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# Grassroots innovation success: The role of self-determination and leadership style

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ABSTRACT

An increasing number of firms engage in grassroots innovation, i.e., the voluntary generation and development of innovations by any member of an organization, regardless of function or seniority. However, no empirical study to date identifies the determinants of success or failure of grassroots innovation initiatives. We execute a survey study among 3,728 managers in 14 countries, 2,353 of which (63.1%) had already engaged in grassroots innovation. We find that, on average, firms that adopt grassroots innovation outperform firms that do not. We also find that firms that enable (1) employee autonomy, (2) competence development, and (3) relatedness (i.e., helping employees establish mutually beneficial relationships with trusted colleagues) in their grassroots innovation initiatives outperform firms that do not. We document that such effects are contingent on a firm's institutional environment (i.e., leadership style and market orientation). For instance, the lower the market orientation and the higher the hierarchical leadership of the firm, the higher the performance returns the firm obtains from fostering autonomy and relatedness in grassroots innovation. These findings encourage managers and firms to adopt (or persist in their) grassroots innovation initiatives, to infuse them with sufficient autonomy, competence, and relatedness and match them with the right leadership style.


## 1. Introduction

In a quest to promote a strong innovation culture, and complementary to other forms of innovation, many firms engage in grassroots innovation, i.e., the voluntary generation and development of innovations by any member of an organization, regardless of function or seniority. As a form of bottom-up innovation, grassroots innovation contrasts with top-down innovation in which senior management delegates innovation efforts to a "lab elite" and subsequently pushes it down through the organization. Grassroots innovation can be applied to different types of innovation, such as incremental or radical innovation (Wuyts, Dutta, & Stremersch, 2004), and product, process, or business model innovation (Keko, Prevo, & Stremersch, 2018). Also, higher layers of management can participate in grassroots innovation, as long as their participation *is not* conditional upon their function or seniority.

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The value of grassroots innovation has been recognized by many organizations (see Table 1) and their leaders, such as Microsoft's CEO, Satya Nadella (Rawlings, 2016), Virgin's Sir Richard Branson (Branson, 2011), Google's Sundar Pichai (McCracken, 2016), and GE's Jeff Immelt (Pino, 2014). At the same time, several grassroots innovation initiatives – at companies such as Best Buy, GlaxoSmithKline, and UBS – are claimed to not "have the impact that their proponents would have liked" (Birkinshaw, Bouquet, & Barsoux, 2011; p. 49).

On the positive side, grassroots innovation initiatives can leverage on the positive outcomes one may expect from satisfying participants' need for self-determination, by stimulating participant autonomy, competence development, and relationship building. Granting employees autonomy over their innovation projects, may help firms access creativity that resides "deep in the bowels of the organization" (Tellis, 2013, p.16). Offering competence development opportunities to employees who participate in a grassroots initiative – e.g., on ideation, idea maturation, or project implementation - can help them properly execute their innovation projects (e.g., Burroughs et al., 2011; Dahl, Chattopadhyay, & Gorn, 1999). Firms can also leverage grassroots innovation initiatives to help participants connect with colleagues who may have complementary knowledge and skills to build stronger teams around an innovation idea (Uzzi & Spiro, 2005).

On the negative side, in a quest to promote employee self-determination, firms may increase the risk that employees drift away from firm-wide goals (e.g., Locke, 2003). Take Google's 20% rule as an example. The "rule" – which allowed employees to dedicate 20 percent of their time to innovation ideas of their own - placed a strong emphasis on employee self-determination (Adams, 2016). In 2013, Google cancelled its 20% rule, reportedly to refocus its innovation efforts on firm-wide goals and avoid wasting resources (Ross, 2015).

Despite these conflicting views, the growing importance of grassroots innovation for firms (Hamel, 2020), and the heterogeneity across firms in grassroots innovation success, there has been no empirical study to date that assesses (1) whether grassroots innovation, on average, leads to success or failure; and (2) what the key determinants of success or failure of grassroots innovation are. In this paper, we address these gaps and inform firms whether they should deploy or continue grassroots innovation efforts, despite possibly facing disappointing results initially, and how to design their grassroots innovation processes most effectively.

Conceptually, we ground our hypotheses on self-determination theory (Ryan & Deci, 2000). We propose that the extent to which a firm emphasizes the satisfaction of the three psychological needs of autonomy, competence, and relatedness is a grassroots innovation *process design choice* that firms make – either consciously or by default – at the start of any grassroots innovation initiative. We then propose that these grassroots innovation process design choices interact with two key aspects of a firm's institutional environment - leadership style and market orientation - to influence grassroots innovation performance. We define grassroots innovation performance as the extent to which a firm's grassroots innovation initiatives succeed in developing innovations that address the needs of their target customers and are generally considered a success at the firm.

We study the role of leadership style as an aspect of the firm's institutional environment because of the tension in grassroots initiatives between employee self-determination and alignment with corporate goals. Two common facets of leadership styles (Adler & Chen, 2011; Barnes et al., 2013; Greasley & Stoker, 2008) that are particularly relevant to this tension, are how facilitative and how hierarchical leaders should be in such initiatives. While facilitative leadership interventions may be supportive of self-determination principles, hierarchical leadership interventions may better enable employees to align with corporate goals. We study the role of market orientation as an aspect of the firm's institutional environment, because of the market-oriented way in which we define grassroots innovation performance.

Empirically we tested our conceptual framework through a survey of 3,728 managers in 14 countries, 2,353 of which (63.1%) indicated that their firm had already engaged in grassroots innovation. Based on this large-scale survey data, we find broad support for the developed theory. However, despite our extensive data collection efforts, sole reliance on cross-sectional data without the collection of objective hard data has known limitations (Rindfleisch et al., 2008). To mitigate these, we followed strict recommendations in the survey methodology literature to avoid common threats such as self-selection biases and common method variance (Rindfleisch & Antia, 2012; Rindfleisch et al., 2008). Specifically, our findings are robust across estimation methods and model specifications such as a Heckman two-step procedure to control for selection bias and the inclusion of a latent methods factor to control for common method variance. In addition, we focus our inferences on multiplicative hypotheses, further reducing concerns with common method variance (Podsakoff, MacKenzie, & Podsakoff, 2012; Siemsen, Roth, & Oliveira, 2010).

Our main conclusions are as follows. First, we find that, on average, firms that adopt grassroots innovation outperform firms that do not adopt grassroots innovation. Second, we show that emphasizing the psychological needs of autonomy, competence, and relatedness of employees participating in a grassroots innovation initiative enhances grassroots innovation performance. Third, we find support for a strong moderating role of the firm's institutional environment. In terms of leadership style, we show that firms with a high (vs. low) hierarchical leadership style (i.e., with formalized processes and reporting mechanisms to monitor innovation projects) and firms low (vs. high) in market orientation obtain higher performance returns from fostering autonomy and relatedness in grassroots innovation processes. We derive actionable recommendations from these findings on how to design grassroots innovation processes and an institutional environment conducive to successful grassroots innovation.

**Table 1**
Selected Examples of Grassroots Innovation Initiatives.

| Company (Industry) | Initiative Name | Summary of the Initiative | Source(s) |
|---|---|---|---|
| Alcatel-Lucent (Telecom. Equip.) | *Entrepreneurial Boot Camp* | Innovation retreats that originated in Belgium in 2004 with the goal of stimulating an entrepreneurial spirit among employees. Teams had to pitch their ideas to an expert panel who evaluated them to select 'winning ideas'. | Brown (2010). |
| Allianz UK (Insurance) | *i2s (ideas to successs)* | Grassroots innovation initiative through which Allianz UK collects ideas from any employee through special "calls". Ideas are rated and selected both by the internal crowd and by formal review panels of experts. | Benbya & Leidner (2018) |
| AT&T (Telecom.) | *The Innovation Pipeline (TIP)* | Crowdsourcing innovation platform where employees can share, vote on, and discuss their own innovative ideas and the ideas of other employees. The top-ranked ideas are pitched by their founders to senior management. | https://about.att.com/innovationblog/2019/05/innovation_pipeline_anniversary.html<br>https://www.forbes.com/sites/larrymyler/2013/12/05/atts-innovation-pipeline-engages-130000-employees |
| Bayer (Pharmaceuticals) | *i-coach network* | A network of hundreds of Bayer employees who are trained in innovation methodologies and are invited to generate new ideas to tackle business challenges from process-optimization to business model innovations. | Lessl, Trill, & Birkinshaw (2018)<br>https://www.bayer.com/en/innovation/employee-innovation |
| Danfoss (Engineering) | *Man on the Moon* | Internal idea generation competition that gives everyone in the company with a great idea the chance to develop it and pitch it to senior management. | https://www.danfoss.com/en/about-danfoss/news/cf/stepping-out-of-the-comfort-zone/ |
| ING (Banking) | *Innovation Bootcamp* | Employees from across the world can submit ideas, regardless of seniority. The best ideas are matured with the support of innovation mentors and pitched before a jury and webcasted to all ING employees. | https://www.ing.com/Newsroom/News/Features/Innovation-Bootcamp-More-than-1800-ideas-from-ING-employees.htm |
| Merck Group (Pharmaceuticals) | *Innospire* | A grassroots innovation initiative to collect and advance new business ideas. The program emphasizes employee autonomy, upskilling opportunities, and cross-fertilization between different business areas within Merck. | Betz, Camacho, Gerards, & Stremersch (2014) |
| Nestlé (FMCG) | *InGenius* | Nestlé's employee-driven innovation accelerator, an initiative focused on incentivizing employees to share their innovative ideas and on providing support to make those ideas become a reality in a short timeframe. | https://ingenius-accelerator.nestle.com/challenges/184 |
| Qualcomm (Semiconductors & Telecom. Equipment) | *Venture Fest* | Program to stimulate entrepreneurship and employees' willingness to "own" and fight for their ideas, as well as upskill participants on how to turn ideas into fundable experiments. | Dos Santos & Spann (2011) |
| Samsung (Consumer Electronics) | *C-Lab* | Created in December 2012, C-Lab is an in-house idea incubation program through which Samsung encourages its employees from all its business areas to propose innovation ideas. | https://research.samsung.com/culture/ces2019/aboutclab |
| SEAT (Automotive) | *SEAT Ideas* | A grassroots innovation program focused on process innovations. Specifically, SEAT encourages all company employees to propose improvements in their day-to-day work that enable them to optimize tasks, processes, and any other aspect of their working environment. | https://www.seat.com/company/news/company/ideas-programme.html |
| Telenor (Telecom) | *Ignite Incubator* | Grassroots innovation initiative where employee teams compete by presenting ideas for innovative products and services. The best ideas are chosen, and the teams get time and resources to mature their idea. | https://www.telenor.com/telenor-group-launches-intrapreneur-program/ |
| TomTom (Consumer Electronics) | *TomTom Lab* | The TomTom innovation lab is a grassroots event in which TomTom employees invent and devise innovative ideas and propose such ideas to other TomTom employees. | https://www.tomtom.com/blog/life-at-tomtom/product-innovation-hackathon/ |
| U.S. Dep. of Veterans Affairs (Public Sector) | *VA Demo Day* | The VA demo day is an opportunity for VA employees to show their own innovative ideas through three-minute pitches. | https://fcw.com/articles/2016/08/16/va-demo-day-gunter.aspx |

## 2. Conceptual background

### 2.1. Grassroots innovation

The concept of grassroots has been used in diverse social settings. Political scientists have used the term to denote voluntary action by ordinary civilians in civil society (Goode & Ben-Yehuda, 1994; Spires, 2011). Sustainability scholars have studied voluntary actions by local communities (Seyfang & Smith, 2007). To delineate the concept of grassroots innovation in a business context, we specify the social system relevant for grassroots innovation as the corporation (rather than society at large) and we use the term grassroots to refer to employees across all ranks and functions of an organization (rather than ordinary civilians or local communities). Specifically, we define an innovation process as *grassroots innovation* when it entails the voluntary generation and development of innovations by any member of an organization, regardless of function or seniority. Consequently, we define *grassroots innovation performance* as the extent to which a firm's grassroots innovation initiatives succeed in developing innovations that address the needs of their target customers and are generally considered a success at the firm.

Grassroots innovation is distinct from other innovation approaches such as crowdsourcing and internal markets. First, grassroots innovation differs from crowdsourcing, which is defined as "the act of taking a task once performed by an employee and outsourcing it to a large, undefined group of people external to the company in the form of an open call" (Bayus, 2013, p. 226). While crowdsourcing is also voluntary and decentralized, it differs from grassroots innovation in that it targets unknown populations beyond an organization's boundaries (Bayus, 2013; Camacho et al., 2019; Nishikawa et al., 2017). In contrast, grassroots innovation targets the known population of all "members" of an organization, and thus takes place within the organization's boundaries.

Second, grassroots innovation differs from an innovation practice called internal markets (Chandy & Tellis, 1998; Tellis, 2013). Internal markets refer to an innovation approach whereby business units are given more autonomy and compete with other business units (e.g., via funding contests and prototype races), a practice often implemented to stimulate competition among technology platforms. This practice follows the formal organizational structure and centers on the role of the business unit. Grassroots innovation, however, aims to stimulate innovation that originates with any employee irrespective of her hierarchical position or seniority and can lead to informal teams which cross internal boundaries or functional silos.

### 2.2. Self-Determination motivational drivers: Autonomy, competence and relatedness

Self-determination theory (Ryan & Deci, 2000) proposes three innate psychological needs—for autonomy, competence, and relatedness—that, when satisfied, drive employees' behaviors and performance. The extent to which a firm emphasizes each of these self-determination motivational drivers in grassroots innovation affects participants' willingness and ability to develop innovations successfully.

#### 2.2.1. Autonomy

Conferring autonomy to employees in grassroots innovation initiatives – i.e., granting them decision-making authority over their innovation projects – helps firms capitalize on their creative talents (Amabile, 1998). In addition, since employees are often closer to the end customers than the firm's managers are (Baumann & Stieglitz, 2014; Bendapudi & Leone, 2002), allowing them to determine the direction of their innovation projects may increase the value of new ideas to customers.

Increasing autonomy also has a downside, however, in that employees may drift away from firm-wide goals and explore avenues that have little promise or are disconnected. This may happen either because employees who are distant from senior management are not aware of firm-wide goals, or because they consciously engage in opportunistic innovation efforts that they find rewarding, even if they have a tenuous fit with the firm's goals (Mundy, 2010).

#### 2.2.2. Competence

Enhancing the competences of employees who participate in a grassroots innovation initiative ensures they feel capable of successfully overcoming challenges, and of properly executing the tasks required by their innovation projects. For instance, firms can offer tools and workshops that help develop employees' customer-centric competences, such as improving their capacity to understand customer needs, to create customer value, or to commercialize their ideas. Such competences strengthen employees' ability to overcome hurdles in the innovation process and to work smarter towards the creation of customer value (Burroughs et al., 2011; Dahl, Chattopadhyay, & Gorn, 1999).

However, a firm's institutional environment may amplify (or suppress) the beneficial effects of enhancing employees' competences in a grassroots innovation initiative. For instance, if, after an upskilling workshop, employees feel they have sufficient resources and support to apply their newly acquired competences on their projects, then competence development can be highly motivating. If, in contrast, employees feel they lack the resources or support they would need to apply their newly acquired competences on their projects, then competence development can backfire and demotivate rather than motivate employees.

#### 2.2.3. Relatedness

To enhance the relatedness of employees who participate in a grassroots innovation initiative, firms may organize events or channels that allow employees participating in a grassroots innovation initiative to connect and discuss their projects with each other, or with colleagues throughout the organization. Relatedness triggers a sense of belonging, encouraging feelings of responsibility towards others (Gardner, Gabriel, & Lee, 1999), which, in turn, enhance employees' determination to discover solutions for customer problems (Schepers et al., 2012). In addition, relatedness increases the likelihood that employees find and mingle with colleagues with complementary knowledge and skills (Uzzi & Spiro, 2005), increasing their access to skills required to develop novel customer solutions.

However, a firm's institutional environment may determine how valuable it is to stimulate relationship building and information sharing across colleagues, thereby potentially moderating the effect of relatedness on grassroots innovation performance. For example, in firms characterized by a facilitative leadership style, senior managers pay close attention, offer support, and transparently communicate with employees, which may reduce the need – and, thus, the effectiveness - of firms' actions to stimulate employee relatedness. Along similar lines, in market-oriented firms - where customer and market insights are readily available - engineers or scientists may see less value in establishing relationships with their marketing colleagues, even if the firm stimulates such connections.

### 2.3. Leadership style

The company's *leadership style* plays a critical role in influencing and guiding the activities of innovation project teams toward the achievement of corporate goals (Judge et al., 2002). This is particularly important in grassroots innovation. In contrast with traditional top-down innovation initiatives, grassroots innovation initiatives are not necessarily governed through a classic, vertically integrated bureaucratic organization. How can leaders in charge of grassroots innovation initiatives align the individual innovation projects with overarching corporate goals? To address this question, we follow recent developments in the leadership literature (Barnes et al., 2013; Greasley & Stoker, 2008) and identify two facets of leadership style: the degree of "hierarchical leadership," and the degree of "facilitative leadership". Hierarchical and facilitative leadership styles are not mutually exclusive. Leaders may implement formal reporting mechanisms and determine key performance indicators to monitor innovation projects (ascribed to a hierarchical leadership style), while also paying close attention, offering support, and increasing communication transparency about such projects (ascribed to a facilitative leadership style). That one style does not rule out the other, is consistent with the literature on management control systems, which holds that hierarchical and enabling mechanisms can and often do co-exist (Mundy, 2010). We will hypothesize that both facets of leadership style have implications for how firms should best design their grassroots innovation initiatives.

### 2.4. Market orientation

Jaworski and Kohli (1993) conceptualize *market orientation* as the extent to which a firm has formalized processes for the generation, dissemination, and responsiveness to market intelligence. According to this conceptualization, a firm's market orientation is reflected in a set of institutionalized processes centered on the customer and in the prioritization of superior value creation for customers (Jaworski & Kohli, 1993; Narver & Slater, 1990). A market orientation unifies employees around the common goal of serving customers and offers processes to evaluate the match between new ideas and customer needs and preferences. In essence, firms with a strong market orientation equip any employee (e.g., an engineer or scientist) with customer insights that could otherwise reside, and remain, only with marketing or customer-facing staff. We will hypothesize that a firm's level of market orientation has implications for how firms should best design their grassroots innovation initiatives.

## 3. Hypotheses[1]

We now develop our hypotheses (see Fig. 1 for a graphical overview). We propose that enabling the *self-determination motivational drivers* (autonomy, competence, and relatedness) lead to higher *grassroots innovation performance*, but that the degree to which they do so depends upon the firm's institutional environment according to two main firm-level moderators: leadership style and market orientation. We discuss our hypotheses each in turn, organized by such firm-level moderators.

### 3.1. The effect of autonomy, competence and relatedness on grassroots innovation performance as moderated by leadership style

We expect that leadership style can either undermine or stimulate the effects of emphasizing the three self-determination motivational drivers (i.e., autonomy, competence, and relatedness) on grassroots innovation performance. To capture the two facets of leadership style discussed above, we develop moderating hypotheses for hierarchical leadership (which entails specification of KPIs, formal reporting, and monitoring), and for facilitative leadership (which entails attention and support).

[1] The hypotheses were not formally derived prior to data gathering.

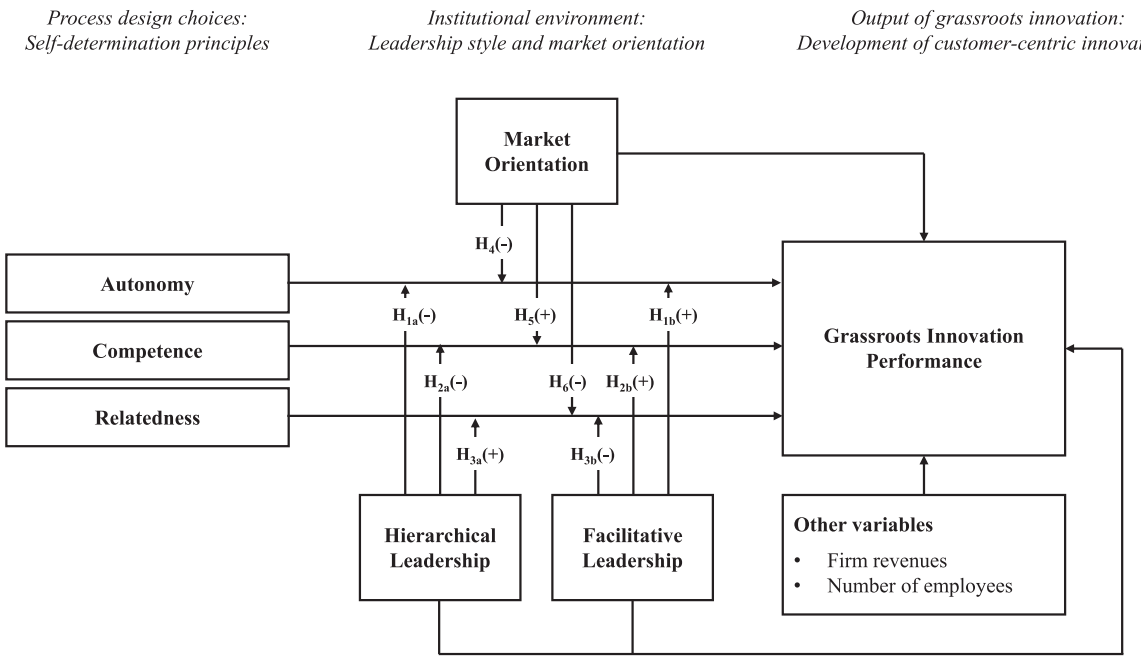


**Fig. 1.** Conceptual Framework and Hypotheses.

*3.1.1. Autonomy, grassroots innovation performance and leadership style*

Hierarchical and facilitative leadership styles may have opposite moderating effects on the effect of employee autonomy on grassroots innovation performance. On the one hand, because a hierarchical leadership style entails formal mechanisms to monitor and guide creative teams, employees may perceive it at odds with autonomy, decreasing the creativity benefits of autonomy (Bauer & Erdogan, 2015). For instance, employees may interpret the strict reporting and monitoring imposed by a hierarchical leadership style as a breach of trust which may, counterproductively, offend their sense of autonomy (Heide, Wathne, & Rokkan, 2007; Spreitzer, 1995). In addition, monitoring mechanisms instill a sense of pressure and "having to do" tasks on employees (Adler & Chen, 2011, p. 75), which may lead employees to adhere to the views of their managers out of self-preservation, undermining the benefits inherent to increased autonomy. More formally:

**H1a** The greater a firm's level of hierarchical leadership, the weaker the positive effects of enabling employee autonomy in grassroots innovation initiatives on grassroots innovation performance.

On the other hand, we expect a facilitative leadership style to amplify the benefits of autonomy on grassroots innovation performance. Autonomy and facilitative leadership are congruent as both are indicative of a communal form of organizing, of which trust, and social support are important building blocks (Barnes et al., 2013). Prior management research suggests that the effectiveness of employee autonomy depends on the degree to which leaders actively facilitate and support employees who work autonomously (Seibert, Silver, & Randolph, 2004). Such indicators of organizational support strengthen employees' perceptions of empowerment (Chamberlin, Newton, & LePine, 2018), which, we expect, will influence the beneficial effect of autonomy on the creative behaviors that make grassroots innovation initiatives successful. In addition, facilitative leadership tends to promote a transparent and collaborative dialogue between senior managers and employees (Adler & Borys, 1996; Barnes et al., 2013), which may suppress the risk of lack-of-focus which autonomy can also produce. For example, senior managers can use feedback and encouragement to guide employees' focus in ideation (avoiding "wild ideas" disconnected from corporate goals) without being perceived as intrusive (as opposed to hierarchy-based mechanisms). Thus, we hypothesize:

**H1b** The greater a firm's level of facilitative leadership, the stronger the positive effects of enabling employee autonomy in grassroots innovation initiatives on grassroots innovation performance.

*3.1.2. Competence, grassroots innovation performance and leadership style*

Hierarchical and facilitative leadership may also have two opposite moderating effects on the effect of enabling employees' competence development on grassroots innovation performance. A large body of research in management suggests that there is a natural friction between competence development and formal monitoring systems. For instance, Gulati (2018) recommends that leaders should "focus on developing employees' capabilities rather than on monitoring their behavior" (p. 76).

Even though this friction has been documented decades ago (Bartlett & Ghoshal, 1995), the key question of how to address it remains largely unaddressed (Gulati, 2018). We address this issue by postulating different moderating effects of the two facets of leadership we identify – hierarchical and facilitative leadership – on the effect of enabling employee competence in grassroots innovation initiatives on grassroots innovation performance.

On the one hand, we expect a hierarchical leadership style to suppress the benefits of competence development on grassroots innovation performance. When one's activities and outputs are regularly subject to formal external evaluation, employees may question both their leaders' appreciation and their own assessments of their mastery of important skills, and their ability to bring their projects to completion. Prior SDT research indeed demonstrates that certain markers of a hierarchical leadership style, such as deadlines and surveillance, can be discouraging (Amabile, DeJong, & Lepper, 1976; Plant & Ryan, 1985). Hence, we expect a hierarchical reporting structure to cast a shadow of doubt over employees' success at task completion. If grassroots innovation initiatives stimulate employees to overcome challenges and successfully complete tasks, formal control structures can be perceived as intrusive (Heide, Wathne, & Rokkan, 2007) if they signal a lack of confidence in employees' competence. Therefore, we hypothesize that hierarchical leadership undermines the opportunity for grassroots innovation initiatives to satisfy employees' need for competence and thus weakens its positive effect on grassroots innovation performance:

**H2a** The greater a firm's level of hierarchical leadership, the weaker the positive effects of enabling employee competence in grassroots innovation initiatives on grassroots innovation performance.

On the other hand, we expect a facilitative leadership style to *amplify* the benefits of competence development on grassroots innovation performance. According to SDT, expressions of confidence and support by leadership stimulate and encourage employees not only to seek goal completion but also to attribute such goal completion to their own skills (Forner et al., 2020; Vansteenkiste, Ryan, & Soenens, 2020). Facilitation and support can help leaders offer guidelines that provide employees with a "galvanizing sense of where the organization is trying to go" (Gulati, 2018, p.71). Thus, the friction between leaders' influence and competence development can be overcome when leaders work to facilitate rather than monitor grassroots innovation initiatives. Therefore, we hypothesize that a facilitative leadership style complements designing grassroots innovation initiatives to satisfy employees' need for competence, which should be reflected in enhanced grassroots innovation performance:

**H2b** The greater a firm's level of facilitative leadership, the stronger the positive effects of enabling employee competence in grassroots innovation initiatives on grassroots innovation performance.

*3.1.3. Relatedness, grassroots innovation performance and leadership style*

We also expect leadership style to moderate the effect of enabling employee relatedness on grassroots innovation performance in two distinct ways. On the one hand, we expect satisfying employees' need for relatedness to be more valuable as a motivator in more hierarchical and formalized environments than in less hierarchical and formalized environments. This happens because in environments with highly formalized reporting systems and communication channels employees' need for socialization is typically less adequately satisfied than in less formalized environments. The practices associated with hierarchical leadership such as oversight and stringent monitoring and reporting are not conducive to the development of good collaborative relationships (e.g., see Heide & Wathne, 2006 for a detailed discussion in the context of interorganizational relationships), leaving the need for relatedness largely unaddressed. Addressing that need at the level of grassroots innovation initiatives therefore likely complements a more hierarchical leadership style. Thus:

**H3a** The greater a firm's level of hierarchical leadership, the stronger the positive effects of enabling employee relatedness in grassroots innovation initiatives on grassroots innovation performance.

On the other hand, a facilitative leadership style likely suppresses the benefits of relatedness on grassroots innovation performance. This happens because environments characterized by a facilitative leadership style are more communal in nature and encourage a culture of feedback and support. Encouraging feedback and support gives employees a sense of being significant to others, thereby directly addressing their need for relatedness (Kovjanic et al. 2012). Therefore, additional efforts at the level of the grassroots innovation initiative to stimulate the development of trusted and mutually beneficial relationships may be less impactful in terms of satisfying employees' psychological need for relatedness. In other words, a facilitative leadership style may substitute for project-level opportunities for relatedness. Hence, we expect that addressing the need for relatedness in grassroots initiatives is less impactful in firms where managers display a facilitative leadership style. Formally:

**H3b** The greater a firm's level of facilitative leadership, the weaker the positive effects of enabling employee relatedness in grassroots innovation initiatives on grassroots innovation performance.

### 3.2. The effect of Autonomy, competence and relatedness on grassroots innovation performance as moderated by market orientation

We now turn to the moderating role of market orientation. Market orientation may affect the extent to which the three self-determination motivational drivers (i.e., autonomy, competence, and relatedness) enhance grassroots innovation performance, in two opposing ways. On the one hand, employees who participate in grassroots innovation initiatives may perceive a strong market orientation as constraining of their creativity. This happens because superior market-sensing capabilities may lead firms to narrow employees' ideation space to a search area that befits the firm's existing customer and market insights. A strong market orientation may, therefore, weaken the motivational benefits of self-determination.

On the other hand, employees may perceive a strong market orientation as supportive of their efforts to develop and implement customer-centric innovations. Specifically, firms with a strong market orientation develop shared values and behavioral expectations surrounding the importance of customer focus. Shared customer-centric values and behavioral expectations, in turn, should help employees access the internal support, knowledge, and resources they need to implement their innovation projects. Departing from these two opposing forces, we now postulate how the effects of autonomy, competence, and relatedness on grassroots innovation performance depend on a firm's level of market orientation.

#### 3.2.1. Autonomy, grassroots innovation performance and market orientation

As discussed above, autonomy motivates employees to make optimal use of their creative skills (Amabile, 1998), thereby helping firms bridge the gap with the market (Tellis, 2013). However, such advantage is likely smaller in firms with high levels of market orientation because such firms already have institutionalized processes for accessing, sharing, and responding to customer insights (Deshpandé & Farley, 1997). Autonomy and market orientation may, in this regard, serve as alternative routes toward the same end goal: to bring new customer-centric ideas to market.

In addition, management in more market-oriented firms have access to a high quantity of customer information, whereas management in less market-oriented firms have sparser information about customers. Access to a high quantity of information makes people anchor on such information and become less flexible in negotiations with others (Wiltermuth & Neale, 2011). Management in more market-oriented firms may thus anchor on information about current customers, in turn becoming more dominant, or steering the direction of employees' projects too much, as compared with management in less market-oriented firms. For these reasons, we expect firms' efforts to let employees work autonomously in grassroots innovation initiatives to be less effective in more market-oriented firms than in less market-oriented firms. Formally,

**H4** The positive effect of enabling employee autonomy in grassroots innovation initiatives on grassroots innovation performance is weaker in more market-oriented firms, as compared to less market-oriented firms.

#### 3.2.2. Competence, grassroots innovation performance and market orientation

We propose that enabling employee competence in grassroots innovation initiatives will have a more positive impact on grassroots innovation performance in more (versus less) market-oriented firms. This is because market orientation makes it easier for employees to mobilize internal resources for customer-centric ideas, which helps them apply the skills they acquired in the development of their innovation projects, positively affecting grassroots innovation performance. For example, imagine that a firm upskills employees who participate in a grassroots innovation initiative on the usage of customer-centric tools, such as 'visual imagery' (Dahl, Chattopadhyay, & Gorn, 1999). Our argument is that it will be much easier for such employees to mobilize the resources they need to activate those skills (e.g., to organize ideation workshops supported by visual imagery tools) in firms with high rather than low market orientation. Thus:

**H5** The positive effect of enabling employee competence in grassroots innovation initiatives on grassroots innovation performance is stronger in more market-oriented firms, as compared to less market-oriented firms.

#### 3.2.3. Relatedness, grassroots innovation performance and market orientation

Enabling the development of mutually beneficial relationships with colleagues in a grassroots innovation initiative addresses employees' need for relatedness, which improves grassroots innovation performance. This effect may be less pronounced in a more market-oriented firm, where the firm-level culture already promotes shared values and behavioral expectations about the importance of customer focus. While this sense of shared purpose likely complements firms' efforts to develop employees' competences in grassroots innovation initiatives (see H5), we expect that it *substitutes* for their efforts to give employees a sense of belongingness. In H3b we argued that helping employees develop a sense of relatedness, is less impactful in firms with a facilitative leadership style as such firms have a more communal culture that already satisfies their need for relatedness. Consistent with the idea that top-down approaches may substitute for project-level opportunities for relatedness, we expect employees in more (versus less) market-oriented firms to have a lesser need for new opportunities to relate to other colleagues because the organizational culture already reflects a shared customer-centric purpose and contributes to a communal atmosphere. Hence,

**H6** The positive effect of enabling employee relatedness in grassroots innovation initiatives on grassroots innovation performance is weaker in more market-oriented firms, as compared to less market-oriented firms.

## 4. Data and method

We gathered data to test our hypotheses using a large cross-national survey among 3,728 managers in 14 countries, 2,353 of which (63.1%) indicated that their firm already engaged in grassroots innovation initiatives. We use the survey method for three main reasons. First, firms are not required to measure or report on their grassroots innovation performance, which means archival data is not available. For instance, there is no secondary data we are aware of that systematically captures grassroots innovation performance across companies. Second, our independent variables (i.e., self-determination motivational drivers, hierarchical/facilitative leadership style, and market orientation) are perceptual in nature, again precluding archival measures across a large sample of firms. Third, firms typically ascribe a high strategic importance to their grassroots innovation initiatives, which makes them less amenable to experimental interventions.

We use innovation managers with long tenure at their firms as key informants. They are deeply knowledgeable about their firms' innovation practices. As grassroots innovation initiatives are highly salient events, we expect key informant data to be reliable and valid (see Homburg et al., 2012).

We explicitly address concerns of common method variance bias and selection bias following recommendations in the survey methodology literature (Hulland, Baumgartner, & Smith, 2018; Podsakoff et al., 2003; Rindfleisch et al., 2008; Sande & Ghosh, 2018). Moreover, we focus our inferences on the interactive effects between the self-determination motivational drivers we described (i.e., autonomy, competence, and relatedness) and a firm's institutional environment (i.e., leadership style, and market orientation) on grassroots innovation performance. While common method variance can inflate linear relationships, it cannot inflate interaction effects (Evans, 1985; Podsakoff, MacKenzie, & Podsakoff, 2012; Siemsen et al., 2010), further reducing concerns with common method bias. We thus conclude that these biases do not pose a threat to our findings.

### 4.1. Survey design and pretesting

We used the following procedure to design our survey, following current guidelines for survey research (Hulland, Baumgartner, & Smith 2018). First, we designed a preliminary questionnaire using scales and items from prior academic research. Second, we piloted our survey in English in a small (40 respondents) convenience sample of innovation managers, through our own network. In this pilot, we gathered feedback from participants on the clarity of our definitions and key terms (e.g., grassroots innovation, firm, and business unit). We then redesigned the survey based on the feedback of this convenience sample. Third, we formally pretested the redesigned survey in English among 486 subjects in the UK (N = 217), the US (N = 166), and Germany (N = 103). We contracted uSamp, a global market research company[2], to run the fieldwork of this pretest. Fourth, after checking the validity and reliability of our scales in our pretest and revising instructions and survey structure, we employed a back-translation procedure on the retained items (Brislin 1970) to ensure translation equivalence across all languages for the items and the response category labels.

### 4.2. Sampling

We contracted uSamp to execute the full, Internet-based, survey in local languages among innovation managers in firms with at least 500 employees in 14 countries: Belgium, Brazil, China, Germany, India, Indonesia, Italy, Mexico, the Netherlands, Philippines, South Korea, Spain, the United Kingdom, and the United States. This sample ensured sufficient coverage of developed and emerging economies, given budget constraints. We gradually rolled out the survey over these 14 countries in an 18-month period that ended in March 2015. We considered respondents eligible if they had been working at their current company for at least four years and if they were sufficiently knowledgeable about innovation in their firm (i.e., if they had a score of six or higher on knowledge of innovation: see Homburg et al. 2012 for how these factors increase accuracy).

In total, uSamp solicited 4,120 eligible respondents. We conducted additional data integrity checks to remove incomplete responses (N = 156) and responses identified as fraudulent by uSamp (N = 236) (following Cacioppo et al., 2013). It involves checking the integrity of respondents' identities and reported functions, checking whether their IP addresses match their reported country of residence using digital fingerprints, identifying respondents who answer the survey more than once, among others. These data integrity checks reduced the sample to 3,728 respondents, out of which 2,353 (63.1%) indicated that their firm had already engaged in grassroots innovation initiatives.

### 4.3. Questionnaire composition

In the first part of the questionnaire, we explained the context of our study and provided respondents with clear and simple definitions of our key terms, such as grassroots innovation. To increase interest and respondent motivation, we also offered respondents the possibility to receive a customized benchmarking report. In the second part, we inventoried general information such as respondents' job description, functional domain of expertise, general measures of firms' innovation per-

[2] uSamp is nowadays part of Dynata (http://www.dynata.com/).

formance (i.e., number of radical and incremental innovations, return on investment, sales growth, and profitability from innovation, and time from ideation until market launch). In the third part, we asked if the respondent's firm had ever engaged in grassroots innovation. For respondents from firms which had already engaged in grassroots innovation, we then measured grassroots innovation performance, the self-determination motivational drivers the firm emphasizes in its grassroots innovation initiatives, and the firm's leadership style. In the last part, which was answered by all respondents, we inventoried market orientation, other general company characteristics, and control variables such as number of employees and firm revenues.

### 4.4. Survey measures

We now discuss our measures (see Web Appendix A for all survey items).

#### 4.4.1. Grassroots innovation performance

We measured grassroots innovation performance using a new scale of four items capturing the extent to which grassroots innovation initiatives succeed in developing innovations that address the needs of their target customers and are generally considered a success at the firm ($\alpha = 0.89$).

#### 4.4.2. Self-determination motivational drivers

We adapted items from the Intrinsic Need Satisfaction scale (Deci et al., 2001) to measure the extent to which, in its grassroots innovation initiatives, a respondent's firm emphasizes employee autonomy (4 items; $\alpha = 0.90$), competence (4 items; $\alpha = 0.91$), and relatedness (5 items; $\alpha = 0.92$).

#### 4.4.3. Hierarchical and facilitative leadership style

We developed two new scales to measure hierarchical leadership style (3 items; $\alpha = 0.85$) and facilitative leadership style (3 items; $\alpha = 0.90$). We domain-sampled these two scales from Adler and Borys (1996), Adler and Chen (2011), and Barnes et al. (2013).

#### 4.4.4. Market orientation

To measure market orientation, we used the 8-item scale developed by Deshpandé and Farley (1997), to put less burden on respondents than the full 32-item scale proposed by Jaworski and Kohli (1993), while still capturing the three components of the construct domain – generation and dissemination of insights in customer needs and organization-wide responsiveness to it ($\alpha = 0.93$).

#### 4.4.5. Other variables

We measured the number of employees and total revenues according to 12 (number of employees) and 14 (revenues) ordered categories (for these categories, see Web Appendix A).

#### 4.4.6. Descriptive statistics

Table 2 depicts the descriptive statistics and bivariate correlations among the focal constructs in our model in this subsample of firms that have adopted grassroots innovation. To compute these correlations, we averaged respondents' answers to the items in each of the scales to produce summated scales for each construct. In doing so, we follow the standard argument in psychometrics (Nunnally & Bernstein, 1994) and in marketing research textbooks (Iacobucci & Churchill, 2010) that it is both safe and useful to treat summated Likert scales as interval scales.

**Table 2**
Descriptive Statistics (N = 2,353).

| Construct | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Grassroots Innovation Performance | 0.83 | | | | | | |
| 2. Autonomy | 0.70 | 0.84 | | | | | |
| 3. Competence | 0.75 | 0.82 | 0.87 | | | | |
| 4. Relatedness | 0.76 | 0.75 | 0.82 | 0.85 | | | |
| 5. Hierarchical Leadership Style | 0.72 | 0.70 | 0.75 | 0.75 | 0.83 | | |
| 6. Facilitative Leadership Style | 0.68 | 0.66 | 0.70 | 0.69 | 0.77 | 0.87 | |
| 7. Market Orientation | 0.72 | 0.60 | 0.66 | 0.69 | 0.68 | 0.64 | 0.81 |
| M | 5.69 | 5.60 | 5.73 | 5.78 | 5.64 | 5.69 | 5.92 |
| SD | 0.93 | 1.00 | 0.94 | 0.92 | 1.02 | 1.07 | 0.91 |
| Reliability (Cronbach's $\alpha$) | 0.89 | 0.90 | 0.91 | 0.92 | 0.85 | 0.90 | 0.93 |
| Composite Reliability (Bagozzi and Yi 1998) | 0.85 | 0.88 | 0.89 | 0.90 | 0.81 | 0.86 | 0.92 |

Note: The diagonal elements depict the square root of the average variance extracted (AVE) for each construct. We also report the mean (M) and standard deviation (SD) of the focal constructs across our sample (N = 2,353).

### 4.5. Model

We estimated a Bayesian structural equation model (SEM) estimated on the subsample of firms that have adopted grassroots innovation (N = 2,353) to test our hypotheses.

#### 4.5.1. Model specification

In our model, $i$ indexes respondents ($i$ = 1,. . .,N; N = 2,353), $p$ indexes the response items measuring latent constructs ($p$ = 1,. . .,P; P = 31), and $r$ indexes latent exogenous constructs ($r$ = 1,. . .,R; R = 6). We specify our measurement equations relating the latent endogenous construct –grassroots innovation performance (GIP) – to the observed responses as follows:

$$y_{ip} = \tau_p + \lambda_p \times \eta_i + \varepsilon_{ip}, \text{ for } 1 \leqslant p \leqslant 4, \tag{1}$$

where $\eta_i$ denotes our endogenous latent variable (grassroots innovation performance), $\tau_p$ are item-specific intercepts. We define the latent exogenous constructs – autonomy, competence, relatedness, hierarchical leadership style, facilitative leadership style, and market orientation - as follows:

$$y_{ip} = \tau_p + \lambda_p \times \xi_{r,i} + \varepsilon_{ip}, \text{ for } p \geqslant 5 \tag{2}$$

where $\xi_{r,i}$ denotes an exogenous latent construct. We collect the error terms in Equation (1) and Equation (2) in a ($P \times 1$) random vector of residuals, $\boldsymbol{\varepsilon_i}$, which we assume to be normally distributed as N($\mathbf{0}$,$\boldsymbol{\Psi}$), where $\boldsymbol{\Psi}$ is a ($P \times P$) diagonal covariance matrix. The error terms are orthogonal to the latent constructs.

Our structural model is defined as:

$$\begin{aligned}\eta_i = {} & \gamma_1 \times \xi_{1,i} + \gamma_2 \times \xi_{2,i} + \gamma_3 \times \xi_{3,i} + \gamma_4 \times \xi_{4,i} + \gamma_5 \times \xi_{5,i} + \gamma_6 \times \xi_{6,i} \\ & + \gamma_7 \times \xi_{1,i} \times \xi_{4,i} + \gamma_8 \times \xi_{2,i} \times \xi_{4,i} + \gamma_9 \times \xi_{3,i} \times \xi_{4,i} \\ & + \gamma_{10} \times \xi_{1,i} \times \xi_{5,i} + \gamma_{11} \times \xi_{2,i} \times \xi_{5,i} + \gamma_{12} \times \xi_{3,i} \times \xi_{5,i} \\ & + \gamma_{13} \times \xi_{1,i} \times \xi_{6,I} + \gamma_{14} \times \xi_{2,i} \times \xi_{6,i} + \gamma_{15} \times \xi_{3,i} \times \xi_{6,i} \\ & + \Gamma' X_i + \delta_{i,}\end{aligned} \tag{3}$$

where the $\gamma$ parameters capture the structural paths of interest, to be estimated. This structure clarifies that our endogenous latent variable is *grassroots innovation performance* ($\eta_i$), while our exogenous latent variables are *autonomy* ($\xi_{1,i}$), *competence* ($\xi_{2,i}$), *relatedness* ($\xi_{3,i}$), *hierarchical leadership style* ($\xi_{4,i}$), *facilitative leadership style* ($\xi_{5,i}$), and *market orientation* ($\xi_{6,i}$).

In addition, we control for firm size using two single-item covariates (number of employees and revenues). To ensure that our results in the subset of firms that have adopted grassroots innovation are not threatened by selection bias, we also include an Inverse Mill's ratio ($\lambda$) from a Heckman two-step correction for selection bias (Sande & Ghosh, 2018; see section 5.6.2) as a single-item covariate in the model. For these single-item covariates, we first standardize these variables. We then collect these single-item covariates in the vector $\mathbf{X_i}$. Consequently, $\boldsymbol{\Gamma}$ contains the structural paths corresponding to the effects of number of employees ($\gamma_{16}$), revenues ($\gamma_{17}$), and the Inverse Mill's ratio ($\gamma_{18}$) on grassroots innovation performance. We collect all exogenous latent variables in a ($R \times 1$) vector $\boldsymbol{\xi_i}$ distributed according to N($\mathbf{0}$,$\boldsymbol{\Phi}$), where $\boldsymbol{\Phi}$ is a (R × R) full covariance matrix and we assume the residual, $\delta_i$, is independent of the latent variables and distributed according to N(0,$\psi_\delta$).

#### 4.5.2. Model estimation

We used a Bayesian approach to estimate our SEM model. The Bayesian approach is based on individual observations rather than the sample covariance matrix and uses data augmentation (Lee, 2007), which allows sampling the latent constructs alongside the model parameters (Tanner & Wong, 1987). Therefore, latent constructs are available for usage in estimation, which facilitates modeling interaction effects, a key advantage of the Bayesian approach (Lee, 2007). For this reason, Bayesian estimation is increasingly recognized as a more flexible approach to the estimation of theory-driven structural equation models than maximum likelihood (Muthén & Asparouhov, 2012).

We specified the posterior distribution of the parameters of interest across all respondents in our sample. In accordance with standard structural equation models, we include item-specific intercepts in our measurement model, which capture the mean of each item. Following Lee (2007), we impose that the exogenous latent constructs in the structural model are normally distributed with zero means. Taken together, the item-specific intercepts and the constraint that exogenous latent constructs have zero means facilitate the interpretation of the results since the latent constructs are effectively mean-centered.

We sampled the model parameters from their posterior distributions using the Gibbs sampler (Casella & George, 1992) with data augmentation (Tanner & Wong, 1987). We used the standard priors proposed by Lee (2007) for Bayesian SEMs (normal distributions for measurement intercepts, loadings and structural parameters, and inverse-Wishart distributions for variance–covariance matrices) and standard Markov chain Monte Carlo procedures with two concurrent chains for estimation. We ran our model for 30,000 draws and ensured model convergence by inspecting the Gelman-Rubin statistics (Gelman & Rubin, 1992). We discarded the first 10,000 iterations as burn-in values and used the next 4,000 thinned draws (2,000 in each of the two chains, as we used every 10th draw to reduce autocorrelation) for posterior inference.

### 4.6. Model diagnostics and robustness

#### 4.6.1. Common method variance

Common method variance (CMV) – systematic error variance shared among variables measured with a single method and source – is a common concern in cross-sectional survey research (Podsakoff et al., 2003; Rindfleisch et al., 2008). We believe that CMV does not pose a threat to our results for three reasons. First, we followed standard procedural measures, such as ensuring respondent anonymity and using key informants (Rindfleisch et al., 2008). Second, we formally tested for CMV bias. Specifically, following Podsakoff et al. (2003), we control for the effect of an unmeasured latent common method factor by letting all items load on their theoretical constructs as well as a common factor. The results are robust to the inclusion or removal of this common method factor (see Web Appendix B). Third, in this study all hypothesized effects are interaction effects. Prior literature has provided ample evidence that interaction effects cannot be an artifact of CMV (see Evans, 1985 for a Monte Carlo study and Siemsen et al., 2010 for an analytical derivation). Marketing scholars have also acknowledged that CMV bias is not a concern for the test of moderation hypotheses (e.g., Korschun, Bhattacharya, & Swain, 2014).

#### 4.6.2. Selection bias

Some firms may have better capabilities and resources for innovation and, hence, may be more likely to adopt grassroots innovation because they expect to achieve better results. To control for this potential endogeneity problem, we employed Heckman's (1979) two-step procedure, as recommended by recent survey methodology literature (Sande & Ghosh, 2018). We used data from all 3,728 eligible respondents, which included respondents who worked in firms which had (N = 2,353) and had not yet (N = 1,375) engaged in grassroots innovation initiatives.

Following Heckman (1979), we specify a Probit selection model, in which we regress a firm's decision to adopt or not adopt grassroots innovation on covariates explaining such decision. We assume that a firm's decision to adopt grassroots innovation depends on its expectations about the success of grassroots innovation initiatives. Such expectations, in turn, may depend on a firm's innovativeness and on available resources. To instrument for firm's innovativeness, we include three markers of firms' prior innovation success vis-à-vis competitors in our selection equation (see e.g., Chandy & Tellis, 1998; De Luca & Atuahene-Gima, 2007; Wuyts et al., 2004): (i) number of radical innovations introduced in the market in last three years, (ii) number of incremental innovations introduced in the market in last three years, and (iii) time from ideation until market launch. We also include market orientation, as prior research has shown that market orientation is an antecedent of a firm's innovativeness (Hurley & Hult, 1998). To instrument for resource availability, we include number of employees and revenues in our selection model, to proxy economies of scale (Cohen & Levin, 1989) and access to a larger pool of ideas (Girotra, Terwiesch, & Ulrich 2010).

Next, we used the Probit estimates to calculate the Heckman correction factor, or inverse Mills ratio. Following Heckman (1979), and in line with recent marketing literature (Wetzel, Hammerschmidt, & Zablah 2014), we augment our SEM model by including the inverse Mills ratio as an additional predictor of grassroots innovation performance, to solve the selection issue. The exclusion of the inverse Mills ratio from our model does not affect our results (see Web Appendix C).

#### 4.6.3. Multicollinearity

We also assessed whether multicollinearity affects our estimates[3], using an extension of the condition index method (Belsley, Kuh, & Welsch, 1980) for SEM models proposed by Kaplan (1994). Kaplan (1994) proposes a diagnostic based on the inverse of the information matrix, approximated by the estimated covariance matrix of the latent constructs. We calculated the scaled condition indexes for our model and found the highest condition index (9.11) to be well below the threshold of 30 recommended by Belsley et al. (1980). Hence, our model shows no signs of harmful multicollinearity. In addition, Grewal, Cote, and Baumgartner (2004) show that SEM models with good discriminant validity (which, as we discuss next, is the case in our model) are unlikely to suffer from problematic multicollinearity.

## 5. Results

### 5.1. Measurement model Fit, reliability and validity

We validated model fit and our measures using confirmatory factor analysis. The fit of our measurement model was acceptable. The root mean square error of approximation (RMSEA = 0.049), the comparative fit index (CFI = 0.963) and the Tucker-Lewis Index (TLI = 0.958), were both below (in the case of RMSEA) and above (in the case of CFI and TLI) the commonly recommended cutoff values, indicating an acceptable fit.

Following Anderson and Gerbing (1988), we also checked our measurement scales for unidimensionality, reliability, convergent and discriminant validity. First, to assess unidimensionality, we conducted factor analyses on all constructs taking one scale at a time. Using the common cut-off of an eigenvalue of 1.0, we found that only a single factor was extracted for

[3] Multicollinearity inflates standard errors and thus leads to loss of statistical power and Type II error, not Type I error, or parameter bias (Grewal et al., 2004).

each of the constructs. Given that the fit of the measurement model reported above was also acceptable, we conclude that all our measures showed satisfactory unidimensionality.

Second, all scales in our model showed satisfactory reliability. All scales have a Cronbach's $\alpha$ of at least 0.85. The composite reliability of all scales is also above 0.81, indicating acceptable fit (Bagozzi & Yi, 1988). We also assessed the average variance extracted, which is a more conservative measure of reliability. The average variance extracted is greater than 0.65 for all scales, again demonstrating high reliability (Fornell & Larcker, 1981).

Third, we assessed convergent validity through the path coefficients from the latent construct to their corresponding indicators. All loadings were significant at $p < 0.1$ and all parameter estimates were at least ten times as large as the standard errors (Anderson & Gerbing, 1988). Thus, our measures showed high convergent validity.

Fourth, all pairs of constructs passed Fornell and Larcker's (1981) discriminant validity test. For all constructs the square root of the average variance extracted was greater than their correlation with other constructs (Fornell & Larcker, 1981), which indicates acceptable discriminant validity among our constructs.

### 5.2. Fit of the structural model

To assess the fit of the structural model, we compared several models using the deviance information criterion (DIC), for which lower values indicate a better fit (Spiegelhalter et al., 2002). Model 1 is a baseline model that includes only the self-determination motivational drivers and the control variables as predictors of grassroots innovation performance ($DIC_{M1}$ = 307,066). We then gradually introduce the institutional environment variables (i.e., leadership style and market orientation). Specifically, in Model 2, we introduce the direct and moderating effects of hierarchical and facilitative leadership styles which improves model fit ($DIC_{M2}$ = 307,030). Finally, in Model 3 we introduce the direct and moderating effects of market orientation, which again improves model fit ($DIC_{M3}$ = 306,957). Even though individual DIC values are hard to interpret, the Bayesian literature recommends comparing the differences in DIC between models (Burnham & Anderson, 2004). Following Burnham and Anderson (2004), we compare the difference between each model and the model with minimum DIC ($\Delta_i = DIC_i - DIC_{min}$) and consider models with $\Delta_i > 10$ as having essentially no support, as compared with the best-fitting model. This analysis shows that Model 1 ($\Delta_1$ = 109) and Model 2 ($\Delta_2$ = 73) have essentially no support, when compared with our proposed model (Model 3).

### 5.3. Hypotheses testing

We depict the results of our model in Table 3, below. Please recall that the item-specific intercepts in our measurement model and the constraint that our latent exogenous constructs have zero means facilitate our interpretation of the results in a manner akin to mean-centering. Specifically, the parameters we depict in the first six rows of Table 3 capture the marginal

**Table 3**
Bayesian SEM Model Results (Estimates are the Posterior Means of the MCMC Chains).

| Marginal Effects | Hypothesis | Grassroots Innovation Performance (N = 2,353) | |
|---|---|---|---|
| Autonomy → Grassroots Innovation Performance | | **0.13** | *** |
| Competence → Grassroots Innovation Performance | | **0.13** | * |
| Relatedness → Grassroots Innovation Performance | | **0.26** | *** |
| Hierarchical Leadership Style → Grassroots Innovation Performance | | **0.13** | *** |
| Facilitative Leadership Style → Grassroots Innovation Performance | | **0.07** | ** |
| Market Orientation → Grassroots Innovation Performance | | **0.21** | *** |
| **The Moderating Role of Leadership Style** | | | |
| Autonomy x Hierarchical Leadership Style → Grassroots Innovation Performance | $H_{1a}$ (-) | **0.30** | * |
| Competence x Hierarchical Leadership Style → Grassroots Innovation Performance | $H_{2a}$ (-) | **-0.88** | *** |
| Relatedness x Hierarchical Leadership Style → Grassroots Innovation Performance | $H_{3a}$ (+) | **0.56** | *** |
| Autonomy x Facilitative Leadership Style → Grassroots Innovation Performance | $H_{1b}$ (+) | 0.14 | |
| Competence x Facilitative Leadership Style → Grassroots Innovation Performance | $H_{2b}$ (+) | 0.23 | |
| Relatedness x Facilitative Leadership Style → Grassroots Innovation Performance | $H_{3b}$ (-) | **-0.30** | *** |
| **The Moderating Role of Market Orientation** | | | |
| Autonomy x Market Orientation → Grassroots Innovation Performance | $H_4$ (-) | **-0.66** | *** |
| Competence x Market Orientation → Grassroots Innovation Performance | $H_5$ (+) | **0.98** | *** |
| Relatedness x Market Orientation → Grassroots Innovation Performance | $H_6$ (-) | **-0.34** | *** |
| **Other Variables** | | | |
| Nr. Employees → Grassroots Innovation Performance | | **0.01** | |
| Revenues → Grassroots Innovation Performance | | **-0.02** | * |
| Inverse Mill's Ratio ($\lambda$) → Grassroots Innovation Performance | | **-0.31** | *** |

Note: We let all models converge and run our Bayesian SEM model for 30,000 draws in two chains. We then discarded the first 10,000 draws for burn-in and used the remaining thinned draws for posterior inference (we used every 10th draw to reduce autocorrelation, so a total of 4,000 draws in the two chains). In the third column we report the posterior mean of each parameter. We use '***' to indicate that the 99% Credible Interval of a parameter does not contain zero, '**' to indicate that the 95% Credible Interval does not contain zero, and '*' to indicate that the 90% Credible Interval does not contain zero.

effects of our exogenous variables on grassroots innovation performance, conditional on other variables being centered at their corresponding means.

*5.3.1. Marginal effects*

Supporting the assertion that grassroots innovation initiatives leverage the self-determination of participating employees to enhance their creativity and bridge the gap between the firm and the market, we find positive marginal effects of autonomy ($\gamma$ = 0.13; 95% CI = [0.05; 0.21]), competence ($\gamma$ = 0.13; 90% CI = [0.02; 0.23]), and relatedness ($\gamma$ = 0.26; 95% CI = [0.18; 0.35]) on grassroots innovation performance (GIP). The same holds for hierarchical leadership style ($\gamma$ = 0.13; 95% CI = [0.03; 0.24]), facilitative leadership style ($\gamma$ = 0.07; 95% CI = [0.00; 0.14]), and market orientation ($\gamma$ = 0.21; 95% CI = [0.15; 0.27]).

*5.3.2. The moderating role of leadership style*

Our results do not confirm H1a, as we do not find a significant negative interaction between autonomy and hierarchical leadership style. In fact, the posterior mean for this parameter is positive ($\gamma$ = 0.30), and even though its 95% credible interval contains zero ($\gamma$ = 0.30; 95% CI = [-0.04; 0.58]), its 90% credible interval does not (90% CI = [0.03;0.54]). Hence, we find a marginally significant *positive* interaction between hierarchical leadership style and autonomy. Our results also do not confirm H1b, as we do not find a significant positive interaction between autonomy and facilitative leadership style ($\gamma$ = 0.14; 95% CI = [-0.11; 0.42]).

Our results confirm H2a, as we find a negative interaction between competence development and hierarchical leadership style ($\gamma$ = -0.88; 95% CI = [-1.21; -0.51]). However, our results do not support H2b, because we do not find a significant positive interaction between competence development and facilitative leadership style ($\gamma$ = 0.23; 95% CI = [-0.14; 0.58]).

Confirming H3a, we find a positive interaction between relatedness and hierarchical leadership style on grassroots innovation performance ($\gamma$ = 0.56; 95% CI = [0.37; 0.77]). At the same time, we find a negative interaction between relatedness and facilitative leadership style ($\gamma$ = -0.30; 95% CI = [-0.48; -0.13]), confirming H3b.

*5.3.3. The moderating role of market orientation*

We find that the greater a firm's level of market orientation, (1) the smaller the positive effect of autonomy on GIP ($\gamma$ = -0.66, 95% CI = [-0.83; -0.47]), confirming H4; (2) the more beneficial the effect of competence development on GIP ($\gamma$ = 0.98, 95% CI = [0.72; 1.23]), confirming H5; and (3) the smaller the positive effect of relatedness on GIP ($\gamma$ = -0.34, 95% CI = [-0.48; -0.21]), confirming H6.

*5.4. Post hoc analyses*

We investigated whether firms that adopt grassroots innovation initiatives outperform those that have not yet adopted grassroots innovation across five innovation performance metrics: (1) radical innovation performance, (2) incremental innovation performance, (3) ROI from innovation, (4) sales growth from innovation, and (5) profits from innovation. We estimated a multivariate regression system on our full sample (N = 3,728), i.e., including both informants from firms that had already adopted grassroots innovation (N = 2,353), and from firms that had not (N = 1,375). We simultaneously regressed each of these five metrics on a *grassroots innovation adoption dummy* (0, if a firm had never engaged in grassroots innovation; 1, if a firm had already engaged in grassroots innovation), controlling for firm size (i.e., number of employees and revenues). The results of this model, which we discuss at greater length in Web Appendix D, show that firms that adopt grassroots innovation outperform firms that do not adopt grassroots innovation in all five metrics ($\beta_{RADICALINNOV}$ = 0.67; $p$ < .01; $\beta_{INCRINNOV}$ = 0.67; $p$ < .01; $\beta_{ROI}$ = 0.60; $p$ < .01; $\beta_{SALESGROWTH}$ = 0.60; $p$ < .01; $\beta_{PROFITS}$ = 0.59; $p$ < .01).

## 6. Discussion

Companies have recently started exploring grassroots innovation, an organizational approach to innovation that relies on the voluntary generation and development of innovations by any member of an organization, regardless of function or seniority. There is considerable heterogeneity among firms in the degree to which grassroots innovation is successful. We offer the first empirical test of factors that influence the success, or failure, of grassroots innovation. We now discuss the theoretical and managerial implications of our research.

*6.1. Theoretical contributions*

There is a growing theoretical interest in how to organize for innovation across a variety of fields (e.g., Keum & See, 2017). Due to its decentralized and voluntary nature, grassroots innovation poses challenges for firms. We argue that, when designing a grassroots innovation initiative, a firm needs to decide how much to emphasize the satisfaction of three psychological needs of employees: autonomy, competence, and relatedness. When doing so, firms typically face a tension between the level of self-determination they confer to participating employees, and the need to give direction to employees to align their innovation efforts with firm-wide goals. We propose that the level of employee autonomy, competence, and relatedness they confer to participating employees interacts with two key characteristics of a firm's institutional environment - leadership

style and market orientation - to influence grassroots innovation performance. To the best of our knowledge, the effects of these organizational characteristics on grassroots innovation success have not been empirically examined. These contingencies contribute to the literature as they challenge an implicit assumption in self-determination theory (Ryan & Deci, 2000), that increasing employee self-determination universally benefits the innovation efforts of firms.

Some of our findings warrant special attention as they reject commonly held beliefs about SDT and leadership (e.g., see Forner et al., 2020). We find no support for a complementary role of facilitative leadership in reaping the benefits of satisfying the innate psychological needs of autonomy, competence, and relatedness. In fact, we demonstrate that facilitative leadership negatively interacts with relatedness which suggests a substitute relationship. While prior research has suggested that facilitative leadership may strengthen employees' perceptions of empowerment (Chamberlin, Newton, & LePine, 2018) and give employees a sense of direction (Gulati, 1998), our combined findings (of a positive marginal effect on grassroots innovation performance, and a negative interaction with relatedness) suggest that facilitative leadership primarily fosters a communal environment that can also be achieved by emphasizing relatedness in the design of grassroots innovation initiatives. Interestingly, we also find that hierarchical leadership does not necessarily undermine satisfying psychological needs in grassroots initiatives: while hierarchical leadership undermines satisfying the need for competence, it *complements* autonomy and relatedness. When the goal is to generate customer-centric innovation, the benefits associated with outcome and process monitoring procedures (such as alignment of grassroots initiatives with corporate goals) appear to outweigh possible employee-level concerns about their constraining nature (Heide, Wathne, & Rokkan, 2007).

Our combined findings also point to another facet of the institutional environment that has received far less attention in the prior SDT literature: the strategic orientation of the firm. With a focus on customer-centric innovation resulting from grassroots innovation initiatives, we singled out a firm's market orientation and found strong support for its moderating role. This suggests that designing grassroots innovation initiatives to satisfy innate psychological needs, requires an outlook on the "institutional environment" beyond the traditional employee-leader workspace, to include the corporation.

Our findings also contribute to the ever-expanding research stream on firm-level drivers of innovation success. The interactive effects we uncover call for a more integrative approach which crosses disciplinary boundaries. That the impact of market orientation extends beyond the marketing sphere in the corporation is well understood and has been studied at great length in marketing (Atuahene-Gima & Ko, 2001; Han, Kim, & Srivastava, 1998; Hurley & Hult, 1998; Im & Workman, 2004; Matsuno, Mentzer, & Özsomer, 2002). We extend this research to the context of grassroots innovation. Research on the linkages between leadership and innovation, however, is sparser. Our research highlights conceptual and empirical linkages between different facets of leadership style and organizational levers to shape innovation initiatives (i.e., self-determination motivational drivers in grassroots innovation). These insights illuminate a novel research trajectory, on the interface between marketing and organizational behavior, which not only further expands the domain of influence of marketing and innovation theories, but also enriches organizational theories.

### *6.2. Managerial implications*

The contribution of grassroots innovation to a firm's overall innovation performance varies widely across firms. Our post hoc analyses suggest that firms should adopt grassroots innovation, as it helps them increase their overall innovation performance (i.e., radical and incremental innovation performance, ROI from innovation, sales growth from innovation, and profits from innovation). While correlational in nature, these results constitute an important contribution as they can help managers in firms that did not yet implement grassroots innovation to make a case to their superior executive layers in favor of grassroots innovation to be deployed in their firm.

For firms seeking to launch new or improve their existing grassroots innovation initiatives, this paper offers guidance on how they can maximize the impact of their grassroots innovation initiatives on the firm's innovation output. Specifically, our findings suggest that to maximize the impact of their grassroots innovation initiatives, firms need to consistently evoke participants' self-determination, i.e., firms should design grassroots innovation initiatives that satisfy employees' innate needs for autonomy, competence, and relatedness. Importantly, we also show that the success of a grassroots innovation initiative depends on the fit between the design of a grassroots innovation initiative and the firm's institutional environment. Next, we derive implementation recommendations for each of the three self-determination motivational drivers discussed.

First, to maximize the potential of grassroots innovation, firms should satisfy employees' innate need for autonomy. For example, firms can ensure that employees who participate in grassroots innovation initiatives see such initiatives as a unique opportunity to work on "their own baby" (i.e., their own idea). One way to do so is to allow employees to self-assemble their own teams or decide on the direction of their own projects. At the same time, firms need to weigh the benefits of high employee autonomy (i.e., enhanced creativity and market insight) with its potential drawbacks (i.e., the risk that employees drift away from corporate-wide goals). Such potential drawbacks can be effectively managed inside the design of the grassroots innovation process. For instance, process owners can secure effective communication with participants on firm strategy and provide feedback throughout the process to participants how the ideas they work on potentially fit the firm's interests and context.

To mitigate the drawbacks of employee autonomy, firms should also adopt an adequate leadership style. For instance, to avoid employees from drifting from corporate-wide goals, firms can install a high-level steering committee to which

employees regularly report (e.g., monthly, or quarterly) to update senior leadership on the progress of their innovation projects. Indeed, our results disconfirm the common wisdom that monitoring employees with pre-agreed KPIs and formal reporting mechanisms (i.e., using a hierarchical leadership style) is incongruent with high employee autonomy. We also do not find a positive interaction between facilitative leadership style (i.e., transparent, and collaborative dialogue between senior management and employees) and autonomy. Hence, a structured process with stage-gates, KPIs, milestones, and formal reporting structures would be a good strategy to mitigate the drawbacks of employee autonomy.

Second, firms should also satisfy employees' innate need for competence to maximize the potential of grassroots innovation. They can do so by delivering workshops and events to share tools and best-practices (e.g., in areas such as creativity, customer-centricity, business case development, assumption validation, etc). At the same time, in grassroots innovation initiatives with a strong competence development component, firms need to be careful not to overemphasize hierarchical control mechanisms. The risk here is that if too much formalized reporting is asked from employees, they end up feeling burdened and attributing the success of their projects to external factors rather than themselves. Firms with a strong hierarchical leadership style may, for instance, entrust a separate unit (e.g., an incubator office) to monitor grassroots innovation projects with a more informal and less hierarchical leadership style, as compared to the standard monitoring and reporting mechanisms used in the "mother company." One way to do so is to involve senior managers in project selection decisions only late in the innovation process. Firms may also invite senior management to sit in "demo" moments where employees are asked to pitch their ideas, but brief senior managers that they should give feedback rather than making project selection decisions (e.g., their first question should be "how can I help?").

Third, firms should also satisfy employees' innate need for relatedness to maximize the potential of grassroots innovation. To do so, firms need to ensure that grassroots innovation initiatives contain mechanisms to help employees establish mutually beneficial relationships with other trusted colleagues who can help them develop their innovations. For instance, firms may organize "marketplace events" where selected employees can promote their ideas and recruit colleagues to join their innovation teams. Another option is to deploy online platforms with social components to help employees who participate in grassroots innovation initiatives connect, develop a sense of trust, and leverage the expertise of colleagues who can help them develop their innovations.

### *6.3. Limitations and Future Research*

This study suffers from several limitations that offer opportunities for future research. First, we rely on cross-sectional key informant data, perceptual in nature, to test our hypotheses. Even though we followed several steps to ensure key informant accuracy (Homburg et al., 2012) and mitigate well-documented limitations of survey research - such as self-selection biases (Sande & Ghosh, 2018), common method variance, and the ability to infer causation from observed empirical relations (Rindfleisch et al., 2008) - future research should consider replicating our model in different settings and with different types of data. We believe that it is difficult to study the outcomes we focus on for a sufficiently large number of grassroots innovation initiatives with hard data that is comparable across such initiatives, for several reasons. First, firms do not routinely document the success of grassroots innovation processes specifically, as they may do for their overall R&D budget and the ROI thereof. Second, firms may not necessarily do so with hard data either. One of the authors has conducted such reviews for several firms, but firms typically do this also with "soft" data, such as employee surveys or interview-based benchmarking. Third, if such data would exist within firms, it is unlikely to be comparable across firms. The most likely source for "harder" data is data derived from (third-party) online innovation platforms that manage (grassroots) innovation campaigns, such as Hype or Cognistreamer (see a deployment of the latter in Camacho et al., 2019).

Second, we have been prudent throughout the paper to not claim causation and merely claim correlation. However, future research replicating our findings with causal inference - for instance, through an experimental design - would be valuable. For example, one can conceive behavioral experiments with ideators to examine the influence of self-determination motivational drivers and elements of the institutional environment on the quality of their innovation ideas. Field experiments involving both employees and managers, while costlier and more difficult to implement, would also be valuable.

Third, we conducted a post hoc analysis to investigate whether firms that adopt grassroots innovation initiatives outperform those that have not yet adopted grassroots innovation. In our analysis, we do not control for the potential endogeneity in the adoption of grassroots innovation initiatives. Our results are coherent with our theoretical expectations, which may reduce concerns with endogeneity and reverse causality (Rindfleisch et al., 2008). In addition, given that firms' interest in grassroots innovation is already strong, it is likely that managers share their ideas and approaches in conferences and other fora, which may suggest that the causality goes from grassroots innovation adoption to overall innovation performance, rather than the reverse. However, future studies could disentangle the direction of causality, e.g., using longitudinal data.

Fourth, there may exist several other potential drivers of grassroots innovation performance beyond the self-determination principles, leadership style and market orientation, which we examine, and firm size which we control for, which would be valuable to study, such as (i) access to external and internal innovation knowledge bases (e.g., innovation agreements with other firms, and a firm's resident innovation knowledge and skills), (ii) prior experience with grassroots innovation, (iii) R&D expenditures, as well as (iv) industry-specific trends or shocks. In addition, our cross-sectional data also does not allow us to model unobserved heterogeneity (as we lack repeated observations), therefore, future research should better explore whether our results are robust to controlling for either observed or unobserved heterogeneity.

In general, we hope the present paper stimulates the adoption of grassroots innovation and best practices in the design of grassroots innovation initiatives. We have shown that to harness the potential of grassroots innovation, firms need to bolster employee self-determination while considering the firm's institutional environment - i.e., leadership style and market orientation. These insights may guide managers in their efforts to implement grassroots innovation. From an academic point of view, we hope our research stimulates further research into the effects of market orientation and, especially, leadership style, not in parallel with but in conjunction with developments in the innovation literature.

## Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: [The first and third authors declared to have worked as a paid consultants to firms implementing grassroots innovation].

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijresmar.2021.10.003.

## References

Adams, B. (2016). How Google's 20 Percent Rule Can Make You More Productive and Energetic. *Inc.com*, (accessed May 5th, 2021), [available at https://bit.ly/3eYJUTG].
Adler, P. S., & Borys, B. (1996). Two Types of Bureaucracy: Enabling and Coercive. *Administrative Science Quarterly, 41*(1), 61–89.
Adler, P. S., & Chen, C. X. (2011). Combining Creativity and Control: Understanding Individual Motivation in Large-Scale Collaborative Creativity. *Accounting, Organizations and Society, 36*(2), 63–85.
Amabile, T. M. (1998). How to Kill Creativity. *Harvard Business Review,* 76 (September-October), 77-87.
Amabile, T. M., DeJong, W., & Lepper, M. R. (1976). Effects of Externally Imposed Deadlines on Subsequent Intrinsic Motivation. *Journal of Personality and Social Psychology, 34*(1), 92.
Anderson, J. C., & Gerbing, D. W. (1988). Structural Equation Modeling in Practice: A Review and Recommended Two-step Approach. *Psychological Bulletin, 103*(3), 411–423.
Atuahene-Gima, K., & Ko, A. (2001). An Empirical Investigation of the Effect of Market Orientation and Entrepreneurship Orientation Alignment on Product Innovation. *Organization Science, 12*(1), 54–74.
Bagozzi, R. P., & Yi, Y. (1988). On the Evaluation of Structural Equation Models. *Journal of the Academy of Marketing Science, 16*(1), 74–94.
Bartlett, C. A., & Ghoshal, S. (1995). Changing the Role of Top Management: Beyond Systems to People. *Harvard Business Review, 73*(3), 132–142.
Barnes, B., Humphreys, J. H., Oyler, J. D., Haden, S. S. P., & Novicevic, M. M. (2013). Transcending the Power of Hierarchy to Facilitate Shared Leadership. *Leadership & Organization Development Journal, 34*(8), 741–762.
Bauer, T. & Erdogan B. (2015). *Organizational Behavior Version 2.0*, Flat World Knowledge, Inc.: Washington D.C.
Baumann, O., & Stieglitz, N. (2014). Rewarding Value-Creating Ideas in Organizations: The Power of Low-Powered Incentives. *Strategic Management Journal, 35*(3), 358–375.
Bayus, B. L. (2013). Crowdsourcing New Product Ideas over Time: An Analysis of the Dell IdeaStorm Community. *Management Science, 59*(1), 226–244.
Belsley, D. A., Kuh, E., & Welsh, R. E. (1980). *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity*. New York: John Wiley & Sons Inc.
Benbya, H., & Leidner, D. E. (2018). How Allianz UK used an Idea Management Platform to Harness Employee Innovation. *MIS Quarterly Executive, 17*(2), 139–155.
Bendapudi, N., & Leone, R. P. (2002). Managing Business-to-Business Customer Relationships Following Key Contact Employee Turnover in a Vendor Firm. *Journal of Marketing, 66*(2), 83–101.
Betz, U. A. K., Camacho, N., Gerards, M., & Stremersch, S. (2014). Grassroots Innovation: A Promising Innovation Paradigm for Pharmaceutical Companies. In *Innovation and Marketing in the Pharmaceutical Industry* (pp. 119–148). New York, NY: Springer.
Birkinshaw, J., Bouquet, C., & Barsoux, J. L. (2011). The 5 Myths of Innovation. *MIT Sloan Management Review, 52*(2), 42–50.
Branson, R. (2011). Richard Branson on Intrapreneurs: The Business Icon Talks About Empowering Employees to Break the Rules. *NBC News,* (accessed December 20th, 2019), [available at https://goo.gl/R29PkY].
Brislin, R. W. (1970). Back-translation for Cross-Cultural Research. *Journal of Cross-Cultural Psychology, 1*(3), 185–216.
Brown, A. S. (2010). Boot Camp for Entrepreneurs. *Mechanical Engineering, 132*(8), 28–30.
Burnham, K. P., & Anderson, D. R. (2004). Multimodel Inference: Understanding the AIC and BIC in Model Selection. *Sociological Methods Research, 33*, 261–304.
Burroughs, J. E., Dahl, D. W., Moreau, C. P., Chattopadhyay, A., & Gorn, G. J. (2011). Facilitating and Rewarding Creativity During New Product Development. *Journal of Marketing, 75*(4), 53–67.
Cacioppo, J. T., Cacioppo, S., Gonzaga, G. C., Ogburn, E. L., & VanderWeele, T. J. (2013). Marital Satisfaction and Break-ups Differ across On-Line and Off-Line Meeting Venues. *Proceedings of the National Academy of Sciences, 110*(25), 10135–10140.
Camacho, N., Nam, H., Kannan, P. K., & Stremersch, S. (2019). Tournaments to Crowdsource Innovation: The Role of Moderator Feedback and Participation Intensity. *Journal of Marketing, 83*(2), 138–157.
Casella, G., & George, E. I. (1992). Explaining the Gibbs Sampler. *The American Statistician, 46*(3), 167–174.
Chamberlin, M., Newton, D. W., & LePine, J. A. (2018). A Meta-Analysis of Empowerment and Voices as Transmitters of High-Performance Managerial Practices to Job Performance. *Journal of Organizational Behavior, 39*(10), 1296–1313.
Chandy, R., & Tellis, G. (1998). Organizing for Radical Product Innovation: The Overlooked Role of Willingness to Cannibalize. *Journal of Marketing Research, 34*(November), 474–487.
Cohen, W. M., & Levin, R. C. (1989). Empirical Studies of Innovation and Market Structure. In R. Schmalensee & R. D. Willig (Eds.). *Handbook of Industrial Organization* (Vol. 2, pp. 1059–1061). Amsterdam: Elsevier Science Publishers.
Dahl, D. W., Chattopadhyay, A., & Gorn, G. J. (1999). The Use of Visual Mental Imagery in New Product Design. *Journal of Marketing Research, 36*(1), 18–28.

De Luca, L. M., & Atuahene-Gima, K. (2007). Market Knowledge Dimensions and Cross-Functional Collaboration: Examining the Different Routes to Product Innovation Performance. *Journal of Marketing, 71*(1), 95–112.
Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need Satisfaction, Motivation, and Well-Being in the Work Organizations of a Former Eastern Bloc Country: A Cross-Cultural Study of Self-Determination. *Personality and Social Psychology Bulletin, 27*(8), 930–942.
Deshpandé, R., & Farley, J. U. (1997). Measuring Market Orientation: Generalization and Syntesis. *Journal of Market Focused Management, 2*, 213–232.
Dos Santos, R., & Spann, M. (2011). Collective Entrepreneurship at Qualcomm: Combining Collective and Entrepreneurial Practices to Turn Employee Ideas into Action. *R&D Management, 41*(5), 443–456.
Evans, M. G. (1985). A Monte Carlo Study of the Effects of Correlated Method Variance in Moderated Multiple Regression Analysis. *Organizational Behavior and Human Decision Processes, 36*(3), 305–323.
Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research, 17*(February), 39–50.
Forner, V. W., Jones, M., Berry, Y., & Eidenfalk, J. (2020). Motivating Workers: How Leaders Apply Self-Determination Theory in Organizations. *Organization Management Journal, 18*(2).
Gardner, W. L., Gabriel, S., & Lee, A. Y. (1999). 'I' Value Freedom, but 'We' Value Relationships: Self-Construal Priming Mirrors Cultural Differences in Judgment. *Psychological Science, 10*(4), 321–326.
Gelman, A., & Rubin, D. B. (1992). Inference from Iterative Simulation Using Multiple Sequences. *Statistical Science, 7*(4), 457–472.
Girotra, K., Terwiesch, C., & Ulrich, K. T. (2010). Idea Generation and the Quality of the Best Idea. *Management Science, 56*(4), 591–605.
Goode, E., & Ben-Yehuda, N. (1994). Moral Panics: Culture, Politics, and Social Construction. *Annual Review of Sociology, 20*, 149–171.
Greasley, S., & Stoker, G. (2008). Mayors and Urban Governance: Developing a Facilitative Leadership Style. *Public Administration Review, 68*(4), 722–730.
Grewal, R., Cote, J. A., & Baumgartner, H. (2004). Multicollinearity and Measurement Error in Structural Equation Models: Implications for Theory Testing. *Marketing Science, 23*(4), 519–529.
Gulati, R. (2018). Structure That's Not Stifling. *Harvard Business Review, 96*(3), 68–79.
Gulati, R. (1998). Alliances and networks. *Strategic Management Journal, 19*(4), 293–317.
Hamel, G. (2020). *Humanocracy: Creating Organizations as Amazing as the People Inside Them*. Harvard Business Review Press.
Han, J. K., Kim, N., & Srivastava, R. K. (1998). Market Orientation and Organizational Performance: Is Innovation a Missing Link? *Journal of Marketing, 62*(October), 30–45.
Heckman, J. J. (1979). Sample Selection Bias as a Specification Error. *Econometrica, 47*(1), 153–161.
Heide, J. B., & Wathne, K. H. (2006). Friends, Businesspeople, and Relationship Roles: A Conceptual Framework and a Research Agenda. *Journal of Marketing, 70*, 90–103.
Heide, J. B., Wathne, K. H., & Rokkan, A. I. (2007). Interfirm Monitoring, Social Contracts, and Relationship Outcomes. *Journal of Marketing Research, 44*(3), 425–433.
Homburg, C., Klarmann, M., Reimann, M., & Schilke, O. (2012). What Drives Key Informant Accuracy? *Journal of Marketing Research, 49*(4), 594–608.
Hulland, J., Baumgartner, H., & Smith, K. M. (2018). Marketing Survey Research Best Practices: Evidence and Recommendations from a Review of JAMS Articles. *Journal of the Academy of Marketing Science, 46*(1), 92–108.
Hurley, R. F., & Hult, T. G. (1998). Innovation, Market Orientation, and Organizational Learning: An Integration and Empirical Examination. *Journal of Marketing, 62*(July), 42–54.
Iacobucci, D., & Churchill, G. A. Jr., (2010). *Marketing Research: Methodological Foundations* (10th Ed). Stamford, CT: Cengage Learning.
Im, S., & Workman, J. P. (2004). Market Orientation, Creativity, and New Product Performance in High-Technology Firms. *Journal of Marketing, 68*(April), 114–132.
Jaworski, B. J., & Kohli, A. K. (1993). Market Orientation: Antecedents and Consequences. *Journal of Marketing, 57*(3), 53–70.
Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and Leadership: A Qualitative and Quantitative Review. *Journal of Applied Psychology, 87*(4), 765–780.
Kaplan, D. (1994). Estimator Conditioning Diagnostics for Covariance Structure Models. *Sociological Methods Research, 23*(November), 200–229.
Keko, E., Prevo, G. J., & Stremersch, S. (2018). The What, Who and How of Innovation Generation. *Handbook of Research on New Product Development*. Edward Elgar Publishing.
Keum, D. D., & See, K. E. (2017). The Influence of Hierarchy on Idea Generation and Selection in the Innovation Process. *Organization Science, 28*(4), 653–669.
Korschun, D., Bhattacharya, C. B., & Swain, S. C. (2014). Corporate Social Responsibility, Customer Orientation, and the Job Performance of Frontline Employees. *Journal of Marketing, 78*(3), 20–37.
Kovjanic, Snjezana, Schuh, Sebastian, C., Jonas, Klaus, Niels, Van Quaquebeke, Rolf, Van Dick, et al (2012). How do transformational leaders foster positive employee outcomes? A self-determination-based analysis of employees' needs as mediating links. *Journal of Organizational Behavior, 33*, 1031–1052.
Lee, S. (2007). *Structural Equation Modeling: A Bayesian Approach*. Chichester, West Sussex: John Wiley & Sons Ltd.
Lessl, M., Trill, H., & Birkinshaw, J. (2018). Fostering Employee Innovation at a 150-year-old Company. *Harvard Business Review Digital Articles, 12*(17), 1–5.
Locke, E. A. (2003). Leadership: Starting at the Top. In C. L. Pearce & J. A. Conger (Eds.), *Shared Leadership: Reframing the Hows and Whys of Leadership* (pp. 271–284). CA, Sage: Thousand Oaks.
Matsuno, K., Mentzer, J. T., & Özsomer, A. (2002). The Effects of Entrepreneurial Proclivity and Market Orientation on Business Performance. *Journal of Marketing, 66*(July), 18–32.
McCracken, H. (2016). At Sundar Pichai's Google, AI is Everything – And Everywhere. *Fast Company,* December, (accessed December 20th, 2019), [available at https://goo.gl/vCck3N].
Mundy, J. (2010). Creating Dynamic Tensions through a Balanced Use of Management Control Systems. *Accounting, Organizations and Society, 35*(5), 499–523.
Muthén, B., & Asparouhov, T. (2012). Bayesian SEM: A More Flexible Representation of Substantive Theory. *Psychological Methods, 17*(3), 313–335.
Narver, C. J., & Slater, S. F. (1990). The Effect of a Market Orientation on Business Profitability. *Journal of Marketing, 54*(October), 20–35.
Nishikawa, H., Schreier, M., Fuchs, C., & Ogawa, S. (2017). The Value of Marketing Crowdsourced New Products as Such: Evidence from Two Randomized Field Experiments. *Journal of Marketing Research, 54*(4), 525–539.
Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory* (3rd Ed). New York: McGraw-Hill.
Pino, I. (2014). A Secret Ingredient for Success at General Electric: General Electric's Most Valuable Asset is too Often Ignored by the Average Investor. *The Motley Fool,* (accessed September 14th, 2018), [available at https://bit.ly/3lssvXY].
Plant, R. W., & Ryan, R. M. (1985). Intrinsic Motivation and the Effects of Self-Consciousness, Self-Awareness, and Ego-Involvement: An Investigation of Internally Controlling Styles. *Journal of Personality, 53*(3), 435–449.
Podsakoff, P. M., MacKenzie, S. B., Lee, J., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology, 88*(5), 879–903.
Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of Method Bias in Social Science Research and Recommendations on How to Control It. *Annual Review of Psychology, 63*, 539–569.
Rawlings, T. (2016). How Microsoft's 'Garage' Keeps Its Innovative Spark Burning. *Knowledge@Wharton Interview,* (accessed December 20th, 2019), [available at https://goo.gl/nd4V1Q].
Rindfleisch, A., & Antia, K. D. (2012). Survey Research in B2B Marketing: Current Challenges and Emerging Opportunities. In G. L. Lilien & R. Grewal (Eds.), *Handbook of Business-to-Business Marketing* (pp. 699–730). Northampton: Edward Elgar.
Rindfleisch, A., Malter, A. J., Ganesan, S., & Moorman, C. (2008). Cross-Sectional versus Longitudinal Survey Research: Concepts, Findings, and Guidelines. *Journal of Marketing Research, 45*(3), 261–279.

Ross, A. (2015). Why Did Google Abandon 20% Time for Innovation? *HR Zone*, (accessed December 20th, 2019), [available at https://goo.gl/LZ754Q].
Ryan, R. M., & Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist, 55*(1), 68–78.
Sande, J. B., & Ghosh, M. (2018). Endogeneity in Survey Research. *International Journal of Research in Marketing, 35*(2), 185–204.
Schepers, J., Falk, T., de Ruyter, K., de Jong, A., & Hammerschmidt, M. (2012). Principles and Principals: Do Customer Stewardship and Agency Control Compete or Complement when Shaping Frontline Employee Behavior? *Journal of Marketing, 76*(6), 1–20.
Seibert, S. E., Silver, S. R., & Randolph, W. A. (2004). Taking Empowerment to the Next Level: A Multiple-Level Model of Empowerment. *Academy of Management Journal, 47*(3), 332–349.
Seyfang, G., & Smith, A. (2007). Grassroots Innovations for Sustainable Development: Towards a New Research and Policy Agenda. *Environmental Politics, 16*(4), 584–603.
Siemsen, E., Roth, A., & Oliveira, P. (2010). Common Method Bias in Regression Models with Linear, Quadratic, and Interaction Effects. *Organizational Research Methods, 13*(3), 456–476.
Spiegelhalter, D. J., Best, N. G., Carlin, B. P., & van der Linde, A. (2002). Bayesian Measures of Model Complexity and Fit. *Journal of the Royal Statistical Society: Series B (Statistical Methodology), 64*(4), 583–639.
Spires, A. J. (2011). Contingent Symbiosis and Civil Society in an Authoritarian State: Understanding the Survival of China's Grassroots NGOs. *American Journal of Sociology, 117*(1), 1–45.
Spreitzer, G. M. (1995). Psychological Empowerment in the Workplace: Dimensions, Measurement, and Validation. *Academy of Management Journal, 38*(5), 1442–1465.
Tanner, M. A., & Wong, W. H. (1987). The Calculation of Posterior Distributions by Data Augmentation. *Journal of the American Statistical Association, 82*(398), 528–540.
Tellis, G. J. (2013). *Unrelenting Innovation: How to Create a Culture for Market Dominance*. John Wiley & Sons.
Uzzi, B., & Spiro, J. (2005). Collaboration and Creativity: The Small World Problem. *American Journal of Sociology, 111*(2), 447–504.
Vansteenkiste, M., Ryan, R. M., & Soenens, B. (2020). Basic Psychological Need Theory: Advancements, Critical Themes, and Future Directions. *Motivation and Emotion, 44*, 1–21.
Wetzel, H. A., Hammerschmidt, M., & Zablah, A. R. (2014). Gratitude versus Entitlement: A Dual Process Model of the Profitability Implications of Customer Prioritization. *Journal of Marketing, 78*(2), 1–19.
Wiltermuth, S. S., & Neale, M. A. (2011). Too Much Information: The Perils of Nondiagnostic Information in Negotiations. *Journal of Applied Psychology, 96*(1), 192–201.
Wuyts, S., Dutta, S., & Stremersch, S. (2004). Portfolios of Interfirm Agreements in Technology-Intensive Markets: Consequences for Innovation and Profitability. *Journal of Marketing, 68*(2), 88–100.