The Frugal Entrepreneur: A Self-regulatory Perspective of Resourceful Entrepreneurial Behavior

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Abstract

The present research complements extant perspectives of resourcefulness, which assert that resourceful behaviors arise out of responses to environmental constraints, by developing a model illustrating that entrepreneurs self-impose constraints on resource acquisition and deployment for differing reasons. Specifically, we introduce a novel conceptualization of frugality and differentiate it from self-control to develop a set of hypotheses that frugality predicts resource use behaviors based on long-held preferences (e.g., effectuation and bricolage) and self-control predicts resource use behaviors based on known end states or goals (e.g., causation and pre-commitments). After accumulating evidence of reliability and validity for a new measure of frugality contextualized for entrepreneurship research, the results support our self-regulatory theoretical framework. Our study contributes to research on resourcefulness by making multiple theoretical insights, and we outline numerous future research opportunities for applying the construct of frugality to explain entrepreneurial behavior.

JEL Codes: L26; D91

Keywords: Resourcefulness; Self-regulation; Frugality; Self-control; Construct validation

Highlights:

- Develops a self-imposed constraint perspective of resourceful entrepreneurial behaviors to complement extant environmental constraints perspectives
- Introduces a novel construct (i.e., trait frugality) to entrepreneurship research
- Applies self-regulatory theory to differentiate frugality and self-control
- Frugality predicts higher amounts of bricolage and effectuation behaviors
- Self-control predicts higher amounts of causation and pre-commitment behaviors
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1. Executive Summary

There is widespread agreement within the academic literature, as well as the popular press, that ‘resourcefulness’ is a critical component for success in the domain of entrepreneurship, and much is known about the behavioral patterns that emerge in terms of how and when individuals act resourcefully. Overall, the prevailing perspective in the literature is that entrepreneurs act more resourcefully when situational or resource constraints are present. However, we contend that this approach does not yet account for the resourceful behavior of entrepreneurs in times when there are no situational or resource constraints. Put differently, we know little about why individuals behave resourcefully in times of resource slack or abundance.

To advance the literature, we take a socio-cognitive perspective on self-regulation and introduce the construct of frugality, defined as one’s general preference to (a) conserve resources and (b) apply an economic rationale in the acquisition of resources (i.e., assessing the opportunity cost of newly acquired resources). In following, we juxtapose the new construct of frugality with extant literature on self-regulatory control, defined as one’s general tendency to stay committed to an action plan in the face of momentarily more alluring alternatives, to highlight differences in how entrepreneurs engage in resourceful behaviors. Our novel approach enabled us, using a sample of 178 entrepreneurs with time-lagged dependent variables, to examine entrepreneurs’ predisposition to engage in resourceful behaviors.

Our findings provide evidence consistent with the inference that frugality is a distinctive trait that is different from individual self-control. And, in line with our hypotheses, we find that higher levels of frugality positively relate to higher amounts of bricolage behavior and effectuation behaviors (i.e., affordable loss and flexibility), relative to higher self-control which
positively relates to higher amounts of causation behaviors and the establishment of pre-commitments (i.e., mechanisms used to help control the future). In sum, we introduce the concept of frugality to the entrepreneurship literature to provide an individual-level explanation for why entrepreneurs may behave resourcefully regardless of their environment.

2. Introduction

Interest from academics and practitioners alike continues to grow with regards to how entrepreneurs organize and deploy resources to start and scale their ventures. Although this field of work is still evolving, there is a consensus around the notion that resourcefulness plays a critical role in new venture survival and performance (Duchesneau & Gartner, 1990; Zahra & Garvis, 2000). Scholars have applied the concept of resourcefulness to entrepreneurship through a variety of behavioral perspectives which include bricolage (Senyard, Baker, & Davisson, 2009), bootstrapping (Rutherford, Pollack, Mazzei, & Sanchez-Ruiz, 2017), co-opting resources (Starr & MacMillian, 1990), causation, and effectuation (Sarasvathy, 2001; 2008), among others. These perspectives emphasize the importance for entrepreneurs to get more use out of less resources due to resource constraints (Duchesneau & Gartner, 1990; Zahra & Garvis, 2000). In this way, resourcefulness arises out of an individual response to situational constraints (Bradley, 2015; Corbett & Katz, 2013).

However, these extant theoretical perspectives do not adequately account for resourceful behaviors in which situational conditions do not limit the acquisition and/or deployment of resources (c.f., Sonenshein, 2014; Sonenshein, 2017; Williams et al., 2019). Prior research has made it clear that individuals will behave resourcefully when situational conditions constrain entrepreneurs’ options to either 1) identify novel and clever ways to assemble and deploy resources to maintain their venture pursuit, or 2) terminate the venture (Corbett & Katz, 2013).
But, it is less clear why some individuals (continue to) behave resourcefully under conditions of resource slack or abundance. While prior research has certainly advanced our understanding as to how entrepreneurs deploy resources to overcome resource constraints due to the liabilities of newness and smallness of new ventures (Bruderl & Schussler, 1990; Stinchcombe, 1965), much of this work remains difficult to apply to individuals’ resourceful behaviors, irrespective of their situational conditions or resource constraints (i.e., of their own volition). Thus, a gap in our understanding of entrepreneurial resourcefulness exists when considering the boundary conditions of existing behavioral perspectives.

To advance the literature, we extend the underlying logic of extant perspectives that assume that resourcefulness arises from responses to *environmental constraints* by proposing a complementary perspective, namely that resourcefulness can also arise from responses to *self-imposed constraints*. More specifically, we apply a socio-cognitive perspective of self-regulation (Bandura, 1991) to explain why some entrepreneurs may be predisposed to engage in resourceful behaviors and that these behaviors are not contingent on situational constraints. We introduce and define frugality — one’s general preference to (a) conserve resources and (b) apply an *economic rationale in the acquisition of resources* (i.e., assessing the opportunity cost of newly acquired resources). This, importantly, is distinct from *self-control* — one’s general tendency to *stay committed to an action plan in the face of momentarily more alluring alternatives* (Duckworth et al., 2019) — and, this distinction highlights the role of self-imposed constraints in predicting common resource use approaches in the creation of a new venture (c.f., Fisher, 2012).

While frugality and self-control act as self-imposed constraints on resource acquisition and use, they differ in important ways. Self-control regulates individuals’ resource acquisition and deployment behaviors (e.g., fixing their office plumbing issues) to align with necessary plans
to achieve one’s pre-determined goals (e.g., save enough money to move office locations) even if regulated behaviors are counter to long-held preferences (e.g., hire plumber). In this way, self-control should predict causation-related resource use behaviors where pre-determined ends are known and the entrepreneur is tasked with adhering to a plan to reach short-term goals despite temptations to deviate from the plan due to their long-held preferences. Conversely, frugality represents resource conservation and an economic rationale (e.g., fixing their own plumbing issues) that aligns with one’s long-held individual preferences (e.g., do-it-yourself principles) regardless of current circumstances (e.g., the availability of funds to hire plumber). In this way, frugality as a trait antecedent should predict bricolage behavior and the dimensions of effectuation that are not pre-determined resource use behaviors (i.e., experimentation, affordable loss, and flexibility). Put simply, individuals with high trait frugality will view resource conservation and doing more with less as “who they are” and “what they and their ventures do,” whereas individuals with high trait self-control view resource conservation and doing more with less as “something they have to do” for a period of time or until they have reached a goal.

To examine this theoretical and empirical distinction, we test our hypotheses with a sample of 178 entrepreneurs with time-lagged dependent variables. Our results support the inference that frugality and self-control are indeed distinctive traits. Moreover, our findings support our application of a self-regulatory perspective to explain resourceful entrepreneurial behaviors. Overall, we find that higher levels of trait self-control indicate a preference for causation behaviors and the establishment of pre-commitments (i.e., mechanisms used to help control the future) (Sarasvathy, 2001). In contrast, entrepreneurs high in trait frugality, but not self-control, tend to engage in higher amounts of bricolage behavior and higher amounts of effectuation behaviors (i.e., affordable loss and flexibility). One surprising result was that neither...
trait self-control nor frugality was associated with experimentation behaviors, which are subsumed under the effectuation construct (Chandler et al., 2011). These findings provide important insights for advancing theory on entrepreneurial resourceful behaviors.

First, our self-imposed constraints perspective provides a complementary lens to extant environmental-constraints frameworks that examine the resourceful behaviors of entrepreneurs. Specifically, our approach extends the boundary conditions of environmental constraints perspectives by applying a self-regulatory theoretical perspective. Here, a self-regulatory perspective of resourceful behavior helps capture a more complete picture for why some entrepreneurs behave resourcefully despite non-constraining situational conditions. This contribution is especially intriguing because behavioral perspectives of resourcefulness, like bricolage, generally assume that resourcefulness behaviors during the venture creation process are primarily due to a resource constrained environment (Baker & Nelson, 2005). However, recent studies have found evidence that bricolage behaviors also occur in non-resource constrained environments (c.f., An et al., 2018). This suggests that some individuals will choose to restrict their resource environment. Building on this insight, our theory suggests that highly frugal entrepreneurs and entrepreneurs with high levels of self-control will self-impose resource constraints on their resource endowments, even under conditions of resource slack, or in munificent environments.

Second, our study introduces the construct of frugality to the entrepreneurship literature. To our knowledge, this is the first conceptualization, and empirical study, that uses the construct of frugality, in comparison to self-regulatory control, to explain why entrepreneurs engage in resourceful behaviors. Although frugality has been mentioned as a potentially important trait in successful venture creation (c.f., Aldrich & Yang, 2012; Dana, 2009; Geroski, Mata, & Portugal,
2010), the concept has remained underdeveloped in its application to the entrepreneurship process. In this regard, our study makes important strides by developing the frugality construct from a conceptual standpoint and providing reliability and validity evidence for a new measure of frugality contextualized to entrepreneurship. As a new construct for entrepreneurship research, frugality offers interesting insights into the natural preference for resource slack (i.e., a stock of assets not currently being used as working capital), resource-based decision-making, and subsequent behaviors associated with venture creation.

Third, we demonstrate how the distinction between trait frugality and self-control has important implications for current conceptual thinking associated with resourceful entrepreneurial behaviors. In particular, our study indicates how trait frugality and self-control have different relationships to bricolage, effectuation, and causation behaviors, and thus provides additional clarity as to how these resourceful behaviors are activated, and under what circumstances. Specifically, our study provides evidence that causal perspectives of resource use (i.e., causation and pre-commitments) are associated with trait self-control. In contrast, bricolage and effectuation (i.e., affordable loss and flexibility), are associated with trait frugality. This is enlightening as existing research on identifying the antecedents of causal and effectual behavior remains inconsistent and “much more complex than previously anticipated” (Johansson & McKelvie, 2012, p. 12). Furthermore, research highlighting the antecedents of causation, effectuation, and bricolage behaviors have not yet integrated individual traits as possible antecedents, and instead have focused on constructs like perceived environmental uncertainty, stocks of human capital (i.e., entrepreneurial and management experience), and investor influence (e.g., see Frese, Geiger, & Dost, 2019). We position trait frugality and self-control as antecedents of resourceful behavior, and in doing so provide both theoretical and empirical
distinction between causal and effectual behavior through self-control and frugality, respectively.

3. Theoretical Framework

3.1 Resourceful Behaviors

Recently, agreement on the definition of resourcefulness has been mixed. For example, Bradley, McMullen, Atmadja, Simiyu and Artz, (2011, p. 648) define resourcefulness, as “learned behavioral, financial and social repertoires for dealing with problems, especially those of novelty, in starting a business.” However, recent calls for research (Williams et al., 2019) have asked scholars to re-evaluate the resourcefulness construct and have suggested that resourcefulness is “getting more from less, by identifying novel and clever ways to bring, assemble, and deploy resources” (p. 2). Despite the lack of agreement concerning the definition of resourcefulness to date, there are multiple theories and approaches in the entrepreneurship literature that seek to address the question of how entrepreneurs gather and use resources during the venture creation process. Three core conceptual approaches in entrepreneurship that focus on resource use are (1) Causation, (2) Effectuation, and (3) Bricolage (Fisher, 2012). While an extensive review is outside of the scope for the current study, we briefly explain each approach.

Causation represents a deterministic view of the venture creation process, and highlights a linear process of planning, resource organization, and resource deployment to achieve a goal (i.e., the ends are known) (Sarasvathy, 2001; Shah & Tripsas, 2007). Entrepreneurs who engage in a causation-based process of resource use tend to start with a predetermined goal and work backwards to identify and subsequently execute the means to achieve the desired goal. Essentially, an entrepreneur applying a causal perspective of entrepreneurship is attempting to control an unknown future through detailed planning as a means to reduce uncertainty and thus get the most out of their limited resource pools (Fisher, 2012).
Alternatively, effectuation is a resource use logic that emphasizes starting with the means, rather than with the end goal in mind (Sarasvathy, 2001). Effectuation provides an explanation for how adaptability in the entrepreneurial process unfolds, and involves flexibility and experimentation in resource use to reduce uncertainty (Fisher, 2012). Effectuation logic has been found to be an effective way to create value when the end goal is not known. In this way, effectuation describes how entrepreneurs may change or adapt goals given resource constraints (Berends, Jelinek, Reymen, & Stultiëns, 2014; Perry, Chandler, & Markova, 2012).

Finally, bricolage is a resource utilization behavior conceptualized as making do with resources at hand, and the recombination of these resources for new purposes (Baker & Nelson, 2005). Not surprisingly, engaging in bricolage behaviors relates to higher levels of firm innovativeness (Senyard, Baker, Steffens, & Davidsson, 2014). In sum, multiple studies have shown that entrepreneurs facing resource constraints engage in bricolage behaviors to maintain venture operations (Baker, 2007; Desa, 2012; Sharma & Iyer, 2012).

Taken together, these three theoretical approaches in the entrepreneurship literature explain how entrepreneurs gather and use resources to create and maintain new ventures. However, the literature has tended to emphasize the environment’s role in influencing resourceful behavior (Corbett & Katz, 2013), or that resourceful behavior is a result of one’s situational conditions or constraints (Baker & Nelson, 2005; Sarasvathy, 2001). While we acknowledge that resourceful behavior, in part, can stem from resource constraints (Baker & Nelson, 2005; Bradley, Wiklund, & Shepherd, 2011), an explanation is not readily apparent outside of this boundary condition, and does not provide insights as to why entrepreneurs engage in resourceful behavior in non-resource constrained conditions. Moreover, the focus of each respective approach is on the displayed behavior of an entrepreneur, which we argue does not
account for the cognitive processes and individual traits that can also influence resource usage during venture creation (c.f., Baron, 1998; 2007). We develop our model using a self-regulatory perspective of resourceful entrepreneurial behavior, using trait frugality and self-control, to enhance our understanding of causation, effectuation, and bricolage behavior.

### 3.2 Self-Regulation Theory

*Self-Regulation Theory* (SRT) offers a cognitive framework to explain why and how entrepreneurs manage their resources. According to Bandura (1991), “self-regulatory systems lie at the very heart of causal process… and provides the very basis for purposeful action” (p. 248). Self-regulatory systems are made up of the following three principles: (1) The self-monitoring of one’s behavior to include the recognized cause of such behavior and resulting outcomes; (2) The judgment of individual behavior relative to personal standards; and (3) How one’s judgment of their behavior leads to an affective self-reaction (Bandura, 1991).

Applying these principles, self-regulation includes cognitive processes involved in attaining and maintaining desired states. According to Bandura (1991), self-regulation consists of perceptions of current behaviors, a referent standard, a comparative process, and determination of whether behavior needs modification. The perception of current behaviors assesses how one is currently behaving. The referent standard is an image of the ideal state of behavior to uphold an individuals’ principles (i.e., appropriate behavior) or reach an important goal (i.e., performance levels). The cognitive comparative process matches the perceived current behavior with the referent standard to determine if there is a discrepancy. In the instance that a discrepancy is recognized, the individual seeks to modify the subsequent behavior to bring it in line with the referent standard. However, the affective self-reaction (i.e., action or no action) involves the determination if the behavioral change will yield tangible positive or negative outcomes.
Implicit to self-regulatory theory is the assumption of time. The theory suggests that changes in behavior manifest from the self-reflective incongruity between a current and desired future state (Hall & Fong, 2007). We contend that individuals are both planners (i.e., focused on reaching long-term desired states), and doers (i.e., focused on satisfying current needs and wants). That is, self-regulation theory is inherently about the conflict between short- and long-term preferences. Thus, individuals often regulate present behaviors in the hopes of reaching future desired states.

Overall, self-regulation theory asserts that individuals impose self-constraints to guide purposive action. With regards to entrepreneurship, entrepreneurs self-regulate how to conserve or deploy finite resources (tangible or intangible) in relation to their personal standards of desirable behavior or what is thought of as “appropriate” resource acquisition and deployment. However, entrepreneurs’ personal standards of desirable behavior—or what is thought to be “appropriate” resource acquisition and deployment behavior—likely depend on their dispositional traits or long-held preferences for resource acquisition and deployment. We introduce frugality as distinct from self-control and explore these two dispositional traits which, from a theoretical perspective, should influence differences in why self-constraints are applied and therefore will influence different types of resource use behaviors that are enacted.

3.2.1 Frugality

We conceptualize frugality as an individual trait, developed and fostered over the course of a person’s life experiences and from their culture (c.f., Aldrich & Yang, 2012). The concept of frugality has evolved over time and is grounded in Max Weber’s notion of asceticism (Weber, 1930; Witkowski, 2010). Weber’s notion of asceticism is most closely linked with the Protestant Work Ethic (PWE), defined as a moral justification for the accumulation of wealth through hard
work, delay of gratification, frugality, and thrift (Furnham, 1984). In fact, Weber believed that asceticism, frugality, and thrift are values that encourage successful entrepreneurship (Dana, 2009).

More recently, the concept of asceticism has been adapted to economic asceticism to explain frugal consumer behaviors as a means to separate frugality from religious motivations (Lastovicka et al., 1999). Lastovicka et al. (1999) defined frugality as “a unidimensional consumer lifestyle trait characterized by the degree to which consumers are both restrained in acquiring and in resourcefully using economic goods and services to achieve longer-term goals” (p. 88). Frugal consumers are less susceptible to interpersonal influence, less materialistic, less status conscious, less compulsive in buying, more value conscious, and are not driven by ecological or environmental motivations for resource conservation (Goldsmith, Flynn, & Clark, 2014; Lastovicka et al., 1999). Following the history of frugality in consumer research, we adapt the definition of frugality from Lastovicka et al. (1999) by removing reference to strictly consumer behaviors and by highlighting the inherent opportunity costs associated with acquiring new resources. Thus, frugality is defined as an individual trait reflecting one’s general preference to (a) conserve resources and (b) apply an economic rationale in the acquisition of resources (i.e., assessing the opportunity cost of newly acquired resources).

Frugality is different from the related construct of self-control in important ways. Although frugality and self-control share conceptual similarity in that both are traits which impose self-constraints in self-regulation, they differ in why self-constraints are imposed. Within a self-regulation framework, frugality imposes consistent self-constraints on resource acquisition and deployment due to long-held preferences of resource conservation, while self-control imposes temporary constraints on long-held preferences of resource acquisition and deployment.
in an attempt to reach long-term goals. Simply put, frugality can be viewed as an individuals’ preference for conserving resources and getting more out of less regardless of situational conditions. That is, these individuals view resource conservation and doing more with less as “who they are.” Conversely, self-control is an individuals’ recognition that conserving resources and “getting more out of less” might not be their preference, but something that has to be done in a given moment to pursue a goal (i.e., a known end state). We expand on this distinction below.

### 3.2.2 Self-Control

Self-control is an individual trait reflecting one’s general tendency to adhere to an action plan to attain valued goals in the face of momentarily more alluring alternatives (Duckworth et al., 2019). Self-control involves the property of denying a preference to indulge in a more gratifying current situation in order to achieve a desirable future situation (i.e., delayed gratification) (Lian et al., 2017; Mischel, 2014; Mischel, Shoda, & Rodriguez, 1989; Tice & Bratslavsky, 2000). To illustrate this, consider a nascent entrepreneur who faces a self-control conflict when choosing between only purchasing essential resources for their business or upgrading a working economy company car (i.e., functional and accomplishes to goals of the business) to a luxury company car (i.e., a non-essential purchase). Purchasing an expensive luxury car is extremely fun in the moment, but not valued in the long run particularly because this entrepreneur dreams of taking her business to a national presence. In contrast, dealing with issues related to a used car (i.e., repairs and maintenance) is not very fun in the moment, but valued in the long run, because choosing to purchase an expensive car would delay her goal of growing her business. Thus, the entrepreneur exerts self-control when choosing the goal—congruent response (e.g., purchasing only the essentials) rather than the goal—incongruent response (e.g., unnecessarily upgrading to a luxury vehicle).
Two aspects differentiate self-control from related constructs. First, self-control is a self-initiated constraint on short-term desires as they relate to reaching long-term goals. For example, if an entrepreneur chooses to follow a budget, they are exercising self-control (Baumeister, 2002; Kamawar et al., 2018). Second, self-control is only relevant to situations in which one option is more valuable in servicing long-term goals than the other, but the less valuable option for the long-term goal is more attractive in the present due to individual preferences (Hall & Fong, 2007). In other words, choosing the less valuable option for the long-term goal is more gratifying in the moment because it aligns with current preferences, but will likely be regretted because it is counter to long-term goals. Therefore, goals are organized hierarchically, with lower-level goals serving as means to higher-level goals (Kruglanski 1996). Importantly, goal hierarchy forms only in situations when a desired end state is known to individuals (i.e., possess a goal), because it gives meaning to which action paths or options are more valuable in reaching the desired end state. In this way, trait self-control ranges from low to high and captures the tendency to set aside what individuals merely want to do in the moment for what they want in the future.

Taken together, we propose that trait self-control characterizes a more deterministic mentality in the self-activation of one’s behavior to reach a desired goal (e.g., diet and exercise will result in losing weight) (Baumeister, 2002; Vohs & Faber, 2007), while trait frugality stimulates resourceful behaviors that are not necessarily predetermined as part of one’s master plan in reaching a desirable outcome. An entrepreneur high in frugality is not necessarily planning for why they are saving resources and how to use them in the future – it is simply who they are and what they do. This distinction between trait frugality and self-control as antecedents has important implications for the types of resource use behaviors individuals enact in their entrepreneurial endeavors. In the following section, we develop a series of hypotheses using self-
regulation theory to explain these distinct differences between trait frugality, self-control, and resource use behaviors.

4. Hypothesis Development

Overall, the development of our proposed model specifies two general principles. First, that trait frugality and self-control are conceptually different, and second that these differences are related to different conceptualizations of resource use behavior by entrepreneurs. To aid in our hypotheses development, we provide a model of our proposed relationships (see Figure 1).

**Figure 1.** Theoretical model: Self-regulatory traits and relationships to the resource use behaviors of entrepreneurs.

**4.1 Frugality and Effectuation Resource Use Behaviors**

Frugality is theorized to impose self-constraints for resource acquisition and use behaviors due to long-held preferences for conserving resources. Therefore, entrepreneurs with high trait frugality are not necessarily planning for why they are saving resources and how to use them in the future. Frugality stimulates resourceful behaviors that are not necessarily...
predetermined as part of one’s master plan in reaching a desirable outcome – it is simply what they do. Thus, we assert that frugality imposes self-constraints on resource use to align with one’s long-held individual preferences of conserving resources regardless of current circumstances. In other words, entrepreneurs with high frugality start with who they are and what they have and enact resource use behaviors to align with this referent.

Effectuation is a resource use approach that emphasizes starting with the means, rather than the end goal, in mind (Sarasvathy, 2001). Effectuation behaviors consist of experimentation, affordable loss, and flexibility (Chandler et al., 2011). According to Chandler et al. (2011), experimentation is trying different approaches before settling on a business concept, affordable loss refers to assessing how much one is willing to lose and experimenting within the bounds of that constraint, and flexibility refers to adapting to changing circumstances, unexpected events, and new knowledge. As a formative construct, each dimension represents a behavioral domain that entrepreneurs may or may not exhibit in relation to one another (Edwards, 2011; Edwards & Bagozzi, 2000) and thus can be examined at the dimensional level (c.f., Scheaf et al., 2019).

To understand why frugality will relate to effectual behavior, we suggest that entrepreneurs higher in frugality have a preference to conserve their resources despite not knowing how the future will play out. We also contend that trait frugality reinforces one’s personal standards for resource use and acquisition, which results in consistent behavioral responses aimed at conserving resources and acquiring resources economically, rather than a more fixed attempt to control the future itself through short-term sacrifices (i.e., self-control and causation logic).

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1 In operationalizing the effectuation construct, the dimension of pre-commitments was found to theoretically align with causation, thus highlighting the conceptual overlap between causation and effectuation logics in venture creation.
Accordingly, we suggest that frugality will positively relate to effectuation behaviors because entrepreneurs will seek to conserve resources and acquire resources economically to remain consistent with their personal standards for resource use. In this way, we expect entrepreneurs with high frugality will seek to create resource slack (i.e., flexibility) and delay the acquisition of new resources (i.e., affordable loss) because their long-held preference to conserve resources influences their referent standard of appropriate resource use behaviors. Furthermore, considering the value consciousness and inherent opportunity costs associated with trait frugality, we expect that entrepreneurs with high frugality will engage in more experiments (mental and economical) with different resource alternatives in order to distinguish between the most economical means to align with their resource use preferences than entrepreneurs with low frugality. For example, entrepreneurs high in frugality may be more inclined to experiment with new products and services in their venture as long as the resource-cost burden is nominal (e.g., using a 30-day free trial for a new budgeting software). Based on this line of reasoning, we propose the following hypotheses.

_Hypothesis 1: Frugality will be positively related to engagement in affordable loss behaviors._

_Hypothesis 2: Frugality will be positively related to engagement in flexibility behaviors._

_Hypothesis 3: Frugality will be positively related to engagement in experimentation behaviors._

### 4.2 Frugality and Bricolage Resource Use Behavior

Bricolage is the process of conserving resources (i.e., making do) for the purpose of creating and exploiting new opportunities. ‘Making do’ refers to using or combining resources on hand in a new way to solve problems. Bricolage is distinct from causation—in that bricolage
represents an action focused on resource use, which can be planned (Baker, 2007), while causation represents a planning logic and sticking to a sole course of action—and effectuation—in that entrepreneurs do not act in ways to shape near-term future states to match current resource stocks. Rather, bricolage behaviors encapsulate a process that entrepreneurs enact in the development of their ventures, which includes (a) the refusal to enact limitations to commonly accepted definitions of material inputs, (b) the combination and reuse of resources for new purposes, and (c) the utilization of resources at hand (Baker & Nelson, 2005). The underlying assumption in the bricolage framework is that entrepreneurial action occurs in a resource scarce environment. Thus, an entrepreneur’s response to resource scarcity represents the driving factor for ‘making something from nothing’ (Baker & Nelson, 2005, p. 340).

The bricolage literature’s focus on resource scarcity has generated, to date, a notable lack of attention on the entrepreneurial actor (Welter, Mauer, & Weubker, 2016). Although bricoleurs often operate in resource-constrained environments, the tendency to self-identify and take pride in doing things differently (e.g., Gioia, Schultz, & Corley, 2000; Rao, Davis, & Ward, 2000) suggests the need for a complementary perspective on the actor.

Following the tenants of self-regulation theory, we assert that entrepreneurs with high frugality have a long-held preference for conserving their resources and economically acquiring resources, thus “getting more out of less” in order to maximize the expected value of resources on hand for the purpose of achieving long-term venture goals. This preference produces a personal standard for appropriate resource acquisition and use behaviors. Thus, in our next hypothesis, we suggest that entrepreneurs higher in frugality are more likely to regulate resource behaviors to align with this standard and enact more bricolage behaviors (i.e., making do with existing resources).
Hypothesis 4: Frugality will be positively related to engagement in bricolage behaviors.

4.3 Self-Control and Causation Resource Use Behaviors

Entrepreneurs are motivated to create successful ventures, and although definitions of success may vary between entrepreneurs, a minimal view of success is acquiring and deploying resources in an effective way to generate enough revenue to maintain operations (Brush, Greene, & Hart, 2001). However, entrepreneurs operate in conditions of uncertainty and therefore cannot know how and when to optimally acquire and deploy resources (McMullen & Shepherd, 2006). The inability to know for certain when and how to acquire, reassemble, and deploy resources generates the possibility of exercising poor judgment in making resource related decisions (Klein, 2008). The chance for exercising poor judgment is heightened when individuals do not have preferences for conserving resources, which can lead to frivolous resource use and impulsive purchasing (c.f., Baumeister, 2002). In this way, entrepreneurs regulate resource acquisition and deployment behaviors in attempts to avoid poor entrepreneurial judgment and ultimately venture failure (Van Gelderen, Kautonen, & Fink, 2015).

Following the theoretical line of thinking established above, if entrepreneurs do not have long-held preferences for conserving resources, but have goals for maintaining or growing their ventures, then we expect entrepreneurs to self-impose constraints on resource acquisition and use behaviors to align with a set of pre-determined behaviors to reach envisioned end states.

Given that a causation approach to entrepreneurship represents a deterministic view of the venture creation process where ends states are known (Sarasvathy, 2001; Shah & Tripsas, 2007), entrepreneurs will start with a predetermined goal and work backwards to identify and subsequently execute the means to achieve the desired goal. Thus, the entrepreneur is attempting to control an unknown future through detailed planning as a means to reduce uncertainty and
thus get the most out of limited resources (Fisher, 2012). However, not all individuals who establish a plan to reach a goal follow through—some do fail (e.g., Jenkins, Wiklund, & Brundin, 2014).

Accordingly, we assert that self-control is an important trait in determining whether entrepreneurs regulate resource use behaviors to enact causation approaches to entrepreneurship. Self-control is an individual trait reflecting one’s general tendency to adhere to an action plan to attain valued goals in the face of momentarily more alluring alternatives (Duckworth et al., 2019). In this way, we expect a positive relationship between individuals with high levels of trait self-control and the engagement in causation-based entrepreneurial behaviors because individuals with high self-control are more likely to effectively regulate their behavior to adhere to the referent performance standards associated with goal attainment than individuals with low self-control. Following this logic, we expect that self-control will positively relate to a causal approach to resource use during venture creation and hypothesize the following:

**Hypothesis 5: Trait self-control will be positively related to engagement in causation-based entrepreneurial behaviors.**

Although the topic of pre-commitments has been discussed as a dimension of effectuation (Chandler et al., 2011; Sarasvathy, 2001), it has been more conceptually related to causation behaviors (McKelvie et al., in press). Pre-commitments refer to establishing early relationships with customers, suppliers, and other strategic partners to reduce uncertainty and spread responsibility to other stakeholders. In this way, entrepreneurs establish *known* ends and seek to organize *unknown* means to service these relationships. For example, an entrepreneur may develop a relationship with a sole supplier in order to receive a discount on bulk pricing in the future. Thus, in this scenario, the entrepreneur has committed to a specific path and potentially
closed alternative resource paths. Thus, engaging in pre-commitments represents a more inflexible position and directly reduces an entrepreneur’s ability to adapt or change goals, which is counter to effectuation theory (Sarasvathy, 2001; 2008). Indeed, Chandler and colleagues (2011, p. 379) discuss how entrepreneurs use “pre-commitments and strategic alliances in an attempt to control an unpredictable future.” Utilizing pre-commitments becomes an attractive option when the potential for loss is high, thus entrepreneurs will use pre-commitments as a means to reduce future uncertainty in an attempt to control or “de-risk” the decision context (Dew & Sarasvathy, 2007; Sumner, 1987). In doing so, the entrepreneur self-restricts their current position in an attempt to control an unknown future.

In the same vein as causation, we assert that self-control is an important trait in determining whether entrepreneurs regulate resource use behaviors to enact pre-commitments. Specifically, individuals with high levels of trait self-control are likely to enact higher pre-commitment entrepreneurial behaviors than with low levels of trait self-control. Following this logic, we hypothesize the following:

\[ \text{Hypothesis 6: Trait self-control will be positively related to engagement in behavioral pre-commitments.} \]

5. Method

Following best practices for studies that introduce a novel concept or conceptualization to test theory (c.f., Kier & McMullen, 2018; Scheaf et al., 2019), it is first necessary to develop a measure of frugality before testing focal hypotheses. In this section, we describe our method for measure development and empirical testing, in which a series of confirmatory factor analyses and hierarchical regressions are applied to assess the reliability and validity of our frugality measure. We proceed with a 3-stage method for accumulating evidence of validity and reliability
for a frugality measure. In stage 1, a definition is established, items developed, and content validity is assessed. In stage 2, multiple methods are used to empirically assess convergent, and discriminant validity of our proposed measure. Finally, in stage 3, we test our focal hypotheses in order to build evidence for the predictive and incremental validity of frugality as an antecedent of resourceful entrepreneurial behaviors.

5.1 Stage 1 of Scale Development: Content Validity

To establish the content validity for the frugality scale, 206 items were constructed using 15 doctoral students trained on Hinkin’s (1998) criteria for item development—this initial number of items was reduced to 35 items, and then 7 items, through two independent sample screening processes. In the first screening process, the 206-item list was subjected to a formal item-by-item review (e.g., see Crocker & Algina, 1986), which assessed accuracy, redundancy, appropriateness, appearance of bias, and level of readability. Additionally, items were subjected to Lawshe’s (1975) quantitative method for establishing content validity. In this method, each judge reviewed all 206 items and rated whether the item was 1) not necessary, 2) useful, but not essential, or 3) essential to frugality as relevant to the definition. With these ratings, Lawshe’s content validity ratio (CVR) was calculated using the formula,

\[
CVR = \frac{(n_e - N/2)}{N/2}
\]

where \(n_e\) is the number of number of raters who rated the item essential to frugality and \(N\) is the total number of raters. Each expert then discarded or kept items based on a combination of the criteria outlined above and a cut-point for the CVR (e.g., a CVR below 0). Examples from the initial 35 item list included, “I always compare prices,” “My friends call me thrifty,” “I frequently make impulse purchases,” and “I stick to a strict budget.”

A second test for content validity on the remaining 35 items was conducted using a
sample of 60 naïve respondents (i.e., undergraduate students) in an entrepreneurship class at a large university located in the Southeastern United States. Following the approach of Schriesheim et al. (1993), the 35 items were randomly sorted across two separate pages and students were told to match each item using a rating scale from 1 (No match) to 5 (Excellent match) to determine the degree to which the item matched the specific dimensional definition of frugality (i.e., conservation or economical rational), which was defined at the top of each page. Items with the highest matching scores were considered for the final scale. Final scale items were selected that best matched the theoretical representation of frugality. Examples of dropped items from the list of 35 included items that measured impulsiveness, focused too heavily on opportunity costs (e.g., “Making purchases without considering other options is unwise”), were overly complex or ambiguous (e.g., “I try to stretch my money as far as I can”), or polarizing items (e.g., “I think carefully before making an expensive purchase”). Overall, using theory as our primary guide, a final measure of 7 items was selected for confirmatory testing and possible refinement (see section 5.2.2, below, for final items).

5.2 Stage 2 of Scale Development: Construct Validity

Construct validity is a process of naming and grouping phenomena. According to Shadish, Cook and Campbell (2002), construct inferences are fostered by (1) a clear definition, (2) carefully selecting items that match the construct, (3) assessing the match between items and constructs to determine if slippage between the two occurred, and (4) revising the construct definition in accordance. To address if slippage occurred, this study makes strong causal assumptions (Bollen, 1989) to empirically test the dimensionality of the proposed construct of frugality through confirmatory factor analysis (CFA). In addition, convergent and discriminant validity were assessed through reliability analysis, a validity matrix, Fornell and Larker’s (1981)
method for assessing discriminant validity, and likelihood ratio-tests between frugality and conceptually similar constructs.

5.2.1 Sample for Construct Validity

We surveyed active entrepreneurs defined as individuals actively deploying resources towards new ventures in conditions of uncertainty (Klein, 2008). Specifically, we used a panel of pre-screened entrepreneurs classified as founders of new ventures within the past 5 years as the sampling frame. The panel was constructed using a combination of university connections, entrepreneurship centers, and invitations solicited through crowdfunding websites. Using such a broad approach to the panel’s construction resulted in a diverse set of entrepreneurs, and we sought to reflect the broader population of entrepreneurs and optimize generalizability.

Data were collected over two time periods. Each respondent received a $10 gift card for completing part one and a second $10 gift card for completing part two. At time one, the entrepreneurs were emailed a survey link for all independent, control, and demographic variables (please see below for measure descriptions). A total of 219 study invitations were sent and 178 were completed (82% response rate). Time two invitations were sent approximately one week after part one completion and contained all dependent variables (i.e., causation, bricolage, and effectuation). A total of 155 respondents responded to part two (87% retention rate). Imputation of data with less than 13% missing data is acceptable (e.g., see Enders, 2010). Data for time two was imputed using the multiple imputation through chained equations (i.e., mice) package in R (Stef van Buuren & Groothuis-Oudshoorn, 2011), with 500 simulations utilizing predictive mean matching of our study variables.

We followed the recommendations of Podsakoff, MacKenzie and Podsakoff (2012) to reduce common method bias and careless responses. First, we used time-lagged dependent
variables to reduce the chance that common method variance between independent and dependent were artificially inflated or biased their association. Second, items were randomized to prevent response patterns and “do not respond” items were inserted as attention checks. Overall, no responses were removed. In addition to these methodological design decisions, we followed Kibler et al. (2019) and conducted a post-statistical procedure to assess the amount of common method variance associated with our focal independent variables collected in time one (i.e., risk taking, frugality, and self-control). Following the procedure highlighted in Podsakoff et al. (2003), all observable variables were loaded onto a common latent factor. Following recommendations from Lowry et al. (2013), we squared the unstandardized loading associated with the common latent factor \((0.496^2 = 0.246)\), which highlighted that CMV accounted for 24.6% of the variance, which is below the 50% threshold recommended by Lowry et al. (2013) indicating that CMV does not represent a concern for the regression estimates in the current study. Thus, multiple methods indicated that CMV is not a critical concern for our study.

Demographics for the sample included age in years (\(M = 37.42\)), gender (49% female), education (77% with a 4-year college degree), ethnicity (63% white), years of entrepreneurial experience (\(M = 7.41\)), number of prior start-ups (\(M = 2.09\)), firm age in years (\(M = 3.61\)), firm size in number of employees (\(M = 6.98\)), financial status (52% indicating they have enough resources to run the business for 3 or more months), perceived access to venture financing (46% indicating moderate to full satisfaction with access to resources), and industry (43% considered themselves to a part of the manufacturing industry). Data were analyzed using the programming language R (version 3.3.2) and the lavaan package (R Core Team, 2016; Rosseel, 2012).

5.2.2 Measures for Construct Validity
Means, standard deviations, and correlations for all variables are displayed in Table 1. The validity matrix shown in Table 2 highlights the relationships (described below) related to convergent validity.

Control variables—used to rule out alternative explanations for the hypothesized relationship between frugality with bricolage and persistence—included (a) gender (1 = male, 2 = female), (b) age in years, (c) education (1 = less than high school, 2 = high school, 3 = some college, 4 = 2 year degree, 5 = 4 year degree, 6 = professional degree, 7 = doctorate), (d) ethnicity (1 = White, 2 = Black or African American, 3 = American Indian or Alaska Native, 4 = Asian, 5 = Native Hawaiian or Pacific Islander, 6 = other), (e) entrepreneurship experience in years, (f) number of prior startups, (g) firm age in year, (h) firm size in number of employees, (i) satisfaction with access to resources on a 1-to-5 Likert scale, (j) financial status of the venture measure in months remaining of capital\(^2\), and (k) industry (1 = non-manufacturing, 2 = manufacturing).

In addition to control variables, we also collected variables to assess the convergent validity between frugality and similar constructs by means of correlation. Specifically, we collected (a) conscientiousness (Gosling et al., 2003), (b) rational decision-making (Scott & Bruce, 1995), (c) long-term orientation (Bearden, Money, & Nevins, 2006), (d) spontaneous decision-making (Scott & Bruce, 1995), and (e) emotional stability (Gosling et al., 2003). All scales used were collected on items identical to their source article. All variables, except two, are expected to significantly and positively relate to frugality. Spontaneous decision-making style and emotional stability are the two that are expected to negatively relate, and not relate, to

\(^2\) Financial status was a single item from Wiklund and Shepherd (2005) measured by the question, “What is the current financial status of your venture?” which ranged from, (1) “It is not sufficient to formally incorporate the venture” to (5), “It is sufficient to finance the venture for more than 6 months.”
frugality, respectively. These presumptions are based upon aforementioned research on frugality in consumer behavior highlighting a low emotion and rational approach to resource decisions (Lastovicka et al., 1999), our definition of frugality that incorporates long-term orientation, and a theoretical connection to conscientiousness through Protestant Work Ethic (Furnham, 1984).

For testing the predictive validity of frugality, in addition to the control variables mentioned already, multiple theoretically meaningful covariates were included as follows: product versus service orientation of the firm, trait risk, perceived innovativeness, and self-control. In relation to industry type, product versus service oriented firms are expected to differ with regards to physical capital required to develop and sell new products, which has been suggested as a covariate with bricolage behaviors (Senyard et al., 2014). Product vs. service orientation was measured by the question, “To what extent do you consider your new venture to be product or service oriented?” This question was on a 1-to-5 Likert scale, which ranged from 100% product oriented to 100% service oriented with 25% increments.

Trait risk was measured using the Jackson (1994) personality inventory. Risk taking has long been associated with entrepreneurial behavior and past research has found that risk taking propensity is higher in founding entrepreneurs (Begley & Boyd, 1987) and related to entrepreneurial intentions (Zhao, Seibert, & Lumpkin, 2010). Frugality is expected to be unrelated to trait risk as recent research indicates that trait risk and self-regulatory control are unrelated (Duell et al., 2016). However, we do include risk as a covariate from past research highlighting the association of risk taking and bricolage behaviors at the firm-level (e.g., see Salunke, Weerawardena, & McColl-Kennedy, 2013). Risk taking was measured using 10 items on a 1-to-7 Likert scale measuring agreement. Reliability for the measure was $\alpha = .84$. 
Innovativeness was measured by the question, “What is the degree to which you view your firm as being innovative?” and is a covariate of bricolage behaviors (Senyard et al., 2014). Furthermore, effectuation has been found to be predictive of successful new product development projects as compared with causal logics for more innovative projects (Brettel, Mauer, Engelen, & Küpper, 2012). In addition, innovativeness has closely been associated with the risk propensity of entrepreneurs (Lumpkin & Dess, 1996). Perceived innovativeness of the venture was measured using a 1-to-5 Likert scale with the anchors of “not innovative” and “radically innovative.”

Self-control is included as an expected covariate of frugality to test the differential hypothesized effect of self-control versus frugality on entrepreneurial resourceful behaviors. Self-control is the most commonly associated construct used to measure the concept of self-constraint with regards to impulsive purchasing behaviors (e.g., see Baumeister, 2002). Self-control has also been found to play a central role in entrepreneurial decision making with regards to opportunity evaluation and goal setting (Baron, Mueller, & Wolfe, 2016). Self-control was measured using the brief 13-item measure of self-control from Tangney et al. (2004). Example items included, “I am good at resisting temptation” and “I wish I had more self-discipline.” Reliability for the measure was α = .83.

Frugality, developed and validated in sections 5.1 and 5.2, was measured using 7 items on a 1-to-7 Likert scale ranging from (1) Strongly disagree to (7) Strongly agree. For each item, frugality was contextualized to the entrepreneurial venture by adding, “With respect to resources in my venture…” before each item in the construct. Items included the following: “I am frugal” and “I try to get as much use out of things before disposing of them,” “If you can reuse an item you already have, there’s no sense in buying something new,” “I try to avoid paying more for
something than it is worth,” “I tend to be conservative with my money,” “I make economical choices when purchasing things,” and “I make rational choices when shopping.” Reliability for the measure was α = .82.

Dependent variables included the constructs of causation, effectuation, and bricolage. Causation and effectuation were both measured from Chandler et al. (2011) on a 1-to-7 Likert scale of agreement. Causation contained seven items on a 1-to-7 Likert scale of agreement (α = .81). Effectuation was measured with four dimensions: (1) experimentation (four items, α = .62), (2) affordable loss (three items, α = .82), (3) flexibility (four items, α = .67), and (4) pre-commitments (two items, r = .43, p < .001). Example items included, “We designed and planned business strategies,” “We experimented with different products and/or business models,” “We were careful not to commit more resources than we could afford to lose,” “We allowed the business to evolve as opportunities emerged,” and “We use pre-commitments with customers and suppliers as often as possible,” respectively. Bricolage behavior was measured using the behavioral construct developed and tested by Davidsson, Baker and Senyard (2017). The measure of bricolage behaviors contained 8 items on a 1-to-5 Likert scale ranging from never to always. Example items included, “We are confident of our ability to find workable solutions to new challenges by using our existing resources” and “We deal with new challenges by applying a combination of our existing resources and other resources inexpensively available to us.” Reliability of the measure was α = .80.

In total, 17 independent variables were included in the hierarchical regression analysis for each focal dependent variable. An a priori power analysis suggested that testing the incremental validity of frugality with respect to 16 other variables requires a sample size of 81 respondents to detect an effect size of .10 at a power level of .80 and alpha level of .05.
5.2.3 Results for Convergent and Discriminant Validity

A bootstrapped confirmatory factor analysis (CFA), with n = 500 replications, was conducted on the data collected from our sample of 178 entrepreneurs, regarding the frugality scale, which indicated excellent model fit following recommendations from Hu & Bentler (1998) ($\chi^2(12) = 18.87, p = .092, \text{CFI/RNI} = 0.98, \text{TLI/NNFI} = 0.97, \text{IFI} = 0.98, \text{RMSEA} = .057$) and was identified via the 3 indicator rule (Bollen, 2016; Bollen 1989; Davis, 1993). This was not surprising as the reliability of the frugality scale was acceptable ($\alpha = .82$) and the validity matrix illustrated the expected relationships.

Here, results highlighted that frugality was correlated as expected with similar constructs. Frugality was positively related to conscientiousness ($r = .26, p < .001$), self-control ($r = .35, p < .001$), rational decision-making ($r = .40, p < .001$), and long-term orientation ($r = .29, p < .001$). And, as expected, frugality was negatively related to spontaneous decision-making ($r = -.28, p < .001$) and not related to emotional stability ($r = .11, p = .150$). See Table 2 for detailed results.

Discriminant validity was established using Fornell and Larcker’s (1981) method. Self-control, bricolage, affordable loss, and flexibility were used to assess the discriminant validity of frugality with similar constructs. The AVE of the frugality measure relative to the other established constructs showed the AVE for frugality was larger than all of the correlations with other constructs, which indicated no other construct accounted for more variance than did the items contained within the frugality scale. To further assess discriminant validity, likelihood-ratio tests were conducted by constraining the correlation to 1.0 between each similar construct with frugality. In other words, this method allows for a formal statistical test of if frugality is
unique from each measure. Results from each test (see Table 3) indicated that the overall CFA model fit with all constructs (i.e., frugality, self-control, bricolage, affordable loss, and flexibility)\(^3\) freely estimated (i.e., not constrained to unity) provided the best fit. Thus, frugality is empirically distinct from self-control, bricolage, affordable loss, and flexibility.

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Insert Table 3 about here
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5.3 Hypotheses Testing and Predictive and Incremental Validity

Having established evidence for the convergent and discriminant validity of the frugality scale, our next step was to establish the incremental (Sechrest, 1963) and predictive validity by testing our self-regulatory theory. Not only is establishing predictive validity required to fully demonstrate construct validity—that is, having frugality predict theoretically relevant outcomes within the context of entrepreneurship is necessary (Shadish et al., 2002). In doing so, we seek to advance our understanding of enacting resourceful behaviors via our focal hypotheses.

Hypotheses 1, 2, and 3 examined frugality with regards to effectuation behavior. Table 4 provides detailed results of relationship between frugality and the effectuation behaviors of experimentation, affordable loss, and flexibility. Hypotheses 1 and 2 were both supported as frugality positively related to affordable loss \((b = .38, t = 3.28, p = .001)\) and flexibility \((b = .15, t = 2.57, p = .011)\), respectively. The models explained 23\% of the variance in affordable loss \((R^2 = .21, F (17) = 2.77, p = .001)\) and 18\% of the variance in flexibility \((R^2 = .18, F (17) = 2.10, p = .001)\). Self-control did not relate to any dimension of effectuation. In sum, controlling for self-

\(^3\) Note. All CFA analyses presented are bootstrapped with \(n = 500\) replications and items were parcelled to assess model fit. Psychometrically, parcels are advantageous over item indicators in that they reduce the chances of correlated errors (Little et al., 2002) and sampling error (MacCallum et al., 1999). Parcels were created for each dimension by averaging items with respect to the similarity of content within each dimension.
control, frugality was positively related to the affordable loss and flexibility components of effectuation. However, hypothesis 3 was not supported—frugality was not positively related to experimentation ($b = -.13$, $t = -1.49$, $p = .139$).

Hypothesis 4 was supported (see Table 5)—frugality positively related to bricolage behaviors ($b = .16$, $t = 3.10$, $p = .002$) above and beyond existing antecedents. The model explained 29% of the variance in bricolage behavior ($R^2 = .29$, $F (11) = 3.80$, $p < .001$). Last, the incremental validity of frugality was tested for affordable loss, flexibility, and bricolage behaviors. Controlling for all other variables in the model, adding frugality explained an additional 6% of the variance in affordable loss ($R^2$ change from .17 to .23; $F(1) = 10.04$, $p = .001$), an additional 4% of the variance in flexibility ($R^2$ change from .17 to .23; $F(1) = 6.59$, $p = .011$), and an additional 5% of the variance in bricolage ($R^2$ change from .17 to .23; $F(1) = 9.63$, $p = .002$). Overall, results support the incremental and predictive validity of frugality.

Hypothesis 5 was supported—controlling for frugality, self-control positively related to causation ($b = .40$, $t = 5.07$, $p < .001$). The model explained 29% of the variance in causation ($R^2 = .29$, $F (17) = 3.76$, $p < .001$). Similarly, hypothesis 6 was supported as self-control positively related to pre-commitments ($b = .31$, $t = 2.54$, $p = .012$), a scale theoretically aligned with causation. The model explained 21% of the variance in pre-commitments ($R^2 = .21$, $F (17) = 2.57$, $p = .001$). Controlling for all other variables in the model, adding self-control explained an additional 12% of the variance in causation behavior ($R^2$ change from .17 to .29; $F(1) = 25.71$, $p < .001$) and an additional 3% of the variance in pre-commitments ($R^2$ change from .18 to .21; $F(1) = 6.44$, $p = .012$). Frugality was not related to causation or pre-commitments.

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Insert Tables 4 and 5 about here
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6. Discussion

Entrepreneurs are faced with the challenge of resourcing their ventures, which has led to the emergence and proliferation of a large research literature focused on entrepreneurial resourcefulness (Baker & Nelson, 2005; Bradley et al., 2011; Bloodgood et al., 2014; Penrose, 1959; Rutherford, 2015; Sarasvathy, 2001; Zhang, Soh, & Wong, 2010). This literature has been predominantly centered on the idea that entrepreneurs must deal with resource constraints while simultaneously managing unknown or risky futures, and thus resourcefulness-related behaviors, such as effectuation (Sarasvathy, 2001) and entrepreneurial bricolage (Baker & Nelson, 2005), have been developed to explain this phenomenon. With our study we add a necessary, complementary, perspective—that is, we posit that individuals bring their own individual personalities and traits to their ventures, and that there are certain traits that enact self-imposed resource constraints. From our study, we introduce trait frugality as an antecedent to resourceful entrepreneurial behavior and identify how individual traits (i.e., frugality and self-control) provide differentiation between causal and effectual logics applied in the resourcing of a new venture. Put succinctly, findings supported our general premise—individual-level traits are positively associated with resourceful entrepreneurial behaviors (i.e., causation, effectuation, and bricolage). Multiple theoretical as well as practical contributions emerge from these findings.

6.1 Theoretical Implications

A key theoretical contribution is in our application of self-regulation theory (Bandura, 1991), and our findings bolster the contention of Aldrich and Yang (2012), who state that “habits such as timeliness and frugality, what children learn within their families, could contribute to successful start-up activities” (p. 10). In applying a social-cognitive approach, and introducing trait frugality to explain resourceful behavior, we provide an understanding for why
entrepreneurs may artificially constrain their resource environment, which results in a preference towards self-regulatory discipline over one’s resources for the purpose of achieving one’s longer-term goals. Put differently, using SRT we provide theoretical support for a cognitive perspective of resourceful entrepreneurial behavior, and explain why some entrepreneurs are predisposed towards resourceful behavior apart from, or in addition to, environmental influence.

According to research from Amezcua, Grimes, Bradley and Wiklund (2013), just because one operates in a resource munificent environment does not mean the entrepreneur or firm will survive or grow. Instead, their results showed that resources must fit the needs of the emerging organization to have a positive effect on venture survival (Amezcua et al., 2013). Our findings bolster this premise, and in line with our definition of frugality we expect that frugal entrepreneurs will be more capable of navigating and shaping their resource environment in order to make sure that the required resources for the survival of their firm add value to the overall longer-term success of the entrepreneur. This perspective of resource fit, and how frugal entrepreneurs prioritize resources has important implications for long-term venture success.

Second, our work further develops the concept of frugality by applying theoretical rigor and developing an associated measure for a trait disposition not yet specified in the entrepreneurship literature. Through an extensive construct development and validation process we introduce frugality as a construct that can be used to test entrepreneurial theory concerning the use of resources during the venture creation process. Our contribution here addresses calls from researchers to examine how individuals approach the conservation of resources (O’Shea, Buckley & Halbesleben, 2017) and how frugality relates to resourceful behaviors exhibited during the venture creation process (Williams et al., 2019). Results from our study supported a unidimensional measure of frugality that is context specific to the use of resources in one’s
venture. Factor structure, convergent, and discriminant validity were strong and highlighted frugality as distinct from similar constructs such as self-control and entrepreneurial bricolage. In sum, providing a measure of frugality allows for future researchers to more clearly articulate the interaction between individuals and their environment with respect to resource-based decisions.

Finally, our results extend theory on effectuation and entrepreneurial bricolage by highlighting frugality as a trait antecedent to both behaviors. Bricolage and effectuation behaviors represent an entrepreneurial behavior more aligned with the resourceful behaviors of entrepreneurs as opposed to causation (Bradley, 2015; Fisher, 2012; Sarasvathy, 2001). Through the juxtaposition of trait self-control and frugality with respect to resourceful entrepreneurial behaviors, we provide a trait differentiation for how causal and effectual logics are activated in entrepreneurs. Specifically, our results show that trait self-control relates positively to causal logic in resourcing one’s venture (i.e., causation and pre-commitments), while trait frugality relates positively to effectual logics (i.e., affordable loss and flexibility).

Similarly, our work provides an extension to the boundary conditions of entrepreneurial bricolage. Until now, an individual-level perspective has not been applied to explain why an individual entrepreneur engages in bricolage irrespective of environmental or situational constraints (c.f., Welter et al., 2016). Through our results, we show that frugal entrepreneurs are more likely to engage in bricolage behavior as a result of their preference towards self-restraint in their use and deployment of existing resources, thus directly related to the conceptual definition of entrepreneurial bricolage (Baker & Nelson, 2005). This established relationship between frugality and bricolage behavior supports the contention that both individual traits and environmental factors help explain meaningful variance in the behaviors of entrepreneurs.
(Shane, 2003), and directly supports recent calls for additional research on decision-making in the context of entrepreneurship (Shepherd, Williams, & Patzelt, 2015).

Overall, introducing self-regulatory theory to explain resourceful entrepreneurial behavior provides an improved understanding for why entrepreneurs engage in specific resourceful behaviors. Highlighting the difference between trait frugality and self-control offers a clearer understanding for why an entrepreneur may continue to conserve resources despite changing environmental or situational conditions (i.e., resource abundance or goal attainment). Results from the current study provide a foundation from which future research can more accurately determine the individual and environmental determinants of resourceful behavior.

6.2 Limitations and Future Research

We note the following limitations and associated directions for future research. First, we opted for a degree of control to test the new measure of frugality and to rule out potential confounds. However, this rendered our sample of respondents solely from the United States, which does not allow for any cross-cultural generalizations of frugality. Future research can advance our work by looking at frugality (as well as self-control) in different cultures. Related, future research is encouraged to look at the construct of frugality in differently sized ventures with a wide array of firm ages and industries represented. Similarly, we believe a valuable future research topic will be to assess the role of frugality across multiple levels of analysis (i.e., individual, team, and firm). For example, understanding how frugality operates at the team level and how team dynamics may change the relationship between individual frugality and entrepreneurial behavior may enhance our understanding of how resources are selected, prioritized, and used during the venture creation process. We hope that researchers will also take the opportunity to explore frugality across individual and national socioeconomic gradients.
Regarding directions for future research, frugality did not relate to experimentation behavior as hypothesized—and, we caution future research relating frugality to the omnibus construct of effectuation behavior. Rather, we recommend future research to conduct experiments to determine if the environmental context (e.g., munificence or uncertainty) moderates the behavior of frugal entrepreneurs with respect to resourceful behaviors. Similarly, frugality provides a new construct to empirically test recent theoretical developments in terms of resourcefulness. For example, future work on entrepreneurial identity (Fisher & Kotha, 2015; Powell & Baker, 2014; Powell & Baker, 2011) and in building resilience after resource shock or job loss (Williams & Shepherd, 2016; Shepherd & Williams, 2018) could be exciting to explore. For identity theory, the idea of frugality may represent a unique aspect of one’s entrepreneurial identity where resource-based decisions are fixed relative to the entrepreneur’s trait preference towards frugal behavior (e.g., see Dana, 1995; 2009).

Intriguingly, trait frugality reflects an effective capture and use of important resources with long-term goals in mind. This does not reflect a short-term mentality, but perhaps the desire to marshal resources with flexibility in mind. This marshalling of resources for flexibility could be seen as a mechanism to create resource slack. The idea of slack creation within new ventures, driven by trait frugality, is a novel idea that may provide important numerous theoretical advancements. Similarly, the orientation towards a long-term focus that is related to frugality may correlate positively with resilience and provide an explanation for why some entrepreneurs are more able to bounce back from resource shock than others. In other words, frugal entrepreneurs may be more resilient to firm failure as they have learned, over time, to focus on long-term goals and more effectively manage their resources in relation to future uncertainty. Future research on resourcefulness would benefit greatly from understanding the implications of
a frugal identity with respect to one’s well-being, and if these frugal entrepreneurs are more resilient to resource volatility within their environment.

Related to this line of thought, one intriguing area of research for future inquiry should focus on the stability of entrepreneurs’ frugality over time. Although we are inclined to think of this characteristic as primarily a trait, can it be changed? Put differently, with time, effort, and energy can someone become more frugal? Could we “prime” a frugal mindset in a field setting, or laboratory, in which entrepreneurs are induced to adopt a frugal approach in a randomized clinical trial? If so, how long would the manipulation of a more frugal mindset last—minutes, days, weeks? Perhaps the manipulation would last for longer? As the effective use of resources is a critical entrepreneurial behavior, we as researchers need to explore how the facilitation of adaptive mindsets can be encouraged. Recent work shows that individuals’ mindsets can indeed be changed in the domain of entrepreneurship (e.g., Burnette et al., in-press), and a study that takes a randomized controlled experiment approach related to frugality would be appealing.

In the future, we expect that the foundational work we have done with regards to frugality will lead to advancements in literature on entrepreneurial bootstrapping behavior, defined as “starting a business with only financial capital possessed by the owners of the business or family members of the owners” (Rutherford et al., 2017, p. 659). Considering the trait nature of frugality, it may help provide a theoretical grounding for entrepreneurial bootstrapping behavior, which is based upon venture resourcing through individual means. A reliance on only behavior to explain resource bootstrapping has resulted in an ongoing theoretical debate for the past 30 years (Miao, Rutherford, & Pollack, 2017; Rutherford, 2015), which has resulted in bootstrapping being characterized as a construct in search of a theory (Rutherford et al., 2017).
Currently, a self-regulatory explanation for why entrepreneurs bootstrap their ventures does not exist, for which we offer frugality as a new opportunity to help explain bootstrapping behavior.

Finally, as our current study highlights how high levels of trait frugality positively relates to higher amounts of entrepreneurial resourceful behaviors, an interesting future research direction would be to investigate how and when low levels of frugality influence the venture creation process. Applying our definition, entrepreneurs with low frugality would be less likely to conserve resources and less likely to assess the opportunity costs associated with acquiring new resources. Entrepreneurs low in frugality may seek or acquire resources more quickly (e.g., hiring a CEO before a funding round) in lieu of evaluating long term opportunity costs associated with the acquisition of those new resources. These resource decisions could be a reflection of an entrepreneur low in frugality looking to overcome liabilities of newness or address legitimacy concerns with respect to their entrepreneurial venture (Bruderl & Schussler, 1990; Stinchcombe, 1965). Thus, we expect that frugality may also advance literature on resource dependence theory (RDT; Pfeffer & Salancik, 2003) and signaling theory (Connelly, Certo, Ireland, & Reutzel, 2011) by highlighting how individual traits interact with the role of external controls in the development of new ventures. In sum, low levels of frugality may prove beneficial in environments where new ventures are highly dependent upon external forces or in situations where resources are transient. Related, future research may also seek to investigate if entrepreneurs high in frugality choose not to exploit opportunities as a result of environments with higher levels of external control over resources.

6.3 Practical Implications

We highlight two practical implications of our work. First, we advocate that entrepreneurs self-assess their own frugality. When nascent entrepreneurs take stock of their
skills and abilities, entrepreneurial self-efficacy is often measured. But, we suggest that frugality could be among the characteristics measured. And naturally, the possibility of training entrepreneurs is relevant here; i.e., self-assessment can provide insights as to how entrepreneurs are predisposed to act in certain situations which may help practicing individuals optimize cash flow and make better long-term strategic decisions. And, if future research shows that frugality, or a more frugal mindset, can be induced (for an example of a mindset intervention, see Burnette et al., in-press), teaching entrepreneurs frugal skills may provide an opportunity to help entrepreneurs strategically prioritize resources and achieve long-term goals.

The second practical implication is that we might be able to inform individuals’ behavior on a large scale. For example, there is a sizeable community of frugal minds across the internet who have interesting methods for maximizing the value of resources. The online community Reddit has a sub-forum labeled, “/r/Frugal,” with over 1,000,000 members worldwide who actively discuss practical methods of being frugal—thus, our work could have a very tangible audience of individuals who will be eager to both self-assess, as well as adopt new behaviors. For example, displaying multiple methods and examples of frugal behavior to practicing entrepreneurs (and other interested individuals in the sub-forum on Reddit) may serve as a catalyst—and, if results from future research about priming a “frugal mindset” prove encouraging, this could hold great promise as a way to enable entrepreneurs to be more thoughtful with their use of resources.

6.4 Conclusion

Until now, the resourcefulness literature has primarily focused on environmental or situational constraints to explain why entrepreneurs engage in resourceful behaviors. In contrast, we provide a new perspective, with empirical support, asserting that self-imposed constraints
(i.e., trait frugality and self-control) associate with multiple, common, resource use behaviors that are demonstrated in the creation of a new venture (i.e., effectuation, bricolage, and causation). Applying a self-regulatory theoretical perspective is a novel contribution that adds needed insight, and nuance, to the literature on resourceful behaviors. We hope our work, and the numerous future research directions we outline, facilitate additional inquiry regarding the application of frugality to understand entrepreneurial behavior. More broadly, we hope the idea of self-imposed constraints stimulates new lines of theoretical inquiry concerning resource use in a variety of organizational contexts.
References


Table 1

Correlations and descriptive statistics

|          | M  | SD  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |
|----------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. Gender| 1.51 | 0.53 | 1.00 |
| 2. Age   | 37.42 | 11.34 | -0.14 | 1.00 |
| 3. Ethnicity | 2.21 | 1.92 | 0.21 | -0.07 | 1.00 |
| 4. Education | 4.93 | 1.14 | -0.06 | 0.20 | -0.17 | 1.00 |
| 5. E-experience | 7.41 | 8.23 | -0.19 | 0.64 | -0.09 | 0.05 | 1.00 |
| 6. Prior startup | 2.09 | 1.75 | -0.15 | 0.44 | -0.10 | 0.07 | 0.58 | 1.00 |
| 7. Firm age | 3.61 | 2.99 | -0.16 | 0.20 | -0.07 | 0.10 | 0.23 | 0.14 | 1.00 |
| 8. Firm size | 6.98 | 51.12 | -0.08 | 0.16 | -0.05 | 0.00 | 0.34 | 0.04 | 0.13 | 1.00 |
| 9. Venture stage | 2.49 | 1.00 | -0.03 | 0.19 | -0.14 | -0.02 | 0.22 | 0.12 | 0.26 | 0.14 | 1.00 |
| 10. Financial status | 2.75 | 1.61 | -0.16 | -0.06 | -0.13 | -0.06 | 0.08 | -0.02 | 0.29 | 0.13 | 0.16 | 1.00 |
| 11. Financial access | 2.49 | 1.19 | -0.01 | -0.17 | 0.06 | -0.14 | -0.09 | -0.14 | 0.15 | 0.17 | 0.13 | 0.42 | 1.00 |
| 12. Industry | 1.43 | 0.50 | -0.34 | 0.20 | -0.07 | 0.10 | 0.15 | 0.19 | 0.11 | -0.05 | -0.03 | 0.11 | -0.02 | 1.00 |
| 13. Risk | 4.09 | 0.96 | -0.06 | -0.14 | 0.02 | -0.10 | -0.05 | 0.13 | -0.04 | -0.08 | -0.10 | 0.08 | -0.06 | -0.04 | (.84) |
| 14. Product vs. service | 2.66 | 1.45 | 0.33 | -0.14 | 0.02 | 0.07 | -0.07 | -0.10 | -0.08 | -0.07 | -0.05 | -0.04 | -0.16 | -0.51 | 0.01 | 1.00 |
| 15. Innovative | 3.48 | 0.89 | -0.02 | 0.23 | -0.03 | 0.08 | 0.16 | 0.22 | -0.04 | -0.02 | 0.06 | 0.16 | -0.12 | 0.14 | 0.08 | 0.07 | 1.00 |
| 16. Bricolage | 3.82 | 0.69 | -0.06 | 0.15 | 0.02 | 0.04 | 0.27 | 0.16 | 0.13 | 0.14 | 0.17 | 0.29 | 0.02 | 0.22 | 0.05 | 0.00 | 0.22 | (.80) |
| 17. Causation | 5.13 | 1.00 | -0.11 | -0.01 | 0.05 | -0.07 | 0.03 | 0.01 | -0.06 | 0.12 | 0.11 | 0.19 | 0.15 | 0.16 | 0.07 | -0.09 | 0.20 | 0.36 | (.81) |
| 18. Experimentation | 4.18 | 1.06 | -0.01 | -0.03 | 0.01 | -0.03 | 0.09 | 0.05 | 0.12 | 0.05 | -0.09 | 0.09 | -0.12 | 0.01 | 0.02 | 0.04 | 0.05 | 0.12 | 0.17 | (.62) |
| 19. Affordable loss | 5.09 | 1.46 | 0.09 | -0.16 | -0.03 | 0.10 | -0.14 | -0.17 | -0.11 | -0.15 | -0.04 | -0.12 | 0.09 | -0.24 | -0.08 | 0.19 | -0.10 | -0.04 | -0.10 | -0.05 | (.82) |
| 20. Flexibility | 5.60 | 0.72 | 0.14 | 0.02 | 0.00 | -0.02 | 0.12 | 0.05 | -0.03 | 0.00 | 0.10 | 0.11 | 0.02 | -0.13 | 0.00 | 0.26 | 0.10 | 0.42 | 0.32 | 0.20 | 0.09 | (.67) |
| 21. Pre-commitments | 4.55 | 1.42 | -0.09 | -0.13 | -0.01 | -0.12 | -0.02 | 0.00 | -0.04 | 0.10 | 0.13 | 0.22 | 0.06 | 0.17 | 0.03 | -0.01 | 0.07 | 0.34 | 0.38 | -0.02 | 0.12 | 0.24 | 0.43 |
| 22. Self-control | 5.01 | 0.63 | 0.02 | 0.21 | -0.15 | 0.20 | 0.15 | 0.11 | 0.14 | -0.06 | 0.17 | 0.17 | 0.11 | -0.28 | 0.02 | 0.22 | 0.22 | 0.34 | -0.06 | -0.01 | 0.19 | 0.18 | (.83) |
| 23. Frugality | 5.65 | 0.83 | -0.11 | 0.12 | -0.15 | 0.13 | 0.16 | 0.02 | -0.03 | -0.10 | 0.10 | 0.08 | 0.05 | 0.08 | -0.13 | 0.08 | 0.19 | 0.28 | 0.16 | -0.13 | 0.25 | 0.26 | 0.15 | 0.35 | (.82) |

N = 178

Note. Correlations with r < .05 are bolded; r > |.15| is significant at p < .05; r > |.20| is significant at p < .01
Table 2

Validity Matrix: Correlations to test convergent validity

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<td>1. Frugality</td>
<td></td>
<td>(.82)</td>
<td></td>
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<td></td>
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<td>2. Conscientiousness</td>
<td>.26***</td>
<td>.44***</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3. Self-control</td>
<td>.35***</td>
<td>.60***</td>
<td>(.83)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Rational decision making</td>
<td>.40***</td>
<td>.34***</td>
<td>.35***</td>
<td>(.61)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Long-term orientation</td>
<td>.29***</td>
<td>.31***</td>
<td>.33***</td>
<td>.24***</td>
<td>(.73)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Spontaneous decision making</td>
<td>-.28***</td>
<td>-.24***</td>
<td>-.42***</td>
<td>-.42***</td>
<td>.02</td>
<td>(.77)</td>
<td></td>
</tr>
<tr>
<td>7. Emotional stability</td>
<td>.11</td>
<td>.28***</td>
<td>.34***</td>
<td>.13</td>
<td>.11</td>
<td>-.13</td>
<td>.42***</td>
</tr>
</tbody>
</table>

N = 178

Note. Reliability estimates reported in diagonal; Conscientiousness and emotional stability are pearson correlations

Note. all correlations > .13 are significant at p < .001
Table 3

Discriminant validity: Fornell & Larcker (1981) procedure

<table>
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<tr>
<th></th>
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<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
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<td>1. Frugality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(.61)</td>
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<tr>
<td>2. Self-control</td>
<td>.12</td>
<td>(.71)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3. Bricolage</td>
<td>.08</td>
<td>.05</td>
<td>(.60)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Causation</td>
<td>.03</td>
<td>.12</td>
<td>.13</td>
<td>(.52)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Affordable loss</td>
<td>.06</td>
<td>.00</td>
<td>.01</td>
<td>.01</td>
<td>(.60)</td>
<td></td>
</tr>
<tr>
<td>6. Flexibility</td>
<td>.07</td>
<td>.04</td>
<td>.18</td>
<td>.10</td>
<td>.01</td>
<td>(.38)</td>
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</table>

Discriminant validity: Confirmatory Factor Analysis and Likelihood-ratio tests

<table>
<thead>
<tr>
<th></th>
<th>Chi-square</th>
<th>df</th>
<th>p-value</th>
<th>CFI</th>
<th>TLI</th>
<th>IFI</th>
<th>RMSEA</th>
<th></th>
<th></th>
</tr>
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<tr>
<td>All construct freely estimated</td>
<td>191.98</td>
<td>137</td>
<td>.001</td>
<td>.95</td>
<td>.93</td>
<td>.95</td>
<td>.055</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frugality ~ Self-control</td>
<td>235.10</td>
<td>138</td>
<td>.000</td>
<td>.91</td>
<td>.88</td>
<td>.91</td>
<td>.073</td>
<td>43.13</td>
<td>1</td>
</tr>
<tr>
<td>Frugality ~ Bricolage</td>
<td>241.02</td>
<td>138</td>
<td>.000</td>
<td>.90</td>
<td>.88</td>
<td>.90</td>
<td>.075</td>
<td>49.05</td>
<td>1</td>
</tr>
<tr>
<td>Frugality ~ Affordable loss</td>
<td>219.15</td>
<td>138</td>
<td>.000</td>
<td>.92</td>
<td>.90</td>
<td>.92</td>
<td>.067</td>
<td>27.17</td>
<td>1</td>
</tr>
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<td>Frugality ~ Flexibility</td>
<td>224.57</td>
<td>138</td>
<td>.000</td>
<td>.92</td>
<td>.90</td>
<td>.92</td>
<td>.070</td>
<td>32.59</td>
<td>1</td>
</tr>
</tbody>
</table>

Note. Average variance extracted is reported in the diagonal.

Note. The “~” symbol reflects constraining both constructs to unity in the measurement model (i.e., $r = 1.0$).

Note. All measurement models reflect $n = 500$ bootstrapped samples.

N = 178
Table 4

Regression results

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Effectuation – Affordable Loss</th>
<th>Effectuation – Flexibility</th>
<th>Effectuation – Experimentation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>t</td>
<td>p</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>6.11</td>
<td>5.40</td>
<td>0.000</td>
</tr>
<tr>
<td>Gender</td>
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<td>-0.06</td>
<td>0.953</td>
</tr>
<tr>
<td>Age</td>
<td>-0.01</td>
<td>-1.02</td>
<td>0.310</td>
</tr>
<tr>
<td>Ethnicity</td>
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<td>-0.59</td>
<td>0.556</td>
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<tr>
<td>education</td>
<td>0.17</td>
<td>1.79</td>
<td>0.075</td>
</tr>
<tr>
<td>E-experience</td>
<td>0.01</td>
<td>0.45</td>
<td>0.656</td>
</tr>
<tr>
<td>Prior startup</td>
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<td>-0.75</td>
<td>0.453</td>
</tr>
<tr>
<td>Firm age</td>
<td>-0.02</td>
<td>-0.42</td>
<td>0.674</td>
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<td>Firm size</td>
<td>0.00</td>
<td>-1.87</td>
<td>0.063</td>
</tr>
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<td>Venture stage</td>
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<td>-0.26</td>
<td>0.793</td>
</tr>
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<td>-1.50</td>
<td>0.135</td>
</tr>
<tr>
<td>Financial access</td>
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<td>2.04</td>
<td>0.043</td>
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<td>Industry</td>
<td>-0.59*</td>
<td>-2.28</td>
<td>0.024</td>
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<td>Risk</td>
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<td>-0.77</td>
<td>0.441</td>
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<td>Product vs. Service</td>
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<td>0.69</td>
<td>0.491</td>
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<tr>
<td>Innovative</td>
<td>-0.06</td>
<td>-0.49</td>
<td>0.626</td>
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<td>Self-control</td>
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<td>-1.19</td>
<td>0.238</td>
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<tr>
<td>Frugality</td>
<td>0.38**</td>
<td>3.28</td>
<td>0.001</td>
</tr>
</tbody>
</table>

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>$R^2$</td>
<td>0.23**</td>
<td>0.18*</td>
<td>0.11</td>
<td></td>
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<tr>
<td>$F (17)$</td>
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<td>1.14</td>
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<tr>
<td>$p$-value</td>
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<td>0.011</td>
<td>0.324</td>
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</tbody>
</table>

N = 178

$p < .050^* , p < .010^{**}, p < .001^{***}$
Table 5

Regression results

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Bricolage</th>
<th></th>
<th>Causation</th>
<th></th>
<th>Effectuation – Pre-commitments</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$b$</td>
<td>$t$</td>
<td>$p$</td>
<td>$b$</td>
<td>$t$</td>
<td>$p$</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>2.31***</td>
<td>4.49</td>
<td>0.000</td>
<td>4.34***</td>
<td>5.84</td>
<td>0.000</td>
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<td>-0.01</td>
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<tr>
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<td>0.927</td>
<td>-0.09</td>
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<td>E-experience</td>
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<td>0.98</td>
<td>0.328</td>
<td>-0.01</td>
<td>-0.73</td>
<td>0.469</td>
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<td>-0.20</td>
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</tr>
<tr>
<td>Firm age</td>
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<td>0.905</td>
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<td>Venture stage</td>
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<td>0.10</td>
<td>0.920</td>
</tr>
<tr>
<td>Industry</td>
<td>0.32**</td>
<td>2.72</td>
<td>0.007</td>
<td>0.30</td>
<td>1.77</td>
<td>0.078</td>
</tr>
<tr>
<td>Risk</td>
<td>0.07</td>
<td>1.40</td>
<td>0.164</td>
<td>0.18*</td>
<td>2.37</td>
<td>0.019</td>
</tr>
<tr>
<td>Product vs. Service</td>
<td>0.04</td>
<td>0.98</td>
<td>0.327</td>
<td>0.00</td>
<td>0.01</td>
<td>0.996</td>
</tr>
<tr>
<td>Innovative</td>
<td>0.03</td>
<td>0.46</td>
<td>0.644</td>
<td>0.10</td>
<td>1.17</td>
<td>0.245</td>
</tr>
<tr>
<td>Self-control</td>
<td>0.06</td>
<td>1.15</td>
<td>0.252</td>
<td>0.41***</td>
<td>5.07</td>
<td>0.000</td>
</tr>
<tr>
<td>Frugality</td>
<td>0.16**</td>
<td>3.10</td>
<td>0.002</td>
<td>0.06</td>
<td>0.75</td>
<td>0.456</td>
</tr>
</tbody>
</table>

$R^2$ 0.29*** 0.29*** 0.21**

$F (17)$ 3.80 3.76 2.57

$p$-value 0.000 0.000 0.001

N = 178