Journal of Business Research 172 (2024) 114427

Contents lists available at ScienceDirect

Journal of Business Research

journal homepage: www.elsevier.com/locate/jbusres

Dynamics of entrepreneurial well-being: Insights from computational theory

Dimo Dimov [a,b,*], Joseph Pistrui [c]

[a] School of Management, University of Bath, Claverton Down, Bath BA2 7AY, United Kingdom
[b] Reykjavik University, Iceland
[c] IE Business School, IE University, Spain

ARTICLE INFO

Keywords:
Entrepreneurship
Entrepreneur
Well-being
System dynamics
Computational theory
Simulation

ABSTRACT

We explore the dynamics of entrepreneurial performance and well-being through computational theory. Our model connects mechanisms of work-related motivation and strain processes with the unfolding of an entrepreneurial process. The simulation results show that how an entrepreneur's energy ebbs and flows over their journey, charting certain venturing performance and levels of well-being, can be linked to distinct interplays of ambition, skill, self-regulation, and dynamism. Our work contributes a holistic account of entrepreneurship and well-being, stimulates computational modelling, and enriches discussions about the entrepreneurial future of work.

1. Introduction

How does well-being reflect the complex, dynamic work engagement between an individual and environment? Entrepreneurship and employment have traditionally been juxtaposed as representing distinct environments for well-being, trading off autonomy and flexibility for certainty and predictability (Stephan et al., 2022). With digitalization and now artificial intelligence (AI) transforming the workplace, there are new opportunities to reshape traditional production patterns (World Bank, 2019) and the emergence of non-standard employment can increase flexibility and freedom, and promote entrepreneurism (Dabic et al., 2023). Indeed, when looking at non-standard work models—which include labor platforms that upend traditional models of employment—platform workers are described as a virtual community of self-employed micro-entrepreneurs, partners, and subcontractors (Palier, 2019; Todolí-Signes, 2017). In addition, discussions on the future of work emphasize the design of meaningful work, whereby employees can go beyond their "assigned" work to pursue learning and experiment with new ideas (Malhotra, 2021), making their work more entrepreneurial. A variety of digital technologies are already affecting changes to work that extend beyond traditional entrepreneurship and innovation practices to more broadly influence culture, politics and society (Si et al., 2023). Indeed, digital technology encourages more entrepreneurial awareness among all types of workers (Fellnhofer, 2022).

As work becomes more entrepreneurial and more traditional algorithmic forms of routine work are taken over by digital technologies such as AI, questions arise about the implications of such trends for well-being, including closer scrutiny of entrepreneurial well-being. Entrepreneurial well-being is defined as "the experience of satisfaction, positive affect, infrequent negative affect, and psychological functioning in relation to developing, starting, growing, and running an entrepreneurial venture" (Wiklund et al., 2019, p. 582). It has both positive (bright) and negative (dark) aspects: engaging in entrepreneurship can bring happiness and work and life satisfaction through the autonomy and independence it enables; but it can also diminish one's quality of life through exposure to uncertainty and higher stress, giving rise to distress and mental health problems (Stephan, 2018; Stephan et al., 2022). The interplay between the positive and negative aspects of well-being is entwined with the dynamic nature of the entrepreneurial journey, calling for aligning our understanding of well-being with the dynamic nature of the entrepreneurial process (Wiklund et al., 2019). We need understanding that is both holistic, exploring how different factors work together, and recursive, exploring how day-to-day processes unfold into broader patterns across time (Wach et al., 2021).

In this paper, we take on this challenge by developing a computational theory of entrepreneurial process and well-being. Such theory aims to build an account of how key variables influence one another over time and its simulation can help explore how a system changes over

* Corresponding author.
E-mail address: d.p.dimov@bath.ac.uk (D. Dimov).

https://doi.org/10.1016/j.jbusres.2023.114427
Received 21 November 2022; Received in revised form 21 November 2023; Accepted 22 November 2023
Available online 19 December 2023

time from certain initial conditions, enabling the examination of counterfactual situations that are otherwise difficult to manipulate (Taber & Timpone, 1996). Our model connects the dual motivation-strain mechanisms of the demand-resources model of how job characteristics affect well-being (Bakker & Demerouti, 2007) and the distinction between challenge and hindrance stressors in differentiating job demands (Lepine et al., 2005). Additionally, by combining this with a process account of entrepreneurship (McMullen & Dimov, 2013), we can trace how an entrepreneur's well-being unfolds on a day-to-day basis and over time. Specifically, we incorporate three entrepreneur-related parameters (ambition, skill, and self-regulation) and one environmental parameter (dynamism) that enable systematic exploration of model behavior. Our simulation results show that these characteristics interact in particular ways to define distinct trajectories of entrepreneurial performance and well-being.

Our work makes important contributions to research on entrepreneurship, well-being, and the future of work. First, our approach builds a holistic account of the dynamics of entrepreneurship and well-being. It enables us to capture the recursive nature of the entrepreneurial process and formalize the dynamic, reciprocal relationships between stress processes and the entrepreneurial process (e.g. Rauch et al., 2018). In addition, our account integrates many piecemal relationships established in prior work, such as individual characteristics and performance (Rauch & Frese, 2007) and entrepreneurial stress and performance and well-being (Lerman et al., 2021). Second, our work provides a framework for computational modelling in entrepreneurship, whereby computational models can provide a virtual laboratory for operationalising our intuitions and guiding our reasoning on the dynamics of entrepreneurial well-being. Finally, we contribute to discussions about the future of work (World Bank, 2019), with its impetus towards designing meaningful work (Malhotra, 2021), by showing how entrepreneurial ambition needs to be matched with appropriate skill and self-regulation ability, with broader implications for learning and development in organizations.

2. Theoretical background

2.1. Modeling entrepreneurship: Market and entrepreneur sides

Entrepreneurship entails an interface between actors (entrepreneurs) and markets (Venkataraman, 1997) in the same way that playing a game entails an interface between players and game. The distinction between player and game is meaningful in that it separates the performance of something and that which is performed (Wolterstorff, 1975). As players, entrepreneurs pursue aspirations to attain certain market impact; as the overarching game, the market determines whether entrepreneurs succeed or fail in their aspirations (Sergeeva et al., 2021). Whereas what can happen is up to the world (market), whether it will actually happen is up to the entrepreneurs (Ramoglou & McMullen, 2022).

No game can take place without players and no players can be identified without a game. Focusing on the game requires abstracing from the individual players; and focusing on the players requires abstracting from the game. There are thus two distinct sides to the interface between entrepreneurs and markets, from which scholars can engage with entrepreneurship. The *market* side is about the economic function of entrepreneurship as a conduit for market impact. It concerns market activities such as production and exchange and outcomes such as profits, losses, new venture creation, creative destruction, equilibrium, or disequilibrium. This entails focus on the game itself in terms of mechanisms for determining winners and losers. When entrepreneurship is viewed from this side – a birds-eye view of the market as competitive arena – entrepreneurs operate in the background as abstract providers of the competing entries that need to be assorted in determining the outcomes of the game.

The *entrepreneur* side is about the psychological function of entrepreneurship as a conduit for individual aspirations. It concerns individual work as the exertion of physical and cognitive effort and outcomes such as well-being, stress, motivation, etc. This entails focus on the player in terms of mechanisms that enhance or diminish the player's well-being and their ongoing work commitment. When entrepreneurship is viewed from this side – a headshot view of the work of an entrepreneur in pursuing their aspirations – the game operates in the background as abstract provider of performance feedback that elicits psychological response by the player and affects their further commitment to being in the game.

As an analytical device that connects inputs and outputs, a model enables us to prioritize inputs based on whether and how they affect outputs that we consider desirable. Building a model of entrepreneurship implicates a choice of side to the interface between markets and entrepreneurs. A model can thus be about market outcomes (game perspective) or about entrepreneur outcomes (player perspective). Each provides a distinct type of operationalization. Focus on the market enables us to consider the types of entrepreneurial offerings that can produce better outcomes in the market. Focus on the entrepreneur enables us to consider market and individual charactersitcis that produce better outcomes for the entrepreneur. Notably, Lerman et al. (2021) distinguish venture- and entrepreneur-related performance in ways that align these with the two distinct sides.

Simulation approaches to entrepreneurship have largely focused on its market side (economic function), modelling market outcome processes, while using stylistic accounts of entrepreneurial agents as contestants. This includes using a characteristic function to assign payoff values to different coalitions of players (Keyhani et al., 2015), calculating fit with vectors of market demand (Mauer et al., 2018), observing others to draw inferences about entrepreneurial opportunities (Minniti, 2004), mapping decisions into payoffs and assessing overall fitness (Ganco & Agarwal, 2009), and using resource capture as proxy for venture emergence (Bort et al., 2023).

In contrast, this paper takes the entrepreneur (player) side and thus focuses on developing a holistic, dynamic understanding of the entrepreneur's well-being. Well-being has been the subject of keen scholarly interest in a quest for understanding human happiness, life satisfaction, meaning, and self-realization (Kahneman et al., 1999; Ryan & Deci, 2001; Ryff, 1989). In the following sections, we review key ideas that are instrumental for developing a computational theory of entrepreneurial well-being. They are anchored in current understanding of employee well-being in organizations, distinct aspects of entrepreneurial well-being, and factors associated with entrepreneurial performance.

2.2. Well-being in organizations

Interest in the well-being of employees within organizations arises from a quest to understand employee engagement and burnout as key factors for organizational performance (Crawford et al., 2010). Well-being fluctuates both across persons and within persons (on a day-to-day basis), with significant implications for employee performance (Sonnentag & Ilies, 2011) and with both individual and work-related factors at play. Their effects on performance and well-being are mediated by the satisfaction of basic psychological needs of autonomy, competence and relatedness, as well as by the motivational aspects of the job (Deci et al., 2017).

The demands-resources model (Bakker & Demerouti, 2007; Demerouti et al., 2001) synthesizes research on the relationship between job characteristics and organizational outcomes by (1) proposing two overarching categories for job characteristics, namely resources and demands; and (2) proposing two underlying processes of motivation and strain through which job demands and resources are channelled into certain outcomes. Job demands refer to the required sustained physical or mental effort and are thus associated with certain psychological costs. Job resources refer to aspects of the job that are functional in achieving work goals, stimulating personal growth and development, and reducing job demands. Examples of job resources include job control,

opportunities for development, participation in decision making, task variety, feedback, and social support. In terms of processes, strain relates to the exhaustion of physical and mental resources and, ultimately to problems such as burnout. The motivational pathway is related to increased work engagement through the satisfaction of basic psychological needs and increased effectiveness in achieving work goals.

Against the basic idea that job resources promote engagement through motivational processes and job demands contribute to exhaustion and burnout through the stain pathway, Crawford et al.'s (2010) meta-analysis of the effects of job demands and resources suggests that the relationship between job demands and engagement depends on the type of demand at stake. In particular, they distinguish between *hindrances* as demands that are negatively related to engagement and *challenges* as demands that are positively related to engagement. The model that emerges from this meta-analysis suggests that resources are associated with increased engagement and reduced burnout; hindrance demands are associated with reduced engagement and increased burnout; and challenge demands are associated with increased engagement and increased burnout. Similarly, in another meta-analysis of the effects of challenge and hindrance stressors[1] on performance, Lepine et al. (2005) find that challenge stressors have positive indirect effects via motivation and negative effects via strain; and hindrances have negative indirect effect via both strain and motivation.

Against the negative impact of job stressors lies the need for a recuperative effect of recovery, whereby recovery-enhahcing activities such as psychological detachment, physical exercise, and sleep can protect one's well-being (Sonnentag, 2018). At the same time, Sonnentag discusses a paradoxical interplay between stress, recovery, and well-being, whereby recovery processes are actually impeded by high job stress, which in effect unleashes a vicious cycle as reduced recovery reduces well-being and increases stress, which further reduces recovery and well-being. The paradox thus lies in the fact that while job stressors make recovery necessary, they are actually associated with lower recovery processes. This occurs through negative activation (arousal) that makes recovery more difficult, depletion of energy leading to exhaustion and fatigue, and constant technological connectivity that impairs psychological detachment from work.

Overall, understanding the dynamics of well-being in work settings requires an account of how work-related demands and resources affect motivation and strain at work, as well as of how recovery processes work to recuperate one's energy and reduce stress.

2.3. Entrepreneurial well-being

Entrepreneurs operate in a distinct context of both higher autonomy and unique sources of stress associated with uncertainty, workload and resource constraints (Williamson et al., 2021). Their experiences span a continuum with negative and positive ends: illbeing, which entails distress or mental health problems that generally diminish one's quality of life; and well-being, which entails happiness, satisfaction, and general optimal psychological functioning as indicators of high quality of life (Stephan, 2018). Entrepreneurial well-being is inherently dynamic in that different aspects come into play in different phases of the entrepreneurial process (Shir & Ryff, 2022). A recent meta-analysis affirms that both positive and negative well-being are activated in the entrepreneurial process: compared to employees, entrepreneurs exhibit higher levels of positive well-being, such as work and life satisfaction, but there are no differences between the two groups in negative well-being, namely negative affect and stress-related mental health problems (Stephan et al., 2022).

The demands (stressors)-resources framework discussed in the previous section is readily applicable in the context of entrepreneurship by providing overarching categories for describing entrepreneurial experiences and their relationships to well-being. In terms of resources, subjective vitality reflects the experience of possessing energy and thus the activation of physical and mental resources that contribute to well-being (Stephan et al., 2020). Similarly, autonomy, job satisfaction, and meaningfulness play instrumental roles in reducing burnout (Tahar et al., 2022) and increasing well-being (Ryff, 2019; Stephan et al., 2020).

In terms of demands, stress is a hallmark entrepreneurial experiences. Prior studies have shown that entrepreneurs (self-employed) experience higher levels of stress (e.g. Cardon & Patel, 2015). Entrepreneurial stress has diverse sources (Grant & Ferris, 2012) and is a dynamic part of the entrepreneurial process (Rauch et al., 2018), driven by interpretation and response to various events (Lerman et al., 2020). In a recent meta-analysis of the consequences of entrepreneurial stress, Lerman et al. (2021) reconcile inconsistent findings in prior work by highlighting the need to differentiate stressors. By deploying the *challenge* and *hindrance* stressor distinction to a wide range of constructs used previously as descriptions of stressful experiences, they demonstrate their divergent effects: challenge stressors affect performance but not well-being, while hindrance stressors affect well-being but not performance.

In another recent application of the challenge-hindrance stressors framework, Wach et al. (2021) connect it to recovery and examine whether cognitive demands (challenge stressors) and emotional demands (hindrance stressors) impair psychological detachment as a key recovery mechanism. They find that, on a day-to-day basis, both cognitive and emotional demands reduce detachment, which in turn decreases the entrepreneurs' well-being. Over time, however, cognitive demands have a direct positive effect on well-being, while emotional demands have a direct negative effect. This study highlights the different nature of the daily and longer-term dynamics of well-being and thus reinforces the need for time-sensitive theorizing. In work that resonates with the distinction between cognitive and emotional demands, Nikolaev et al. (2022) distinguish problem- and emotion-focused coping and find that they similarly exhibit different effects on well-being, positive and negative respectively. In the same vein, emotional demands increase burnout (Tahar et al., 2022).

In light of the detrimental effects of certain stress in the entrepreneurial process, recovery activities are essential as they help replenish the resources of the body and mitigate the effects of stress (Williamson et al., 2021). These include improving the quality and amount of sleep, psychological detachment from work, and meditation exercises. The importance of such activities is heightened by the dark side of entrepreneurship, namely the negative psychological reactions to engaging in entrepreneurial action as well as the possible loss of capital and negative impact on society (Shepherd, 2019).

Overall, the relationship between entrepreneurship and well-being arises in the context of entrepreneurial work as the effort that agents exert to bring about desired states of the world (Ramoglou & McMullen, 2022), in which its motivation and strain aspects such as stressors, resources, and recovery are combined with an overall sense that autonomy and purpose make such work more meaningful.

2.4. Entrepreneurial effort and performance

While the experience of work can determine the effort that entrepreneurs exert in the entrepreneurial process, whether and how such effort translates into entrepreneurial performance (i.e. market impact) invokes consideration of different factors, based on studies of entrepreneurial performance. Market performance outcomes in entrepreneurship, such as revenue and revenue growth, have highly skewed, power-law distributions (Crawford et al., 2015). They reflect not only the uncertainty so characteristic of entrepreneurship (Packard et al., 2017) but also the complexity of social processes that lie beyond the entrepreneur's control and generate power-law patterns (Andriani &

[1] Given the interchangeable reference to demands and stressors, from here onwards we retain the terminology of stressors, referring respectively to challenge stressors and hindrance stressors.

McKelvey, 2009). This suggests that it is unreasonable to expect strong associations between the efforts of entrepreneurs and the market performance of their ventures. These characteristics of the "game" of entrepreneurship is what distinguishes – from a player's point of view – entrepreneurship from other purposeful activities such as sport. To the extent that entrepreneurs can choose to play in markets with varying competitive and environmental dynamics (Dess & Beard, 1984), the strength of the relationship between effort and performance can vary accordingly.

The effect of entrepreneurial effort also varies with the personal characteristics of those who exert it. A meta-analysis of the relationship between personal characteristics and business creation and success suggests there are moderate effects at best, yet with some distinct patterns (Rauch & Frese, 2007) revealing several important results. First, effects are generally stronger when the traits are relevant to the task of business creation and business success. This highlights the importance of skill. Second, traits most strongly correlated with business creation and success included need for achievement, self-efficacy, innovativeness, stress tolerance, need for autonomy, and proactive personality. These convey a general sense of ambition and ability to endure in the entrepreneurial process.

Entrepreneurs vary in their human capital as the knowledge and skills they bring to the tasks at hand are diverse. Specific human capital or skills that are closely related to the venture creation activities matter for the entrepreneurs' progress throughout the venturing process (Brüderl et al., 1992; Davidsson & Honig, 2003) and for ultimate survival (Bosma et al., 2004). At the same time, entrepreneurial success cannot be attributed to skill alone, as the moderate effects highlighted by Rauch and Frese (2007) readily attest. Indeed, chance explanations need to play more prominent role in entrepreneurship theories, reflecting not only the systemic uncertainty of the market but also random variation in the processes that comprise entrepreneurial phenomena (Denrell et al., 2015). In this sense, both skill and luck are necessary but not sufficient conditions for entrepreneurial success. Their effects are multiplicative rather than additive, making each a crucial ingredient for success (Dimov, 2017).

That entrepreneurs vary in their achievement motivation is an intuitive claim (Shaver & Scott, 1992) and such motivation is instrumental for business creation and success (Rauch & Frese, 2007). Entrepreneurs have different ambitions for the size of ventures they seek to build (Cassar, 2006; Martiarena et al., 2022; Verheul & van Mil, 2011). The intention to grow is a major factor in firm growth, magnified by the entrepreneurs' education and experience, and the dynamism of the environment (Wiklund & Shepherd, 2003). Therefore, ambition provides a sense of how far entrepreneurs aim to reach with their ventures. Combined with complementary traits such as self-efficacy and innovativeness, there is also a sense that higher ambition can expose entrepreneurs to higher-risk yet potentially higher-reward endeavours as various contingencies beyond their control play out in the market.

Finally, entrepreneurs vary in their ability to endure in the entrepreneurial processes by sustaining their goal directed effort. Different terms have been used to capture this trait. *Tenacity* or *perseverance* has an indirect effect on venture growth through its effects on the beliefs and goals of entrepreneurs throughout the process (Baum & Locke, 2004). Another term is *resilience*, conceptualized as an ability to manage crises, setbacks and challenges in the entrepreneurial process (Korber & McNaughton, 2018). The roots of resilience are in the child development literature, where it is defined as "dynamic process encompassing positive adaptation within the context of significant adversity" (Luthar et al., 2000, p. 543). Yet another related term is *grit,* defined as "perseverance and passion for long-term goals" (Duckworth et al., 2007, p. 1087), whereby one sustains a strenuous pursuit toward challenges. Notably, grit combines perseverance and passion, with the latter being the subject of growing interest in entrepreneurship (Cardon et al., 2009). Cardon et al. (2009) define passion as "intense positive feelings experience by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the self-identity of the entrepreneur" (p. 517) and suggest that it mobilizes self-regulation processes that underpin persistence.

More broadly, self-regulation represents the idea that goal-directed behavior is regulated by processes of feedback control (Carver & Scheier, 1998). Through self-control one regulates the deliberate, active aspects of behavior, the absence of which can result in ego depletion (Baumeister et al., 1998). Research has shown that one's implicit theories about the nature of such willpower as a limited or unlimited resource can affect self-regulation in the face of increased stress and demands (Job et al., 2010). Therefore, we can say broadly that there is something about how entrepreneurs self-regulate their behavior that determines how well they cope with stress and thus affects their sustained effort over time.

In summary, the dynamism of the market as well as the skill, ambition, and self-regulation of the entrepreneur provide an important conceptual toolbox for understanding the performance of entrepreneurs in their entrepreneurial journeys. Market dynamism conveys a sense of the extent to which broader socio-economic processes at play can disrupt entrepreneurial efforts and thus enshrine the entrepreneurs' deliberations in uncertainty. The notion of ambition captures how far entrepreneurs aim to reach through their efforts; the notion of skill captures how equipped they are with relevant knowledge and abilities; and the notion of self-regulation captures how they respond to the vagaries of the entrepreneurial journey. As we will show, this has implications for entrepreneurial well-being.

Fig. 1 provides a blueprint for our model building that synthesizes the different aspects of entrepeneurship and well-being discussed in this section into a holistic account of their interrelationships, i.e. a system. In the figure, rectangles represent core processes, parallelograms represent inputs / outputs, and ovals represent parameters that modulate the behavior of the system and can be varied. The motivation and strain of the work at hand drive the effort that entrepreneurs exert and are reflected in the well-being of entrepreneurs. In this sense, well-being and effort are interrelated indicators of the state of the system: well-being is a gauge for the physical and psychological state of the entrepreneur, while effort expresses their readiness to act in the world. Motivation and strain in turn are affected by the ambition and self-regulation of the entrepreneur as well as by the processes of recovery and performance feedback. Performance is affected by the effort, skill, and ambition of the entrepreneur, as well as by the externalities of market dynamism and random factors. As a source of feedback, performance is evaluated in light of the entrepreneur's accumulated effort. Finally, recovery is affected both by the accumulated motivation and strain, and the entrepreneur's self-regulation.

3. Computational model of entrepreneurial well-being

Based on our current knowledge of the piecemeal relationships that comprise our blueprint in Fig. 1, we cannot derive a robust sense of how everything works together as an interconnected whole. In this section, we translate the blueprint into a computational model in order to explore the behavior of this system. This can provide insights into the dynamics of entrepreneurial well-being based on complex interactions that are difficult to capture in empirical settings. Against a future in which work will become more entrepreneurial, this approach can inform the design of meaningful work, underpinned by entrepreneurial effort.

3.1. Holistic, systems thinking about entrepreneurial well-being

The notion of system refers to an organized whole composed of interconnected and interacting parts (Backlund, 2000). General Systems Theory introduced a new conception of 'wholeness' that suggested that the similarities in behavioral properties of diverse systems can be explained in terms of their structures as the arrangement and interplay of component elements (von Bertalanffy, 1950). This framework enables

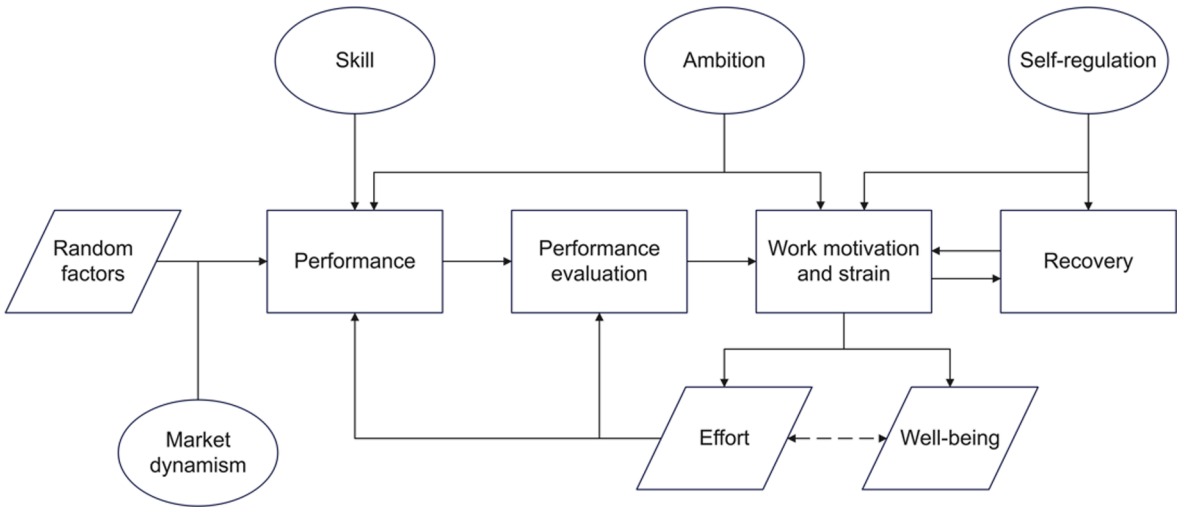


Fig. 1. A blueprint for modelling entrepreneurial process, performance and well-being.

us to study the interaction of systems with their external environments, while recognizing that they exhibit different levels of complexity (Boulding, 1956). The first level is static structure or *framework* – it enables the organization of theoretical knowledge and a simple description of the dynamics of the system. The second level is what Boulding calls *clockworks* and pertains to simple stable equilibrium systems that can be studied through comparative statics. At level three lie control mechanisms or cybernetic systems (*thermostat)*. Here, the transmission and interpretation of information become essential for the behavior of the system. At level four is the open system or self-maintaining structure (*cell*). Boulding suggests that it is at this level that we can differentiate life from non-life. Open systems are characterized by negative entropy: they acquire energy from the environment to sustain themselves (Katz & Kahn, 1966).

Self-regulating systems of Boulding's level four and above (plant, animal, human, social organization, and transcendental systems) are living systems that can maintain regularity in the face of fluctuations in the environment via the regulative force of internally generated desired states (Vancouver, 1996). The self-regulating properties of humans and their organizations make them suitable for modelling their behavior through the logic of living systems, which deploy various feedback control loops and certain reference states that are internal to the system (Vancouver, 1996).

Computational theory is a particular form of modelling that can capture the underlying complexity of its object of interest by providing an account of how key variables influence each other over time and thereby enabling the examination of system changes from a set of initial conditions (Taber & Timpone, 1996). Its language of computational symbolics, whereby relationships can be expressed as algorithms, can provide complex descriptions and enable the simulation of theory to explore its implications. As such, computational theories are not limited by empirical reality and can explore counterfactual or difficult-to-manipulate situations (Taber & Timpone, 1996). Specific examples of applications of computational theory for understanding human organizational behavior highlight their ability to capture the complexity and dynamics of phenomena of interest. By developing a computational theory of multiple goal pursuit, Vancouver, Weinhardt, and Schmidt (2010) are able to integrate processes of goal choice and goal striving. Similarly, Vancouver, Tamanini, and Yoder's (2010) model of organizational socialization of newcomers is able to integrate multiple processes, whose piecemeal consideration has tended to produce only partial explanations.

A distinct approach to modelling system behavior - System Dynamics (SD) - emphasizes circular causality and time delays (Sterman, 2000) and deploys a distinct language of stock-flows, time delays, and feedback loops. A stock-flow structure is used to represent changes in the system. Stocks represent accumulations while flows represent the rate of change in stocks. For example, Dierickx and Cool (1989) discuss the stocks and flow of asset accumulation as key to sustainable competitive advantage. They distinguish stocks and flows through a "bathtub" metaphor – stocks represent the amount or level of water in the tub, while flows refer to the water coming into or out of the tub. A feedback loop represents the idea that changes in a given factor within a system can lead to further changes in the same factor – immediately or after a relative delay – based on the activation of a chain of causal relations with other factors. Feedback loops can be positive (reinforcing) and negative (balancing). In a positive feedback loop, increases in a factor leads to further increases in that factor, as the well familiar deafening noise of microphone feedback demonstrates. In a negative feedback loop, an increase in the factor can eventually lead to its decrease, thereby keeping it in check. The thermostat of our home heating enacts such negative feedback – after a boiler produces more heat, it causes the temperature in the room to reach its pre-set ceiling level, which in turn switches off the boiler and thus stops the production of further heat.

Our blueprint in Fig. 1 focuses on the individual entrepreneur as exerting effort to achieve market impact via their entrepreneurial venture. This is a recursive process in that the effort is exerted repeatedly over time, from day to day. The complexity of this system is reflected in stock-flow relationships as well as in two broad feedback loops. Motivation, strain, effort, and performance have stock-like features in that they accumulate and vary over time. One feedback loop represents performance feedback, whereby the entrepreneur's effort leads to some progress for the venture, which is then evaluated and – via the motivaton-strain process – affects the entrepreneur's further effort. The other feedback loop relates to how the entrepreneur's recovery process both is affected by and affects the accumulation of motivation and strain. In the next section, we develop the computational structure of our model.

3.2. Model structure

In what follows, we discuss each element of the blueprint and its translation into algorithmic relationships depicted in Fig. 2. Starting with the motivation-strain processes, reflecting the basic structure of the job demands-resources model discussed earlier, we model *motivation* and *strain* as stock variables, affected by respective flow processes – inflows related to increases in motivation or stress; outflows related to decreases in motivation and strain. In this way, resources affect motivation increase and strain decrease – shown with positive signs at the arrowheads, i.e. higher resources lead to higher motivation increases

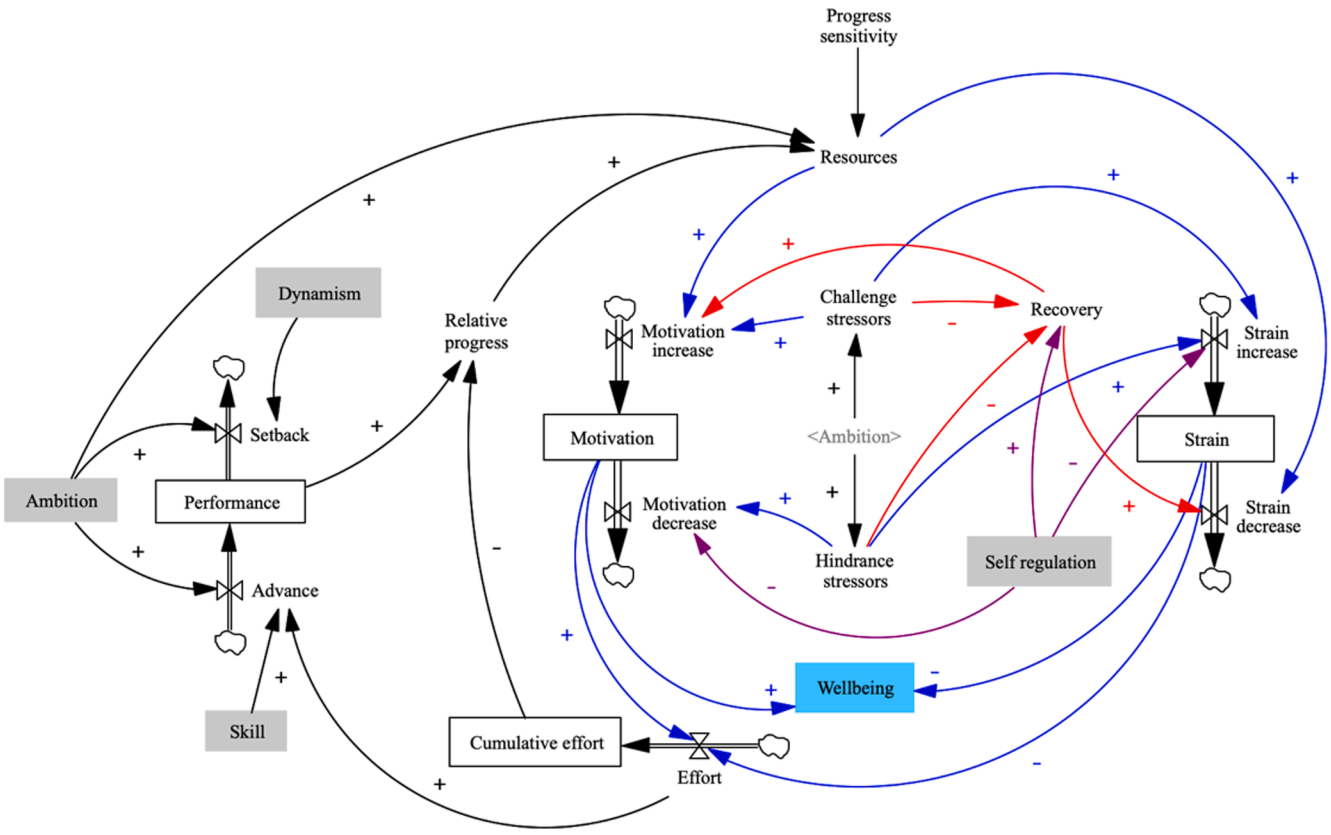


Fig. 2. System dynamics model of entrepreneurial process, performance, and well-being.

and higher strain decreases (which lead to lower stock level of strain). We also differentiate demands into *challenge stressors* and *hindrance stressors*. Challenge stressors positively affect motivation increase and strain increase; and hindrance stressors positively affect motivation decrease and strain increase. All these relationships are shown in blue.

The relationships in red relate to the inclusion of *recovery* processes in the model. Recovery positively affects the increase in motivation and the decrease in strain. In turn, it is negatively affected by the challenge and hindrance stressors. Finally, the relationships in purple relate to our inclusion of *self-regulation* as a parameter in the model that can modulate the effects of challenge and hindrance stressors on recovery (positively) as well as on motivation decrease (positively) and strain increase (negatively). The intuition is that with high degree of self-regulation, higher challenge or hindrance stressors do not translate readily into reduced recovery, reduced motivation or increased strain.

The interplay between motivaton and strain affects *well-being*, which acts as a gauge of the psychological experience of the entrepreneur. The relative balance between motivation and strain also determines the ongoing *effort* that the entrepreneur would exert in their endeavour. The effort variable thus acts as a gateway to the performance side of the model, with the respective relationships shown in black. Effort is modelled as a flow variable that accumulates in the stock variable *cumulative effort*. The stock variable *performance* reflects the results or outcome of the entrepreneurial endeavour and is in turn determined by two flow variables – *advance* (inflow), which increases performance; and *setback* (outflow), which decreases performance. The amount of advance is determined by the level of effort exerted as well as by two parameters, *ambition* and *skill*. Ambition reflects the aspiration of the entrepreneur, while skill reflects their ability. Ambition also affects setback since more ambitious endeavours are more likely to experience setback. Setback is also affected by the dynamism of the market in which the entrepreneur operates. In addition, ambition affects the challenge and hindrance stressors, since high-ambition efforts are more likely to lead to heightened cognitive and emotional demands.

To model the entrepreneur's ongoing evaluation of their performance, we use *relative progress* as a variable that captures the ratio between performance and cumulative effort, i.e., it reflects progress in relation to cumulative effort as guiding the entrepreneur's perception of how well they are doing. In this sense, higher performance for given cumulative effort or less cumulative effort for given performance indicate higher relative progress. Together, ambition and relative progress enhance the resources for further entrepreneurial effort. This reflects the intrinsically motivational nature of entrepreneurial activity and the feedback from entrepreneurial performance as a guide for further effort and development. In order to model the relative weights of ambition and relative progress in affecting resources, the variable *progress sensitivity* sets the weight of relative progress in influencing resources. This weight would be low in the early stages, when not much progress is to be made and thus the entrepreneur would be driven almost entirely by ambition. The weight would increase over time. We modelled this time-dependent effect through the ratio *time / final time*, where time represents the current time at any point in the simulation and final time is the total number of time steps. This means that progress sensitivity is 0 at the start and 1 at the end.

In the overall model, ambition plays a central role given its direct influence of the different parts of the model. When there is no entrepreneurial ambition, there are no resources and no demands (stressors) on the entrepreneur, and therefore no effort and no progress. In other words, when ambition is absent (0), the model is effectively "switched off". With the appearance of ambition, the model switches on – motivation and strain are activated via resources and challenge and hindrance stressors; motivation and strain activate entrepreneurial effort, which in turn leads to performance.

Two broad feedback loops evident in the model. The first starts from effort and via performance and relative progress affects resources, which in turn affects motivation and strain to affect further effort. Through this

loop alone, making progress increases resources, which drives motivation for sustained effort, particularly as the relative importance of performance increases over time. Conversely, lack of progress can decrease resources, particularly as the motivating effect of ambition wanes over time and more attention is paid to relative progress, which does not boost motivation and can gradually lead to its depletion and thus to no further effort. Entrepreneurial effort is sustained with progress and fizzles out with lack of progress.

The second broad loop relates to the balancing effects of challenge and hindrance stressors, particularly as they affect recovery. Alongside resources, these stressors "fire up" motivation and strain as determinants of effort, and are sustained by the entrepreneur's ambition, which effectively activates the stressors at each step of the process. Because challenge and hindrance stressors increase strain and reduce recovery – which can dampen motivation and further increase strain – a vicious cycle can be triggered whereby strain gradually overpowers motivation and stops any further effort. This is effectively a state of burnout for the entrepreneur in that they are unable to muster any more effort. This cycle can be counteracted by the motivational boost of performance (via resources) or by increased self-regulation that can dampen the depleting effects of the stressors.

3.3. Model equations

The full model is publicly available.[2] The variables and equations used to translate the model structure of Fig. 2 into a computational theory are presented in Appendix 1. The table lists separately the different categories of variable used in the model. All the stock variables are interpreted in terms of a common energy unit through the use of a notional energy unit constant defined as unit of energy per day. The units for the flow variables are energy per day, while the remaining variables in the model are dimensionless (dmnl). Here we highlight several prominent features.

There are four parameters in the model, whose values can be systematically varied in the simulation. These are ambition, skill, self-regulation, and dynamism. They are modelled to take on values between 0 and 1, which eases interpretation as a standardized scale (with 0 as minimum and 1 as maximum) onto which any empirical measure can be transformed.[3] The zero values for ambition and skill act as reality checks for the model: when ambition is 0, the model does not start – there is nothing to drive entrepreneurial effort; when skill is 0, the entrepreneur does not make any progress and their resources are gradually depleted.

We use a logistic function to model effort as a function of motivation and strain. Effort thus takes values between 0 and 1 based on the relative magnitude of strain and motivation, with 1 representing "full" effort and 0 representing no effort. When motivation and strain are balanced (equal), there is effectively "half" effort.

In modelling advance, in addition to direct effects of effort and skill, we include a random component, which reflects the dynamic and unpredictable nature of an entrepreneurial journey and thus the importance of luck. The random component varies with ambition, as explained in Appendix 2. Our modelling of setback is a combination of frequency and magnitude. The frequency of setback is affected by the dynamism of the market. This is modelled as a Poisson distribution with a mean set at the value of the dynamism parameter and minimum and maximum values set at 0 and 1 respectively. This formulation produces a value of 1 with frequency equal to the value of dynamism: it effectively acts as a pulse that triggers a setback. The magnitude of setback is relative to ambition and is based on the same random component as advance. In this way, both advance and setback are influenced by the entrepreneur's ambition in that more ambitious efforts can face bigger advances and setbacks.

The effects of ambition on challenge and hindrance stressors are also modelled with a random formulation. This reflects the intuition that the demands on the entrepreneur can vary from day to day. Because the magnitude of the stressors reflects the entepreneur's ambition, we use the same specification as advance and setback. The random variables for advance, setback, challenge stressors and hindrance stressors are based on different noise seeds, i.e. the draws are made from different streams of random numbers and thus are not interdependent.

We model relationships where several variables are involved in influencing another variable as follows. The effect on motivation increase is the product of recovery and the maximum of resource and challenge stressors. In this way, motivation increase is affected by whichever source (resource or challenge stressor) gives a bigger boost. For the effect on strain increase, we use the sum of challenge and hindrance stressors, divided by twice the ambition. This specification produces a value between 0 and 1 and thus can facilitate comparison with other work. We used a similar specification for the effects of challenge and hindrance stressors on recovery. For the effect on strain decrease we used the product of resources and recovery.

In order to facilitate future refinement and calibration of the model, we include weights for all interacting variables. They are currently set at 1, but could vary between 0 and 1.[4] This specification enables expanded sensitivity analysis of the behavior of the model.

3.4. Model validation

To evaluate our computational model, we focus on five validity criteria as outlined by Vancouver, Weinhardt, and Schmidt (2010), pertaining to the structure of the model and its data outputs. *Internal* validity pertains to whether a model represents a successful translation of theory. This is largely based on expert opinion and, in output terms, requires the model to run without error. The latter condition is satisfied in our case and we have ensured the former by building the relationships in our model from a synthesis of relevant prior work. *Outcome* validity relates to whether the model can produce results that are in line with certain predictions or consistent with real-world patterns. This can be assessed both qualitatively and quantitatively, as we do in our analyses.

Process validity pertains to the correspondence between the model processes and real-world processes. We have built the model with process validity in mind, outlining our reasoning at each step. By making available our process equations and a published version of the model, we also invite the expertise of the reader community to validate and refine the model. *Sensitivity* analysis integrates process and outcome validity by assessing the effects of the various free parameters in the model on the behavior of the model itself. This enables examination of the sensitivity of the results to various changes in the model parameters, as shown in our results below. Finally, *parsimony* pertains to the need for a model to be not too complex as to obscure understanding of what generates its

[2] The model can be accessed through the link below. It can be read with Vensim Model Reader, which is freely available and downloadable from the vensim.com website. https://www.dropbox.com/sh/ss7znidlq861lo1/AAAZkxJ1_hc4nkRyayVXZUlNa?dl=0.

[3] This formulation helps deal with the variety of measures and scales used in prior work. For instance, a widely used measure of ambition – from the Global Entrepreneurship Monitor and Panel Study of Entrepreneurial Dynamics research programs – is a dichotomous variable, with 1 being "as large as possible" and 0 being "a size I can manage myself" (Cassar, 2006). Other measures include the actual expected future size (Cassar, 2007) or a combination of perceptions about certain level of growth with ideal size of the business (Wiklund & Shepherd, 2003). Similarly, in regard to skills, some studies rate skills directly from (0) lack to (3) exceptional (Lyons et al., 2020), while others use human capital proxies such as years of education or experience (e.g. Davidsson & Honig, 2003).

[4] These parameters are not shown in Fig. 2, which provides a top-level view of the model for ease of presentation, but can be seen in the deeper view in the published version of the model.

results; and not to too simplistic. Parsimony is reflected in the number of free parameters in the model. In our case, four parameters are the minimum needed to capture the interplay between entrepreneur and world: internal psychological recovery (self-regulation), external contingencies (market dynamics), and modulators of the strength of the effort-performance relationship (ambition and skill).

4. Model simulation

We built and ran the model specified in Fig. 2 in Vensim (PLE Plus, version 10.0.1), a system dynamics simulation software, which has been used in the computational theory examples by Vancouver and colleagues mentioned earlier. The software depicts the behavior of the system over a certain number of runs from initial conditions. This enables us to see how the system behaves over time, as its interrelationships and feedback loops are operated repeatedly. The simulation is regulated by a system clock that represents the discrete steps followed in propagating changes throughout the variables in the system. Variable values are updated at each step, before the clock advances to the next step. For ease of interpretation, we define the clock unit as one day, i.e. a discrete day in the working life of an entrepreneur.

4.1. Initial results

Each simulation run in the system is conducted over 500 days. Given the four main parameters in the model – ambition, skill, self-regulation, and dynamism – our analysis sought to compare the behavior of the model across different configurations of these parameters. With each parameter taking values between 0 and 1, we used 5 values for each parameter (0.1, 0.3, 0.5, 0.7, 0.9), which resulted in 625 distinct configirations in which we ran the model. In our initial analysis, we examined the overall outputs of the system as well as how each of the four main parameters affects the behavior of the system, i.e. how the piecemeal variation in the value of a single parameter affects the behavior of the system. In Fig. 3a, we show the distribution of performance and well-being at day 500 across the 625 model runs. For performance, there is a clear long-tail, power-law-like distribution, which is consistent with prior finidngs (Crawford et al., 2015) and thus provides outcome validity for the model. Well-being varies more widely, across positive and negative values, which invites deeper analysis into the configurations of parameters that produce such variation.

In Figs. 3b and 3c, we show the system trajectory for each of the four paramters and for each of its five values. In this sense, each depicted line represents the average trajectory over the 125 possible configurations of the other 3 paramerers. For ease of comparison, the lines are shaded so that darker lines represent higher parameter values.

Fig. 3b shows the results for performance. They provide additional outcome validation of the model in that it produces patterns consistent with prior work. The figure shows that performance increases with both ambition and skill, and it decreases with dynamism. In regard to self-regulation, performance is affected negatively at its lowest value (0.1) and is unaffected at values of 0.5 and above. These results are in line with our expectations for the individual effects of the four parameters on performance.

The results for well-being are shown in Fig. 3c. It shows that well-being increases with both ambition and self-regulation, with the paths diverging from the very start of the process. When both ambition and self-regulation are low (below 0.5), well-being is negative in the end. For skill and dynamism, the patterns are different, with the paths diverging later on in the process. This reflects the fact that ambition outweighs performance feedback in the early stages of the process and thus acts as a key resource. Higher skill leads to higher well-being in the end. Operating in a market with lower dynamism also ends in higher well-being.

Overall, these results support the intuition that ambition, skill, self-regulation, and dynamism all matter for performance and well-being. Given the skewed distribution of performance and the wide variation in well-being, it is necessary to explore how the four parameters interact to produce these patterns.

4.2. Analyses of parameter interactions

Fig. 4 shows the tabulated results for performance and well-being for each of the 125 different combinations of ambition, skill, and self-regulation. The result for each combination is the average of the scores across the 5 model runs (each with a different value for dynamism) in which the particular combination appears. The results are presented as a heatmap, with higher scores for performance and well-being presented in darker cells. This enables visual tracing of the pathways that produce "darker" scores, i.e. higher performance or well-being.

In regard to performance, it is notable that the cells on the left and above the diagonal contain mostly zero values. Zero values are most prevalent and represent unsuccessful entrepreneurial efforts. They tend to be clustered in cases of low ambition (below 0.5) or low self-

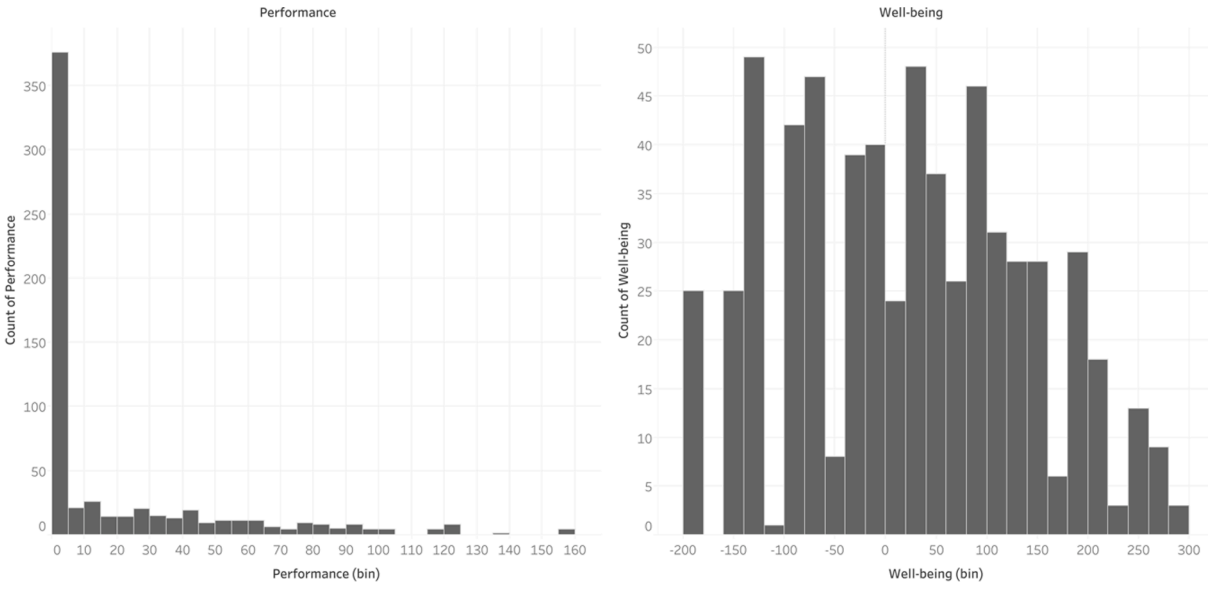


Fig. 3a. Distribution of performance and well-being at time 500 across 625 model runs.

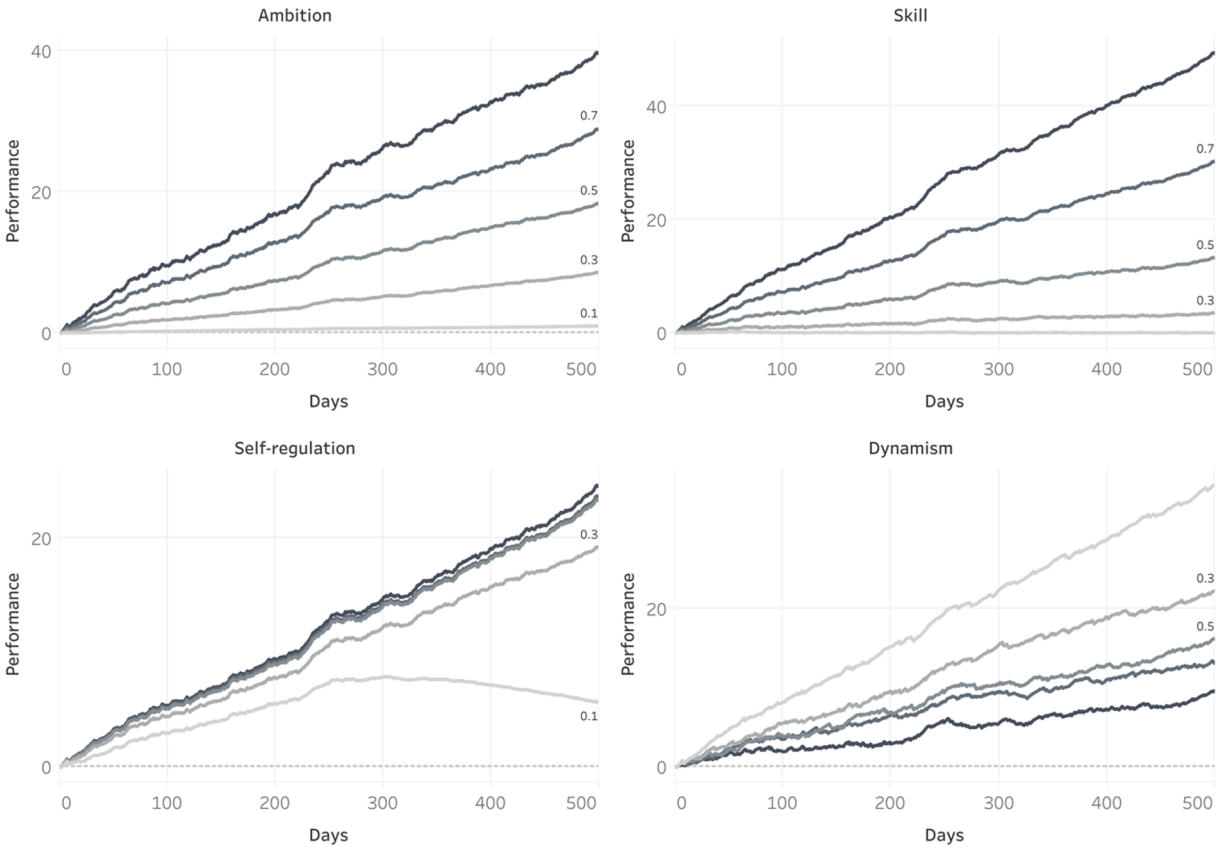


Fig. 3b. Performance over time for different parameter values.

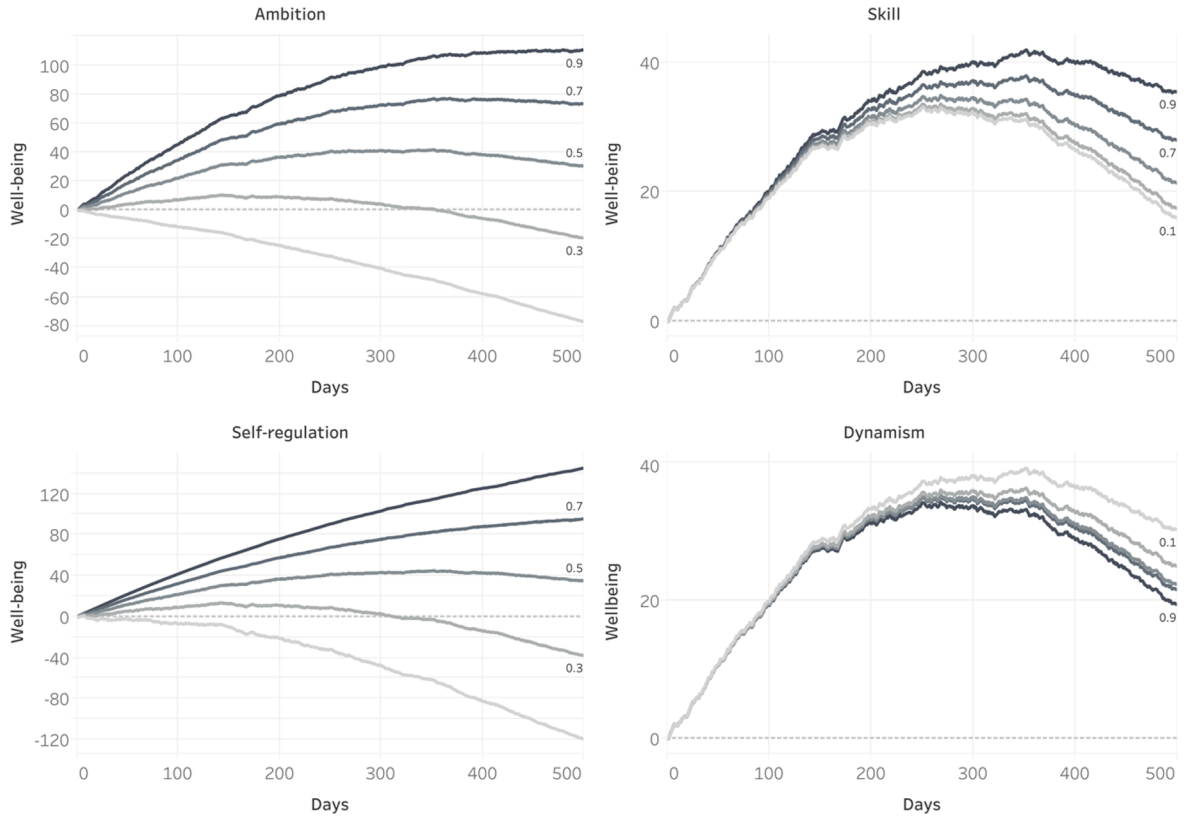


Fig. 3c. Well-being over time for different parameter values.

Performance

Ambition	Skill	Self-regulation 0.1	0.3	0.5	0.7	0.9
0.1	0.1	0.0	0.0	0.0	0.0	0.0
	0.3	0.0	0.0	0.0	0.0	0.9
	0.5	0.0	0.0	0.0	0.1	3.4
	0.7	0.0	0.0	0.0	0.5	7.6
	0.9	0.0	0.0	0.0	1.1	12.0
0.3	0.1	0.0	0.0	0.0	0.0	0.0
	0.3	0.0	0.0	2.1	2.8	2.8
	0.5	0.0	0.0	8.0	10.5	10.5
	0.7	0.0	0.0	21.7	23.2	23.3
	0.9	0.0	0.0	36.2	36.6	36.7
0.5	0.1	0.0	0.0	0.1	0.1	0.1
	0.3	0.0	2.4	4.7	4.7	4.7
	0.5	0.0	8.8	17.5	17.6	17.6
	0.7	0.0	25.8	38.8	39.0	39.0
	0.9	0.0	52.5	61.2	61.4	61.5
0.7	0.1	0.0	0.0	0.1	0.1	0.1
	0.3	0.3	5.7	6.6	6.6	6.6
	0.5	3.9	23.6	24.6	24.7	24.7
	0.7	9.6	54.3	54.6	54.7	54.7
	0.9	21.7	85.7	86.0	86.2	86.3
0.9	0.1	0.0	0.1	0.1	0.1	0.1
	0.3	2.3	8.5	8.5	8.5	8.6
	0.5	9.5	31.6	31.7	31.8	31.8
	0.7	27.4	70.1	70.3	70.4	70.5
	0.9	66.2	110.6	110.8	110.9	111.0

Well-being

Ambition	Skill	Self-regulation 0.1	0.3	0.5	0.7	0.9
0.1	0.1	-181.8	-129.7	-76.5	-23.2	23.1
	0.3	-181.8	-129.7	-76.5	-23.1	23.6
	0.5	-181.8	-129.7	-76.5	-22.5	24.9
	0.7	-181.8	-129.7	-76.5	-21.4	27.0
	0.9	-181.7	-129.7	-76.4	-19.7	29.3
0.3	0.1	-151.4	-82.8	-10.8	45.9	82.3
	0.3	-151.4	-82.8	-9.2	47.4	83.3
	0.5	-151.4	-82.7	-4.9	51.3	85.7
	0.7	-151.4	-82.4	2.5	57.7	89.5
	0.9	-151.4	-81.8	10.8	64.3	93.2
0.5	0.1	-121.0	-36.4	37.1	93.4	139.2
	0.3	-121.0	-34.1	39.5	95.4	140.5
	0.5	-121.0	-28.2	45.7	100.5	143.9
	0.7	-120.9	-17.3	56.0	108.7	149.4
	0.9	-120.7	-4.9	67.0	116.6	155.5
0.7	0.1	-91.4	-5.3	72.9	138.0	195.6
	0.3	-90.3	-2.1	75.5	140.2	197.3
	0.5	-87.0	6.5	82.6	146.2	201.8
	0.7	-79.9	20.6	94.3	155.8	209.2
	0.9	-67.9	35.7	106.7	165.0	217.7
0.9	0.1	-71.9	18.4	103.5	180.7	251.8
	0.3	-70.1	22.1	106.7	183.5	253.9
	0.5	-65.1	31.7	115.2	190.6	259.6
	0.7	-53.9	47.2	128.9	201.6	269.0
	0.9	-36.2	62.9	142.3	212.3	280.0

Fig. 4. Interaction of ambition, skill, and self-regulaiton on performance and well-being.

regulation (below 0.5). When both ambition and self-regulation are below 0.5, all runs result in zero performance regardless of the level of skill. This result reflects persistent burnout, whereby strain overpowers motivation and thereby leads to reduced effort. Once self-regulation reaches a value of 0.5, it makes a negligible difference to performance. In this space, both ambition and skill create step changes in performance. For instance, when self-regulation, ambition and skill are at 0.5, resulting in a performance score of 17.5, increasing self-regulation to 0.7 increases performance to 17.6 (0.5 % increase); increasing ambition to 0.7 increases performance to 24.6 (40.6 % increase); and increasing skill to 0.7 increases performance to 38.8 (121.7 % increase). These results show that ambition, skill, and self-regulation work together to improve performance. Self-regulation has a minimum viable threshold, while ambition and skill work together, with higher ambition demanding higher skill.

In regard to well-being, it is notable that the cells on the left and above the diagonal contain negative values. These are cases of ill-being associated with burnout and unsuccessful entrepreneurial efforts. They tend to be clustered in cases of low ambition (below 0.5) or low self-regulation (below 0.5). When self-regulation is lowest, well-being is negative regardless of the level of ambition or skill. When self-regulation takes a value of 0.3, well-being goes into positive territory only for the highest levels of ambition and skill. While all three parameters create step changes in well-being, this effect is more pronounced for self-regulation and ambition. For instance, when self-regulation, ambition and skill are at 0.5, resulting in a well-being score of 45.7, increasing self-regulation to 0.7 increases well-being to 100.5 (120 % increase); increasing ambition to 0.7 increases performance to 94.3 (106.3 % increase); and increasing skill to 0.7 increases performance to 56 (22.5 % increase). Self-regulation alone can take well-being into positibe

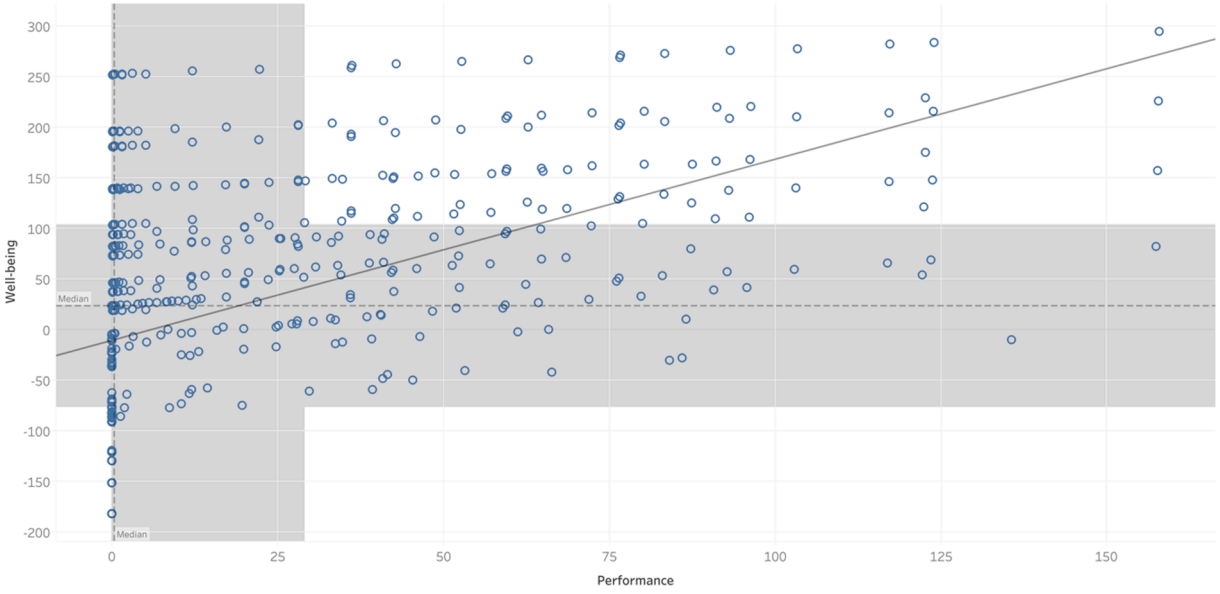


Fig. 5. Interplay of performance and well-being at time 500 across 625 model runs (shaded areas represent the inter-quartile ranges for each dimension).

territory even at the lowest levels of ambition and skill. These results show that ambition, skill, and self-regulation work together to affect well-being.

In the light of the different interactions of the model parameters on performance and well-being, Fig. 5 shows the interplay of performance and well-being over the 625 model runs. The shaded areas represent the interquartile range for each variable, with the median line shown. A linear trend line is also shown, indicating a positive relationship between the two, with performance explaining 25 % of the variation in well-being. Even when performance is lowest – which represents almost half of all cases, in line with its skewed distribution and median value of 0.4 – there is wide variation in well-being, with both very high and very low values. We can infer from Fig. 4 that these are cases when an entrepreneur has low skill but high ambition and high self-regulation. This suggests that pursuing one's high ambition and the ability to withstand the frustrations of low performance can nevertheless boost well-being.

5. Discussion

In this paper, we explore the dynamics of entrepreneurial performance and well-being through computational theory. We integrate perspectives on well-being at work and on the human side of entrepreneurship into a holistic account of how key variables influence each other over time. By simulating the model and examining its behavior over the full range of values for its key parameters, we show how an entrepreneur's energy ebbs and flows over their journey, charting certain performance and levels of well-being. Against future visions of work as becoming more entrepreneurial, reflecting opportunities to reshape traditional producton boundaries (World Bank, 2019) and designed as more meaningful through enabling learning and experimentation (Malhotra, 2021), research on entrepreneurial well-being will play an important role given the dual effect that entrepreneurial activity can have on well-being, namely through the positive force of autonomy and meaningfulness and the negative force of exposure to uncertainty and higher stress (Stephan et al., 2022). In this regard, our work offers important insights as it aligns the dynamic nature of entrepreneurship with a dynamic account of well-being, in line with recent calls for doing so (Wiklund et al., 2019).

Our computational approach enables complex interactions and feedback loops to play out, which are difficult to observe empirically or trace analytically. In addition, the parametrization of the model enables experimentation and counterfactual reasoning, whereby we can observe and compare the behavior of different model runs under systematic variation of the levels of key factors of interest. Ambition, skill, and self-regulation represent key sources of inter-personal differences among entrepreneurs, while dynamism reflects the nature of the environment in which they operate. The interplay of these factors can help us understand how the positive and negative aspects of entrepreneurship play out in the entrepreneurial journey.

5.1. Synopsis of results

Our model generates distinct, long-tail patterns of entrepreneurial performance: well over 50 % of its runs result in zero outcomes. These are driven by low self-regulation and low ambition, whose combination ultimately leads to the depletion of effort. Once self-regulation reaches a minimum viable threshold, ambition and skill work together to enhance performance, with higher ambition demanding higher skill. Well-being varies widely, relatively independent of the level of performance. Self-regulation makes the biggest difference in well-being: at low levels it leads to ill-being; at higher levels it sustains well-being even when performance is paltry. Ambition provides a similar, complementary boost to well-being. Skill makes a difference in well-being only at higher levels of self-regulation and ambition.

Overall, the three factors represent a powerful force for performance and well-being. Ambition is a hallmark of meaning, with entrepreneurship providing a channel for the autonomous pursuit of meaningful ends. In turn, self-regulation is an anchor in dealing with the inevitable uncertainty and stress that arise in the process. Skill completes the balancing act, in the sense that it needs to be channelled towards certain ends but at the same time can be deployed only when one sustains strenuous effort throughout the journey.

5.2. Contributions

Our work makes several contributions to scholarly understanding of entrepreneurship and well-being. These arise from our holistic approach, computational method, and implications for the future of work.

5.2.1. A holistic approach

First, our computational approach builds a holistic account of the dynamics of entrepreneurship and well-being from the perspective of the acting entrepreneur. We focus on the psychological function of entrepreneurship as a conduit for individual aspirations. For this perspective, an entrepreneur exerts physical and cognitive effort to attain envisioned outcomes (Ramoglou & McMullen, 2022) and in the process interacts with the world (marketplace), giving rise to processes of motivation and strain, which in turn affect one's well-being and the exertion of further effort. By modelling well-being as a gauge of the balance between motivation and strain, and modelling the latter as stock variables that can be filled and emptied throughout the entrepreneurial processes, we capture the nature of the entrepreneur as a living system that exerts effort to make a change in a dynamic environment.

The holistic nature of our account reveals itself in two ways. The first relates to the recursive nature of our mechanisms, i.e. we model effort and its consequences as ongoing, whereby outputs from one step become inputs to the next. Our model thus formalizes recent insights on the dynamic, reciprocal relationship between stress and entrepreneurial effort. Uncertainty is an inevitable companion to entrepreneurial endeavours (McMullen & Shepherd, 2006) and its permeation of the entire entrepreneurial process can help us understand how stress processes in entrepreneurship are connected over time (Rauch et al., 2018). Our model makes these insights analytically tractable by introducing dynamism and randomness to the modelling of advance and setback as the inflows and outflows to entrepreneurial perfomance. This makes it difficult for the entrepreneur to anticipate how things are going to play out from one period to the next. Setbacks in particular feed directly back into reduced motivational resources and the accumulation of strain. We also provide channels for stress to dissipate in the short-term via recovery but also to be modulated over time by the entrepreneur's self-regulation. In this way, we illuminate specific mechanisms through which stress can induce or impede entrepreneurial effort as well as be affected by progress in the entrepreneurial journey.

The second holistic aspect of our account relates to the integration of many piecemeal relationships established in prior work, as highlighted in our model blueprint in Fig. 1. It shows that there are distinct yet interconnected loops of (1) processes of motivation, strain and recovery that affect well-being and effort, and (2) processes of performance and its evaluation that are affected by effort. As such, through this holistic picture we could evaluate prior work as providing only partial snapshots of a broader process. This is understandable given the challenges of data collection and diverse research designs across studies. For example, while Wach et al. (2021) examine the relationships between stressors, recovery, and well-being, the individual factors of ambition, skill, and self-regulation – factors that our models shows to be important shapers of performance and well-being – are not part of the picture. Simlarly, while Lerman et al.'s (2021) recent meta-analysis highlights the differential effects of challenge and hindrance stressors on performance and well-being, the effects do not take into account ambiton, skill, self-regulation or dynamism. In this regard, our model extends such prior

work by (1) linking the demands of entrepreneurial work to the entrepreneur's ambition, (2) making the depleting effect on recovery dependent on the entrepreneur's self-regulation, and (3) making the motivating effect of cognitive demands interdependent with the broader resources of entrepreneurial work, which channel the entrepreneur's ambition and skill via performance over time. In this way, we integrate work on entrepreneurial stress and well-being with adjacent work on individual characteristics and performance (Rauch & Frese, 2007).

5.2.2. Computational modelling

Our second contribution pertains to providing a framework for computational modelling in entrepreneurship, whereby computational models can provide a means for operationalizing our intuitions and guiding our reasoning on the dynamics of entrepreneurial performance and well-being. Computational theory can enable scholars to explore otherwise inaccessible complex interactions and feedback loops and thereby inform further theorizing into the dynamic nature of entrepreneurial well-being. While computational approaches have been used to advance understanding of what we describe (in section 2.1) as the market function of entrepreneurship (e.g. Bort et al., 2023; Keyhani, 2019), our work makes inroads into the psychological function of entrepreneurship, as a channel for individual aspirations. It complements resource-intensive empirical work by creating a virtual laboratory for testing complex interactions, in the same manner that engineers can investigate the behaviour of certain designs under simulated turbulent conditions, enabling them to fine-tune the development of physical prototypes to be tested in real conditions. For example, our computational approach enables connecting short- and long-term dynamics of performance and well-being. Once fired up, the engine of entrepreneurial effort can stumble over time as difficulties begin to loom large and frustration and strain increase. In many simulation runs, progress was very limited, but in a good number of cases it is impressively vast. Nevertheless, the dynamics of well-being do not mirror exactly the dynamics of progress, because of the intervening effects of ambition and self-regulation, underpinning the entrepreneur's ability to keep stress at bay and thereby maintain their motivation and sustained effort.

Simulations of dynamic models of entrepreneurial performance and well-being can act as virtual interfaces for the theoretician, providing a set of tuning "knobs" or "levers" through which one can explore the implications of certain assumptions and their combinations. In turn, this can inform empirical research designs through which we can search for isomorphic patterns in real-world settings. Insights into the dynamics of entrepreneurial well-being can both inform public policy related to stimulating and supporting entrepreneurship, and provide a self-regulation tool for acting entrepreneurs. One gains solid footing by starting with simple models, to be expanded over time. In this regard, our model offers a first verson of something that can be gradually elaborated and expanded as the research community explores different reasoning pathways. Our model aimed to provide a minimum viable representation of entrepreneurial process and the motivation-strain structure behind well-being. Its initial validation in this paper invites further iteration of the model in, hopefully, a growing community of modelers. Such a community can develop a shared library of models and fine-tune their individual components or introduce entirely new components to be plugged in.

5.2.3. The future of work

Our third contribution relates to discussions on how entrepreneurship and work in organizations can be combined for the future. Recent technological advances not only open up new opportunities by supplanting traditional boundares of value creation (World Bank, 2019), but also enable non-standard employment that promotes entrepreneurism through increased flexibility and freedom (Dabic et al., 2023). This makes the design of meaningful work a hallmark for the future (Malhotra, 2021), aimed at unleashing the entrepreneurial energy of employees. In this regard, our computational theory has an integrative effect, bringing the mechanisms of job demands and resources (Bakker & Demerouti, 2007) into entrepreneurship and the mechanisms of entrepreneurship (Rauch & Frese, 2007; Stephan et al., 2022) into job considerations. Where organizations are exogenous sources of resources and demands for organizational jobs, the shift to the autonomous setting of entrepreneurship makes resources and demands endogenous to the entrepreneurial process. Similarly, our conceptualization of entrepreneurship as a source of both motivation and stress is strengthened by the incorporation of established mechanisms of motivation and strain from organizational research. In this sense, we connect the streams of organizational psychology, entrepreneurship, and the psychology of entrepreneurship into one holistic account.

Our results show how the catalyzing effect of ambition needs to be matched with appropriate skill and self-regulation abilities, with broader implications for learning and development in organizations, particularly as the locus of work shifts towards self-detemination (Deci et al., 2017). Developing new and relevant skills is an important ingredient of entrepreneurship within organizations (Urbano et al., 2022). Yet attention also needs to be paid to cultivating ambition and preparation for the inevitable stress that comes with the vicissitudes of entrepreneurship. As previously stated, understanding the dynamics of well-being in work settings requires an account of how work-related demands and resources affect motivation and strain at work, including how recovery works to recuperate energy and reduce stress. By establishing ambition, skill and self-regulation as key drivers of entrepreneurial performance and well-being we must now raise important questions for the design of meaningful work in organizations, especially as they endeavor to move away from traditional notions of employment and toward more entrepreneurism in work.

On the one hand, we know that entrepreneurs operate in a context of higher autonomy and corresponding sources of stress associated with uncertainty, workload and resource constraints (Willianson et al., 2021). Under this noton of entrepreneurship, the distinction between individual (entrepreneur) and organization (emerging new venture) is murky, in that the individual vision for a different future and the emerging organizational purpose are difficult to separate, especially in the early stages of the entrepreneurial process (Dimov, 2010). In other words, the presumed individual-organization separation in entrepreneurship dissolves as the individual's notion of the future defines collective market interactions.

On the other hand, employment has traditionally been seen as an explicit contractual relationship between an individual and organization where terms, conditions and performance expectations are established. And the interaction with the market is shaped by collective purpose more than individual aspiration per se. As employment moves toward non-traditional forms and work becomes more entrepreneurial in nature, it will be important to understand the implications of these changes on the individual-organization nexus and the evolving work design as a means to anticipate the impact of shifting nature of work on well-being.

For example, will individual "employees" be willing and able to achieve the same emotional, psychological, and physiological experiences as independent "entrepreneurs" simply because their work becomes more entrepreneurial? In other words, will the forces influencing well-being in a traditional entrepreneurial sense—ambition, skill and self-regulation—be accessible to individual workers thrust into increasingly autonomous roles? Or will organizations need to develop a corresponding entrepreneurial orientation (Miller, 1983), provide the corresponding culture, supporting infrastructure and skill formation for the well-being benefits of entrepreneurship to be realized? These questions have important implications for the design of future work as entrepreneurism takes hold and organizations seek to expand their horizons to reap the performance and well-being outcomes of entrepreneurship.

5.3. Limitations and future research

The main limitations of our work relate to the temptation to take its implications beyond the merits of computational theory and make direct inferences to empirical settings. Our results do not constitute direct empirical evidence and should not be treated as such. While our language inevitably makes references to the dynamics of entrepreneurial well-being, we refer to the experience of our artificial entrepreneurs (the simulated system) rather than that of real-life entrepreneurs. Our results are empirical not in the sense of reflecting observations made in real-life settings but rather in the sense of producing behavioral patterns from the premises of established theories that could inform our inferences about real-life settings. As such, our work should be best seen in the spirit of computational social science where the interest has been in explaining (social) regularities in terms of simpler generative mechanisms under the guise of "if you did not grow it, you didn't explain its emergence" (Epstein, 2006, p. 8).

Opportunities for future research arise in relation to iterations of the model itself and to the actual empirical valudation of its insights. In terms of the model, we have treated ambition, skill, self-regulation, and dynamism as static parameters. Further iteration can make these parameters dynamic, for instance through the development of skill via learning or the calibration of ambition in response to performance. Similarly, self-regulation can be modelled to vary in systematic ways over time. In terms of empirical validation, the interplay among ambition, skill, self-regulation, and dynamism provides an immediate impetus for gathering relevant empirical evidence. A possible research design entails observation of these variables as initial conditions for entrepreneurs who start out their jouneys, to be followed up by assessment of performance, well-being, and effort after some time.

6. Conclusion

The study of entrepreneurial well-being has opened an exciting and important new chapter in the entrepreneurship literature. As evidence of the bright and dark sides of well-being accumulates and we begin to ask deeper questions – such as how the two sides interact over time – we need to expand our methodological arsenal. We hope that this paper provides an instrumental step in this direction. In addition, as we look towards an entrepreneurial future of work, we can think about the challenges of generating and sustaining employee engagement in new ways. In the light of the "switched off" mode of our model, where entrepreneurial ambition is absent, our work offers a clue for redesigning the future of work in ways that unleash human ambition so that it can serve as a lever for engagement. Considering engagement in light of Boulding's self-regulating systems and their capacity to maintain regularity in the face of fluctuations in the environment, this suggests that human engagement in the form of entrepreneurial ambitions could not only be valuable but even virtuous.

CRediT authorship contribution statement

Dimo Dimov: Writing – review & editing, Writing – original draft, Visualization, Methodology, Formal analysis, Conceptualization. **Joseph Pistrui:** Writing – review & editing, Writing – original draft, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data were used for the research described in the article.

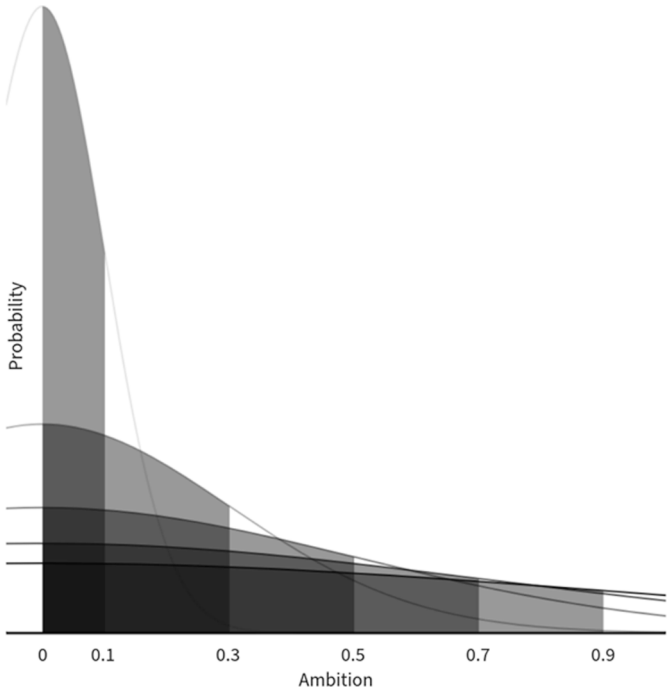
Appendix 1. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jbusres.2023.114427.

Appendix 2

Modelling the random components of advance, setback, and stressors

The random component of advance is a variable drawn from a standardized normal distribution, whose standard deviation is set at the level of ambition and whose drawn values are truncated with a minimum of 0 and maximum equal to the value of ambition. This makes advance positively affected by ambition, in that for higher levels of ambition, the maxima of the drawn values are higher and their probability is also higher. This is illustrated in the figure below. The shaded areas represent the draw range: the value of ambition defines both the maximum value and the standard deviation of the distribution (with mean 0). When ambition is lower, the probability of drawing 0 (no advance) is higher. With higher ambition, there is a lower probability of drawing 0 and higher probability of drawing larger values.



Modelling randomness according to ambition.

We use the same random component in the modelling of setback relative to ambition. In this way, setback is influenced by the entrepreneur's ambition in that more ambitious efforts can lead to higher setback. We also use this random component in the modelling of challenge and hindrance stressors relative to ambition. In this way, more ambitious efforts can give rise to higher challenge and hindrance stressors.

References

Andriani, P., & McKelvey, B. (2009). From Gaussian to Paretian thinking: Causes and implications of power laws in organizations. *Organization Science, 20*(6), 1053–1071. https://doi.org/10.1287/orsc.1090.0481

Backlund, A. (2000). The definition of system. *Kybernetes, 29*(4), 444–451. https://doi.org/10.1108/03684920010322055

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: State of the art. *Journal of Managerial Psychology, 22*(3), 309–328. https://doi.org/10.1108/02683940710733115

Baum, J. R., & Locke, E. A. (2004). The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *The Journal of Applied Psychology, 89*(4), 587–598. https://doi.org/10.1037/0021-9010.89.4.587

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology, 74*(5), 1252–1265. https://doi.org/10.1037//0022-3514.74.5.1252

Bort, J., Wiklund, J., Crawford, G. C., Lerner, D. A., & Hunt, R. A. (2023). The strategic advantage of impulsivity in entrepreneurial action: An agent-based modeling approach. *Entrepreneurship Theory and Practice, in press*. https://doi.org/10.1177/10422587231178882

Bosma, N., van Praag, M., Thurik, R., & de Wit, G. (2004). The Value of Human and Social Capital Investments for the Business Performance of Startups. *Small Business Economics, 23*(3), 227–236. https://doi.org/10.1023/B:SBEJ.0000032032.21192.72

Boulding, K. E. (1956). General Systems Theory—The Skeleton of Science. *Management Science, 2*(3), 197–208. https://doi.org/10.1287/mnsc.2.3.197

Brüderl, J., Preisendörfer, P., & Ziegler, R. (1992). Survival Chances of Newly Founded Business Organizations. *American Sociological Review, 57*(2), 227–242. https://doi.org/10.2307/2096207

Cardon, M. S., & Patel, P. C. (2015). Is stress worth it? Stress-related health and wealth trade-offs for entrepreneurs. *Applied Psychology: An International Review, 64*(2), 379–420.

Cardon, M. S., Wincent, J., Singh, J., & Drnovsek, M. (2009). The nature and experience of entrepreneurial passion. *Academy of Management Review, 34*(3), 511–532. https://doi.org/10.5465/amr.2009.40633190

Carver, C. S., & Scheier, M. F. (1998). *On the Self-Regulation of Behavior*. Cambridge University Press. https://doi.org/10.1017/CBO9781139174794

Cassar, G. (2006). Entrepreneur opportunity costs and intended venture growth. *Journal of Business Venturing, 21*(5), 610–632. https://doi.org/10.1016/j.jbusvent.2005.02.011

Cassar, G. (2007). Money, money, money? A longitudinal investigation of entrepreneur career reasons, growth preferences and achieved growth. *Entrepreneurship and Regional Development, 19*(1), 89–107. https://doi.org/10.1080/08985620601002246

Crawford, E. R., Lepine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *The Journal of Applied Psychology, 95*(5), 834–848. https://doi.org/10.1037/a0019364

Crawford, G. C., Aguinis, H., Lichtenstein, B., Davidsson, P., & McKelvey, B. (2015). Power law distributions in entrepreneurship: Implications for theory and research. *Journal of Business Venturing, 30*(5), 696–713. https://doi.org/10.1016/j.jbusvent.2015.01.001

Dabic, M., Maley, J. F., Svarc, J., & Pocek, J. (2023). Future of digital work: Challenges for sustainable human resources management. *Journal of Innovation & Knowledge, 8*(2), Article 100353. https://doi.org/10.1016/j.jik.2023.100353

Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing, 18*(3), 301–331. https://doi.org/10.1016/S0883-9026(02)00097-6

Deci, E. L., Olafsen, A. H., & Ryan, R. M. (2017). Self-Determination Theory in Work Organizations: The State of a Science. *Annual Review of Organizational Psychology and Organizational Behavior, 4*(1), 19–43. https://doi.org/10.1146/annurev-orgpsych-032516-113108

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*, 499–512. https://doi.org/10.1037/0021-9010.86.3.499

Denrell, J., Fang, C., & Liu, C. (2015). Perspective—Chance Explanations in the Management Sciences. *Organization Science, 26*(3), 923–940. https://doi.org/10.1287/orsc.2014.0946

Dess, G. G., & Beard, D. W. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly, 29*, 52–73. https://doi.org/10.2307/2393080

Dierickx, I., & Cool, K. (1989). Asset Stock Accumulation and Sustainability of Competitive Advantage. *Management Science, 35*(12), 1504–1511.

Dimov, D. (2010). Nascent entrepreneurs and venture emergence: Opportunity confidence, human capital, and early planning. *Journal of Management Studies, 47*(6), 1123–1153.

Dimov, D. (2017). *The Reflective Entrepreneur* (p. 104). Routledge: Taylor & Francis. https://doi.org/10.4324/9781315228105

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 92*(6), 1087–1101. https://doi.org/10.1037/0022-3514.92.6.1087

Epstein, J. M. (2006). Generative Social Science. *Princeton University Press*. https://press.princeton.edu/books/ebook/9781400842872/generative-social-science.

Fellnhofer, K. (2022). Entrepreneurial alertness toward responsible research and innovation: Digital technology makes the psychological heart of entrepreneurship

pound. *Technovation, 118*, Article 102384. https://doi.org/10.1016/j.technovation.2021.102384
Ganco, M., & Agarwal, R. (2009). Performance differentials between diversifying entrants and entrepreneurial Start-Ups: A complexity approach. *Academy of Management Review, 34*(2), 228–252.
Grant, S., & Ferris, K. (2012). Identifying sources of occupational stress in entrepreneurs for measurement. *International Journal of Entrepreneurial Venturing, 4*, 351–373.
Job, V., Dweck, C. S., & Walton, G. M. (2010). Ego Depletion—Is It All in Your Head?: Implicit Theories About Willpower Affect Self-Regulation. *Psychological Science, 21*(11), 1686–1693. https://doi.org/10.1177/0956797610384745
Kahneman, D., Diener, E., & Schwartz, N. (1999). *Well-Being: Foundations of Hedonic Psychology*. Russell Sage Foundation. https://www-jstor-org.ezproxy1.bath.ac.uk/stable/10.7758/9781610443258.
Katz, D., & Kahn, R. L. (1966). *The social psychology of organizations*. Wiley.
Keyhani, M., Lévesque, M., & Madhok, A. (2015). Toward a theory of entrepreneurial rents: Simulation of the market process. *Strategic Management Journal, 36*, 76–96.
Keyhani, M. (2019). Computational modeling of entrepreneurship grounded in Austrian economics: Insights for strategic entrepreneurship and the opportunity debate. *Strategic Entrepreneurship Journal, 13*, 221–240. https://doi.org/10.1002/smj.2203
Korber, S., & McNaughton, R. B. (2018). Resilience and entrepreneurship: A systematic literature review. *International Journal of Entrepreneurial Behavior & Research, 24*(7), 1129–1154. https://doi.org/10.1108/IJEBR-10-2016-0356
Lepine, J. A., Podsakoff, N. P., & Lepine, M. A. (2005). A Meta-Analytic Test of the Challenge Stressor-Hindrance Stressor Framework: An Explanation for Inconsistent Relationships Among Stressors and Performance. *Academy of Management Journal, 48*(5), 764–775. https://doi.org/10.5465/amj.2005.18803921
Lerman, M. P., Munyon, T. P., & Carr, J. C. (2020). Stress events theory: A theoretical framework for understanding entrepreneurial behavior. In P. L. Perrewé, P. D. Harms, & C.-.-H. Chang (Eds.), *Entrepreneurial and Small Business Stressors, Experienced Stress, and Well-Being (Research in Occupational Stress and Well Being* (Vol. 18, pp. 35–63). Bingley: Emerald Publishing Limited. https://doi.org/10.1108/S1479-355520200000018003.
Lerman, M. P., Munyon, T. P., & Williams, D. W. (2021). The (not so) dark side of entrepreneurship: A meta-analysis of the well-being and performance consequences of entrepreneurial stress. *Strategic Entrepreneurship Journal, 15*(3), 377–402.
Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*(3), 543–562.
Lyons, T. S., Lyons, J. S., & Jolley, G. J. (2020). Entrepreneurial skill-building in rural ecosystems: A framework for applying the Readiness Inventory for Successful Entrepreneurship (RISE). *Journal of Entrepreneurship and Public Policy, 9*(1), 112–136. https://doi.org/10.1108/JEPP-09-2019-0075
Malhotra, A. (2021). The Postpandemic Future of Work. *Journal of Management, 47*(5), 1091–1102. https://doi.org/10.1177/01492063211000435
Martiarena, A., Levie, J., Marlow, S., Hart, M., & Bonner, K. (2022). A 'deviant men' theory of business expectations in nascent entrepreneurs. *Small Business Economics*. https://doi.org/10.1007/s11187-022-00716-4
Mauer, R., Wuebker, R., Schlüter, J., & Brettel, M. (2018). Prediction and control: An agent-based simulation of search processes in the entrepreneurial problem space. *Strategic Entrepreneurship Journal, 12*(2), 237–260. https://doi.org/10.1002/sej.1271
McMullen, J. S., & Dimov, D. (2013). Time and the Entrepreneurial Journey: The Problems and Promise of Studying Entrepreneurship as a Process. *Journal of Management Studies, 50*(8), 1481–1512. https://doi.org/10.1111/joms.12049
McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial Action And The Role Of Uncertainty In The Theory Of The Entrepreneur. *Academy of Management Review, 31*(1), 132–152. https://doi.org/10.5465/amr.2006.19379628
Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management Science, 29*(7), 770–792.
Minniti, M. (2004). Entrepreneurial alertness and asymmetric information in a spin-glass model. *Journal of Business Venturing, 19*(5), 637–658. https://doi.org/10.1016/j.jbusvent.2003.09.003
Nikolaev, B. N., Lerman, M. P., Boudreaux, C. J., & Mueller, B. A. (2022). Self-Employment and Eudaimonic Well-Being: The Mediating Role of Problem- and Emotion-Focused Coping. *Entrepreneurship Theory and Practice*. , Article 10422587221126486. https://doi.org/10.1177/10422587221126486
Packard, M. D., Clark, B. B., & Klein, P. G. (2017). Uncertainty types and transitions in the entrepreneurial process. *Organization Science, 28*(5), 840–856. https://doi.org/10.1287/orsc.2017.1143
Palier, B. (2019). Work, social protection and the middle classes: What future in the digital age? *International Social Security Review, 72*(3), 113–133.
Ramoglou, S., & McMullen, J. S. (2022). What is an opportunity? From theoretical mystification to everyday understanding. *Academy of Management Review*, In press.
Rauch, A., Fink, M., & Hatak, I. (2018). Stress Processes: An Essential Ingredient in the Entrepreneurial Process. *Academy of Management Perspectives, 32*(3), 340–357. https://doi.org/10.5465/amp.2016.0184
Rauch, A., & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *European Journal of Work and Organizational Psychology, 16*(4), 353–385. https://doi.org/10.1080/13594320701595438
Ryan, R. M., & Deci, E. L. (2001). To be happy or to be self-fulfilled: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*(1), 141–166.
Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069.
Ryff, C. D. (2019). Entrepreneurship and eudaimonic well-being: Five venues for new science. *Journal of Business Venturing, 34*(4), 646–663. https://doi.org/10.1016/j.jbusvent.2018.09.003
Sergeeva, A., Bhardwaj, A., & Dimov, D. (2021). In the heat of the game: Analogical abduction in a pragmatist account of entrepreneurial reasoning. *Journal of Business Venturing, 36*(6), Article 106158.
Shaver, K. G., & Scott, L. R. (1992). Person, Process, Choice: The Psychology of New Venture Creation. *Entrepreneurship Theory and Practice, 16*(2), 23–46. https://doi.org/10.1177/104225879201600204
Shepherd, D. A. (2019). Researching the Dark Side, Downside, and Destructive Side of Entrepreneurship: It is the Compassionate Thing to Do! *Academy of Management Discoveries, 5*(3), 217–220. https://doi.org/10.5465/amd.2018.0194
Shir, N., & Ryff, C. D. (2022). Entrepreneurship, Self-Organization, and Eudaimonic Well-Being: A Dynamic Approach. *Entrepreneurship Theory and Practice, 46*(6), 1658–1684. https://doi.org/10.1177/10422587211013798
Si, S., Hall, J., Suddaby, R., Ahlstrom, D., & Wei, J. (2023). Technology, entrepreneurship, innovation and social change in digital economics. *Technovation, 119*, Article 102484. https://doi.org/10.1016/j.technovation.2022.102484
Sonnentag, S. (2018). The recovery paradox: Portraying the complex interplay between job stressors, lack of recovery, and poor well-being. *Research in Organizational Behavior, 38*, 169–185. https://doi.org/10.1016/j.riob.2018.11.002
Sonnentag, S., & Ilies, R. (2011). Intra-individual processes linking work and employee well-being: Introduction into the special issue. *Journal of Organizational Behavior, 32*(4), 521–525. https://doi.org/10.1002/job.757
Stephan, U. (2018). Entrepreneurs' Mental Health and Well-Being: A Review and Research Agenda. *Academy of Management Perspectives, 32*(3), 290–322. https://doi.org/10.5465/amp.2017.0001
Stephan, U., Rauch, A., & Hatak, I. (2022). Happy Entrepreneurs? Everywhere? A Meta-Analysis of Entrepreneurship and Well-being. *Entrepreneurship Theory and Practice*. , Article 10422587211072800. https://doi.org/10.1177/10422587211072799
Stephan, U., Tavares, S. M., Carvalho, H., Ramalho, J. J. S., Santos, S. C., & van Veldhoven, M. (2020). Self-employment and eudaimonic well-being: Energized by meaning, enabled by societal legitimacy. *Journal of Business Venturing, 35*(6), Article 106047. https://doi.org/10.1016/j.jbusvent.2020.106047
Sterman, J. (2000). *Business dynamics: Systems thinking and modeling for a complex world*. McGraw Hill.
Taber, C. S., & Timpone, R. J. (1996). Beyond Simplicity: Focused Realism and Computational Modeling in International Relations1. *Mershon International Studies Review, 40*(Supplement_1), 41–79. https://doi.org/10.2307/222641
Tahar, Y. B., Rejeb, N., Maalaoui, A., Kraus, S., Westhead, P., & Jones, P. (2022). Emotional demands and entrepreneurial burnout: The role of autonomy and job satisfaction. *Small Business Economics*. https://doi.org/10.1007/s11187-022-00702-w
Todolí-Signes, A. (2017). The 'gig economy': Employee, self-employed or the need for a special employment regulation? *Transfer: European Review of Labour and Research, 23*(2), 193–205.
Urbano, D., Turro, A., Wright, M., & Zahra, S. (2022). Corporate entrepreneurship: A systematic literature review and future research agenda. *Small Business Economics, 59*. https://doi.org/10.1007/s11187-021-00590-6
Vancouver, J. B. (1996). Living systems theory as a paradigm for organizational behavior: Understanding humans, organizations, and social processes. *Behavioral Science, 41*(3), 165–204. https://doi.org/10.1002/bs.3830410301
Vancouver, J. B., Tamanini, K. B., & Yoder, R. J. (2010). Using Dynamic Computational Models to Reconnect Theory and Research: Socialization by the Proactive Newcomer as Example. *Journal of Management, 36*(3), 764–793. https://doi.org/10.1177/0149206308321550
Vancouver, J. B., Weinhardt, J. M., & Schmidt, A. M. (2010). A formal, computational theory of multiple-goal pursuit: Integrating goal-choice and goal-striving processes. *Journal of Applied Psychology, 95*, 985–1008. https://doi.org/10.1037/a0020628
Venkataraman, S. (1997). The Distinctive Domain of Entrepreneurship Research. *Advances in Entrepreneurship, Firm Emergence and Growth*, 3.
Verheul, I., & van Mil, L. (2011). What determines the growth ambition of Dutch early-stage entrepreneurs? *International Journal of Entrepreneurial Venturing, 3*(2), 183–207. https://doi.org/10.1504/IJEV.2011.039340
von Bertalanffy, L. (1950). An Outline of General System Theory. *The British Journal for the Philosophy of Science, 1*(2), 134–165.
Wach, D., Stephan, U., Weinberger, E., & Wegge, J. (2021). Entrepreneurs' stressors and well-being: A recovery perspective and diary study. *Journal of Business Venturing, 36*(5), Article 106016. https://doi.org/10.1016/j.jbusvent.2020.106016
Wiklund, J., Nikolaev, B., Shir, N., Foo, M.-D., & Bradley, S. (2019). Entrepreneurship and well-being: Past, present, and future. *Journal of Business Venturing, 34*(4), 579–588. https://doi.org/10.1016/j.jbusvent.2019.01.002
Wiklund, J., & Shepherd, D. (2003). Aspiring for, and Achieving Growth: The Moderating Role of Resources and Opportunities*. *Journal of Management Studies, 40*(8), 1919–1941. https://doi.org/10.1046/j.1467-6486.2003.00406.x
Williamson, A. J., Gish, J. J., & Stephan, U. (2021). Let's focus on solutions to entrepreneurial ill-being! Recovery interventions to enhance entrepreneurial well-being. *Entrepreneurship Theory and Practice, 45*(6), 1307–1338.
Wolterstorff, N. (1975). Toward an ontology of art works. *Noûs, 9*(2), 115–142.
World Bank (2019). *World Development Report 2019: The Changing Nature of Work* [Text/HTML]. World Bank. https://www.worldbank.org/en/publication/wdr2019.

Dimo Dimov is Professor of Entrepreneurship and Innovation at University of Bath, UK. His research focuses on entrepreneurial thinking, processes, and practice.

Joseph Pistrui is Professor of Entrepreneurship and Innovation at IE University in Madrid, Spain. His research focuses on entrepreneurial thinking and practice in organizations.