepreneurs, results from cross-lagged panel analysis indicate that only through social and hypotheticality distance, but not through temporal or spatial distance, do perceptions shape the actions of entrepreneurs over time.

Through this study, we contribute to the research literature that further improves explanations for how individual perception relates to acting entrepreneurially (McMullen & Dimov, 2013). We now can address several puzzling anomalies in entrepreneurial action research such as, for example, why perceptions sometimes have such a profound effect on entrepreneurial action. With a cross-lagged panel analysis we demonstrate how perceptions of social distance can be magnified in a self-reinforcing and possibly momentum-building loop. Other examples include, why doubt leads to hesitancy (McMullen & Shepherd, 2006) possibly stemming from hypotheticality distance

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perception; why action from self-efficacy has in the past been asserted to come from multiple assessments and analyses (Gist & Mitchell, 1992) instead of coming directly from perceptions (of social distance or hypotheticality); or why an inaction gap is assumed to exist (Van Gelderen et al., 2015) rather than expanding the scope of action to include an abstractness continuum (more abstract to more concrete) which then encompasses what previously might have been misconstrued as inaction because it was not sufficiently concrete, instead being thinking-based action. With respect to practice, we also can address some of the persistent problems that arise in venturing, teaching, and public policies that our findings can inform. These include mitigating the effects of social pressure on venture perceptions, explaining the problem with overemphasis on business plan preparation in entrepreneurship education, and suggesting the need to match the expectations from incubators vs. SBDCs to their capacity to transform perceptions into action.

Abstract

In this paper we develop the concept of abstractness as an underlying theoretical structure of entrepreneurial action, specifically to connect individual perception of psychological distance to entrepreneurial action. We draw on construal level theory to model distance and abstractness, using construal as the mechanism where, in new venture creation, entrepreneurs are expected over time to engage in more abstract action when they perceive greater psychological distance. Based on longitudinal data from 350 entrepreneurs, results from cross-lagged panel analysis indicate that psychological distance shapes the actions of entrepreneurs over time through social distance and hypotheticality. These findings advance entrepreneurial action research, practice, and pedagogy by showing that the apparently implicit relationship between entrepreneurial perception and entrepreneurial action may actually be quite explicit, when abstractness of action is seen as a construal-mechanism-based function of psychological distance.

1. Introduction

In 2003 a venture team of first-time entrepreneurs (which included an author on this paper) called it quits. Their venture was an Internet-based peer-to-peer video sharing and education platform, not unlike the now relatively well-known companies YouTube (introduced in 2005) and Udacity (introduced in 2010). They were first movers into this space, but they didn't continue due to conflicting perceptions of what action to take next. One founder perceived new venture creation to depend upon perfecting the technology before approaching the market. Other co-founders perceived new venture creation to depend more on launching the service in market, and less on fine-tuning the technology. Eventually, they chose the former. Why? What explains such perception-based preference for entrepreneurial action, as taken in the case of these new entrepreneurs—and similar preferences for actions taken in other cases of entrepreneurs much like them?

This question is important, because—as in the foregoing example—something happens in the apparently implicit relationship between entrepreneurial perception and entrepreneurial action that is not well understood. We know that without action, there would be no entrepreneurship (McMullen and Shepherd, 2006). And, since almost anyone can be an *a priori* entrepreneur (McMullen and Dimov, 2013), what animates entrepreneurship is not just what entrepreneurs think (Mitchell et al., 2007), but what they do (Gartner, 1989; McMullen and Shepherd, 2006). Still, knowledge gaps remain in developing explanations for the entrepreneurial process of thinking and doing (Baron, 2007; Bird et al., 2012; McMullen and Dimov, 2013; Randolph-Seng et al., 2015)—in particular to connect specific perceptions of entrepreneurs to specific entrepreneurial action. Therefore in this paper, we examine how the perceptions of entrepreneurs result in construals (Ross, 1987)—the personal processing of observations about the social environment—which then lead to entrepreneurial action that ranges on an abstractness continuum from primarily thinking (most-abstract), to primarily doing (most-concrete).

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Helpfully, each construal in the perception-to-action process represents a type of perception: an underlying assessment of psychological distance—“near” or “far” relative to a goal (Trope and Liberman, 2010; Wilson et al. 2013). Since the goal of interest in our analysis is new venture creation, we argue in this paper that underlying assessments of psychological distance produce decision preferences that shape the composition of entrepreneurial action in new venture creation. In the case of the venture team in the opening case, their actions can be traced to differences in the individual perception of psychological distance: that is, which potential pathway as perceived by each person was nearer or farther in relation to the common goal of new venture creation. We therefore desired to answer the following research question: To what extent is the abstractness of entrepreneurial action related to the perception of psychological distance? We suggest that a targeted application of construal level theory can help to answer this question; and thereby can contribute to the literature that explains how individuals both “think” and “do,” in acting entrepreneurially (McMullen and Dimov, 2013).

Through this research we seek to contribute one of the first studies to account for the influence of psychological distance (an entrepreneur’s perception of “near or far” with respect to a goal), on entrepreneurial action—from abstract action (primarily thinking) to concrete action (primarily doing). We utilize the idea of construals—personal comprehensions, interpretations evaluations, and regulation of observations about the social environment—as the theoretical mechanism that enables us to make the connection of psychological distance to specific types of entrepreneurial action. Thereby we advance entrepreneurial action research, practice, and pedagogy by showing that the apparently implicit relationship between entrepreneurial perception and entrepreneurial action may actually be quite explicit, when abstractness of action is seen as a construal-mechanism-based function of psychological distance.

2. Background

2.1 Entrepreneurial Action

There is a growing body of literature that examines entrepreneurial action; and a variety of entrepreneurial actions thus far have been included in this research. It has been suggested, for example, that entrepreneurs convert goal intentions into goal completion (McMullen and Shepherd, 2006; Mitchell and Shepherd, 2010; Van Gelderen et al., 2015). They identify, evaluate, and exploit opportunities for favorable new products and services (Venkataraman, 1997; Davidsson, 2015). At least since Kirzner (1980) argued that entrepreneurship depends in part upon perception, the role of perception in relation to entrepreneurial action has been under scrutiny (Casson, 1982; Corman et al., 1988; Gaglio and Katz, 2001; Krueger and colleagues, 1993a,b, 1994a,b, 2000; McGrath and MacMillan, 1992; Palich and Bagby, 1995; Sarasvathy, et al., 1998; Simon et al., 2000, 2002; and others). Specific perceptions of entrepreneurs, in particular, those perceptions that distinguish perceived psychological distance are of interest in our research. Moving forward, the examination of questions that connect socially situated entrepreneurial action to the perceptions that guide it, appear to be timely and necessary.

Following the suggestion of Mitchell et al. (2007; 2011), we therefore draw from research in social cognition, particularly from the social-situated perspective which suggests dynamism in social cognition processes (Mitchell et al., 2011; Smith and Semin, 2004), to examine the impact of the social situation on the perception-to-action link. In particular, we use construal level theory (CLT) (Trope and Liberman, 2010), applied from a socially situated perspective (Jiga-Boy et al., 2013), to identify and test the underlying structure of entrepreneurial action as it pertains to the process wherein perception of distance with respect to a goal shapes types of action.

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2.2 Process-Based Entrepreneurial Action

Entrepreneurial action involves individuals' efforts under uncertainty to engage in processes that identify, develop, and pursue various activities, for example: (1) the future introduction of new goods and services (Venkataraman, 1997) or processes (Zahra et al., 2006), (2) the entry into new markets (Lumpkin and Dess, 1996), (3) the creation of new ventures (Gartner, 1985), (4) the making of new economic worlds (Sarasvathy, 2012), and/or (5) the learning of individuals and organizations (Dutta and Crossan, 2005). Since these things do not occur overnight, entrepreneurial action cannot reasonably be conceptualized as a single act, but rather as a process involving many actions unfolding over time (Shepherd, 2015). Thus, consistent with current scholarship (Alvarez and Barney, 2007; McMullen et al., 2008; McMullen and Shepherd, 2006), we define “entrepreneurial action” as: *a process involving goal-oriented cognitive and behavioral activities of individuals to engage perceived uncertainty in creating new ventures.*

Entrepreneurial action thus is conceptualized as a dynamic interactive process that includes both cognition and behavior as shaped by the environment (e.g., Gartner, 1985; McMullen and Shepherd, 2006; Shaver and Scott, 1991; Shepherd, 2015; Stevenson and Jarillo, 1990). We suggest that Lewin's field theory (1951) and his notion of the psychological field (see Mitchell et al., 2007, for a review in support of this observation) is helpful in this conceptualization task. According to Lewin (1951), behavior (B) is explained as a functional interaction (f) of person (P) and environment (E). Behavior thus exists in a totality of interacting elements within a dynamic psychological field. And a key component of such explanations is the concept of psychological distance as suggested by construal level theory.

2.3 Construal Level Theory (CLT)

Construal level theory (Trope and Liberman, 2010) postulates that in an uncertain environment where the location of a target (e.g., a goal) is unknown, the perceived psychological

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distance of an individual from the target shapes the extent to which that target is construed cognitively as more abstract or more concrete. Such construal in turn guides the perception-to-action process: the individual perception, comprehension, interpretation, evaluation, regulation (i.e., the construal), and action toward the target. The link between perception and action is well established in the psychology literature (Dewey, 1896; James, 1890). What has not been as well established until more recently, however, is the identification of exactly which perceptions lead to which actions; and construal level theory has arisen to assist in filling this need.

Of particular interest in CLT are four dimensions of psychological distance where perception is thought to exert influence on action—temporal distance, spatial distance, social distance, and hypotheticality (the distance between imagination and reality). Trope and Liberman (2010) define temporal distance as *the perceived time between a target and the self*, spatial distance as *the perceived space between a target and the self*, social distance as *the perceived degree of social isolation of a target from the self*, and hypotheticality as *the perceived likelihood a target will materialize or occur*. Construal levels are the extent to which individuals represent a target on a continuum cognitively: from abstract to concrete, why to how, ends to means, and so forth as summarized in Table 1.

Table 1. Distinctions between Abstract and Concrete Construals in CLT

Construals	Abstract	Concrete
Description	Why End state General Simple, Parsimonious Desirability Changes in these features produce major changes in the meaning of an event	How Means to an end Incidental Complex, Rich in details Feasibility Changes in these features produce minor changes in the meaning of an event
Mental Representations	Big picture: “The forest”	Components: “The trees”

* Adopted from Trope and Liberman (2003)

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Construal levels thus refer to individuals' perception of *what will occur*: that is, to perceptions of action (Trope and Liberman, 2010). The more abstract construals reflect the schematic and decontextualized core features of a target. In contrast, the more concrete construals reflect the relatively unstructured and contextualized features of a target. For example, inquiring what studying for an exam is may elicit abstract responses such as “succeeding academically,” or concrete responses such as “reading a textbook” (Trope et al., 2007, p. 84). Construals, as applied in CLT, are not autonomous mental processes or “boxologies”— “static representations of abstract, disembodied cognitive structures” (Mitchell et al., 2011, p. 774). Driven by psychological distances that are adaptive to individual perception of physical and social contexts, construal levels facilitate the comprehension, interpretation, evaluation, and regulation of an individual's pragmatic and adaptive action toward distal (far) or proximal (near) targets. From a socially situated perspective, CLT suggests that individuals construe socially situated demands in changing contexts via malleable perceptions of psychological distance, and respond by guiding their actions adaptively in a pragmatic way, to bring themselves closer to demand targets (Jiga-Boy et al., 2013). In the abstract-concrete prioritized structure identified by CLT, abstract actions reflect the desired outcome through thinking that is centered around *why* a target should be pursued. In contrast, concrete actions reflect the feasible means of accomplishment, the concrete doing of *how* a target can be reached. Hence, instead of suggesting that motivation drives planning and planning shapes action (as asserted by predominant theories in social psychology [see, e.g., Gollwitzer, 1990]), CLT maintains that perceived psychological distance can guide adaptive action directly, because individuals in uncertain environments use prioritized structures to organize (or “chunk”) the infinite number of potential courses of action to achieve goals (Chase and Simon, 1973; Chomsky, 1965; Greve, 2001; Koedinger and Anderson, 1990; Miller, 1956; Powers, 1973). Due to its simple yet powerful predictions, CLT has been applied to a variety of important topics in the fields of psychology,

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marketing, management, and entrepreneurship. For instance, studies of marketing campaigns for a recycling program found that pairing positively framed messages with abstract construals and negatively framed messages with concrete construals led to more recycling intentions and actual recycling behaviors (White et al., 2011).

Within the field of entrepreneurship, Tumasjan et al. (2012) found in laboratory experiments that temporal distance separates desirability from feasibility in the entrepreneurial process. They found that when entrepreneurs construe the creation of a new venture to occur in the *distant* future rather than in the *near* future, they focus on desirability characteristics rather than feasibility characteristics. CLT thus sheds light on how construal of a situation influences entrepreneurs' assessments, and provides insights into entrepreneurial action that go beyond those described in McMullen and Shepherd's (2006) two-stage model of entrepreneurial action. Van Gelderen et al. (2015) have further suggested that CLT has the potential to unbundle the intention-to-action process; and contrary to conventional wisdom, they found that the transition from entrepreneurial intention to entrepreneurial action, or from deliberation to implementation (Gollwitzer, 1990), is not as definite as previously supposed. We therefore suggest that CLT can be useful in constructing explanations for how individuals' subjective perception surrounding creating a new venture—as a far or near target—can influence how they construe the demands of the environment and subsequently act in ways ranging from abstract (mostly thinking-type action) to concrete (mostly doing-type action).

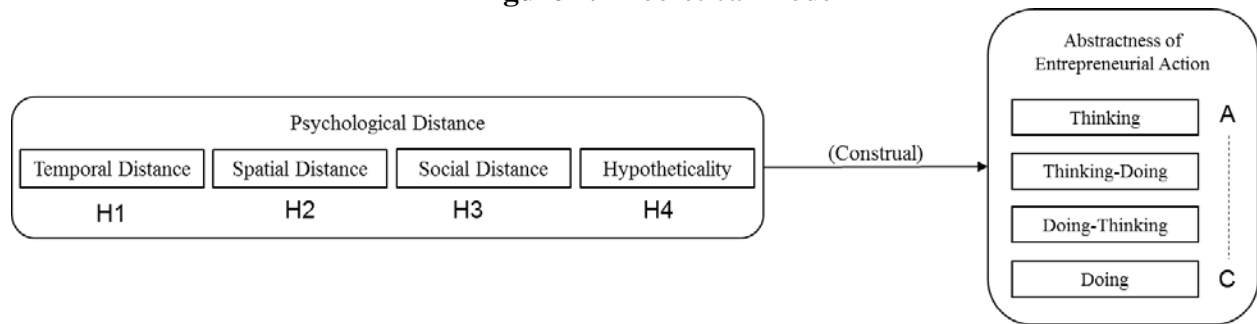
3. Theoretical Framework

In this section, we propose a theoretical model and hypothesize a relationship between the four dimensions of psychological distance and the abstractness of entrepreneurial action, using construal as the actuating theoretical mechanism as illustrated in Figure 1, and as further described in this section. A theoretical mechanism represents “a set of interacting parts—an assembly of elements producing an effect not inherent in any one of them” (Hernes 1998, p. 74, as quoted in Davis and

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Marquis, 2007, p. 336). We argue that comprehension, interpretation evaluation, and regulation of psychological distance constitute an assembly of elements that produce the construal mechanism (the effect) that connects psychological distance (perception) to varying degrees of entrepreneurial action—from more abstract to more concrete.

Figure 1. Theoretical Model





Note: H1 ~ H4 – Hypotheses; A – Abstract; C – Concrete

3.1 Abstractness of Entrepreneurial Action

CLT is a binary theory in that it divides construals only into high (abstract) and low (concrete) levels (Trope and Liberman, 2012). Helpfully, Rasmussen (1983) suggests more differentiation: dividing human action into four decreasing degrees of abstractness that range ordinally along a continuum from abstract to concrete. These range from functional purpose, to abstract function, to generalized function, to physical function. Functional purpose is the most abstract/least concrete because it involves individuals' unobservable thoughts about core values. Physical function is the least abstract/most concrete because it is defined by discrete, observable behaviors for execution, or, means to achieve ends. Importantly, this abstractness-prioritized structure does not imply a top-down or bottom-up fixed sequence of action, but one that is variable, wherein different degrees of action-abstractness can occur simultaneously (Rasmussen, 1983). Since entrepreneurial action is action undertaken in pursuing new venture creation, we reason that entrepreneurial action also can be divided into four such degrees of abstractness, which we summarize in Table 2 and then further explain.

Table 2. Abstractness of Entrepreneurial Action: From Socioeconomic Thinking to Actual Doing

Degree	Activities	
(Socioeconomic) Thinking	Objective Setting (Carter et al., 2003; Manolova et al., 2012) <ul style="list-style-type: none"> • Expected outcomes (e.g., self-realization, financial security) • Personal commitment 	Abstract (Unobservable)   Concrete (Observable)
Thinking (about) Doing	Idea Generating (Baron and Ensley, 2006; Fiet, 2007; Nickerson and Zenger, 2004) <ul style="list-style-type: none"> • Serving unsatisfied market demands • Considering ways to solve a problem • Searching systematically for ideas that fit oneself • Recognizing patterns to connect seemingly unrelated concepts Modeling & Planning (Frese, 2007; Mitchell, 2005; Österwalder et al., 2005) <ul style="list-style-type: none"> • Constructing analytical structures to integrate business components • Selecting strategies, simulating steps, and preparing for alternatives 	
Doing (to inform) Thinking	Assessing (Brinckmann et al., 2010; Wood and Williams, 2014) <ul style="list-style-type: none"> • Appraising opportunity novelty and resource efficiency • Performing feasibility analysis, economic forecasts, and market analysis Experimenting (Autio et al., 2013; Dyer et al., 2011; Sarasvathy, 2012) <ul style="list-style-type: none"> • Learning through collective experimentation and exploration • Testing hypotheses through trial and error 	
(Actual) Doing	Enacting (Bird et al., 2012; Katz and Gartner, 1988) <ul style="list-style-type: none"> • Resources (e.g., human capital, financial capital) • Boundaries (e.g., establishing operations) • Exchanges (e.g., making transactions) 	

3.1.1. Socioeconomic thinking (“Thinking”). *Thinking* represents the most abstract entrepreneurial action on the continuum and cannot be observed in discrete behavior. These unobservable cognitive activities focus on answering the fundamental *why* question for pursuing a new venture or introducing new product/service/process to consumers. Although unobservable, *thinking* is a form of action, because it takes effort and directs any activity that occurs in the process of entrepreneurial action. As Fiske (1992) describes, “(abstract) thinking is for (concrete) doing,” and is “embedded in a practical context, which implies that it is best understood—and its accuracy best evaluated—by its observable and desired consequences” (p. 878). *Thinking* concerns the entrepreneurs themselves as embedded in the practical context, and may involve such things as setting desired end goals, formalizing personal values, predicting their potential, revisiting personal identity construction, and considering the impact of their actions on other people’s lives. *Thinking*

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also entails general objective-setting. For example, entrepreneurs may conceptualize a new venture as a career option, an innovative experience, a path to independence and financial success, or a means for self-realization (Carter et al., 2003; Manolova et al., 2012). Regardless, these highly abstract *thinking* processes are cognitive, sometimes rational and sometimes intuitive (Haidt, 2001), and they often incorporate symbolic meaning.

3.1.2. Thinking about doing (“Thinking-Doing”). Entrepreneurial action at this next lower degree of abstractness involves generating ideas for the new venture and selecting a set of tools, such as strategies and alternatives, to help in achieving those objectives established while *thinking*. Particularly, ideas can be generated through: deliberating ways to solve a problem (Hsieh et al., 2007; Nickerson and Zenger, 2004), searching systematically for ideas that fit the entrepreneur’s specific knowledge (Fiet, 2007), or recognizing patterns to connect seemingly unrelated concepts (Baron and Ensley, 2006). Strategic tools may involve (1) modeling, such as constructing analytical structures to solve previously unstructured market problems (Mitchell, 2005), (2) identifying sources of value creation, and integrating business components (Österwalder et al., 2005), and (3) planning, or mentally simulating the steps necessary to achieve the goal (Frese, 2007), which does not necessarily involve writing formal business plans but rather forming a deeper understanding of one’s own choices (Dimov, 2010). As such, *thinking-doing* action is part of a decision-making process that also involves largely unobservable cognitions.

3.1.3. Doing to inform thinking (“Doing-Thinking”). For new products, services, processes, etc. to be introduced and new ventures to emerge, entrepreneurs need to work toward organizing activities. However, they do not necessarily possess the required knowledge nor have boundless resources and capabilities to achieve their goals. Generally, there are two types of doing-triggered responses to gauge an individual’s capabilities or resource constraints for performing certain tasks. These responses can be stimulated by previously-stored rules from prior experience; or when rules

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are not available, new rules can be generated *ad hoc* through attempts and experiments made in the environment (Rasmussen, 1983). Thus, *doing-thinking* may involve a quick assessment of new venture attractiveness (Wood and Williams, 2014), or an extensive research using sophisticated procedures (Brinckmann et al., 2010). Examples of such assessment and research include analyzing demand for novel solutions, judging resource availability, performing economic forecasts, market analysis, or scenario analysis about the new venture. *Doing-thinking* may also include repeated experiments within user communities (Autio et al., 2013) or trial-and-error searches (Dyer et al., 2011) to test hypotheses (Sarasvathy, 2012) about the new product, service, process, or venture. Either way, these activities are largely observable behaviors and only briefly move into unobservable cognitions when access to stored rules or the generation of new rules is required. Thus, *doing-thinking* entails observable behavior that informs cognition.

3.1.4. Actual doing (“Doing”). Action at the lowest and most concrete degree of abstractness consists of activities related to the tangible means of achieving an objective. *Doing* activities are discrete units of observable behavior based solely on previously stored or newly generated rules, and involve little attributable cognition to the primarily observable behavior. Entrepreneurs need to *do* things, such as bring together resources (e.g., human capital, financial capital, property, equipment), set boundaries (e.g., social relations as in legal contracts, physical considerations), and undertake exchange (e.g., exchanging work for pay within and across organizations) to materialize new ventures and new products/services/processes (Katz and Gartner, 1988). For example, entrepreneurial *doing* activities could include signing a lease agreement, renting or buying equipment, manufacturing products, hiring employees, paying bills, advertising, setting up distribution, and displaying and selling products/services (see Bird et al., 2012, for a review).

In sum, entrepreneurial action, as we have conceptualized it, is not a single phenomenon but is composed of many heterogeneous activities. Using the abstractness structure as theorized above,

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these activities in the process of entrepreneurial action no longer appear to be incidental and random but can be organized ordinally by abstractness level to provide a more fine-grained connection between *thinking* and *doing*. Additionally, this abstractness structure does not imply a static sequence of entrepreneurial action. Rather, it may be expected that activities at different degrees of abstractness might be performed concurrently depending on external contextual variables, including the influence of other actors and the presence of uncertainty (Rasmussen, 1983).

3.2 Psychological Distance and the Abstractness of Entrepreneurial Action

Since the characteristics of a new venture are almost impossible to perceive accurately *ex ante* (Dimov, 2007), entrepreneurs act under uncertainty. Under such uncertainty, CLT suggests to us that entrepreneurs might be expected to utilize one or more dimensions of psychological distance—*temporal distance*, *spatial distance*, *social distance*, and *hypotheticality*. Perceiving their goal as near or far from themselves may influence how an entrepreneur cognitively construes the creation of a new venture. This construal, in turn, is expected to guide the extent of entrepreneurial action at varying degrees of abstractness, thereby bringing the entrepreneur pragmatically closer to the new venture creation goal. We develop these relationships—as illustrated previously in Figure 1—in the paragraphs that follow.

3.2.1. *Temporal distance and abstractness of entrepreneurial action.* As suggested by Trope and Liberman (2010), we conceptualize temporal distance as *the perceived gap between an entrepreneur at the present moment and the creation of a new venture at a particular point in time in the future*. Hence, temporal distance is a subjective and malleable perception of new venture creation. This perception is unique to each entrepreneur at any given moment.

The notion of temporal distance contrasts starkly with other time constructs commonly applied in the field of entrepreneurship. For example, temporal depth (Bluedorn and Martin, 2008) is the distances into the past and future an individual typically considers. Window of opportunity

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(Mitchell and Shepherd, 2010) refers to opportunity-related time pressure determined by changes in the environment: a narrow window invokes “a need to move quickly,” while a wide window allows decision makers “to keep options open” (p. 141). Distinct from the foregoing time construct examples in the entrepreneurship literature, temporal distance is neither a fixed personal trait nor an environmental condition, but rather is a subjective and malleable perception that depends on the new venture, the entrepreneur, and the environment in the moment.

Helpfully, Liberman and Trope (1998, studies 2 and 3) found that as temporal distance increased, the attractiveness of an activity (e.g., attending a guest lecture) depended more on its desirability (e.g., how interesting the lecture was), which involves the value of the action’s desired end goal (an abstract feature), and less on its feasibility (e.g., how convenient it was to attend the lecture), which concerns the means used to reach the end goal (a concrete feature). Tumasjan et al. (2012) also found that entrepreneurs are guided more by desirability assessments of a new venture when it can be exploited in the more distant future. Thus, when entrepreneurs perceive new venture creation to be in the more distant future (with a greater temporal distance), they are likely to be more concerned about the desirability of the new venture (e.g., whether the venture has a high degree of innovativeness or potential for profit) and take actions based upon higher degrees of abstractness, such as *thinking*, and imagine themselves becoming successful and achieving financial goals. In contrast, when new venture creation is perceived to be in the near future (with a shorter temporal distance), entrepreneurs are likely to be more concerned about feasibility (e.g., their own financial, human, and social capital) and take actions at lower degrees of abstractness (*doing-thinking*), such as studying feasibility through market and financial analyses. Therefore, based on this extension of previous findings, we suggest:

Hypothesis 1: The abstractness of entrepreneurial action is positively related to the temporal distance of the creation of a new venture, as perceived by the entrepreneur.

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3.2.2. Spatial distance and abstractness of entrepreneurial action. As suggested by Trope and Liberman (2010), we conceptualize spatial distance to be the perceived space between the target and the self, which in the case of new venture creation suggests spatial distance to be *the perceptual space separating the entrepreneur at the current location (here) from the new venture at a close or distant location (somewhere else)*. Spatial distance therefore is a subjective and malleable perception of the location where a venture will materialize. The location of a venture may be associated with tangible properties (e.g., tax laws, financial systems, and infrastructures) and/or intangible properties (e.g., customers, suppliers, talents, knowledge spillover, venture capital, and culture).

Magee et al. (2010) found that people use more concrete language and personal reactions to describe an event when they are spatially close to its occurrence. Pérez-Nordtvedt et al. (2014) found that business owners are more likely to recognize employee or customer demands and to adapt to environmental changes when ventures are closer in spatial distance. We thus expect that if customers (as intangible properties) associated with the creation of a new venture are perceived to be spatially farther from the self, an entrepreneur is likely to act at higher degrees of abstractness, such as contemplating ways to reach potential customers and simulating strategies to attract them. If customers are perceived to be spatially near to the self, an entrepreneur is expected to act at lower degrees of abstractness, such as talking to customers, showing them the prototypes, and learning their preferences and intent to purchase. Therefore, extending these previous findings, we suggest:

Hypothesis 2: The abstractness of entrepreneurial action is positively related to the spatial distance of the created new venture from the entrepreneur.

3.2.3. Social distance and abstractness of entrepreneurial action. Once again, as suggested by Trope and Liberman (2010), we conceptualize social distance as *the perceived degree of social isolation of an entrepreneur from important parties (e.g. other entrepreneurs) in the new venture social space*. Social distance is a subjective and malleable perception of whom a new venture might

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involve. CLT suggests that people perceive an activity performed by themselves and similar others as more concrete; and they perceive the same activity performed by socially distant and dissimilar others as more abstract (Liviatan et al., 2008; Trope et al., 2007). Similarly, Kim et al. (2008) found that consumers viewed feasible products as more attractive when choosing for themselves; but desirable products as more attractive when choosing for others.

We therefore reason that entrepreneurs may perceive some actions in the creation of a new venture as socially distal if few or no similar others in their social networks are taking such actions. A distal perception might lead to dismissal of the creation of a new venture or rejection of a course of action during its creation. An entrepreneur may then engage in prolonged abstract activities such as *thinking* (e.g., reconsidering entrepreneurship entirely or, as in our introductory case study, everlastingly attempting to reach perfection in a technology that as yet has no validation in the marketplace). Conversely, if entrepreneurs notice others in their extended network starting their own ventures or engaging in similar actions, they may perceive venturing behavior as proximal in social distance and visualize similar actions for themselves. The entrepreneur, perceiving lower social distance, is therefore more likely to engage in more concrete activities such as *doing* (e.g., acquiring necessary human or financial resources and support). Thus, we suggest:

Hypothesis 3: The abstractness of entrepreneurial action is positively related to the social distance surrounding the creation of a new venture, as perceived by the entrepreneur.

3.2.4. Hypotheticality and abstractness of entrepreneurial action. Based on the definition of hypotheticality suggested by Trope and Liberman (2010), we conceptualize hypotheticality in this study to be *the perceived unlikelihood a new venture will emerge*. Hypotheticality thus separates entrepreneurs from ventures unlikely to materialize—the real from the imaginary. Hypotheticality as theorized is somewhat similar to “effect uncertainty” (Milliken, 1987), where uncertainty is a lack of insight into alternatives and/or the inability to foresee the likely consequences. However,

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hypotheticality differs from effect uncertainty in that it is not expected to promote or impede entrepreneurial action dichotomously as suggested by McKelvie et al. (2011). Thus, hypotheticality may be understood more like “doubt” (McMullen and Shepherd, 2006), where “uncertainty in the context of action acts as a sense of doubt that produces hesitancy by interrupting routine action [and] promotes indecision by perpetuating continued competition among alternatives” (p. 135). We expect that entrepreneurs who perceive ventures as more hypothetical (less likely to materialize) will act more abstractly (e.g., engage in extensive justification) while entrepreneurs who perceive ventures as less hypothetical (more likely to materialize) will act more concretely (e.g., engage in purchasing and hiring). Consequently, we offer:

Hypothesis 4: The abstractness of entrepreneurial action is positively related to the hypotheticality of a new venture, as perceived by the entrepreneur.

4. Methods

4.1. Research Design and Data Gathering

To test our hypotheses we used data from the *Panel Study of Entrepreneurial Dynamics (PSED I)*, a rigorous, large-scale longitudinal study conducted between 1998 and 2003 on individuals in the process of creating new ventures. Over 40 months, *PSED I* repeatedly conducted detailed interviews and administered questionnaires with over 150 factors, measured mostly on five-point Likert scales or yes-no indicators. Time 2, Time 3, and Time 4 data were collected 14, 27, and 40 months after Time 1. *PSED I* identified eligible individuals from a total of 64,622 candidates between 1998 and 2000 through two questions (respondents to the second of which we then excluded as further explained below): (1) “Are you, alone or with others, now trying to start a new business?” and (2) “Are you, alone or with others, now trying to start a new business or a new venture for your employer?” Since we have defined entrepreneurial action as *a process involving goal-oriented behavioral and cognitive activities of individuals to engage perceived uncertainty in*

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creating new ventures, we consider this panel of eligible individuals, which included only the former individuals (Item 1), to be appropriate for our study.

The use of this panel has several advantages with respect to both internal and external validity. First (as noted), these are real-world entrepreneurs in the process of creating new ventures at the time the longitudinal study was conducted. Second, the sampling frame—as set in the *now*—should also minimize retrospective bias and hindsight bias. Therefore, we expect threats to internal validity to be much lower than in the use of an experimental design, which typically is found in CLT studies. Third, through use of this panel we were able to minimize several of the external validity issues commonly found in entrepreneurship research, such as non-representative samples, insufficient sample size, and non-generalizable measures as noted by Bird et al. (2012). Furthermore, *PSED I* generalizes well in studies that adapt its design and measures for use in other countries as the sampling procedures also increase studies' statistical conclusion validity (for details see Reynolds and Curtin, 2004a).

Then, to further improve internal validity as well as to decrease unobserved heterogeneity, we refined our sample based on three criteria. First (as noted above), following Brush et al. (2008), we excluded respondents who started ventures for employers as part of their current jobs to ensure that dimensions of psychological distance were at the individual level. Second, to ensure an uncertain environment, we selected only respondents whose products or services required R&D or were not available 5 years ago (see Kim et al., 2015). Third, we selected respondents whose ventures had not yet emerged based on their own report that the ventures are still in an active start-up phase. Once their ventures emerged, these entrepreneurs were dropped from subsequent measurement. Additionally, we used t-tests to examine potential sample bias between those who responded to multiple waves of surveys and those who did not; and in doing so, we found no statistically significant differences regarding study variables. Since the *PSED I* procedures over-sampled women

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and minorities, we corrected sampling design using post-stratification weights (Reynolds and Curtin, 2004b) based on the U.S. Census data, thereby increasing the external validity and generalizability of our findings. Ultimately, these procedures resulted in an unbalanced panel with an unweighted sample of 841 cases, or a weighted analytical sample of 716 cases, collected from 350 entrepreneurs.

4.2. Measurement

4.2.1. Dependent variable: Abstractness of entrepreneurial action—weighted composite index construction. Abstractness of entrepreneurial action is theorized as a composite variable—that is, it is not unidimensional and does not predict any other outcome variables (Howell et al., 2007). Unlike indicators of reflective measures that are affected by the construct, indicators of composite measures are guided by theoretical definitions (Bollen and Bauldry, 2011). Hence, in addition to the literature review performed above, we also used consensus from subject-matter experts (Coltman et al., 2008) through a modified card-sorting technique (Cooke, 1994). This qualitative procedure allowed us to further establish content validity (Lee, 1999), and it helped us to determine which activities to exclude and include in the composite index. The procedure was performed as follows. First, we selected 44 statements—each describing a single cognitive or behavioral activity captured in *PSED I*—that appeared likely to the researchers to be associated with *thinking*, *thinking-doing*, *doing-thinking*, and *doing*. Second, we recruited ten experts, as suggested by LeBreton and Senter (2008), based on their knowledge of entrepreneurship research and practice (Diamantopoulos, 2005). Seven subject matter experts were Ph.D. students in the area of entrepreneurship and management, and three were experienced entrepreneurs. Third, we instructed the experts to sort statements based on the four degrees of abstractness of entrepreneurial action. If a statement did not fit any of the definitions, it was sorted under “not applicable.” The procedure was repeated until all statements were sorted. Fourth, we used multiple inter-rater reliability indices (r_{WG} , a_{WG} , and ICC) as suggested in LeBreton and Senter (2008) to better understand the consensus (or lack thereof) among experts

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and to justify aggregate-level results from lower-level data (Bliese, 2000; Chan, 1998). Overall, inter-rater agreement among subject-matter experts was very strong (.91 to 1.00) for 7 items, strong

Table 3. Measures of Abstractness of Entrepreneurial Action

Thinking
<ol style="list-style-type: none">1) Starting a new venture means at least one of the following to me: (a) To achieve a higher position for myself in society, (b) To have greater flexibility for my personal and family life, (c) To be innovative and in the forefront of new technology, (d) To continue a family tradition, (e) To be respected by my friends, (f) To have considerable freedom to adapt my own approach to work, (g) To give myself, my spouse and children financial Security, (h) To continue to grow and learn as a person, (i) To follow the example of a person I admire, (j) To build a business my children can inherit, (k) To earn a larger personal income, (l) To achieve something and get recognition for it, (m) To develop an idea for a product, (n) To have a chance to build great wealth or a very high income, (o) to fulfill a personal vision, (p) To lead and motivate others, (q) To have the power to greatly influence an organization, or (r) To challenge myself2) My philosophy about starting a new venture can be described by at least one of the following: (a) I would rather have my own business than pursue another promising career, (b) There is no limit as to how long I would give maximum effort to establish my business, or (c) My personal philosophy is to “do whatever it takes” to establish my own business
Thinking-Doing
<ol style="list-style-type: none">1) I believe serving those missed by others is important to my new venture2) I engage in a deliberate, systematic search for ideas for the new venture3) I think about solving a particular problem for ideas for the new venture4) The business plan is unwritten in my head5) Product/service development is still in the idea stage (no work has been done)
Doing-Thinking
<ol style="list-style-type: none">1) The market opportunities is being defined by talking to potential customers or getting information about competition2) The projected financial statements (income and cash flow statements or break-even analysis) is being developed3) I am saving money to invest in this business4) I discuss with (a) my friends and family, (b) potential or existing customers, (c) existing suppliers or distributors, or (d) potential or existing investors or lenders for ideas for the new venture5) A prototype of the product or a procedure of the service is being developed or tested with customers
Doing
<ol style="list-style-type: none">1) Product/service development is completed and ready for sale or delivery2) Marketing or promotional efforts for the new venture have started3) Major equipment, facilities, or property for the new venture are being purchased, leased, or rented4) Raw materials, inventory, supplies, or components for the new venture are being purchased5) I have begun investing my own money in the new venture6) Other people or financial institutions are being asked for funds7) Credit with a supplier has been established8) I have begun devoting full time (35+ hours per week) to the new venture9) Employees have been hired for pay10) Bank account exclusively for the new venture has been opened11) The new venture has received income from the sale of product/service12) The new venture has been listed in the phone book (internet directory)

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(.71 to .90) for 18 items, and high-moderate (.61 to .70) for 2 items. Experts were asked to sort the reduced number of statements again for further construct and measurement clarity. As a result, 24 items (2 for *thinking*, 5 for *thinking-doing*, 5 for *doing-thinking*, and 12 for *doing*) were retained for further analyses, as reported in Table 3.

As a composite variable, abstractness of entrepreneurial action is a linear combination of its composite measures, namely *thinking*, *thinking-doing*, *doing-thinking*, and *doing*. The raw score for each degree of abstractness of entrepreneurial action was calculated using the sum of activities performed each coded 0 or 1. Because *doing* has significantly more activities represented in the data set, and because entrepreneurs performed entrepreneurial activities at different rates (Samuelsson and Davidsson, 2009), we scaled the four raw scores into four percentage-to-total-activities scores. This allowed us to distinguish the abstractness of entrepreneurial action from the rate of activities performed in the process. In addition, a summation of activities without weights does not capture the nuance of abstractness. Weights were thus determined (Bobko et al., 2007) by the ten subject-matter experts who rank-ordered the four degrees of abstractness from 4 (most abstract) to 1 (least abstract). The resulting equation used to calculate the abstractness of entrepreneurial action is:

$$C_i = 4x_{1i} + 3x_{2i} + 2x_{3i} + 1x_{4i},$$

where C_i is the overall composite score for entrepreneurial action, i is for the i^{th} participant, and x_1 , x_2 , x_3 , and x_4 are four percentage scores depicting *thinking*, *thinking-doing*, *doing-thinking*, and *doing*. The scores ranged from 4 (most abstract) to 1 (least abstract). We then used the scores to test hypotheses 1 through 4. Due to the representative nature of the sample, entrepreneurs may have performed some activities years before *PSED I*'s observation period. To help account for potential left truncation and asynchronicity, we include only activities performed within 12 months prior (Yang and Aldrich, 2012).

4.2.2. Independent variables. To operationalize dimensions of psychological distance, we selected items from *PSED I* for each of the four dimensions, choosing as a guideline the linguistic categorization model (Semin and Fiedler, 1988) commonly used in CLT studies. Because they are similar to questions in previous studies, we measured the *temporal distance* of a respondent using the following two questions (e.g., Burris et al., 2014; Tumasjan et al., 2012): “How much longer do you expect to work on starting this business before you will get it up and running or give up?” and “How much longer do you think it will be before this business is up and running?” Both were measured on an ordinal scale, ranging from 1 (most proximal) to 5 (most distal), with the answer choices of hours, days, weeks, months, and years.

We measured *spatial distance* by coding the distance between the respondent and the target customers. We chose customers over other venture-related tangible and intangible properties, because customers are found to be the most salient stakeholders for both small business owners (Kuratko et al., 2004) and CEOs of large firms (Agle et al., 1999). The item we used aligned with previous studies (e.g., Magee et al., 2010; Pérez-Nordtvedt et al., 2014), and is as follows: “Within the first three to four years, what percentage of your customers do you expect to be (1) local, that is located within 20 miles, (2) regional, that is more than 20 but less than 100 miles away, (3) national, that is more than 100 miles away but within the United States, and (4) international, that is outside of the United States?” This resulted in an ordinal scale from 1 (most proximal) to 4 (most distal).

We measured *social distance* using the extent to which similar others, including individuals in the start-up team (Steffens et al., 2012) and support network (Newbert et al., 2013) have started new ventures. We used two questions: “Has [name of team member] helped to start a business as an owner or part owner?” and “Has [name of supporter], alone or with others, ever started a business?” Since respondents were asked to provide up to five team members and five supporters, the count for each question ranges from 0 (none has started or helped to start a business) to 5 (five have started or

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helped to start businesses). We reverse coded and averaged the two counts to result in an ordinal scale ranging from 1 (most proximal) to 5 (most distal).

We measured respondents' perception of *hypotheticality* by combining two dimensions. The first dimension represents a respondent's overall assessment of the creation of a new venture: "What is the likelihood that this business will be operating five years from now?" (measured in Time 1) or "What is the probability that this business will ever be up and running as an operating business?" (measured in Time 2 through 4). The second dimension represents the assessment of milestones: "Considering the economic and community context for the new firm, how certain are you that the new business will be able to accomplish each of the following? (a) Obtain raw materials, (b) Attract employees, (c) Obtain start-up capital, (d) Obtain working capital, (e) Deal with distributors, (f) Attract customers, (g) Compete with other firms, (h) Comply with local, state, and federal regulations, (i) Keep up with technological advances, (j) Obtain a bank's help, and (k) Obtain venture capitalists' help". Since higher certainty denotes less hypotheticality, we reverse coded and averaged the items to derive a scale ranging from 1 (least hypothetical) to 5 (most hypothetical).

4.2.3. Control variables. Experience is thought to have a strong and direct influence in the new venture start-up process (Ucbasaran et al., 2008), in the progress of the start-up process (Samuelsson and Davidsson, 2009), and in venture emergence (Dimov, 2010). We controlled for three different types of experience—entrepreneurial experience, industry experience, and work experience—to account for their influence on the enactment of certain activities at varying degrees of abstractness. Several demographic characteristics also have been found to increase the likelihood of individuals pursuing entrepreneurship and engaging in start-up activities (Davidsson and Gordon, 2012). Therefore, we controlled for respondents' age, education, gender, race, and household income. Consistent with Brush et al. (2008), we controlled for industry (using industry dummies to measure industry effects relative to the baseline industry sector, B2B services) to rule out additional

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unobserved effects of differing operating conditions across industries. Entrepreneurs' access to funding and other resources may also influence their engagement in entrepreneurial activities. Based on the work of Mueller (2006) and Parker and Belghitar (2006) we controlled for four geographic regions to capture the possibility of different regional access to resources. Although we do not discuss the survival of these new ventures, we controlled for left-truncation (Yang and Aldrich, 2012) using process duration (i.e. when entrepreneurs first were considering new ventures) as resilience may allow entrepreneurs to stay in the process longer and perform more entrepreneurial activities. Additionally, we used dummy variables (Time 3 and Time 4) to account for the panel design that may include the same participants as multiple cases across four waves of data collection.

4.3. Data Analysis

To capture the dynamic nature of the distance-abstractness model as theorized, we assessed the suitability of several panel data analysis models. Due to the nature of an unbalanced panel and the unmet assumption of independence between the individual-specific effects and the independent variables (Wooldridge, 2010), we considered fixed effect models rather than random effect models to examine changes over time. Since several recent studies using CLT have suggested bidirectional relationships between psychological distance and action (e.g., Jiga-Boy et al., 2010) we used cross-lagged panel analysis (Kenny, 1975) to compare cross-lagged correlations of longitudinal data and infer the causal directions of changes over time in non-experimental settings (Lang et al., 2011).

A cross-lagged panel model includes four types of correlations: (a) the cross-sectional correlation, (b) the autoregressive correlations of each variable over time, (c) the cross-lagged correlations over time, and (d) the correlations between disturbance terms (Finkel, 1995). As changes are path dependent, the inclusion of cross-sectional and autoregressive effects allows researchers to control prior levels of the outcome variable, rule out the possibility that a cross-lagged effect is due simply to the cross-sectional effect, and infer change.

5. Results

Table 4 reports descriptive statistics and correlation matrix for all study variables. Given the significant correlations among dimensions of psychological distance and the independent variables of the distance-abstractness model, we performed two collinearity tests. We found that multicollinearity was not a concern among independent variables (VIFs between 1.030 and 1.085). We also ran curve estimation and found most relationships to be sufficiently linear for hypotheses testing.

Table 4. Descriptive Statistics and Correlation Matrix

	n	Range	Mean	s.d.	1	2	3	4	5	6	7
1 Abstractness of Action	716	1.00 ~ 4.00	2.44	0.66	1						
2 Temporal Distance	278	1.00 ~ 5.00	4.48	0.63	-0.049	1					
3 Spatial Distance	711	1.00 ~ 3.93	1.83	0.77	0.006	-0.122*	1				
4 Social Distance	712	1.00 ~ 5.00	4.14	0.73	0.071†	0.172**	-0.079*	1			
5 Hypotheticality	714	1.00 ~ 5.00	2.10	0.75	0.231***	0.177**	-0.029	0.097**	1		
6 ENT Experience	716	0 ~ 20	0.69	1.93	-0.037	0.006	0.067†	-0.266***	-0.016	1	
7 Industry Experience	716	0 ~ 60	4.23	8.18	-0.014	0.001	-0.071†	-0.143***	0.006	0.378***	1
8 Work Experience	716	0 ~ 50	17.13	10.74	0.025	-0.121*	-0.005	-0.119**	-0.023	0.137**	0.240***
9 Age	715	18 ~ 74	37.63	11.47	0.016	-0.122*	0.005	-0.140***	-0.001	0.112**	0.235***
10 Education	714	1 ~ 5	3.28	1.12	-0.013	-0.058	0.088*	-0.216***	0.069†	0.128**	0.087*
11 Gender	711	0 ~ 1	0.64	0.48	0.015	-0.103†	0.214***	0.045	-0.024	0.027	-0.169***
12 Race	716	0 ~ 1	0.68	0.47	0.000	-0.100†	0.168**	-0.086*	0.073†	0.039	0.010
13 Household Income	691	1 ~ 5	2.86	1.21	-0.055	0.101†	0.043	-0.120**	-0.025	0.016	-0.002
14 Consumer Services	716	0 ~ 1	0.17	0.38	0.065†	0.039	-0.027	-0.001	0.056	-0.059	-0.089
15 Construction	716	0 ~ 1	0.02	0.15	-0.018	-0.082	-0.058	0.006	-0.081*	0.062†	0.176***
16 Wholesale	716	0 ~ 1	0.03	0.18	-0.060	0.091	0.074*	-0.018	0.064†	-0.001	-0.054
17 U.S. Census Regions	716	10 ~ 40	25.55	10.49	0.024	0.051	0.012	-0.058	-0.029	0.066	-0.043
18 Process Duration at T1	716	1 ~ 6	4.95	0.94	-0.066†	0.080	0.031	0.047	0.043	0.019	-0.301**

	8	9	10	11	12	13	14	15	16	17	18
1 Abstractness of Action											
2 Temporal Distance											
3 Spatial Distance											
4 Social Distance											
5 Hypotheticality											
6 ENT Experience											
7 Industry Experience											
8 Work Experience	1										
9 Age	0.814***	1									
10 Education	0.199***	0.333***	1								
11 Gender	0.047	-0.084*	0.005	1							
12 Race	0.223***	0.178***	0.037	0.011	1						
13 Household Income	0.137***	0.141***	0.358***	0.007	0.178***	1					
14 Consumer Services	-0.101**	-0.077*	0.064†	0.035	-0.035	-0.058	1				
15 Construction	0.069	0.030	-0.167***	0.094*	0.011	-0.004	-0.084*	1			
16 Wholesale	-0.009	-0.011	0.103**	0.024	0.102*	0.091*	-0.068†	-0.028	1		
17 U.S. Census Regions	-0.016	-0.034	-0.021	0.003	0.071	0.053	-0.020	-0.131**	-0.041	1	
18 Process Duration at T1	-0.195**	-0.222**	-0.077*	0.017	0.092*	0.045	-0.016	-0.094*	0.031	-0.035	1

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ for two-tailed tests.

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To analyze the effects between independent variables and the dependent variable at a given point in time, we performed a preliminary test using hierarchical multiple regression analysis. We then used cross-lagged panel analysis to capture the effects in more dynamic terms (Ployhart and Vandenberg, 2010). In the regression analysis, we entered all controls in the first step and then the hypothesized main effects—temporal distance, spatial distance, social distance, and hypotheticality—in the second step to examine the additional effect of these independent variables.

Table 5 reports the results of the multiple regression analysis. Hypothesis 1 suggests that abstractness of entrepreneurial action is positively related to an entrepreneur’s temporal distance with respect to an entrepreneurial new venture. The hypothesis was not supported ($\beta = -0.068$; *ns*).

Table 5. Results of Hierarchical Multiple Regression Analysis

	Model 1	Model 2
<i>Controls</i>		
Entrepreneurial Experience	-0.086	-0.044
Industry Experience	-0.000	0.014
Work Experience	0.167	.185 [†]
Age	-0.035	-.062
Education (5 categories)	-0.001	.048
Gender (1=male)	0.077	.084
Race (1=white)	0.060	.051
Household Income (5 categories)	0.012	.044
Industry: Consumer Services (B2C)	0.020	.035
Industry: Construction	-0.057	-.037
Industry: Wholesale	-0.149 ^{**}	-.202 ^{**}
Time 3 dummy	0.128 [†]	.111 [†]
Time 4 dummy	-0.253 ^{***}	-.265 ^{***}
U.S. Census Regions	0.038	.027
Process Duration at T1	-0.046	-.066
<i>Independent variables</i>		
Temporal Distance		-0.068
Spatial Distance		-0.009
Social Distance		0.197 ^{**}
Hypotheticality		0.178 ^{**}
	Adjusted R ²	0.125 ^{***}
	n	261
		0.186 ^{***}
		261

[†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ for two-tailed tests.

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Hypothesis 2 suggests that abstractness of entrepreneurial action is positively related to an entrepreneur's spatial distance with respect to an entrepreneurial new venture. The hypothesis also was not supported ($\beta = -0.009$; *ns*). Hypothesis 3 suggests that abstractness of entrepreneurial action is positively related to the social distance of an entrepreneur with respect to a new venture. We found support for this hypothesis ($\beta = 0.197$; $p < 0.01$). Finally, Hypothesis 4 suggests that the abstractness of entrepreneurial action is positively related to an entrepreneur's perceived hypotheticality with respect to a new venture. The results also provided support for this hypothesis ($\beta = 0.178$; $p < 0.01$).

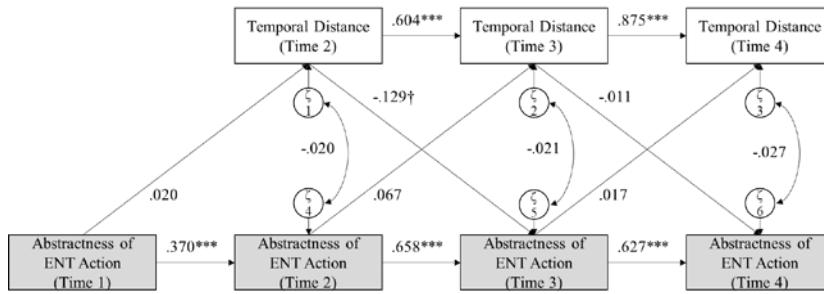
In the cross-lagged panel analysis, we fitted four structural equation models (SEM) using Amos 24 to analyze the relationships between abstractness of entrepreneurial action and each of the four dimensions of psychological distance. Figure 2, following, illustrates these models. We evaluated model fit using multiple fit indices: CFI, TLI, and RMSEA (Hu and Bentler, 1998), and compared relative fit among models using a Chi-square difference test (Hair et al., 2010). As shown in Table 6, all models fit the data well.

The better fit of the direct models between temporal distance and abstractness of entrepreneurial action as well as between spatial distance and abstractness of entrepreneurial action opened the possibility for cross-lagged analytical support of H1 and H2. However, further analysis reported in Figure 2(a), shows that only the autoregressive correlations were significant, indicating that the best predictors of future temporal distance and abstractness of entrepreneurial action were past temporal distance and abstractness of entrepreneurial action. Hence, neither results from the cross-lagged panel analysis nor the multiple regression results supported Hypothesis 1. Similarly, a detailed examination of each measurement point in Figure 2(b) indicated that the cross-lagged effects were only marginally significant. Therefore, consistent with our multiple regression results, we conclude that the cross-lagged analysis did not support Hypothesis 2.

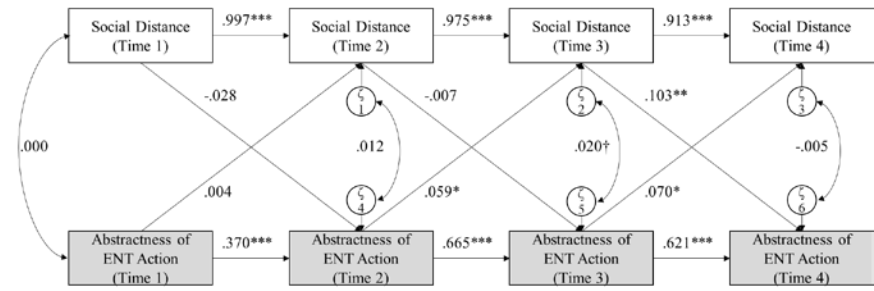
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Figure 2. Cross-Lagged Panel Model Estimates

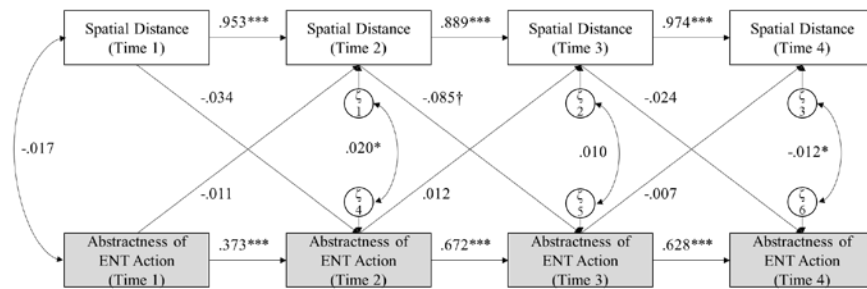
(a) Temporal Distance and Abstractness of Entrepreneurial Action



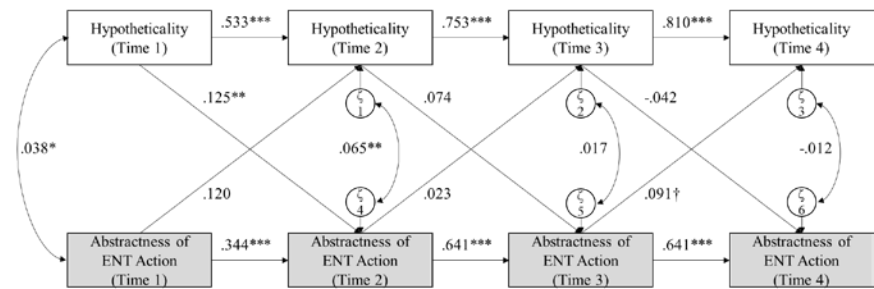
(c) Social Distance and Abstractness of Entrepreneurial Action



(b) Spatial Distance and Abstractness of Entrepreneurial Action



(d) Hypotheticality and Abstractness of Entrepreneurial Action



† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

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Conversely, the better fit of the reciprocal model between social distance and abstractness of entrepreneurial action not only supported Hypothesis 3 but indicated that the relationship is dynamic and complex: Social distance at time t was correlated with abstractness of entrepreneurial action at time $t+1$, and abstractness of entrepreneurial action at time t was correlated with social distance at time $t+1$. Figure 2(c) reveals that there were significant positive cross-lagged correlations between social distance and abstractness of entrepreneurial action across most measurement points. Moreover, when considering the autoregressive, cross-sectional,

Table 6. Cross-Lagged Panel Model Fit Comparisons

		χ^2	<i>df</i>	CFI	TLI	RMSEA
Temporal Distance and Abstractness of ENT Action						
Model 1	Stability: Time, Action	18.063	15	0.995	0.992	0.012
Model 2	Direct: Time \rightarrow Action ^a	12.377	12	0.999	0.998	0.006
Model 3	Reverse: Time \leftarrow Action	13.237	10	0.993	0.979	0.020
Model 4	Reciprocal: Time \leftrightarrow Action	10.975	8	0.993	0.976	0.021
Spatial Distance and Abstractness of ENT Action						
Model 5	Stability: Space, Action	30.425	21	0.995	0.992	0.023
Model 6	Direct: Space \rightarrow Action ^a	13.691	15	1.000	1.000	0.000
Model 7	Reverse: Space \leftarrow Action	18.707	15	0.998	0.996	0.017
Model 8	Reciprocal: Space \leftrightarrow Action	13.347	12	0.999	0.998	0.012
Social Distance and Abstractness of ENT Action						
Model 9	Stability: Social, Action	42.789	21	0.989	0.982	0.035
Model 10	Direct: Social \rightarrow Action	25.512	15	0.995	0.988	0.029
Model 11	Reverse: Social \leftarrow Action	23.605	15	0.996	0.990	0.026
Model 12	Reciprocal: Social \leftrightarrow Action ^a	16.059	12	0.998	0.994	0.020
Hypotheticality and Abstractness of ENT Action						
Model 13	Stability: Hypo, Action	41.828	21	0.975	0.958	0.034
Model 14	Direct: Hypo \rightarrow Action	18.467	15	0.996	0.990	0.017
Model 15	Reverse: Hypo \leftarrow Action	24.290	15	0.989	0.974	0.027
Model 16	Reciprocal: Hypo \leftrightarrow Action ^a	13.429	12	0.998	0.995	0.012
Four Dimensions of Psychological Distance and Abstractness of ENT Action						
Model 17	Stability: Distance, Action	264.897	151	0.975	0.968	0.030
Model 18	Direct: Distance \rightarrow Action ^a	175.179	110	0.986	0.975	0.027
Model 19	Reverse: Distance \leftarrow Action	185.845	109	0.983	0.970	0.029
Model 20	Reciprocal: Distance \leftrightarrow Action	159.481	98	0.986	0.974	0.027

χ^2 = chi-square correction; *df* = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation. ^a indicates the best relative model fit using χ^2/df .

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and cross-lagged paths together, the residual effects suggested that social distance at Time 3 positively influenced change in abstractness of entrepreneurial action between Time 3 and 4, while abstractness of entrepreneurial action at Time 2 (Time 3) positively influenced changes in social distance between Time 2 and 3 (Time 3 and 4).

In other words, change in social distance and change in abstractness of entrepreneurial action were positively related and dependent on one another over time: a decrease (increase) in social distance subsequently decreased (increased) abstractness of entrepreneurial action; and a decrease (increase) in abstractness of entrepreneurial action also decreased (increased) social distance. Lastly, the better fit of the reciprocal model between hypotheticality and abstractness of entrepreneurial action, as indicated in Table 6, seems also to suggest a dynamic relationship. Figure 2(d) indicated a significant direct effect between Time 1 and 2 but only a marginal reverse effect between Time 3 and 4. It reinforced support for Hypothesis 4 and showed that hypotheticality at time t was positively correlated with abstractness of entrepreneurial action at time $t+1$ but not vice versa.

The lack of support for Hypotheses 1 (temporal distance) and 2 (spatial distance) led us to conduct a *post hoc* analysis. We used semi-structured interviews following protocols outlined in Eisenhardt (1989). Six entrepreneurs in the United States in a variety of industries (data-mining, fitness, gaming, marketing, pet-care, wellness) participated in this analysis. We asked participants to describe their ventures using keywords chosen from the linguistic categorization model (Semin and Fiedler, 1988); and this allowed us to examine their perceptions.

Regarding temporal distance, these entrepreneurs described their ventures using keywords differentially. Some utilized future milestone terminology, while others used terminology situated in the present (e.g., exact cash required now), indicating variance in perceptions of temporal distance. Consistent with the non-significance of Hypothesis 1,

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participants who used milestone terminology (indicating greater temporal distance) described their actions in both abstract and concrete terms; and participants who used present-time terminology (indicating less temporal distance) described their actions only in concrete terms. Thus, this *post hoc* examination suggests that the relationship between perception of temporal distance and abstractness of entrepreneurial action may be more complex and needs further research to tease out the underlying additional relationships suggested.

Regarding the non-significance of spatial distance, *post hoc* analysis suggested that entrepreneurs described their ventures in relation to a variety of locations both in tangible terms (e.g., tax laws, financial systems, and infrastructures) and intangible terms (e.g., customers, suppliers, talents, knowledge spillover, venture capital, and culture). However, our operationalization consisted primarily of measuring perceived spatial distance with respect to customers. This narrow operationalization of a construct that could—as suggested in the *post hoc* analysis—include many more location elements, may explain the non-significance of our findings. Once again, further research also is indicated as we discuss further in the next section.

6. Discussion and Conclusion

We now return to the question that motivates this study: To what extent is the abstractness of entrepreneurial action related to the perception of psychological distance? We have argued that because the apparently implicit relationship between entrepreneurial perception and entrepreneurial action may be quite explicit (when abstractness of action is seen as a construal-mechanism-based function of psychological distance), we now can move forward on many important but related fronts. On the research front, we now can address several puzzling anomalies in research on entrepreneurship, entrepreneurial action and CLT. On the practice front, we also can address anomalies such as: (1) In the opening case where differences in perception resulted in competing action alternatives; and (2) some of the persistent problems that arise in

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entrepreneurship-focused research, teaching, and public policies that our findings can inform. We also address the limitations that may qualify the interpretation of our findings; and then conclude the paper.

6.1. Implications for Research

Entrepreneurship research. Entrepreneurship research has yet to develop sufficiently the perception-to-entrepreneurial behavior link: to answer questions such as why some perceptions lead to certain behaviors and not others. For example, Van Gelderen et al. (2015) did not fully explain the entrepreneurial intentions-to-entrepreneurial action process, and have suggested the use of CLT as a likely theoretical pathway forward. In our study, we have made the perception-to-entrepreneurial action connection both in terms of social distance and hypotheticality; and, this suggests progress in the further development in perception-to-behavior research. Entrepreneurship research also continues to be plagued by persistent anomalies that can be solved using a metacognitive approach, such as “why people differ in their cognitive strategies, but also why an individual may use different cognitive strategies when facing different contexts and different motivational states” (Haynie et al., 2010, p, 226). Our study offers a metacognitive argument by explaining at least in part how action is shaped by perception of context—specifically of psychological distance.

In research specifically addressing entrepreneurial action there also exist puzzles still in need of solving. In particular, it is still unclear why perceptions sometimes have such a profound effect on entrepreneurial action. Also, dynamism in entrepreneurial cognition does not yet have an empirically-tested mechanism to explain it (Randolph-Seng et al, 2015). By our finding reflexivity in the social distance-to-action relationship, we offer one explanation for why perceptions of social distance can be magnified in a self-reinforcing and possibly momentum-building loop. Specifically, cross-lagged panel analysis (Figure 2) illustrates this reflexivity in

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the social distance-abstractness model such that social distance was found to influence change in the abstractness of entrepreneurial action positively, while the abstractness of entrepreneurial action also was found to positively influence change in social distance. These findings may help us to explain, for example, how entrepreneurial ecosystems begin, develop, and grow (e.g. Spigel, 2017) as entrepreneurs who immerse themselves among others with entrepreneurial experience consequently act more concretely. Acting more concretely in turn attracts even more like-minded others to join them.

Also, the literature is still unclear as to the types of actions that entrepreneurs use in new venture creation. The perception-to-action structure tested in our study provides the basis for a theoretically meaningful typology as suggested by Delbridge and Fiss (2013) to connect cognitive and behavioral activities systematically. Nor is the literature clear about relationships among specific entrepreneurial actions. By using our action-abstractness model, which dimensionalizes types of action, scholars now can test relationships among various actions of entrepreneurs empirically, as recommended recently (e.g., Davidsson, 2015; McMullen and Dimov, 2013; Shepherd, 2015). And, while some progress has been made in the identification of the antecedents of entrepreneurial action such as intentions (e.g., Krueger et al., 2000); perceived uncertainty and doubt (McMullen and Shepherd, 2006; Van Gelderen, 2015); or multiple contexts (Zahara and Wright, 2011); in our study, using the dimensions of psychological distance, we introduce psychological distance—specifically social distance and hypotheticality—as a new antecedent for entrepreneurial action and as a way to capture, in part at least, the multiplicity of external contexts that affect entrepreneurial action (Welter, 2011; Zahra and Wright, 2011).

CLT research. The primary weakness in CLT research to date is that it is lab-based, not in-the-field based, i.e., the treatments of distance and construal have been either categorical or dichotomous (Wilson et al. 2013). Our contribution to the CLT literature is to be one of the first

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studies to operationalize psychological distance and the construal mechanism in the field. Additionally, CLT researchers have called for further exploration of how the dimensions of psychological distance interact (Lieberman and Trope, 2014). Future research therefore may explore how interactions among dimensions of psychological distance promote or impede entrepreneurial action (such as what has been done for “doubt”, McMullen and Shepherd, 2006; “fear”, Mitchell, 1996; Mitchell and Shepherd, 2010; and “uncertainty”, McKelvie et al., 2011). In this regard, we note that CLT proposes that the dimensions of psychological distance may operate in combination and simultaneously. Our findings support the need to look at all four dimensions, as they may have distinct effects on the outcome of interest.

Interestingly, we find that the dimensions of psychological distance are not all positively correlated with one another (Table 4). This suggests that they may covary more than often is assumed. While beyond the scope of this study, a logical and promising avenue for future research and further development of the psychological distance construct in entrepreneurial action research, would be to look at the combined and interactive effects of the different dimensions. Furthermore, a configurational approach—examining the various combinations of the four dimensions (at low and high levels)—could further our understanding of how psychological distance is associated with entrepreneurial action.

6.2. Implications for Practice

For entrepreneurs. The implications of our study for entrepreneurs follow directly from our opening case, where team members in new venture creation perceived psychological distance differently, made different construals accordingly, and thus were split on appropriate action to take. To foster agreement in such a case, the results of our study suggest efforts to create agreement on perceptions of both hypotheticality and of social distance. We therefore would encourage the team (e.g., through better communication) to align their perceptions of the

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likelihood that a new venture would emerge, which we then would expect to align construals, resulting in the alignment of abstractness of entrepreneurial action. Conversely, we would discourage the divergence in perceptions of social distance that arises from the influence of two distinct social reference groups (technological peers vs. business peers), which once again would be expected to produce alignment.

For educators. We note that much of entrepreneurship education is highly hypothetical (e.g., an imaginary venture), but focused on concrete actions (e.g., starting a business)—which according to our results is a mismatch. This mismatch has been criticized in the entrepreneurship education literature (Honig, 2004; Noyes and Brush, 2012). Our research suggests that in the highly hypothetical setting of the classroom that educators should not fear teaching the more-abstract actions involved in new venture creation, since—as argued in this study—(the more-abstract actions of) entrepreneurial thinking and thinking-doing, also are entrepreneurial action.

For policy makers. As a result of our study, we can better pinpoint expected abstractness of entrepreneurial action. Thus, we suggest that the type of economic development initiative will shape outcomes. For example, incubators, which decrease social distance and hypotheticality should be expected to produce more concrete actions. Small business development centers, which by the nature of their structure have higher social distance and hypotheticality, should be expected to produce less concrete actions—contrary to many policy makers' expectations.

6.3. Limitations

This research should be viewed in the light of its limitations. First, we focused on psychological distance and entrepreneurial action at the individual level. The relationships found may have been strengthened or weakened by distributed cognition (Randolph-Seng et al., 2015), such as team and organizational factors. Additional research is needed to take into consideration the dynamics of new venture teams (e.g., team conflict, Bradley et al., 2013; team cohesion, Franke et

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al., 2008). Second, driven by theory, we aggregated the activities of each entrepreneur in four degrees of abstractness into a weighted composite index. Although the index offers more gradations than unweighted indices used in previous studies (e.g., Gordon, 2012; Samuelsson and Davidsson, 2009), there still are trade-offs. Other possible methods, such as qualitative analysis using fuzzy set approach and quantitative analysis using configuration approach, might preserve more nuance in each degree of abstractness. For the sake of simplicity and interpretability, we also focused on single-new venture pursuit. Future research may consider the pursuit of concurrent opportunities building on theories of multi-goal pursuit in conjunction with CLT. Third, the measures used in this study are constrained by what was available in *PSED I*. Future research may refine the distance-abstractness model through expanding the psychological distance items, including other individual-level factors such as self-efficacy, and the list of entrepreneurial activities beyond what is captured in *PSED I*. Thus, fourth, as the PSED data set was collected between 1998 and 2003, we are aware of a potential threat to temporal validity. We recognize this as a potential limitation; but are persuaded that these data are both unique and remain relevant at least on the variables that we have tested in this study; and we note studies still using use these data (e.g. Newbert et al., 2013), perhaps because there is certain timelessness to the data due to the context of the questions (e.g., whether they were taking action at the time of the survey, for example, is independent of when that survey took place).¹

6.4 Conclusion

Herein, we have connected the abstractness of entrepreneurial action to psychological distance through the mechanism of construal. Our findings, and their application to a case that has been “up close and personal,” suggest broader application to many entrepreneurs whose entrepreneurial actions are shaped by their perceptions of the psychological distance to the creation

¹ We thank a helpful reviewer for this insight.

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of a new venture. These findings advance entrepreneurial action research, practice, and pedagogy by showing that the apparently implicit relationship between entrepreneurial perception and entrepreneurial action may actually be quite explicit, when abstractness of action is seen as a construal-mechanism-based function of psychological distance.

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