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## Means versus goals at the starting line: Performance and conditions of effectiveness of entrepreneurial action

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### ABSTRACT

Various theoretical perspectives suggest that a means-oriented approach to new venture development can be a viable alternative to the conventional approach, which emphasizes pre-determined goals, and that the former is favored by expert entrepreneurs. However, it is still unclear whether, and under which conditions, means-based action positively affects entrepreneurial performance and whether it would also be effective for novices. This study demonstrates the new venture performance impact of means orientation. We further contribute to various strands of entrepreneurship research by highlighting two moderating factors that are salient in the early-stage entrepreneurial process: opportunity recognition beliefs and process control practices.

### KEYWORDS

Means orientation; effectuation; opportunity recognition belief; control; new venture performance; emergence

## Introduction

A fundamentally important decision for entrepreneurs concerns where to focus and spend their time when starting their venturing process. Influential scholarship regards the launch of a new business activity as a process that is essentially concerned with seeking new means-ends relationships (Shane & Venkataraman, 2000). Mirroring this conceptualization, two fundamental views about the start of the entrepreneurial process have taken shape.

The dominant paradigm is one of intentionality and goal setting (Bird, 1988), opportunity identification and pursuit (Shane & Venkataraman, 2000), and business planning (Brinckmann, Grichnik, & Kapsa, 2010). In this approach, the specification of the ends should be the starting point of the entrepreneurial process, regardless of the means and resources currently at hand (Stevenson & Jarillo, 1990), and entrepreneurs should spend substantial time and energy on goal formulation at the outset of that process. Such a paradigm rests on the idea that new means-ends combinations are “lucrative opportunities” that need to be discovered before they can be exploited

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(Shane & Venkataraman, 2000), with the corollary that the opportunity itself points to objects that are capable of drawing out the entrepreneur's commitment – in short, to goals.

In contrast, Gartner (1989) emphasizes the emergent character of the entrepreneurial process and thereby also of the organization's own goals and opportunities. Thus, as the entrepreneurial process came to be regarded as inherently uncertain (McMullen & Shepherd, 2006), a conceptual framework developed that differentiated opportunity discovery processes from opportunity creation processes (Alvarez & Barney, 2007). Studying entrepreneurial processes from this perspective has produced evidence that in the startup of a new business any sequence of events is possible, including having sales before thinking of starting a business (Davidsson, 2012). Cases of hugely successful new means-ends combinations have also been highlighted, in which the goal only emerged long after a project had been undertaken (Thagard & Croft, 1999). Furthermore, the study of entrepreneurial processes has drawn the attention to cases of successful entrepreneurs who arrive at new ends by means-oriented approaches such as bricolage (Baker & Nelson, 2005) or effectuation (Sarasvathy, 2001, 2008). Hence, the opportunity discovery/creation distinction lends legitimacy to entrepreneurial approaches that focus on means and resources as an alternative way to create or develop opportunities under conditions of uncertainty, also suggesting that these approaches can provide the entrepreneurial process with an equally valid starting point.

In sum, the current state of the discussion presents entrepreneurs with a dilemma: Should they understand the entrepreneurial process as ends driven, proceeding from anticipated results – that is, from goals – directed by plans and carried out by acquiring resources and performing specific activities? Or should they regard it as means driven and intrinsically emergent, therefore hardly allowing a clear anticipation of desirable ends?

Empirical evidence seems to indicate that entrepreneurial experience matters in regard to making a decision to engage in entrepreneurial activities (Clarysse, Tartari, & Salter, 2011); at the start of their ventures, experienced entrepreneurs lean more toward their means than novice entrepreneurs (Dew, Read, Sarasvathy, & Wiltbank, 2009) – at least when the experience has been acquired in startups rather than corporate ventures (Schmidt & Heidenreich, 2018). On the other hand, studies of research and development (R&D) teams have not found any effect of means orientation (Brettel, Mauer, Engelen, & Küpper, 2012). As part of this debate, Baron (2009) raised the doubt that the supposed preference of expert entrepreneurs for means might be due to the effect of confounders such as the superior quality of the means that are available to experts. He even questioned whether a focus on means can help a startup achieve performance that is comparable or superior to that achieved by goal-oriented approaches. Hence, the general purpose of this study is to investigate the performance impact and related boundary

conditions of means orientation and, for reasons we presently clarify, to do so in the context of entrepreneurial teams.

In this study, we draw from the feedback model of self-regulation (Carver & Scheier, 2001) to shed light on the relationship between means and goals as well as (entrepreneurial) action theory (Baum, Frese, & Baron, 2007; Frese, 2009) as a metaframework for connecting various constructs that bear on the above questions, but have been developed within different strands of the literature. We argue that while goals are one key element for action regulation, when they are out of focus and emergent, means can increase in prominence and offer valuable guidance to the entrepreneurial process. We argue that the degree of means versus goals orientation – that is, how entrepreneurs are positioned on the continuum that ranges from a focus on means to a focus on goals – impacts the effectiveness of the entrepreneurial process such that, in the early stages of that process, it is advisable for entrepreneurs to adopt a “means orientation” – that is, to position themselves near the means end of that spectrum to facilitate the emergence of the opportunity and related ends (Wiltbank, Dew, Read, & Sarasvathy, 2006).

From the discussion of experts versus novices, we gather that teams of novices are a fitting empirical context. Indeed, the focus on novices removes the potential confound of the different quality of the means that are available respectively to experts and novices. Moreover, working in teams endows novices with a larger variety of means, thus providing them with sufficient incentives to put these on center stage in the development of their ventures.

While focusing on the performance consequences of means orientation in entrepreneurial novice teams, we are further interested in understanding the boundary conditions of this mechanism, particularly in regard to what could hinder a means-oriented action regulation of the entrepreneurial process. Two attributes of our context become salient: (a) the opportunity recognition beliefs of the entrepreneurial team, and (b) the practices that teams (and larger organizations) typically enact to obtain cooperation from their members, who only share partially congruent objectives.

First, in entrepreneurial action theory, the entrepreneurs' projected mental image of the future is an integral part of a process by which they regulate their behavior. One fundamental mental image is their opportunity recognition belief (McMullen & Shepherd, 2006), which can be expected to be in conflict with a means-oriented approach. Second, action theory highlights that action regulation also needs to respond to demands from the social context (Frese, 2009). Teams are miniature social systems that create demands for stability and predictability in behavior and social relations. Such demands often find practical expression through the emergence of practices of control of the organizational members. Hence, we must ask whether the use of managerial practices of control moderates the effect of means orientation on new venture performance.

To test our ideas, we repeatedly surveyed 160 Dutch startup ventures that are led by teams of novice entrepreneurs. All of our startup ventures were part of a program that required participants to commit time and financial resources to their ventures. Although these ventures were time-bound businesses, these teams managed many of the same processes that are observable in open-ended new entrepreneurial ventures. Moreover, they operated within a common set of basic rules and within the same prespecified time bracket, which work as a natural control for many confounding influences. We employed established and validated constructs, testing the relationship of a means versus goals orientation approach on venture performance, including opportunity recognition belief and process control as moderators. The results mostly support our hypotheses of a significant performance effect of means orientation as opposed to goal orientation, and of negative interaction effects of both opportunity recognition belief and process control.

Our study makes a set of important contributions to the extant literature. First, we inform entrepreneurial process theory in the sense that a stronger focus on means with less emphasis on specifying goals is confirmed as an instrumentally rational approach for the starting phase of entrepreneurial novice processes. Second, we add to the theory of entrepreneurial action by offering means orientation as an element of action regulation that is alternative or supplementary to an exclusive focus on goals. In addition, we establish relationships of moderating factors about action-regulatory mechanisms that are usually considered to be important elements in an entrepreneurial team process, but that also happen to reduce the effectiveness of a means-oriented approach. Finally, we contribute to means-oriented models, such as effectuation, by establishing that means orientation – one of the principles of means-oriented models – has clear implications for new venture performance.

### **A framework for means and goals**

The feedback model of self-regulation (Carver & Scheier, 2001) that has been developed in the fields of personality and social psychology provides one of the most systematic attempts to conceive goals and means in relation to human behavior. The model has made a compelling case that many types of complex behavior can be understood as a hierarchy of cybernetic control processes that strives to approach valued goals or avoid disliked antigoes. The basic unit of such processes is the feedback loop, a system that produces behavioral output as a response to detected discrepancies between perceived information about the present circumstances and some goal concerning them. Obviously, the model underscores the importance of goals in relation to behavior, but it also forces the realization that all the elements of a control system are necessary for successful self-regulation. Therefore, it suggests that

an effective internal guidance of behavior also requires different mechanisms when the actor does not clearly know the end that they want to reach or when they cannot decide which behavior could reduce the discrepancy. Clearly, this is relevant for a variety of economic situations, in which action is undertaken under conditions of goal ambiguity (Cohen, March, & Olsen, 1972). These ideas pertain not only to individual behavior, but also to a variety of other complex systems in society. They also have a bearing on entrepreneurship.

The feedback model of self-regulation has left the question of where goals originate relatively untouched, particularly new goals (Csikszentmihalyi & Nakamura, 1999). A classical view in the literature is that the choice of goals can be approached in a top-down way, as a decision problem in which we evaluate the consequences of our decision just as we would evaluate the consequences of any other decision, except that the goals we apply to this decision include our goals for our future goals (Baron, 2008). However, the theory of self-regulation now accepts that goals arise not only in that way, or from the transformation of old goals (as in the classical process of shifting one's level of aspiration), but also through emergent bottom-up processes (Carver & Scheier, 1999).<sup>1</sup> However, such processes do not marginalize goals altogether, as an activity is more likely to be perceived as useful if it serves to move the actor toward some other higher-level goal that is already in place (Carver & Scheier, 2012).

Clearly, top-down and bottom-up processes of goal formation would entail quite different sets of cognitive operations, with the former leaning more toward a model-based anticipation of consequences evaluated by prior preferences and the latter being more skewed toward experimentation, experiential learning, and play. Therefore, if undertaken simultaneously, these approaches would not simply be in competition for the devotion of time and resources toward their attainment, but they would also be more intrinsically in conflict.

The merits of a logic that in highly uncertain situations seeks effects for given means – and thus proceeds more from the bottom up – has been theoretically argued and empirically corroborated by Sarasvathy's seminal contributions to the effectuation research program (Sarasvathy, 2001, 2008) as well as by numerous subsequent studies in that program – mostly of the qualitative type (Read, Sarasvathy, Dew, & Wiltbank, 2016). Similarly, the literature on entrepreneurial bricolage highlights the possibility of rendering unique services by focusing primarily on resources at hand, recombining them, and applying them to purposes other than those for which they were originally intended (Baker & Nelson, 2005). Arguably,

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<sup>1</sup>For example, it is possible that an activity is undertaken, found useful, and eventually encoded and stored in memory as a goal, thereby making it accessible for top-down use later on.

the resource-based view of strategy is also premised on the logical primacy of resources over an *ex ante* specification of uses for them because the possible attributes of a resource are in theory limitless, thus presenting opportunities for discovery and growth (Penrose, 1959). In the same vein, evolutionary economics has highlighted how processes of *exaptation* – discovery or creation of valuable new uses or new attributes of artifacts that were previously invented or adapted for the value of other attributes – are pervasive and quintessentially entrepreneurial (Dew, Sarasvathy, & Venkataraman, 2004).

However, given the influence enjoyed by the alternative view (Hsu, 2008), it is perfectly possible that, even amid substantial uncertainty, many decision-makers would rather follow a top-down approach to goal setting. On these premises, we propose: (a) that in intendedly rational complex economic behavior, such as the development of a new venture, an important role is played by the goals of the actor and the means that the actor can muster; (b) that different actors differ in the extent to which they allow their goals to emerge from reflection and experimentation on their means or, conversely, in the extent to which they seek an early anchoring of their behavior in specific goals, thereby curtailing the time and the cognitive operations they dedicate to goal emergence; and (c) that, accordingly, complex action sequences undertaken under conditions of high uncertainty can be usefully described in terms of how actors are positioned on a continuum ranging from a focus on means to a focus on goals.

Entrepreneurial action theory (for example, Frese, 2009) offers insights that usefully complement this framing. Like the feedback model of self-regulation, action theory aims to explain the regulation of action through cognition. However, also being interested in how cognitive capacities are deployed in the execution of concrete tasks, action theory emphasizes that all actions are situated, meaning that they take up situational cues and that they must adjust to situational requirements if they are to be effective. Most importantly, among these requirements, action theory includes not only task-related demands, but also those that arise from the social context. Furthermore, the theory also holds that action produces feedback, through which the actor can progressively improve the accuracy of their representations of the world, including goals. Finally, it proposes that not all embryonic motivational states are developed into goals and that when they are, the developmental path can be a long one that is also characterized by loops and dead ends (Heckhausen & Kuhl, 1985). In turn, this suggests the possibility that the development of goals during the entrepreneurial process may also take emergent pathways. On these metatheoretical premises, the next sections develop specific hypotheses about our focal constructs.

## Means orientation and firm performance

While entrepreneurs might aim their compass more toward their means, or more toward prespecified goals, it is unclear which strategy would be more beneficial for them in the early period of their ventures.<sup>2</sup> Effectuation theory has been the most articulate advocate of means orientation. Studies in this research program are consistent in considering means orientation as a strategy that is of central importance at the start of an entrepreneurial process (Perry, Chandler, & Markova, 2012, p. 852). Read, Song, and Smit (2009, p. 576) refer to it as the “givens” that “provide the basis for decisions and new opportunities” in a venture process. An entrepreneurial process that adopts this strategy proceeds “outward from means and causes to new effects and unanticipated ends” (Dew et al., 2009, p. 288). The focus is on those means that are closely connected to the entrepreneur. They can be identified by asking (Sarasvathy, 2008): (a) Who am I (preferences, aspirations, tastes); (b) what do I know (knowledge, experience); and (c) who do I know (networks)? These means contain general aspirations that orient toward immediate action while specific goals emerge only progressively as a by-product of entrepreneurial action. Considering all of the above suggests that means orientation comprises two distinctive traits: (a) experimentation with certain means, thus obtaining feedback from what is acted on; and (b) openness to emergent goals.

Obviously, basing action on extant means suggests that entrepreneurs may have to initially operate within a particular, and often restricted, set of resources and skills, and may therefore miss certain opportunities. However, in the case of novices, this limitation is unlikely to offset the positive consequences of an orientation to means. First, conceiving new opportunities involves a creative act of entrepreneurial imagination (Erikson & Korsgaard, 2016), and creativity usually requires domain-related knowledge that is acquired through effortful processes (George, 2007). Therefore, novices’ relative lack of experience curbs their ability to generate valuable opportunities (Politis, 2005) above and beyond those that their means afford. Moreover, lacking a track record, novices will find it hard to give the other stakeholders cues about the quality of their team and may consequently be unable to raise substantial amounts of complementary resources.

In contrast, there are several advantages of means orientation, which allow for more effective action: (a) means that are specific to the individual are close by and do not require a time-consuming search; (b) entrepreneurs are able to extract more services from means they know well than from resources they are scarcely acquainted with (Penrose, 1959); (c) leveraging knowledge

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<sup>2</sup>By “early period,” we mean the period when conceptual and cognitive effort is a substantial part of the entrepreneurial effort. Our research setting offers a natural watershed for operationalizing the early stage, as it requires that entrepreneurial teams draw up a business plan within about three months of the start of the gestation of their ventures. Hence, our early stage, which terminates with the drafting of that plan, approximately corresponds to the idea phase, prestartup, and startup phases of Clarysse and Moray’s (2004) new venture life cycle model.



and skills that were developed through personal experiences in a particular domain of activity is “much less demanding of cognitive capacity and brain energy than the general-purpose logical processing” (Loasby, 2007, p. 39) which is required by unfamiliar problems, so the former approach leaves more cognitive energies to be used for addressing the manifold contingencies a startup always presents; (d) familiarity with the means at hand creates positive affect and motivation because of the strong fit between the means and the intention to carry out relevant actions (Krueger, Reilly, & Carsrud, 2000); (e) by relying on their means, entrepreneurs incur no risk of overpaying resources whose quality is uncertain and about which they are less well informed than the seller (Akerlof, 1970); (f) by avoiding fixed goals early on, entrepreneurs allow themselves to engage in experiential learning not only with regard to the means for developing their ventures, but also with regard to the appropriateness of the goals that they should pursue (Cai, Guo, Fei, & Liu, 2016); and, finally, (g) by focusing on the things over which the entrepreneur has influence, the entrepreneur is under less pressure to make accurate predictions (Wiltbank et al., 2006). Therefore, the costs involved with elaborate prediction are reduced. Hence:

*Hypothesis 1 (H1): A greater orientation of the entrepreneurial team to available means, as opposed to specific goals, is associated with superior startup venture performance.*

### ***The moderating effect of opportunity recognition belief***

Recognizing an opportunity is one of the core acts of entrepreneurship. Building on McMullen and Shepherd (2006), Grégoire, Shepherd, and Lambert (2010) have developed the construct of *opportunity recognition belief* that is defined as the degree of certainty with which an entrepreneur believes that a “venture idea” represents an opportunity, where the confidence is based on a perception of alignment between certain means of supply and a set of identified customer needs and on the perception that this supply-needs combination is feasible and desirable for *someone* with the relevant means and motivations.

To situate this construct within our framework, some background is required. First, opportunity belief is a cognitive construct that consists of an image of the product and organization that an entrepreneur wants to achieve. Thus, it differs from means versus goals orientation, which is more appropriately regarded as an action strategy (Mitchell et al., 2007). Opportunity beliefs are also endowed with some motivational force because they subsume a necessary – though not sufficient – condition for an outcome to generate commitment (a *general* assessment of feasibility and desirability).

However, this assessment also does not necessarily entail a personally relevant perception of feasibility or desirability (Grégoire et al., 2010). Hence, an entrepreneur must engage in further elaboration of their belief, if their general assessment is to be converted in situationally specific motivation – in “goals” – that elicit their commitment. Second, opportunity beliefs suffer from the general fallibility of all beliefs. In entrepreneurial settings, such risk is particularly acute given that entrepreneurs often end up exploiting a different opportunity than the one they thought they were pursuing (Davidsson, 2012), and they often fail altogether. This entails that even when an opportunity belief is held with high confidence, it is not to be assumed that the subsequent entrepreneurial process will simply and necessarily be one of opportunity implementation based on preset goals. An entrepreneur may even reasonably think that the feedback they get by acting on their effectual means might be useful for clarifying the assumptions that underlie their opportunity belief and for developing their belief in greater detail. Indeed, entrepreneurs have also been observed to usefully apply elements of means-based action to the honing of manifest opportunities (Corner & Ho, 2010).

Nevertheless, we conjecture that when enacted in the context of a clearly envisioned opportunity, means orientation may fail to attain its full potential. First, combining the orientation to means with a strong opportunity recognition belief creates duality between those goals that develop from means-based action (Sarasvathy, 2001) and those that ensue from elaboration of the opportunity (Grégoire et al., 2010). Caught between potentially competing demands, entrepreneurial teams are likely to come up with incoherent actions and to dilute precious limited resources (Jensen, 2010; Locke & Latham, 2013). Second, by pointing at a particular supply-needs combination, a strong opportunity recognition belief entails that certain means can have no use in the project and are not worth experimenting with. Finally, at some point on the pathway along which aspirations are converted into goals, the focus of information processing is known to change: Information search narrows down, and information processing becomes biased toward committing to the goal (Heckhausen, 2007; Heckhausen & Kuhl, 1985). Owing to the pressure exercised by its motivational component, opportunity beliefs may prematurely take such a development path (Heckhausen & Kuhl, 1985), thus damaging the experimentation component of means orientation. For all these reasons, we posit:

*Hypothesis 2 (H2): The positive effect on the startup venture performance of a greater orientation of the entrepreneurial team to available means, as opposed to specific goals, will be weaker for teams that strongly believe they have recognized an entrepreneurial opportunity.*

## The moderating effect of process control practices

Organized contexts tend to create demands for stability and predictability in behavior and in social relations. These demands often find practical expression through the emergence of practices of control, which direct attention, motivate, and encourage organizational members to act in desired ways to meet a firm's objectives. Among the various forms in which control exists, this study specifically addresses process control (Turner & Makhija, 2006); that is, prescriptions and the monitoring of behaviors and processes in which organizational actors must engage.

Process control also exists in entrepreneurial firms (Cardinal, Sitkin, & Long, 2004; Kimberly, 1979), though rarely in a highly formalized way. Rather, it is exercised directly by the entrepreneur (Hmieleski & Ensley, 2007) and, when a startup venture is led by a team, it is often the case that an individual emerges as the leader (Ensley, Carland, & Carland, 2000), who prescribes behaviors for the rest of the team. Control can be an issue even when teams' relationships are more egalitarian, as work groups often control the actions of their members more powerfully than hierarchical systems (Coleman & Voronov, 2003). On these premises, we discuss how controlling team members interact with means orientation, regardless of whether control is formalized or whether it is exercised by a team director or by the whole team.

From a system-level viewpoint, process control is an integral part of the cybernetic process by which people and organizations regulate themselves to stay on course and meet their goals. Hence, it may seem that a stringent process control is the inevitable consequence of a goal-oriented approach to the entrepreneurial process. However, action theories highlight the fact that goal setting, on the one hand, and monitoring and feedback, on the other hand, are conceptually distinct stages of an action sequence that are each subject to their respective drivers. They also highlight that action, and action-regulation strategies, must respond not just to the task at hand, but also to demands from the social context (Frese, 2009). Thus, as a rule, process control is at least partially decoupled from goal setting.<sup>3</sup>

In principle, even a means-oriented entrepreneurial process might benefit from some monitoring and evaluation. However, if the experience of product innovation processes is anything to go by, the monitoring and evaluation of emergent processes are problematic (Dougherty, 1999). The use of abstracted and generalized control criteria tends to obliterate the situated realities of a given innovation. As a result, managing the tensions between efficiency and focus on one hand, and emergence on the other, seems to require the use of

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<sup>3</sup>Critical theorists highlight how process control is also deeply affected by cultural determinants that are quite unrelated to the task focus of regulation. Gabriel (1999, pp. 198–199) deplors the “overmanaged and over-controlled image embraced by contemporary management” and argues that “control easily becomes an object of fantasy” rather than of rational design. On these premises, it is not surprising that in our sample, means orientation and process control display a modest correlation coefficient of  $-0.218$ .

“subtle” forms of control (Dougherty, 1999) that are probably not adequately mastered by novices. A key requirement for the effectiveness of process control is task programmability (Eisenhardt, 1985); that is, that the behaviors needed to perform tasks are susceptible to a clear definition *ex ante* and are observable. However, when an entrepreneurial team allows goals to emerge, tasks will initially also be in a state of flux and subject to substantial modification. Thus, in the early stages of such a venture, *ex ante* prescriptions of behavior will often prove incorrect *ex post*. Moreover, the selection of effects for the available means is a process that largely relies on creativity (Brettel, Mauer, & Blauth, 2014; Sarasvathy, 2008). However, process control is usually thought to stifle creativity through the negative effect it has on intrinsic motivation (Shalley, Zhou, & Oldham, 2004). Moreover, by requiring people to conform to certain behaviors, process control may restrict the information that they generate while performing entrepreneurial activities, which in turn reduces the amount of their experiential learning (Gielnik, Frese, Graf, & Kampschulte, 2012). Indeed, empirical studies indicate that individuals (Oldham & Cummings, 1996) and groups (Cardinal, 2001; Woodman, Sawyer, & Griffin, 1993) produce the most creative work when they are supervised in a supportive, noncontrolling fashion. Overall, the available evidence indicates that process control may hinder the creativity of the members of an entrepreneurial team, and the creativity of the team with it (Pirola-Merlo & Mann, 2004). Hence:

*Hypothesis 3 (H3): The positive effect on startup venture performance of a greater orientation of the entrepreneurial team to available means, as opposed to specific goals, will become weaker as an entrepreneurial team increases the use of process control with its members.*

## Methods

We tested our predictions using data from a large set of startup ventures taking part in the Junior Achievement Young Enterprise (JA-YE) Start-Up Program in the Netherlands. JA-YE is the dominant provider of entrepreneurship education programming in the United States and Europe. The program targets entrepreneurial teams whose members usually do not have prior business experience. Participating teams must identify, develop, and pursue a business idea, exploiting it through the founding and development of a small startup venture within a prespecified time period. They raise capital, appoint officers, produce and market products or services, keep accounting records, and conduct shareholders' meetings. Overall, despite the preprogrammed termination of these ventures, program participants need to manage many of the same processes that are observable in open-ended business ventures.

The program is run in the Netherlands by the Dutch Young Enterprise Organization (Stichting Jong Ondernemen, henceforth SJO). Examples of goods produced by participating companies include elder care solutions, occupational therapy equipment, travel goods, handheld battery chargers for mobile phones, Bluetooth speakers, and wooden toy blocks for experimenting with electric circuits. Team members typically hold equity shares in their ventures. Therefore, the members and their venture's other shareholders incur personal economic and reputational losses if the venture is unable to pay back its capital. Clearly, the program is not a business simulation.

Although participating companies must operate within the ground rules set by SJO, they have considerable leeway as to the entrepreneurial approach they can adopt. In preliminary interviews, we learned, for example, that companies may choose their products to take advantage of competencies and skills that some of their team members developed while pursuing a hobby or to exploit personal connections with people in a given industry – both are ways of leveraging knowledge and networks that are ready at hand. Other teams indicated instead that they had started their process from an abstract idea, perceived as potentially profitable (for example, a fire extinguisher aerosol spray, or a cake server with certain characteristics) but difficult to implement, so the team had to insource the services of industrial designers external to the company. However, in other cases, the teams have followed a hybrid approach: First, they chose an idea based on market research and a comparison of expected returns; then, they relied significantly on networks of family and friends for its commercial development. Overall, the Dutch JA-YE program presents a large spectrum of entrepreneurial approaches and offers a suitable context for testing our hypotheses.<sup>4</sup>

### ***Sample and study design***

We focused on all the startup firms from Universities of Applied Sciences and Vocational Education and Training (VET) colleges enrolled with the SJO in the fall of 2012 and committed to developing their business for a period of around 10 months. This sampling framework included 852 firms. The teams of those firms ranged in size from 3 to 12 members, with 6 being the modal size. The average age of the participants was 20.3 years old. Team members were typically enrolled in degree courses that combined business administration with professional education. Participation in the program was part of

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<sup>4</sup>Given the higher level of control that they allow to exercise on many confounding influences, populations of students like this are studied in particular for gleaning insight into novel entrepreneurial constructs and processes (for example, Bonesso, Gerli, Pizzi, & Cortellazzo, 2018), and they have been deemed appropriate for the current state of development of the effectuation field of research (Perry et al., 2012).

their educational curriculum and was not conditional on passing any competitive selection process.

Information about the teams was collected from the archives of SJO and through two extensive online surveys. The first of these, which focused on team-level processes such as the means orientation, was conducted at the end of January 2013, four months after the teams and their startups had been established, at a time when a vast majority of companies were expected to have just completed their business plans. Invitations to participate in the survey were sent by email based on a mailing list provided by SJO. Fully or partially completed questionnaires were returned by 455 companies, generally filled in by the team member that had been appointed to act as the contact person with SJO. To assess the possibility of nonresponse bias, we tested for differences between early and late respondents and found them to be negligible.

The second questionnaire was administered in June 2013, when the firms had been engaging in the production and sales of their products for some months and were in the process of winding up their business in compliance with the JA-YE program. This survey focused on performance indicators as well as on commercialization activities. We obtained questionnaires from 255 of the companies that had answered the original survey. After a listwise deletion of cases due to item missing values, we were able to run tests of the measurement model on 179 cases. Missing values in archival data then left a core sample of 160 observations available for regression analyses (19 percent of the sampling framework). Once again, we performed tests to check whether outright nonresponse or case deletion had affected our results, and we were able to conclude that neither of these sources of attrition was likely to have caused bias (Appendix 1).

## **Measures**

We used existing scales, with minor adaptations to suit our context, and subjected them to pilot field tests with the limited purpose of checking that students understood the Dutch wording of existing scales that were originally in English. Appendix 2 summarizes the final operationalizations.

*Dependent variables:* We operationalized our dependent construct in two different ways, as *output value* and as *financial performance*, to gauge the convergence of our results across different domains of performance. The scale for output value is based on Brettel et al. (2012) and focuses on the extent to which the team met their initial expectations regarding the profits earned, the marketing of products/services, and customer satisfaction. Financial performance (in hundreds of euros) is based on archival data and is the balance between the profit and loss account of the startup ventures at

the time their business is completed. Financial performance captures a narrower domain of performance, which is centered on the simple achievement of economic goals.

*Independent variables:* The measure of *means versus goals orientation* (MO) is based on Brettel et al. (2012); in line with our framework, it presents means orientation and goal orientation as two ends of a continuum. The scale of *opportunity recognition belief* (ORB) is based on the scale of Grégoire et al. (2010). With regard to *process control*, we based the measure on a scale of directive control developed by Lewis, Welsh, Gordon, and Green (2002) for new product development projects. Adaptation was required because, in our context, control might be exercised not only hierarchically, but also by the team as a whole vis à vis particular team members.

*Control variables:* The rules of the Dutch JA-YE program entail that many factors (for example, venture size, venture age, and prior startup experience) exhibit little or no variation in our setting. The remaining heterogeneity is thus arguably caused mostly by structural and cognitive characteristics of the entrepreneurial team. Therefore, we controlled for *team size* (the number of members) and for its gender composition (*ratio of women on a team*). For cognitive characteristics, we used a scale of *cognitive diversity* by Miller, Burke, and Glick (1998), which captures differences among the members of the top management team in beliefs on cause-effect relationships and in preferences for various organizational goals. Furthermore, we controlled for the educational stream in which the members of each team were placed (*educational stream*: 0 = University of Applied Sciences; 1 = VET college). We also controlled for three attributes of the companies' task environment and of their business model, which describe how companies create and capture value (Massa, Tucci, & Afuah, 2017). These are often considered to have a potentially significant influence on performance (for example, Chrisman, Bauerschmidt, & Hofer, 1998; Zott & Amit, 2007). First, we measured whether the team perceived that they had direct competitors or not (*presence of competitors*: 0 = No direct competitors; 1 = Direct competitors). Second, we created a dummy for companies engaging in product versus service business by distinguishing between two ways of creating value (0 = Product business; 1 = Service business). Finally, to assess how a company captures value, we asked the companies to rate how their revenue model compared on a 3-point scale with those prevailing in their industry, with higher values indicating a more innovative model (*revenue model innovation*).

Multi-item scales were constructed as the average of their respective items. The adequacy of the measures was assessed through exploratory factor analyses and then through a confirmatory factor analysis.<sup>5</sup> Two items that

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<sup>5</sup>Data are available from the authors.

**Table 1.** Descriptive statistics and Pearson correlations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Output value	1						
(2) Financial performance	0.340 <sup>c</sup>	1					
(3) Team size	-0.033	0.073	1				
(4) Educational stream	0.184 <sup>a</sup>	0.117	0.053	1			
(5) Ratio of women in team	0.135	0.032	0.111	0.456 <sup>c</sup>	1		
(6) Cognitive diversity	-0.341 <sup>c</sup>	-0.199 <sup>a</sup>	-0.073	-0.007	-0.112	1	
(7) Presence of competitors	0.044	0.210 <sup>b</sup>	-0.008	0.077	0.027	0.200 <sup>a</sup>	1
(8) Dummy for services	-0.046	-0.088	0.091	0.017	-0.101	-0.011	0.000
(9) Revenue model innovation	0.140	0.125	-0.061	0.122	0.196 <sup>a</sup>	-0.148	0.029
(10) ORB	0.246 <sup>b</sup>	0.040	-0.088	-0.087	-0.060	-0.378 <sup>c</sup>	-0.064
(11) Process control	0.204 <sup>b</sup>	0.026	-0.013	0.017	0.059	-0.211 <sup>b</sup>	0.053
(12) MO	0.193 <sup>a</sup>	0.218 <sup>b</sup>	-0.058	0.077	0.087	0.016	0.045
(13) MO x ORB	0.005	0.049	0.057	-0.123	-0.058	-0.185 <sup>a</sup>	0.009
(14) MO x P. control	-0.129	-0.066	0.108	-0.061	-0.080	0.064	-0.015
Mean	4.00	0.21	6.75	1.39	0.39	2.87	0.50
SD	1.36	3.16	1.57	0.49	0.30	1.04	0.50
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(8) Dummy for services	1						
(9) Revenue model innovation	-0.089	1					
(10) ORB	-0.002	0.128	1				
(11) Process control	-0.011	0.012	0.205 <sup>b</sup>	1			
(12) MO	-0.118	-0.146	-0.218 <sup>b</sup>	0.061	1		
(13) MO x ORB	0.096	0.044	0.373 <sup>c</sup>	0.155	0.040	1	
(14) MO x P. control	0.100	0.005	0.176 <sup>a</sup>	-0.122	-0.107	0.153	1
Mean	1.08	2.03	5.44	3.67	3.56	-0.22	0.06
SD	0.26	0.64	0.87	0.79	1.16	1.25	1.00

*N* = 160; <sup>a</sup> *p* < 0.05; <sup>b</sup> *p* < 0.01; <sup>c</sup> *p* < 0.001. ORB = opportunity recognition belief; MO = means versus goals orientation; P. control = process control.

loaded poorly onto their constructs (one from MO, and one from the ORB scale) were deleted. The remaining items loaded well and did not have any substantial cross-loadings on other constructs, demonstrating good convergent and discriminant validity. All the scales have good or excellent internal consistency, as highlighted by the Cronbach’s alphas (Appendix 2). Descriptive statistics (Table 1) and visual inspection indicate that the variables satisfy the requirements for the analyses. The mean of MO is 3.56, indicating a slight average orientation to means. There is an almost equal (49–51 percent) split in the sample between ventures that were oriented predominantly to goals and those that were oriented to means. Correlations among the independent variables are nonproblematic, as indicated by a maximum variance-inflation factor (VIF) of 1.54.

### Analyses and results

We used ordinary least squares (OLS) regressions to test our hypotheses after mean-centering the independent variables to reduce multicollinearity. Table 2 presents the results of our models of output value and financial performance. Model 1A is the base model for output value, including only





Table 2. OLS models of startup performance.

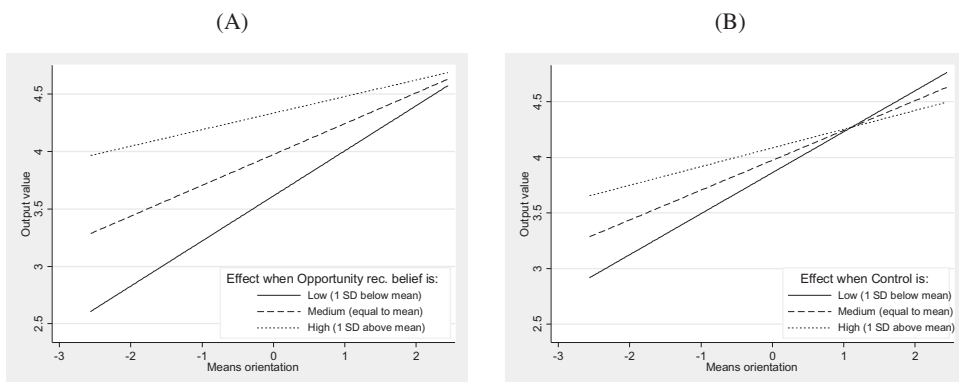
	DV: Output value										DV: Financial performance									
	1A	1B	1C	1D	1E	1F	2A	2B	2C	2D	2E	2F	2A	2B	2C	2D	2E	2F		
Team size	-0.05 (0.08)	-0.04 (0.07)	-0.02 (0.07)	-0.01 (0.07)	-0.01 (0.07)	0.00 (0.07)	0.15 (0.18)	0.14 (0.18)	0.19 (0.16)	0.19 (0.16)	0.20 (0.16)	0.20 (0.16)	0.19 (0.16)	0.19 (0.16)	0.19 (0.16)	0.19 (0.16)	0.20 (0.16)	0.20 (0.16)	0.20 (0.16)	
Educational stream	0.47** (0.19)	0.49** (0.20)	0.46** (0.18)	0.41** (0.19)	0.45** (0.18)	0.41** (0.19)	0.82 (0.51)	0.80 (0.51)	0.73 (0.45)	0.73 (0.45)	0.72 (0.47)	0.72 (0.46)	0.73 (0.45)	0.73 (0.45)	0.73 (0.46)	0.73 (0.45)	0.72 (0.47)	0.72 (0.46)	0.72 (0.46)	
Ratio of women in team	0.04 (0.41)	0.07 (0.39)	-0.00 (0.39)	-0.01 (0.38)	-0.02 (0.38)	-0.02 (0.37)	-0.97 (0.86)	-0.99 (0.87)	-1.15 (0.90)	-1.15 (0.91)	-1.16 (0.92)	-1.16 (0.92)	-1.15 (0.91)	-1.15 (0.91)	-1.15 (0.90)	-1.15 (0.91)	-1.16 (0.92)	-1.16 (0.92)	-1.16 (0.92)	
Cognitive diversity	-0.46*** (0.09)	-0.37*** (0.10)	-0.34*** (0.10)	-0.34*** (0.10)	-0.32*** (0.10)	-0.33*** (0.10)	-0.73*** (0.24)	-0.80*** (0.29)	-0.73*** (0.29)	-0.73*** (0.29)	-0.71** (0.27)	-0.71** (0.28)	-0.73*** (0.29)	-0.73*** (0.29)	-0.73*** (0.29)	-0.73*** (0.29)	-0.71** (0.27)	-0.71** (0.28)	-0.71** (0.28)	
Presence of competitors	0.27 (0.18)	0.24 (0.18)	0.21 (0.16)	0.23 (0.16)	0.21 (0.16)	0.22 (0.16)	1.57*** (0.55)	1.59*** (0.56)	1.53*** (0.52)	1.53*** (0.53)	1.53*** (0.51)	1.53*** (0.52)	1.53*** (0.53)	1.53*** (0.53)	1.53*** (0.52)	1.53*** (0.53)	1.53*** (0.51)	1.53*** (0.52)	1.53*** (0.52)	
Dummy for services	-0.22 (0.47)	-0.21 (0.45)	-0.07 (0.42)	0.01 (0.42)	-0.03 (0.40)	0.04 (0.41)	-1.22* (0.65)	-1.23* (0.64)	-0.89 (0.63)	-0.89 (0.63)	-0.85 (0.66)	-0.85 (0.65)	-0.89 (0.63)	-0.89 (0.63)	-0.89 (0.63)	-0.89 (0.63)	-0.85 (0.66)	-0.85 (0.65)	-0.85 (0.65)	
Revenue model innov.	0.12 (0.20)	0.10 (0.20)	0.18 (0.19)	0.19 (0.18)	0.18 (0.19)	0.20 (0.18)	0.40 (0.33)	0.41 (0.34)	0.60* (0.31)	0.60* (0.31)	0.60* (0.32)	0.60* (0.31)	0.60* (0.31)	0.60* (0.31)	0.60* (0.31)	0.60* (0.31)	0.60* (0.32)	0.60* (0.31)	0.60* (0.31)	
ORB	0.20 (0.13)	0.20 (0.13)	0.29** (0.14)	0.37** (0.15)	0.33** (0.14)	0.41** (0.15)	-0.13 (0.18)	-0.13 (0.18)	0.08 (0.18)	0.08 (0.18)	0.12 (0.12)	0.12 (0.12)	0.08 (0.18)	0.08 (0.18)	0.08 (0.18)	0.08 (0.18)	0.12 (0.12)	0.12 (0.12)	0.12 (0.12)	
Process control	0.19 (0.12)	0.19 (0.12)	0.15 (0.12)	0.17 (0.11)	0.13 (0.11)	0.15 (0.11)	0.15 (0.11)	0.15 (0.11)	0.13 (0.11)	0.15 (0.11)	0.15 (0.11)	0.15 (0.11)	0.13 (0.11)	0.13 (0.11)	0.13 (0.11)	0.13 (0.11)	0.15 (0.11)	0.15 (0.11)	0.15 (0.11)	
MO	0.26*** (0.07)	0.26*** (0.07)	0.26*** (0.07)	0.29*** (0.08)	0.26*** (0.07)	0.29*** (0.08)	0.29*** (0.08)	0.29*** (0.08)	0.26*** (0.07)	0.26*** (0.07)	0.26*** (0.07)	0.26*** (0.07)	0.29*** (0.08)	0.29*** (0.08)	0.29*** (0.08)	0.29*** (0.08)	0.26*** (0.07)	0.26*** (0.07)	0.26*** (0.07)	
MO x ORB	-0.16*** (0.06)	-0.16*** (0.06)	-0.16*** (0.06)	-0.16*** (0.06)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	-0.15** (0.08)	
MO x P. control	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	-0.13** (0.06)	
Constant	4.89*** (1.08)	4.51*** (1.08)	4.08*** (1.03)	3.92*** (1.04)	3.90*** (1.00)	3.77*** (1.02)	0.26 (1.46)	0.52 (1.65)	-0.52 (1.71)	-0.52 (1.66)	-0.68 (1.65)	-0.68 (1.61)	-0.53 (1.66)	-0.53 (1.66)	-0.52 (1.66)	-0.53 (1.66)	-0.68 (1.65)	-0.68 (1.61)	-0.68 (1.61)	
R-squared	0.17	0.20	0.24	0.26	0.25	0.27	0.14	0.14	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	
ΔR-squared	0.028	0.028	0.045	0.017	-0.007	0.015	0.002	0.002	0.048	0.000	0.002	0.000	0.000	0.000	0.048	0.000	0.002	0.000	0.000	
F	8.33	7.78	10.39	11.40	11.26	11.47	4.28	3.55	5.18	4.71	4.68	4.31	4.71	4.71	5.18	4.71	4.68	4.31	4.31	
p <	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
F for the step	2.77	2.77	13.02	7.29	3.49	4.60	0.014	0.14	12.07	0.00	0.33	0.18	0.00	0.00	12.07	0.00	0.33	0.18	0.18	
p-value of the step	0.071	0.071	0.001	0.009	0.067	0.014	0.872	0.872	0.001	0.949	0.566	0.840	0.001	0.001	0.001	0.949	0.566	0.840	0.840	

\* 0.10, \*\* 0.05, \*\*\* 0.01. N = 160. Standard errors in parentheses, adjusted for clusters in host educational institution. Two-tailed tests for controls, one-tailed tests for hypothesized variables. DV= dependent variable; ORB = opportunity recognition belief; MO = means versus goals orientation; P. control = process control.

the control variables. Model 1B adds the main effects of the moderators. Model 1C adds to this MO. Models 1D and 1E add the interaction effects. Finally, Model 1F tests the full model. Models 2A through 2F follow the same structure when analyzing financial performance.

In Model 1A, the coefficient of cognitive diversity is negative and significant ( $\beta = -0.46, p < .01$ ). Miller et al. (1998) found that cognitive diversity among the top managers inhibits planning and a comprehensive examination of opportunities and threats. Our results suggest that it also lowers new venture performance. Adding our moderators (Model 1B) does not significantly improve model fit. Both ORB and process control have a positive coefficient, but none of them are statistically significant. In Model 1C we test H1, which predicted that performance is enhanced by an orientation to means. The coefficient of MO ( $\beta = 0.26, p < .01$ ) shows clear support for this hypothesis. The standardized coefficient for this variable (beta = 0.22) indicates that the effect size is nonnegligible since a one standard deviation increase in the predictor increases output value by 22 percent. In this model, and in all the following models, ORB turns significant ( $\beta = 0.29, p < .05$ ). This indirectly supports what was hypothesized by Shepherd, McMullen, and Jennings (2007), which is that entrepreneurs' confidence in the opportunity they face enhances performance.

Model 1D shows that the effect of the interaction  $MO \times ORB$  is negative and significant ( $\beta = -0.16, p < .01$ ), meaning that H2 is supported using this dimension of performance. Likewise, in Model 1E the interaction  $MO \times$  Process control is negative and significant ( $\beta = -0.15, p < .05$ ), which constitutes support for H3. In the full Model 1F, all the effects previously discussed retain their sign and significance, which indicates that they did not simply reflect shared variance. The interactions of the full model are plotted in Figure 1. Panel A in the figure shows that when ORB is low, MO has a more positive effect on output value than when ORB is higher. Indeed, when this is one standard



**Figure 1.** Effects of means versus goal orientation on the output value at various levels of opportunity recognition belief and process control.

deviation below the mean, the joint effect is .39 ( $t = 3.78, p < .01$ ). However, at higher levels of ORB the positive relationship between MO and output value continues at gentler rates. Eventually, when ORB is one standard deviation above the mean, the relationship attenuates even further, though it still remains positive (joint effect = 0.14,  $t = 1.99, p < .05$ ). Panel B of [Figure 1](#) shows that with increasing values of process control, the positive effect of MO on output value decreases; at high levels of the moderator (one standard deviation above the mean), this term is significantly different from zero only with a lenient criterion for hypothesis rejection (joint effect = .17,  $t = 1.52, p < .1$ ).

As to the models of financial performance, the coefficients exhibit signs and levels of statistical significance that are broadly similar across models. Hence, we only report the results of the full Model 2F. H1, which predicted a positive effect of MO, is supported ( $\beta = 0.63, p < .01$ ). In this model, the standardized coefficient for this variable (beta = 0.23) indicates that the size of the effect is nonnegligible. The interactions of MO with our moderating variables generally exhibit the negative signs that we were expecting, but none of them are significant. Thus, H2 and H3 are not supported with this dimension of performance. Given that interactions are susceptible to measurement error and to substantial underestimation of true effect sizes, such that samples of approximately 400 are recommended for investigating interactions (Aiken & West, 1991), it is not surprising that we were unable to detect significant effects.

To check the robustness of our results, we estimated alternative model specifications. None of the additional variables we controlled for were significant, and their inclusion in the model had a small impact on the size of the other coefficients, did not reverse their sign, and had no influence on their significance. Moreover, they generally reduced model fit.<sup>6</sup>

## Discussion and conclusions

Our study makes contributions in three areas of entrepreneurship literature. First, we inform entrepreneurial process theory. By showing that a greater means orientation during the early period of the new venture positively affects subsequent performance, our findings allow for an increased confidence that the means that are available to the entrepreneur may serve as a suitable focus for entrepreneurial action at the start of an entrepreneurial process. Hence, our findings suggest that an input-based perspective can usefully complement the outcome-based perspectives on process that are dominant in entrepreneurship (Aldrich & Martinez, 2001; Van de Ven & Engleman, 2004).

Our study contrasts with the findings of Brettel et al. (2012), who did not find performance effects of means orientation. However, our sample consists

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<sup>6</sup>Data are available from the authors.

of ventures that are not embedded in a context of technological sophistication, and we observed them at their inception. In contrast, the sample of Brettel et al. (2012) consisted of knowledge-intensive R&D projects undertaken within established firms. Arguably, in the latter context, action is principally regulated by scientific or technological hypotheses rather than identity and personal relationships. Hence, our more typically entrepreneurial venture setting may represent a more suitable context for means orientation to unfold its effects.

While supportive of means orientation, our findings also help to assuage doubts as to the reasons why means orientation is used by entrepreneurs (Baron, 2009). Prior studies show that experts are more likely than novices to draw on their means than on predetermined goals (Wiltbank, Read, Dew, & Sarasvathy, 2009), and assumed that this difference was an element of expertise. However, some causal ambiguity remained since experts may favor an orientation toward means, mainly because they have more and better means at their disposal. By focusing on student entrepreneurs who are relatively limited in their available means, we performed a very conservative test of our hypotheses. Thus, what we found substantially increases the confidence that a means-oriented approach at the start of the entrepreneurial process is a form of “procedural rationality” (Sarasvathy & Dew, 2013) and that the mechanisms through which such an approach affects performance can be quite unrelated to the quality and quantity of the means available.

Second, by offering means orientation as an element of action regulation that is alternative or supplementary to an exclusive focus on goals, we also add to the theory of entrepreneurial action (for example, Frese, 2009) and, more generally, to the stream of entrepreneurship research that puts action at center stage (for example, McMullen & Dimov, 2013; McMullen & Shepherd, 2006). Entrepreneurial action theory has hailed the idea that the starting point of the entrepreneurial process might sometimes be the means rather than the goal to be achieved, “as a highly useful addition to the more traditional concept of having a clear product or service goal in mind which is then pursued” (Frese, 2009, p. 468). On the other hand, action theory is premised on the concept that human behavior is directed toward the accomplishment of goals (Frese & Sabatini, 1985). Hence, it interprets action strategies that are centered on available means and resources as less comprehensive types of planning (Frese & Gielnik, 2014), rather than as approaches that can initially make do with limited goal regulation. Our framework accepts that goals play a role even within bottom-up action regulation, at least in the form of high-level aspirations. On the other hand, we argued that effective means-oriented action under uncertainty may comprise not just an element of controlled experimentation (for example, to test hypotheses about which means best achieve predetermined goals), but also openness to emergent goals.

If our understanding is correct, then the adaptivity of means orientation at the starting line raises the question of why entrepreneurial teams who seek an early anchoring of their behavior in specific goals perform less well, given that goals are usually thought to positively affect performance by: (a) directing attention to the relevant activities, (b) increasing effort, (c) creating persistence, and (d) leading actors to develop task-relevant cognitive strategies (Locke & Latham, 2002). We speculate that this may depend on two reasons. First, it is apparent that these mechanisms are unrelated to the epistemic validity of the goals; that is, with how well justified these goals are. Hence, those entrepreneurial teams that commit too early in their process to specific ends may be actually taking epistemic shortcuts that end up with the formulation of defective intentions.<sup>7</sup> Second, to the extent that goals are set through a bottom-up process that relies on disciplined experimentation, and it is anchored to means that are closely connected to the entrepreneur, we aver that some of the advantages of top-down goal setting can be replicated. Specifically, the focus on those means may provide direction while the positive affect that they arouse may support motivation and persistence. It is a task for future research to clarify which of these explanations carries more weight. Obviously, at some point in the entrepreneurial process, the benefits of means-based experimentation are likely to become less salient. Hence, it is also a task for future research to develop suitable rules for the stopping of the experimentation process.

Third, our study also specifically contributes to effectuation theory. It answers a call to expand the limited body of empirical evidence on the performance consequences of effectuation heuristics with evidence drawn from large *N* observational studies (Arend, Sarooghi, & Burkemper, 2015).<sup>8</sup> Moreover, it establishes that means orientation positively impacts new venture performance. Due to the conceptual difficulties of defining this type of performance, the effectuation literature has generally shied away from openly claiming that the use of effectuation principles has beneficial consequences for this outcome, apart from limiting the downside (bankruptcy) (Sarasvathy, 2012). Rather, it has proposed that the benefits of effectuation are more clearly reaped over the entire career of a repeat entrepreneur due to a learning process that occurs during the establishment of several firms (Sarasvathy, 2012). Our findings suggest that means orientation may have a positive impact on the upside of a new venture as well. In turn, this also

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<sup>7</sup>For example, to seize a perceived opportunity arising from the popularity of Indian food, a team may have formulated the goal of opening the “Curry in a Hurry” Indian restaurant in central Pittsburgh, Pennsylvania, by a certain date. While directing attention to one activity, this goal formulation may have overlooked the fact that catering Indian food to downtown office workers might have capitalized on the opportunity as well while being more justifiable on various grounds (say, predictability of the workflow or scalability of the business).

<sup>8</sup>A recent quantitative study (Cai et al., 2016) has contributed evidence of a positive relationship between effectuation and new venture performance from the context of transition economies, albeit with a focus on the construct of effectuation as a whole rather than specifically on means orientation.

increases the appeal of this principle of effectuation for anyone who needs to undertake highly uncertain project-like business initiatives.

Finally, our results indicate that teams of novices may profit differently from means orientation, depending on the clarity with which they identify an opportunity and on the degree to which they implement process control practices. Thus, they are partially supportive of a contingency view about the approach to be adopted during the early stage. In general, effectuation theory has not discussed which local conditions might affect the performance consequences of its principles (Arend et al., 2015), and occasionally it has given the impression that opportunity recognition is largely immaterial to the working of these principles; for example, “entrepreneurs may or may not begin with a clear vision for a new venture” (Saravathy & Dew, 2013, p. 289). In contrast, our findings indicate that the contribution of means orientation to performance is affected by the mental representations of the entrepreneur about the product and the organization. Hence, it appears that although the effectual logic was inductively derived by studies informed by the methods of the cognitive sciences, integrating some key cognitive constructs within the framework of effectuation theory is still an important task for future research. By discussing process control practices, we also began to address the issues that arise when effectuation is applied in organizational settings (Brettel et al., 2012; Werhahn, Mauer, Flatten, & Brettel, 2015).

### ***Practical implications***

From our study, novices can learn about the value of means orientation in the starting phases of their venture process. Owing to the dominance of the existing paradigm, it is likely novices would find it easy to reach consensus about a goal-oriented approach and on how to implement such approach, but would find it more difficult to achieve consensus whenever the situation warrants a means-oriented approach. Thus, our study may help teams of novices to move beyond intuitive applications of means orientation and to avoid otherwise tough and conflict-laden discussions on how to start the process.

In addition, our results may facilitate conversations about the opportunity in question and on how the governance mechanism in the team should be designed. Specifically, teams may want to consider opportunities as more malleable in the process, thereby seeing positive aspects in the lack of early definition. In terms of governance, novice teams may want to explore self-organization governance mechanisms that would allow individual team members to act on their means and bring results from their explorations back into the group for reflection, also mindful of the control implications that team processes create (Coleman & Voronov, 2003), often inadvertently.

For institutions wishing to support novice entrepreneurs, our evidence should allow for insights into the implications of coaching a team toward a means-oriented approach. From a fit perspective, supporting such a process may include providing information about the relationships among the vision of the entrepreneurial opportunity, as represented among the team members, their potential desire for professional team governance, and the nature of a means-based emergent entrepreneurial process.

Another practical implication of these ideas is that those entrepreneurs who are inclined to start the entrepreneurial process as suggested by the dominant paradigm not only should be mindful of the motivational advantages of formulating specific goals, but also should question the validity of those goals. As to those who lean toward a bottom-up approach, they should be aware that means orientation does not “consist in the blind groping of random acts of wishful thinking” (Sarasvathy & Dew, 2013, p. 291); it is unlikely to be beneficial unless the experimentation is carried out systematically and it is anchored to means personally connected with entrepreneurs.

### ***Limitations and conclusions***

This study also has limitations. First, although we observed our new ventures at two points in time, our data did not allow us to control for unobserved fixed effects such as certain aspects of the business models adopted. Hence, our results do not warrant an assertion of causality. However, the separation in time between the predictors and the criterion variables removes two common threats to internal validity; namely, that of simultaneous and of reverse causal direction. Second, we observed project-like startups that were designed to last only for about 10 months. Future research should be allowed to follow the new venture creation process for a longer period of time to observe whether the performance advantages of means orientation survive once the firm enters a growth dynamic.

As with any single study, there is a question of whether our results can be generalized. Most of our findings can be theoretically generalized to startups led by individual novice entrepreneurs since (except for process control) the interpersonal dimension is not a key component of the mechanisms that underpin our focal relationships. Because experts are likely to be even more proficient than novices in the use of their means, it is not unreasonable to expect that our results generalize all the more to startups led by experts. Our results are not amenable to statistical generalization to firms that are set up as ongoing businesses outside an academic context. However, the fact that none of the mechanisms we discussed require an infinite time horizon to be sustained suggests that the implications of our results may extend beyond the context of time-bound entrepreneurship.

With these caveats, this study demonstrates the contingent value of a means-oriented approach to the entrepreneurial process, and it supports the view that means orientation need not be an action-regulation strategy that develops slowly over time, but is one that can be taught and learned; hence, the means-oriented approach can be applied deliberately and selectively in the entrepreneurial process.

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## Appendix 1. Robustness checks: Attrition bias

### Second-wave survey: Comparing the means of nonrespondents and respondents

	Nonrespondents	Respondents
Ratio of women in team	<u>0.33</u>	<u>0.39</u>
Educational stream	<u>1.62</u>	<u>1.41</u>
Team size	<u>6.42</u>	<u>6.67</u>
Average team age	<u>20.24</u>	<u>20.50</u>
Presence of competitors	0.41	0.49
Dummy for services	1.06	1.10
Revenue model innovation	2.03	2.02
Cognitive diversity	2.87	2.90
ORB	5.19	5.29
MO	3.61	3.54
Financial performance	0.23	0.24
N	200	255

### Second-wave survey: Comparing the means of item-missing cases and core sample

	Item-missing cases	Core sample
Ratio of women in team	0.40	0.39
Educational stream	1.47	1.39
Team size	6.53	6.75
Average team age	20.37	20.58
Presence of competitors	0.48	0.50
Dummy for services	1.15	1.08
Revenue model innovation	2.00	2.03
Cognitive diversity	2.99	2.87
ORB	5.13	5.36
MO	3.49	3.56
Output value	4.20	4.00
Financial performance	0.30	0.21
N	95	160

Notes: Underlined numbers are significantly different at the 5% level.

In the first table, the nonrespondents are similar to respondents on most variables. Most importantly, the two samples do not differ significantly with regard to financial performance, thus indicating that the attrition is unlikely to have selected on the dependent variables and should, therefore, not be a source of bias.

In the second table, no difference is significant.

ORB = opportunity recognition belief; MO = means versus goals orientation.

## Appendix 2. Operationalization of key variables

Output value (alpha: 0.75)

How did your venture perform in terms of ... (1 = Significantly below expectations ...  
4 = Right on expectations ... 7 = Significantly above expectations)

- (1) Realized profits?
- (2) Opportunities to market product/service?
- (3) Customer satisfaction with the product/service?

Means versus goals orientation (alpha: 0.77) (6-point scale, from 1 to 6, reverse coded)

Means pole	Goal pole
(1) Our venture was specified on the basis of given means/resources	Our venture was specified on the basis of given venture objectives
(2) Given resources were the starting point for our venture	Given venture objectives were our starting point
(3) Given means have significantly impacted on the framework of our venture	Given venture objectives have significantly impacted on the framework of our venture

Opportunity recognition belief (alpha: 0.81) (1 = “No, certainly not” ... 7 = “Yes, certainly”)

4. The proposed business solution has the capabilities to answer the needs of the market described.
5. There is a “match” between what the proposed business solution does and what the targeted market demands.
6. Applying the proposed business solution with individuals/firms in the targeted market does constitute a feasible opportunity.
7. The proposed business solution is sufficiently developed to be applied with individuals/firms in the targeted markets.
8. The targeted market does have the “size and money” to make the application of the proposed business solution profitable.
9. The attractiveness of the proposed business solution provides enough reason to capable entrepreneurs to attempt to apply it with individuals/firms in the targeted market.

Process control (alpha: 0.83)

After completing your business plan, how frequently have the whole team, or the team director ... (1 = “Never” ... 5 = “Frequently”)

- (1) become involved in details or in the tightening of schedules?
- (2) given feedback to particular team members about activities under their responsibility?
- (3) become involved in altering the resources, objectives and schedules of particular team members?

Cognitive diversity (alpha: 0.87) (reverse coded)

How strongly do members of the top management team agree or disagree with each other about ... (1 = “We strongly disagree” ... 6 = “We strongly agree”)

- (1) the best way to maximize the firm’s long-term profitability?
- (2) what the firm’s goal priorities should be?
- (3) which organizational objectives should be considered most important?