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Increasing quantity without compromising quality: How managerial framing affects intrapreneurship



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ABSTRACT

Individual-level opportunity recognition processes are vital to corporate entrepreneurship. However, little is known regarding how managerial communication impacts the effectiveness of idea suggestion systems in stimulating individuals' participation in intrapreneurial ideation. Integrating self-determination theory, creativity, and framing research, we theorize how different ways of inviting employees to submit proposals (opt-out/opt-in registration; provision of examples) affect the number and quality of submitted ideas. Our multi-method study (field experiment, vignette experiment, interviews) shows that (i) opt-out increases employee participation without reducing idea quality and (ii) the provision of examples enhances the usefulness of ideas but decreases novelty and the number of submissions.

1. Executive summary

Individual-level opportunity recognition processes are the basic building blocks of corporate entrepreneurship (CE) (Corbett et al., 2013; Ireland et al., 2009). Yet, despite a growing literature that examines individual-level factors in CE (e.g., Corbett and Hmieleski, 2007; Biniari, 2011) scholars' understanding of how the internal corporate environment (e.g., structure, culture, communication, resources) affects opportunity recognition by employees is still far from complete. In this study, we focus on a specific element of the internal corporate environment: formal communications by managers.

Prior research (e.g., Hornsby et al., 2002) has argued that managerial communication forms a crucial link between a firm's entrepreneurial strategy and the behaviors and actions of intrapreneurs (i.e., the *individuals* who act as entrepreneurs—instigating change and renewal—within an existing organization). However, what is missing is an understanding of how specific framing techniques that managers may use in their communication affect CE. Framing refers to manipulations in the problem formulation or contextual features of a situation (Kühberger, 1998). Managers can apply framing techniques when introducing CE initiatives to increase participation and/or foster the effectiveness of the initiative. For example, formal invitations may vary in the degree to which they convey social norms related to participation. Similarly, managers may provide examples of past projects to prevent employees from experimenting with ideas that are not useful for the organization (Campbell and Park, 2004). The effects of applying such framing techniques are relevant to CE because CE requires employees to leave their comfort zone and to take risks. Managers are thus likely to experience barriers to motivating employees to engage in CE, and we draw on self-determination theory (SDT) (Ryan and Deci, 2017) in conjunction with creativity and framing research to theorize how framing affects employees' engagement in CE.

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Most basically, SDT distinguishes between intrinsic and extrinsic motivation. Framing that highlights stimuli which are external to employees is mainly expected to trigger extrinsic motivation (Ryan and Deci, 2017). We theorize that when managers appeal to social norms related to participation in a CE initiative, participation may increase but that this framing will have negative consequences on the novelty and usefulness of the ideas that employees develop (Ryan and Deci, 2017). Similarly, when providing examples, we expect the usefulness of ideas to increase but employees might be less motivated to participate and less likely to develop novel ideas (Amabile, 1996).

We conducted a multi-method study that consisted of a field experiment (main study), an online vignette experiment, and an interview study. For the field experiment, we set-up an Intrapreneurship Challenge (IC) within a Dutch division of an international technology consulting firm. We used an opt-out (automatic) vs. opt-in (self) registration procedure to vary the degree to which communication appealed to social norms; along with a flyer containing examples of past CE projects. We tested the effect of these manipulations on three outcome variables: participation in the IC, novelty of submitted ideas, and usefulness of ideas. The results showed that providing examples indeed led to increased usefulness but decreased participation and novelty. The opt-out registration significantly increased participation but, unexpectedly, did not reduce the novelty and usefulness of ideas. According to the interview data collected after the field experiment, this might have occurred because the signal emphasized by opt-out (the social norm) affected the number of employees who participated but not the *type* of motivation that they applied to the task itself.

Our study has important implications. We extend CE research by examining how framing impacts CE through its effect on the motivation and autonomy of individual employees. Specifically, we show how social norms for participation may increase the quantity of ideas submitted. Interestingly, this increase comes *without* compromising idea quality. In addition, we make a methodological contribution to CE research by illustrating how researchers can generate exogenous data and how a multi-method approach can be used to overcome specific limitations associated with experimenting in the field. For practitioners, we show how framing techniques can be applied to manage CE initiatives and how framing may result in tradeoffs between participation, idea novelty, and idea usefulness.

2. Introduction

When firms seek to adopt an entrepreneurial strategy (Covin and Slevin, 1989, 1991; Engelen et al., 2015), a major challenge arises for managers: How can they motivate key personnel to invest time and effort—alongside their regular jobs—to creatively develop ideas and pursue them towards implementation? In short, how can managers encourage employees to behave more like entrepreneurs? After all, employees represent a group of individuals, who, by definition and (self-)selection are unlikely candidates for entrepreneurial behavior (Baron et al., 2016; Hisrich, 1990). At the very least, this challenge may call for managers to develop specific ways to support employees' corporate entrepreneurial endeavors (Corbett and Hmieleski, 2007). “The process whereby an individual or a group of individuals, in association with an existing organization, create a new organization or instigate renewal or innovation within that organization” is often referred to as Corporate Entrepreneurship (CE) (Sharma and Chrisman, 1999: 18; italics added). *Individuals* who actually act as entrepreneurs—instigating change and renewal—within an existing organization are referred to as “intrapreneurs” (Kuratko et al., 1990; Pinchot, 1985) or, sometimes, as “corporate entrepreneurs”.

Individual-level opportunity recognition processes are the basic building blocks of CE (Bloodgood et al., 2015; Corbett et al., 2013; Ireland et al., 2009) and a growing literature is looking at individual-level factors in CE. Prior studies have yielded important insights, particularly into the role of individual cognition in opportunity recognition (e.g., Plambeck, 2012), the social situatedness of the cognitive models that individuals use to assess opportunities (Corbett and Hmieleski, 2007), and the emotional embeddedness of intrapreneurs and their actions (Biniari, 2011). Furthermore, top management support, resource availability, and organizational structure have been identified as important antecedents of CE (Kuratko, 2017). Scholars have, however, also cautioned against a one-size-fits-all approach, emphasizing the heterogeneity of organizational members (e.g., Phan et al., 2009; Hughes et al., 2018). Hornsby et al. (2009), for example, found that the relationship between characteristics of the internal corporate environment and individuals' intrapreneurial actions differed by managerial level. Therefore, individual-level CE studies increasingly advocate complementary analyses of lower-level managers and regular employees, their intrapreneurial activities, and their potentially diverging responses to antecedents within the internal corporate environment (e.g., Corbett et al., 2013; Hughes et al., 2018; Phan et al., 2009)—a call that this study takes up.

Advancing our knowledge of the role of individuals in CE requires an understanding of the internal corporate environment (Hornsby et al., 2002) and the causal mechanisms through which this environment affects individuals' behavior (Corbett et al., 2013). Interestingly, CE-related communication, despite its potentially profound and pervasive influence on individuals' behavior (see, e.g., Green, 2004), has remained largely unaddressed in prior research. In practice, managers communicate entrepreneurial strategies and objectives to employees, and this communication forms a crucial link between a firm's entrepreneurial strategy and the initiatives that could be developed by employees (e.g., Engelen et al., 2015; Hornsby et al., 2002; Park et al., 2014; Zahra, 1991). Prior studies have, so far, considered the frequency and/or the quality of managerial communication but mostly in an aggregated way, such as a single global score (e.g., Antoncic and Hisrich, 2001; Park et al., 2014; Zahra, 1991), rather than by investigating the effects of specific characteristics of this communication.

Extending this literature by offering a more fine-grained view, this study focuses on the framing of managerial communication, which refers to subtle manipulations in the formulation or contextual features of a problem (Kühberger, 1998). For example, the identical financial consequences of an employee's performance in relation to her annual agreement of objectives could be framed as either a bonus (or lack thereof) or as a penalty (or lack thereof)—with considerable consequences on resulting behavior (related, e.g., Johnson and Goldstein, 2003; Shelley and Omer, 1996). We suggest that variations in the framing of managerial communication

affect *if* and *how* individual employees engage in intrapreneurship. For example, communications can vary in the extent to which they seek to establish a frame of reference that narrows down the range of ideas that employees might consider when submitting to an CE initiative (e.g., Hoegl et al., 2008; Kock et al., 2015).

In this study we specifically examine the effect of two framing variations: first, opt-in vs. opt-out registration for a CE initiative; with opt-out signaling that participation is socially desirable; and, second, provision (or lack thereof) of past CE examples in the invitation to participate in the initiative; with the examples establishing a frame of reference for idea development. In terms of outcome variables, we focus on the *quantity* and *quality* of ideas proposed by lower-level managers and employees within the context of a CE initiative. Quantity relates to employee participation and is a prerequisite of CE as employees must first generate and voice ideas within an organization (Hornsby et al., 2002; Leach et al., 2006). Quality relates to individual-level creativity (Amabile, 1996; Anderson et al., 2014), which is typically characterized as the generation of ideas that are *novel* and *useful* for organizational products, services, or processes (Amabile, 1983a; Sternberg and Kaufman, 2010). Overall, by analyzing frames that communications may entail (i.e., what managers may do in practice), we seek to document *what* works and *how* it works in the context of CE initiatives.

In studying these issues, we draw on self-determination theory (SDT) (Gagné and Deci, 2005; Ryan and Deci, 2017), complemented by creativity and framing research. We hypothesize that social norms—reflecting an external motivational influence—rather than intrinsic task interest hold the key to motivating participation by most employees but that appealing to social norms simultaneously reduces the average novelty and usefulness of submitted ideas. Furthermore, we predict that providing a frame of reference may increase the usefulness of ideas but decreases both employee participation and the novelty of ideas. To test our hypotheses, we adopted a multi-method approach and combined a field experiment with an online vignette experiment and an interview study. In the field experiment (Study 1; $N = 647$; technology consulting firm), we used an opt-out vs. opt-in registration for a CE initiative to manipulate the extent to which managerial communication alluded to social norms of participation (Aldrovandi et al., 2015; Davidai et al., 2012).¹ Second, we used a motivational letter from the CEO—either accompanied by a flyer displaying past CE projects to provide a frame of reference, or without a flyer. We tested the effects of the manipulations by analyzing per treatment (i) the number of employees who submitted an idea (*participation*) and (ii) the quality of the submitted ideas (measured by their *novelty* and *usefulness*). To overcome some limitations of the field experiment (such as not being able to send a “neutral” flyer to the control group), we conducted an online vignette experiment (Study 2: $N = 103$; IT-professionals) in which we tested and confirmed the robustness of Study 1. To further enrich insights into the mechanisms underlying the effects of the framing variations, we conducted qualitative interviews with participants from all treatments (Study 3; $N = 12$; same firm as in Study 1).

Overall, this paper contributes to CE research in several ways. First, this study contributes to the CE literature on individual-level factors by investigating the intrapreneurial contributions of lower-level managers and employees, an underexplored group of individuals within CE research (see Hughes et al., 2018); and it does so in relation to a previously largely neglected antecedent within the internal environment: managerial communication (e.g., Hornsby et al., 2002; Park et al., 2014; Zahra, 1991). Specifically, we show how selected framing interventions may impact both participation in and quality of intrapreneurial actions through affecting motivation and self-determination. Second, field experiments are an important method to establish causal relationships but are rarely used within the field of CE, in no small part because experimentation with CE initiatives can be costly and may result in undesirable outcomes for firms (see Corbett et al., 2013). This study can serve as an example of how CE researchers can overcome such problems and can generate exogenous variation to test causal relationships (also see Chatterji et al., 2016). Finally, third, this study exemplifies how multi-method analysis in CE can be used to overcome limitations of the different methods if used in isolation.

3. Theoretical development

3.1. The role of the individual in CE

Identifying and exploiting new business opportunities within established organizations requires both entrepreneurial processes and behavior (Ireland et al., 2009). A large body of CE literature is dedicated to the elements of the internal corporate environment (e.g., structure, culture, resources) that support the CE process of recognizing and exploiting opportunities (e.g., Hornsby et al., 2002; Kuratko et al., 1990). Recently, however, scholars have started to investigate in more detail the role of the individual in CE and especially how individual-level opportunity recognition contributes to CE (e.g., Biniari, 2011; Corbett et al., 2013; Corbett and Hmieleski, 2007; Hughes et al., 2018).

Actors at different hierarchical levels (e.g., top, middle, lower-level managers, and employees) are involved in the CE process and play different roles (Hornsby et al., 2009). While top and middle managers can be actively involved in opportunity recognition, they are *mainly* responsible for developing a strategic vision on CE and for managing the CE process (Ireland et al., 2009). Lower-level managers and employees are often responsible for implementation but are also a major source of new ideas (Amabile, 1996; Anderson et al., 2014). They are thus likely to play an important role in both opportunity recognition and exploitation and, thereby, to act as

¹ Therefore, the meaning of opt-in/opt-out in this study is related to but differs from the standard use of this terminology in most experimental economics literature (e.g., Johnson and Goldstein, 2003; Davidai et al., 2012; Everett et al., 2015). In this literature, participants usually have to take a single decision (with a default option) that carries a direct commitment (e.g., opting into or out of an organ donation program). In contrast, in our study, opt-in/opt-out represented a first step towards participation. Actual participation required submitting an idea proposal in a second step. Therefore, framing participation in the initiative as either opt-in or as opt-out served purely as a signal of social norms because registration did not imply any commitment to be followed up on by subsequently submitting a proposal.

intrapreneurs by instigating renewal and innovation in existing organizations (Kuratko et al., 1990).

At the root of such opportunity recognition is an individual-level cognitive process (Grégoire et al., 2010; Shane, 2003), in which individuals use their creative and domain-relevant skills for ideation (Amabile, 1983b, 1996; Anderson et al., 2014; Liu et al., 2016). Individual creativity is thus the seed of CE. Opportunity recognition, however, involves distinct dynamics at the dyad, group, and organizational level (Corbett and Hmieleski, 2007; Grégoire et al., 2010) implying that the extent to which employees may deploy their creativity for opportunity recognition is contingent on organizational design, how firms organize their CE processes, and interactions among individuals operating at different hierarchical levels (also see Corbett et al., 2013).

3.2. Intrapreneurial creativity

In the opportunity recognition phase, problems or challenges are formulated and potential solutions or ideas are generated and subsequently validated (Amabile, 1983b, 1996; Shane, 2003). This creative process is expected to result in new value creation if solutions or ideas are both novel (i.e., original and/or surprising) and useful (i.e., valuable and/or solve an urgent problem or fulfill an important need) (Amabile, 1983b, 1996; Zhou and Shalley, 2003). However, intrapreneurial creativity—individual creativity pursued and expressed as part of intrapreneurial activities—places much heavier demands on employees than does engaging in typical workplace creativity: Intrapreneurial creativity requires lower-level managers and employees—individuals with a documented preference *against* typical entrepreneurial behaviors—to act, at least to some extent, in a decidedly entrepreneurial manner.

Employee or workplace creativity is usually conceptualized—referring to Amabile (1983b)—as employees' “production of novel and useful ideas for organizational products, services, or processes” (e.g., Shalley et al., 2004; Liu et al., 2016). Creativity typically does not require employees to commit to their ideas beyond expressing them. While literature on employee creativity typically focuses on ideation alone, entrepreneurial creativity is usually construed as being embedded in the full entrepreneurial process, ranging from opportunity discovery/creation to opportunity exploitation (e.g., Amabile, 1997; Perry-Smith and Coff, 2011; McMullen and Shepherd, 2006), implying a connotation of implementation either explicitly (e.g., Amabile, 1997) or implicitly (e.g., Perry-Smith and Coff, 2011).

Intrapreneurial creativity therefore differs from both employee creativity and entrepreneurial creativity. While a primary reason for CE initiatives is precisely to mimic what is perceived to work well in entrepreneurial settings (e.g., Antoncic and Hisrich, 2001), a core difference concerns the individuals involved: entrepreneurs vis-à-vis paid employees. Employees may be less inclined to appreciate the responsibilities and uncertainties that are inherent to an entrepreneurial approach (e.g., Hisrich, 1990), requiring them to champion ideas “from development to complete profitable reality” (Kuratko et al., 1990: 50). Therefore, CE initiatives likely face significant barriers to motivating employee participation (Frese et al., 1999; Gibbs et al., 2017).

3.3. The role of framing in managing intrapreneurship

Managing CE involves the design of both CE initiatives and initiative-related communication, which is at the heart of this study. When managers communicate, framing is a core element of these communications (e.g., Benford and Snow, 2000; Kaplan, 2008). “Framing” refers to manipulating problem formulations or contextual features with the aim of influencing others' decision-making processes (Kühberger, 1998). Managerial effectiveness in framing CE-related communication can be assessed in both quantitative and qualitative terms (e.g., Kock et al., 2015; Gibbs et al., 2017), with *participation* in CE (initiatives) serving as the most basic, quantitative, level-related criterion and representing a necessary condition for any further assessment. *Novelty* and *usefulness* of ideas capture the qualitative dimension of intrapreneurial ideation.

3.4. Motivating participation in intrapreneurial ideation

Self-determination theory (SDT) offers a framework for conceptualizing interpersonal differences in terms of both the *level* and the *orientation* or *type* of motivation that individuals experience in relation to a focal task (Ryan and Deci, 2000, 2017; Gagné and Deci, 2005). While the level refers to whether an individual experiences sufficient motivation to engage in the focal task (e.g., participate in a CE initiative), orientation or type refers, most basically, to the distinction between intrinsic and extrinsic motivation. Intrinsic motivation refers to performing an activity because it is inherently interesting or enjoyable—e.g., because of specific task characteristics. Extrinsic motivation implies performing an activity for instrumental reasons—e.g., because doing so yields a separable external outcome such as a reward or fulfillment of an obligation, which, in turn, constitutes an extrinsic stimulus.

Will employees be sufficiently intrinsically motivated to participate in CE initiatives? They would need to invest significant resources, such as extra time and additional mental effort (Zhou and Shipton, 2016), outside of their regular job functions (Amabile, 1983b, 1996), with uncertain benefits (Simon et al., 2000). Within each firm, there may be a group of employees who appreciate the opportunities and autonomy that CE activities entail (e.g., Pinchot, 1985), and this group may thus respond positively to CE initiatives because of favorable dispositions (intrinsic motivation) towards entrepreneurially-oriented actions (Judge and Zapata, 2015; Ryan and Deci, 2000). However, dispositions towards CE of a second, potentially larger group of lower level managers and employees are likely to differ; after all, they have already documented a preference for the predictability and safety of paid employment (e.g., Hisrich, 1990). These employees may even be deterred by the responsibility to implement their ideas. In fact, firms already struggle to motivate employees to participate in traditional suggestion systems that solely request idea submission (Gibbs et al., 2017). Appealing to intrinsic task motivation is therefore unlikely to get these employees involved in CE. Following SDT, a second-best solution may be to stimulate the development of extrinsic motivation in this second group of employees, such as by appealing to social norms

as an external stimulus (e.g., Shalley et al., 2004; Zhou and Shipton, 2016). Effectively motivating employees may thus require designing an intrapreneurship initiative in a way that caters simultaneously to all employees' group-specific motivations: to both autonomy-related intrinsic motivation and to extrinsic motivation, in response to, for example, social norms.

3.5. Increasing the output quality of intrapreneurial ideation

Beyond participation, managers may seek to influence the output quality of CE, as reflected in the novelty and usefulness of generated ideas (Perry-Smith and Coff, 2011). In this respect, SDT suggests that when behaviors are performed autonomously and in line with intrinsic interests, task performance in general (e.g., Vansteenkiste et al., 2004) and the development of novel and useful ideas, specifically (Amabile, 1983b, 1996), appear to benefit. Thus, while extrinsic stimuli (e.g., rewards or obligations) may be effective in stimulating participation in a focal activity, creativity research has traditionally tended to view them as predominantly deleterious to creative performance (e.g., Amabile, 1983b, 1996; Gneezy et al., 2011). Recent research offers a somewhat more positive assessment, pointing towards contingent effects of various extrinsic stimuli in distinct contexts and for different (groups of) individuals (e.g., Hennessey, 2010; Anderson et al., 2014; Liu et al., 2016). Yet, the predominant view still is that extrinsic stimuli are less suited than intrinsic ones to stimulate creative performance in terms of both novelty and usefulness.

Interestingly, scholars have recently also developed a more differentiated view of *intrinsic* stimuli, especially regarding their effects on the usefulness dimension of creativity. Specifically, they have highlighted the potential risks and disadvantages of providing overly high levels of autonomy to employees (e.g., Perry-Smith and Coff, 2011; Wiklund and Shepherd, 2011), because creative outputs may lack usefulness in the specific organizational context. Consequently, firms are trying to ensure the usefulness of employees' innovation-related ideas by directing the ideation process in such a way that synergies among proposed projects and existing operations can be achieved (e.g., Kock et al., 2015).

4. Hypotheses

From these basic theoretical considerations emerge several challenges for managers who design CE initiative-related communication: first, to motivate participation by appealing to extrinsic motivation but without deterring intrinsically motivated employees who appreciate autonomy; and, second, to guide ideation in line with firm strategy but without compromising the autonomy-supportive overall initiative design (Vansteenkiste et al., 2004; Kock et al., 2015 refer to this as “creative encouragement”). Therefore, drawing on SDT in conjunction with creativity research and literature on framing, we discuss the expected effectiveness of two selected framing interventions in meeting these challenges. That is, we develop hypotheses on specific framing interventions and how they affect participation in CE initiatives as well as the novelty and usefulness of ideation.

4.1. Opt-in vs. opt-out: motivating participation by signaling social norms

When managers frame participation in a CE initiative as opt-in (self-registration), this framing *signals* that participation is optional, i.e., that employees *may* join the challenge, while opt-out (automatic registration) signals that it is *normal* to join, although they may decide not to join (Aldrovandi et al., 2015). The format of information presentation, i.e., what is presented in a decision-making situation as the default option, appears to influence what is perceived as the social norm (Everett et al., 2015). The way managers frame the decision to participate thus provides clues about their beliefs (Aldrovandi et al., 2015), making norms about socially desired behavior salient (Davidai et al., 2012). Social norms function as an external stimulus (DeCharms, 1968) and individuals choose their behavior with reference to their beliefs about the behaviors of others (Aldrovandi et al., 2015; Mueller et al., 2018). Not all individuals will react similarly to such an external stimulus, and some may remain unmotivated if they do not appreciate the behaviors associated with the stimulus (i.e., amotivation, Ryan and Deci, 2000). Intrinsically motivated employees may not be affected and are likely to act upon their intrinsic motivation anyway; however, others may respond to this signal by participating out of concern for the implied social norm (e.g., Grant and Berry, 2011; Zhou and Shipton, 2016; Cooper and Jayatilaka, 2006). This leads to the first hypothesis:

Hypothesis 1a. (H1a): Using an opt-out registration framing (as opposed to an opt-in registration) increases participation in a CE initiative.

To the extent that an opt-out framing of the initial registration raises participation, the additionally submitted ideas are received from employees who responded positively to the external stimulus (i.e., social norm for participation). Compared to stimuli that appeal to intrinsic motivation, external stimuli are generally expected to lead to the generation of comparatively inferior ideas, especially in terms of novelty (Amabile, 1983b, 1996; Hennessey, 2010). In addition to approaching the focal task with a different type of motivation (extrinsic motivation), employees who primarily join the initiative out of a concern for social norms are likely to apply a lower subjective threshold than their intrinsically motivated peers for considering an idea “good enough” for submission. Submission as such may be an end in itself, compared to striving to submit a specific or a particularly good idea. Of course, also extrinsically motivated employees are unlikely to submit ideas that might potentially jeopardize their career prospects. Still, submission in itself has a socially derived value for this group that is not present for intrinsically motivated individuals. Overall, we therefore expect:

Hypothesis 1b. (H1b): Using an opt-out registration framing (as opposed to an opt-in registration) reduces the average novelty of the resulting intrapreneurial ideas.

Hypothesis 1c. (H1c): Using an opt-out registration framing (as opposed to an opt-in registration) reduces the average usefulness of the resulting intrapreneurial ideas.

4.2. *Flyer vs. no-flyer: providing examples to increase the usefulness of ideas*

Stimulating the generation of a rich and varied set of alternative ideas may be desired to foster CE (Burgelman, 1983). However, employees are likely to waste company resources, already during the ideation stage, when they explore novel but useless ideas (Campbell and Park, 2004). Research in cognitive psychology and innovation management shows that it is possible to enhance the usefulness of ideas by providing a *frame of reference* that serves as a filter at the ideation stage (e.g., Hoegl et al., 2008; Sassenberg et al., 2017). Managers can thus purposefully influence the associations of employees during ideation—for instance, by providing examples (Sharma, 1999). Indeed, Goldenberg et al. (2001) found that using bounded creativity approaches (e.g., providing employees with specific “creativity templates”) increased the fit between new ideas and a company’s current capabilities. We thus expect that the provision of examples as a frame of reference would result in a higher usefulness of submitted ideas. Hence:

Hypothesis 2a. (H2a): Providing examples as a specific frame of reference in managerial communication regarding a CE initiative increases the usefulness of the resulting ideas.

Providing examples as a frame of reference is likely to restrict the range of ideas that employees (correctly) perceive as being aligned with social expectations. Thus, individuals who have already developed nascent ideas that do not fall within this range are less likely to pursue and submit them. Also, some employees who might generate new ideas as part of the focal CE initiative may find that the examples presented as part of the frame of reference do not match their authentic interests (Amabile, 1983b; Ryan and Deci, 2017). On the other hand, some employees who might otherwise not have submitted an idea may draw inspiration from them, a facilitatory effect of providing information such as examples or analogies (cf., Marsh et al., 1996). To the extent that the examples expand their range of associations, this may lead to the submission of ideas that would otherwise not have emerged. However, overall, and in line with psychological research on creativity (e.g., Marsh et al., 1996), we expect this latter, facilitatory effect to be outweighed by the restricting influence of providing examples:

Hypothesis 2b. (H2b): Providing examples as a specific frame of reference in managerial communication regarding a CE initiative decreases participation.

Finally, regarding novelty, both SDT and research on creative cognition suggest a novelty-reducing effect of providing a frame of reference. SDT suggests that when individuals switch to pursuing new ideas that are less aligned with their authentic interests but fall within the frame of reference, this change is accompanied by a shift from intrinsic towards extrinsic motivation. Such a non-autonomously formulated problem has been argued to lead to lower levels of novelty (Amabile, 1983b, 1996; Ryan and Deci, 2017), presumably because it also limits the associative space and restricts creativity overall (e.g., Sassenberg et al., 2017; Goldenberg et al., 2001; Hoegl et al., 2008). Thus, we hypothesize:

Hypothesis 2c. (H2c): Providing examples as a specific frame of reference in managerial communication regarding a CE initiative decreases the novelty of the resulting ideas.

5. Methods and results

Below we report on three empirical studies. Study 1 was a field experiment. In Study 2, we reproduced a part of Study 1 in an online setting to overcome some of the limitations of experimenting in the field and as a robustness check for Study 1. In Study 3, we conducted 12 in-depth interviews with participants of Study 1 to further determine how framing affects CE.

5.1. *Study 1 (main study): field experiment*

5.1.1. *Research setting: company background*

The field experiment took place in a Dutch technology consulting division of a large international firm (hereafter “the Division”). The Division mainly provides IT-related consultancy services to multinational and large (governmental) organizations. Before conducting the experiment, we had several meetings with (senior) management to understand the context of the Division. Approximately two years prior to the research, the Division created an Intrapreneurship Platform. The platform provides resources (e.g., knowledge, budget, time) to support the development and implementation of intrapreneurial ideas. To gather and evaluate ideas, the platform organizes monthly meetings to which all consultants are invited. Those individuals whose proposals are supported are expected to regularly report to the platform. They can also request additional support/funding. Notably, the platform captures both phases of the CE process by promoting the development of new ideas (exploration) and by supporting the implementation of these ideas (exploitation).

5.1.2. *Experimental design*

To retain the natural environment (Levitt and List, 2009), the experiment closely mimicked the practices of the existing Intrapreneurship Platform. All technology consultants were invited to submit their ideas/proposals by means of an official and personal

letter, signed by the Managing Director. This letter was sent to the home addresses of the employees. All communication was in English, which is the official business language of the Division. The letter specified that an Intrapreneurship Challenge (IC) would be organized because intrapreneurship was becoming increasingly important for the Division and any idea (e.g., new product, new service, process improvements) could be submitted. In line with standard practices within the Division, the Managing Director emphasized in the letter that support was available (e.g., time and resources) to help the intrapreneurs to further develop and implement their ideas. This created a situation in which submitting a proposal required commitment to idea implementation. However, by announcing that *any* idea could be submitted for the challenge we prevented a situation in which a specific view on CE was communicated or major hurdles were created.

The IC consisted of three stages. Employees first received an invitation to register themselves for the IC. This invitation was sent by email approximately one week after the letter from the Managing Director was received. Registration was open for four weeks, and employees received two email reminders. After registration closed, employees who had registered received a link to an online form on which they could describe their ideas. They had one month to complete this form. Afterwards, all submitted ideas were evaluated and the Divisions' normal procedures were used to proceed with the development of the projects.

At the time of the experiment, 653 consultants worked at the Division. Consistent with standard company practices, support staff was excluded from the experiment. We also excluded top management, innovation officers, and the employee council, because they were aware of the experiment. HR provided us with the demographic data of all 653 consultants. The data of 6 consultants had some missing variables. To test the hypotheses, we included consultants without any missing data, which resulted in a final sample of $N = 647$ consultants.

5.1.3. Manipulating the frame of reference

In the *flyer treatment*, we added a flyer to the introduction letter (in the same envelope) as an experimental manipulation, which provided a frame of reference. To create the flyer, we asked the Managing Director and the head of the Intrapreneurship Platform to select four past CE projects that were prototypical for what they deemed important for the generation of new business opportunities. These projects—which included new products, services, and processes from all technological fields within the firm and which originated from both senior and junior consultants—were depicted in the flyer as examples (with brief descriptions) to create a frame of reference. By sending the flyer along with the letter, employees were encouraged to submit any type of idea that was aligned with the management's prevalent view of CE. We designed the flyer in collaboration with the European corporate communications team to provide an authentic corporate design. In the *no-flyer treatment*, only the invitation letter was sent out.

5.1.4. Manipulating the saliency of social norms

One week after sending the letter, we administered an *opt-in* and an *opt-out* treatment. In both treatments, employees received an email with additional information about the IC and the invitation to (de)register. The emails were identical except that in the *opt-in* treatment employees received a link to register for the challenge, while in the *opt-out* treatment the email stated that they were automatically registered and that if they did not want to join the challenge, they could deregister by clicking on a link. Importantly, registration carried no obligation to actually participate in the initiative. Thus, participation remained strictly voluntary in the case of automatic registration as well, and required, at a later stage, the submission of an idea proposal. In underlined, bold font, we highlighted that the link was used for (de)registration, and we sent two reminders to (de)register to both treatment groups. Typically, the Division used an *opt-in* framing to invite employees to events. Thus, the *opt-out* framing signaled the importance of participation (Aldrovandi et al., 2015) by making social norms about appropriate behaviors salient (Davidai et al., 2012).

5.1.5. Randomization

When designing a field experiment, minimizing communication between different experimental treatments is essential (List, 2011). For example, if consultants who had received the CEO letter accompanied by the flyer had talked to consultants who had received the letter only, this communication might have erased or at least reduced the effects of either treatment. The Division was ideally suited for preventing such communication: During most of the week (4–5 days), consultants worked at their clients' locations. Hence, they worked at the Division approximately half a day to one day per week for administrative tasks and client acquisition. When working at the client's location, consultants mainly worked with the client's employees and/or a limited number of colleagues from their own team. Because of this client-based project work, as well as very specific projects and competencies within teams, communication among colleagues who belonged to different project teams in the Division was very limited compared to many other organizations. Still, we could not fully exclude the possibility of consultants discussing the IC within their project teams. To make sure that communication would be minimized across experimental conditions, we therefore randomized the treatments at the project team level. However, the technological field in which several teams operated could still play a role, as different fields may provide distinct opportunities for new business development and thus for participating in the IC. We therefore used block randomization (i.e., stratification) to balance teams from different strata of technological fields over the treatments. Stratification methods are commonly used in field experiments when full randomization at the individual level presents difficulties and are likely to result in a balanced distribution across treatments (Bruhn and McKenzie, 2009).

5.1.6. Dependent variables and control variables

To measure *participation* in the IC, we, first, record the number of intrapreneurs per treatment and, second, in our maximum likelihood estimations, use a dummy indicator as a dependent variable for an intrapreneur ($= 1$; 0 otherwise). We regard an employee as an intrapreneur if he or she submitted a proposal to the IC *and* continued working on this proposal (i.e., further developing the proposal and presenting it to management to acquire funding or support). To measure *creative performance*, we followed Amabile's

Table 1

Number of observations, gender split, age (SD), and participants in the IC per treatment.

Treatment		N	Gender (% male)	Age	Participants
No flyer	Opt-in	160	91.88%	34.1(6.82)	5
	Opt-out	162	80.86%	31.22 (4.95)	18
Flyer	Opt-in	170	82.56%	32.03 (6.4)	4
	Opt-out	155	82.8%	31.68 (5.9)	8

Table 2

Probit, logit, and ZINB estimations of the number of participants in the IC.

	Model 1 Probit Treatments	Model 2 Probit Treatments & controls	Model 1 Logit Treatments	Model 2 Logit Treatments & controls	Model 1 ZINB Treatments	Model 2 ZINB Treatments & controls
Flyer dummy	−0.314+ [0.170]	−0.314+ [0.173]	−0.688+ [0.368]	−0.694+ [0.370]	−0.643+ [0.356]	−0.644+ [0.356]
Opt-out dummy	0.525** [0.176]	0.598** [0.186]	1.152** [0.396]	1.321** [0.410]	1.089** [0.387]	1.235** [0.396]
Age (in years)		0.040* [0.017]		0.088* [0.035]		0.081* [0.033]
Gender (female)		−0.204 [0.260]		−0.381 [0.552]		−0.349 [0.534]
Level (senior)		−0.327 [0.234]		−0.848+ [0.503]		−0.781 [0.481]
Intercept	−1.780*** [0.159]	−3.026*** [0.563]	−3.275*** [0.363]	−5.975*** [1.205]	−3.322*** [0.357]	−5.800*** [1.140]
N	647	647	647	647	647	647
Log Likelihood	−129.421	−126.221	−129.321	−125.949	−130.667	−127.546
Chi2	13.419	19.819	13.62	20.363	12.855	19.099
Prob > Chi2	0.001	0.001	0.001	0.001	0.012	0.008

Note: +0.1 *0.5 **0.01 ***0.001 denote levels of statistical significance.

The table reports coefficients with standard errors in parentheses.

(1983a, 1996) consensual assessment method: Four judges independently rated the proposals, which had been anonymized by removing all author-identifying information. A senior manager and an innovation expert from the Division served as internal experts. We also selected two master students to serve as external raters. These students were enrolled in a two-year Innovation Studies Master's program and were familiar with the focal sector. We separately assessed the novelty and usefulness of the proposals. Building on Besemer and Treffinger (1981), the novelty measure ($\alpha = 0.89$) included two items gauging the product's "originality" and "surprisingness." The usefulness measure ($\alpha = 0.87$) consisted of two items assessing the value added to the organization (i.e., relevance—does the idea address an urgent or important problem; hedonics—the impact of the idea in terms of value creation, cost saving, and market potential). All assessments were on a 7-point scale ranging from 1 (very low) to 7 (very high). We calculated the Inter Class Coefficient (ICC) to assess the inter-rater reliability (see Cicchetti, 1994). ICC_{novel} (0.91) and ICC_{useful} (0.84) highlight the consistency between the internal and external raters. The novelty and usefulness scores for each proposal were calculated as the average evaluation of the judges.

For the statistical analysis, we also used demographic data on gender (1 = female; 0 = male), age (in years), and hierarchical level in the firm (1 = senior; 0 = junior) to control for a possible lack of full randomization at the individual level. For assessing statistical significance, we used $p \leq 0.1$, $p < 0.05$, $p < 0.01$ and $p < 0.001$; with $p < 0.1$ included due to the small sample size, as is common in experimental research (e.g., Gerber and Green, 2012).

5.1.7. Analyses and results of Study 1

Table 1 reports the descriptive statistics by providing the number of observations, gender split, average age, and number of participants for each 2×2 treatment. Participation in the opt-out treatment (26 employees) considerably exceeded participation in opt-in (nine employees). Only 12 employees participated after having received a flyer, while 23 participated in the no-flyer treatment.

To test the hypotheses, we first ran maximum likelihood estimations with an employee's participation in the IC as the dependent variable. Table 2 reports the results for the probit and logit regression models. In Model 1, we included dummies for both treatments (opt-out = 1; 0 otherwise; and flyer = 1; 0 otherwise). In Model 2, we additionally included individual-level controls: gender, age, and hierarchical level. All models indicate a positive and significant ($p < 0.01$) effect of opt-out (see Table 2). As shown in Table 1, a substantial fraction of employees did not participate in the IC (94.7%).² In a robustness check, we therefore followed Gibbs et al.

² A participation rate of 5 to 10% is not uncommon. Research by the Global Entrepreneurship Monitor (Bosma et al., 2012) shows that only 7.8% of the employees in the Netherlands and 8.4% in the US engage in intrapreneurial activities.

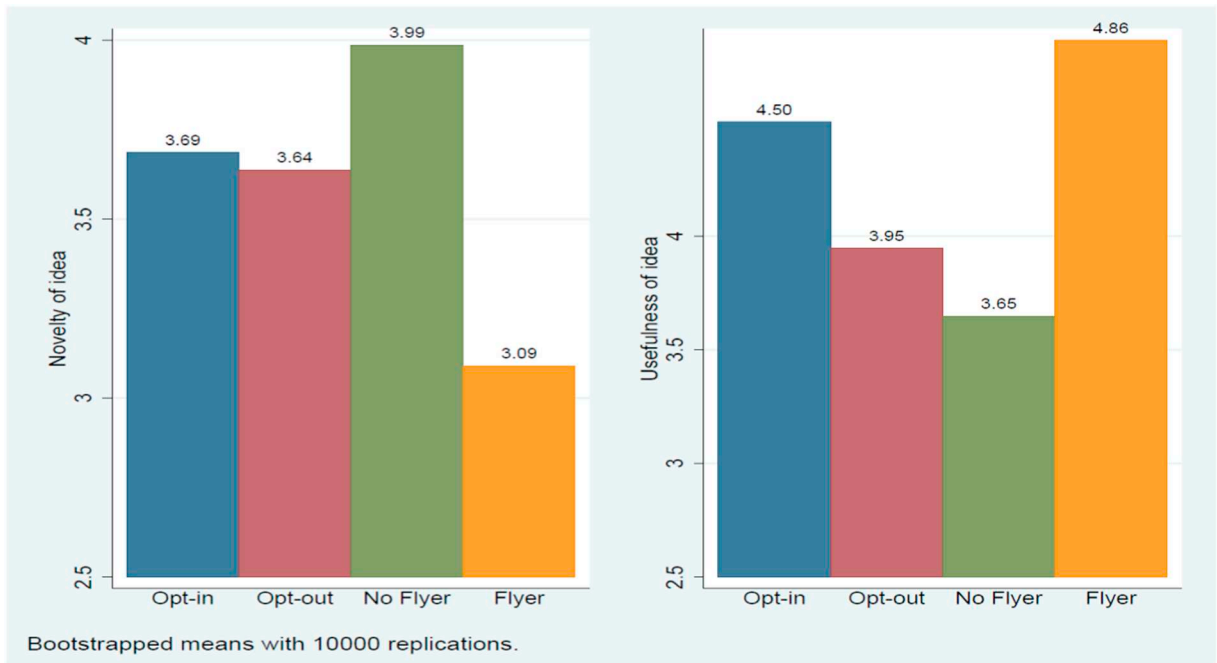


Fig. 1. Managerial ratings per experimental treatment.

(2017) and analyzed the data using a zero-inflated negative binomial model (ZINB), because this method can deal with overly dispersed data such as inflated zeros. As an additional benefit, ZINB is also particularly well suited for field experiment situations in which one-sided noncompliance cannot be excluded. Unlike lab experiments, in which 100% treatment compliance by participants can be assumed, one-sided noncompliance is common in field experiments because experimenters cannot guarantee that the treatment was received by the subjects.³ For example, a subject might have been on vacation or did not read the email at the time of the treatment. ZINB accounts for this by explaining the dependent variable jointly with two data-generating processes that function simultaneously. First, a logit models the employee's basic ability to participate. This logit accounts for inflated zeros and is estimated with an intercept. Second, a negative binomial model describes the deliberate submission of an idea and thereby actual participation in the IC. The final two columns in Table 2 report the results of the latter stage of the ZINB, which shows support for H1a. Regarding H2b, Table 2 shows that the coefficient for the flyer dummy is negative, consistently so for all estimation methods (logit, probit, and ZINB), and marginally significant at the $p < 0.10$ level. Therefore, H2b is (tentatively) supported.

Fig. 1 graphically presents mean novelty and usefulness ratings per treatment. Because of the relatively low number of ideas submitted, we used bootstrapping (10,000 replications) to compute more reliable means. Fig. 1 shows only small differences between opt-in and opt-out with regard to novelty (3.69 versus 3.64) and usefulness (4.5 versus 3.95). In fact, two-sample tests (Mann-Whitney U tests, bootstrapped 10,000 times, and a Monte-Carlo permutation test, sampling 10,000 times) failed to reveal statistically significant differences regarding the novelty or usefulness of ideas under opt-in or opt-out.⁴ In contrast, for the flyer treatment, submitted ideas scored significantly lower on novelty ($p < 0.05$) and significantly higher on usefulness ($p < 0.001$) compared to the no-flyer treatment.

For more rigorous testing, we estimated three OLS specifications (Table 3). First, we included the experimental treatments. In the second model, we added the control variables. Third, we addressed the potential of a selection bias. The decision to participate was most likely not independent of the quality of the idea. Hence, in estimating the treatment's effect on novelty and usefulness, we took the effect on participation into account as well, by estimating a first pass logit, as shown in Model 2 of Table 2, and by then computing the inverted Mills ratio (IMR, also called selection hazard ratio). We included the IMR in the OLS estimation of the treatment effects on creativity (Table 3) to control for non-random selection.

Table 3 shows that despite the increase in the number of participants in opt-out, there is little evidence that the novelty or usefulness of ideas was reduced. H1b is not supported, and H1c is not supported because only one (of three) estimation specifications

³ One-sided noncompliance is problematic for inference at the individual level, e.g., for implications in combination with specific personality traits; however, the interest was whether framing changed the average outcome at the aggregate level for the treated group. Thus, the primary interest was whether framing “made a difference,” regardless of whether it affected a large or small proportion of employees. In such a setting, noncompliance is less of a concern (see chapter 5 in Gerber and Green, 2012).

⁴ Because of the low number of observations we used permutation tests (next to bootstrapped Mann-Whitney U tests), which simulate a test distribution from the data and therefore does not require the underlying assumptions of the Student's t -distribution (for details, see Berry et al., 2002).

Table 3
OLS estimations of idea quality.

	Model 1 Novelty Treatments	Model 2 Novelty Treatments & controls	Model 3 Novelty Treatments & IMR	Model 1 Useful Treatments	Model 2 Useful Treatments & controls	Model 3 Useful Treatments & IMR
Flyer dummy	−0.958* [0.458]	−1.278** [0.489]	−0.937 + [0.498]	1.145** [0.376]	0.847* [0.412]	1.198* [0.495]
Opt-Out dummy	−0.275 [0.428]	−0.767 [0.834]	−0.325 [0.697]	−0.286 [0.396]	−0.963 + [0.574]	−0.411 [0.627]
Age (in years)		−0.014 [0.047]			−0.001 [0.051]	
Gender (female)		−1.594*** [0.408]			−1.367 + [0.733]	
Level (senior)		−0.47 [1.088]			−0.851 [0.821]	
Inverted Mills ratio			−0.128 [1.299]			−0.323 [1.325]
Intercept	4.204*** [0.401]	5.472*** [1.491]	4.475 [2.824]	3.876*** [0.371]	4.907** [1.731]	4.558 + [2.716]
N	37	37	37	37	37	37
Log Likelihood	−60.803	−57.365	−60.797	−62.113	−59.422	−62.077
Adjusted R2	0.116	0.266	0.116	0.175	0.287	0.177
Chi2	4.378	17.99	4.133	9.299	17.631	8.698
Prob > Chi2	0.112	0.003	0.247	0.01	0.003	0.034

Note: +0.1 *0.05 **0.01 ***0.001 denote levels of statistical significance.

The table reports coefficients with standard errors in parentheses (bootstrapped with 10,000 replications).

is significant ($p < 0.10$ Model 2, Table 3). The flyer treatment, however, produced ideas with significantly lower (higher) novelty (usefulness). This flyer effect applies to all specifications in Table 3 (with p -values < 10 , 5, and 1% for novelty and p -values < 5 and 1% for usefulness). Thus, H2a and H2c are supported.⁵

5.2. Study 2: Online vignette experiment

5.2.1. Motivation of the online vignette experiment

In the flyer treatment of Study 1, we sent a flyer along with the introduction letter, while the control group in Study 1 received the letter without the flyer. This setup is in line with prior (field) experiments that have also administered additional information (or other additional treatments) to one group but not to the control group (e.g., Duflo and Saez, 2003; Huber et al., 2014). However, it is possible that simply receiving a flyer draws attention to a task and thus affects behavior. In this case, the flyer effects found in Study 1 would not have been exclusively because of the specific frame of reference: instead, any flyer, even one with unrelated examples, might have had similar effects. We refer to this as a *generalized awareness effect*.

To test this possibility, a neutral-flyer treatment would have had to be included in Study 1, attracting attention without creating a specific frame of reference. However, scholars interested in framing effects have questioned whether truly “neutral” alternatives exist in the first place (e.g., Sunstein and Thaler, 2008). In this study, any flyer with examples of past CE projects of the Division would have created some kind of frame of reference tied to the Division's past/current strategic vision. A more “neutral” flyer (e.g., featuring examples of unrelated innovations from other domains) would have carried a significant risk of compromising the basic design of Study 1 as a natural field experiment. Natural field experiments rely on observing subjects' behavioral responses to interventions when they engage in tasks that they would naturally undertake (Levitt and List, 2009). Therefore, they should “neither know that they are being randomized into treatment nor that their behavior is subsequently scrutinized” (Levitt and List, 2009: 9). Because a flyer with completely unrelated examples would have been entirely inconsistent with prior established corporate communication related to intrapreneurial activities, it would likely have raised suspicions among employees about the invitation and the intentions of management, thus compromising the “naturalness” of the environment. Therefore, for both design and operational reasons, it was not possible to include a “neutral” flyer in the field (Study 1).

To address the generalized awareness effect, we opted for an additional experiment (Study 2). In this study, a neutral flyer was administered in an online vignette experiment, which translated the field setting into a hypothetical scenario (see Section 5.2.2 for details). The Null hypothesis was that behavior with a neutral flyer in the vignette would not differ from behavior in the same vignette without a flyer. If the Null hypothesis was not rejected, this would indicate equivalence of the neutral-flyer treatment and the no-flyer treatment, corroborating the validity of the design of Study 1 as well as its findings, that is, indicating that the effects observed with the (non-neutral) flyer in Study 1 stemmed from the specific frame of reference rather than from a generalized

⁵ It is possible that the error terms of the estimations on novelty and usefulness in the main study are correlated. As a robustness check, a seemingly unrelated regression was run. The results supported the original findings and are provided in Section 1 of the Online Appendix.

Table 4
Number of observations and of ideas, gender split, and age per treatment.

Treatment	N	#Ideas	Gender (% male)	Age (avg, SD)
No flyer	53	14	75.47%	38.15(9.72)
Neutral flyer	50	15	70.00%	38.24 (9.59)

awareness effect. Conversely, if the neutral flyer in Study 2 would produce effects similar to the company-specific flyer in Study 1, then we would have to infer that the flyer effects observed in Study 1 were likely artifacts of administering a flyer as such, regardless of its content.

5.2.2. Experimental design

To ensure comparability with the subjects in the field experiment (Study 1), the vignette experiment was administered online to employees in the IT service industry who did not have a managerial function and who worked at companies with at least 100 employees. To administer the experiment we used the assistance of a market research firm. To use as much as possible of the original text of Study 1, the vignette experiment was administered in English (i.e., the same language as in Study 1) in the US. The design of the vignette experiment was as similar as possible to the two opt-in treatments in Study 1. The exclusive focus on the opt-in treatments was a consequence of not having repeat access to the subjects in Study 2. Thus, the opt-out treatments would not have been meaningful here. The vignette experiment included both a *neutral-flyer* treatment and a *no-flyer* treatment. The key difference between the vignette design and the corresponding treatments of Study 1 is that the flyer did not present company-specific examples but rather general innovation examples that were unrelated to any specific company and even to the IT industry.

The setup was as follows. After a short *welcome screen*, participants entered the *vignette screen*, which asked them to assume that they worked for an international IT consulting company. A short, anonymized description of the company in the field experiment (Study 1) followed. Subjects were then asked to assume that they received an invitation letter from the CEO of this company, which was presented in a separate section on the same screen, i.e., the *vignette screen*. In the letter, which was an anonymized version of the original letter, the CEO emphasized the need for innovation, explained the IC, and invited everyone to submit ideas as part of the IC. Subsequently, for the neutral-flyer treatment, a randomized group of subjects saw the neutral flyer on a separate screen (*neutral-flyer screen*). The screen began with the sentence, “Attached to the letter from the CEO, you will find a flyer with the following innovation examples.” Four well-known general innovation examples (specifically, DNA testing and sequencing, nitrogen fixation, biofuels, and laparoscopy) were then described in the same manner as in Study 1, being displayed in an individually randomized sequence. Thereafter, subjects proceeded to an *idea submission screen* where they could submit their ideas. They were reminded that submitting an idea was optional (opt-in frame). Also, to incentivize idea submission, it was announced that “At the end of the data collection, we will evaluate all ideas and award \$20 to each participant whose idea ranks in the best 20% of all submitted ideas.” All payments were made after idea evaluation had been completed, based on depersonalized subject identifiers. Respondents in the no-flyer treatment did not see the *neutral-flyer screen* but proceeded directly from the *vignette screen* to the *idea submission screen*. Finally, we included a short survey in order to be able to control for the same characteristics (age, gender, hierarchical level) as in Study 1. In total, 103 ($N = 103$) individuals completed the experiment, of whom 53 (50) were randomized into the no-flyer (neutral-flyer) treatment, and 29 participants submitted ideas. Table 4 describes the sample.

5.2.3. Analyses and results of Study 2

Table 5 replicates Table 2 from Study 1. The dependent variable is a dummy that indicates whether an idea was submitted. The main independent variable, *neutral-flyer*, is a dummy that indicates randomization into the neutral-flyer treatment. The coefficient for the dummy is not significant, indicating that the effect of a neutral flyer on the likelihood to submit an idea was not different from providing no flyer.

Fig. 2 replicates Fig. 1 from Study 1 with the average values for the novelty and usefulness of submitted ideas. To rate the submitted ideas, the same scales and procedures as in Study 1 were used. Table 6 replicates Table 3 from Study 1. No difference between treatments for novelty was found (Models 1 to 3 Novelty). Hence, for idea novelty, presenting a neutral flyer was equivalent to presenting no flyer. Models 1 to 3 (Useful) show a significant negative effect of the dummy for the neutral-flyer treatment, suggesting that unrelated examples triggered fewer useful ideas than providing no examples at all.

Overall, the results indicate that the neutral-flyer treatment and the no-flyer treatment were equivalent in terms of the likelihood of submitting an idea and regarding idea novelty. This finding corroborates the validity of the design and the findings for the flyer treatment in Study 1. Interestingly, in Study 2, a neutral flyer even reduced usefulness compared to the no-flyer treatment as a benchmark. In contrast, a company-specific flyer increased usefulness when compared to a no-flyer treatment (Study 1). In sum, the results of Study 1 and Study 2 imply a ranking of flyer effects on usefulness ranging from high (4.86 in Fig. 1 for the company-specific flyer) to medium (3.65 and 3.50 in Figs. 1 and 2 for the no-flyer treatment) to low usefulness (1.93 in Fig. 2 for the neutral-flyer treatment). The company-specific flyer effect in Study 1 can thus be considered a conservative estimate because, as a benchmark treatment, Study 1 included a treatment with medium idea usefulness (no flyer) and not a treatment with low idea usefulness (neutral flyer).

Table 5
Study 2: Probit, logit, and ZINB estimations of number of participants submitting ideas.

	Model 1 Probit Treatment	Model 2 Probit Treatment & controls	Model 1 Logit Treatment	Model 2 Logit Treatment & controls	Model 1 ZINB Treatment	Model 2 ZINB Treatment & controls
Neutral-flyer dummy	0.106 [0.263]	0.018 [0.274]	0.177 [0.439]	0.049 [0.458]	0.127 [0.372]	0.03 [0.377]
Age (in years)		-0,018 [0.014]		-0,032 [0.025]		-0,022 [0.021]
Gender (female)		-0,353 [0.296]		-0,598 [0.519]		-0,421 [0.444]
Level (senior)		-0.564 + [0.307]		-0.986 + [0.540]		-0,716 [0.469]
Intercept	-0.631*** [0.185]	0,354 [0.625]	-1.025** [0.312]	0,69 [1.058]	-1.331*** [0.267]	-0,159 [0.859]
N	103	103	103	103	103	103
Log Likelihood	-61.143	-58.471	-61.143	-58.379	-65.697	-63.712
Chi2	0.163	5.507	0.163	5.691	0.117	4.087
Prob > Chi2	0.686	0.239	0.686	0.223	0.99	0.665

Note: +0.1 *0.5 **0.01 ***0.001 denote levels of statistical significance. The table reports coefficients with standard errors in parentheses.

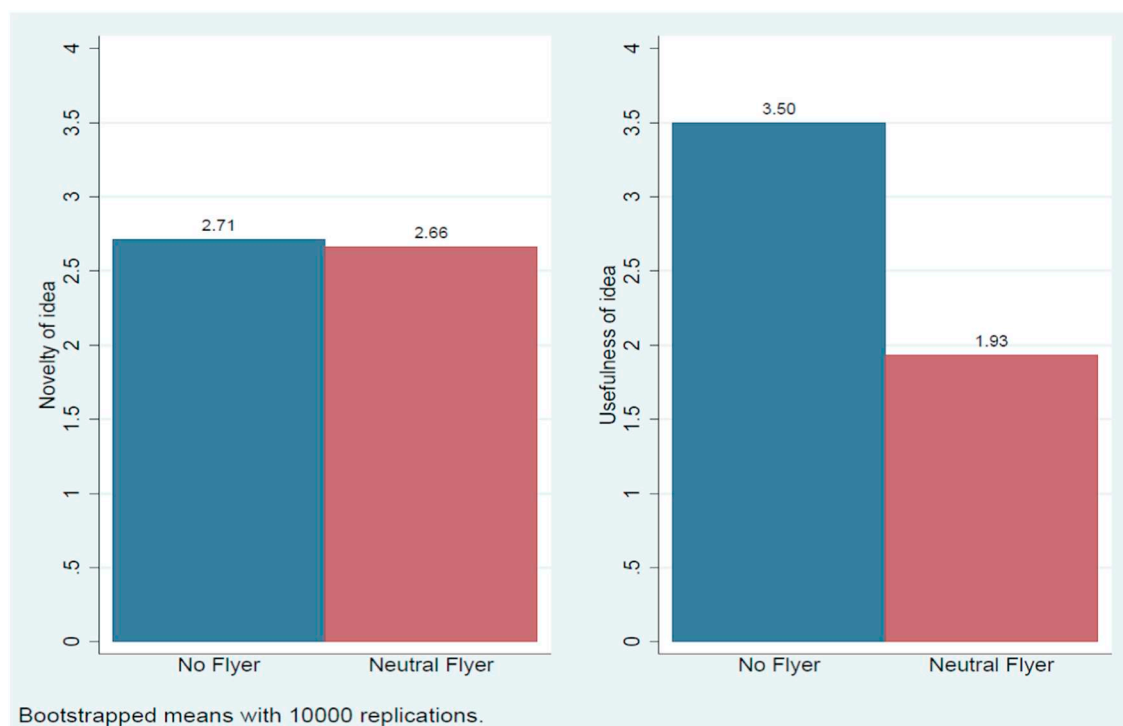


Fig. 2. Managerial rating per experimental treatment (Study 2).

5.3. Study 3: Interview study

5.3.1. Motivation of the interview study

Compared to other types of empirical data, field experiments are particularly suitable for establishing causal relationships (Chatterji et al., 2016). However, the experimental designs needed to test the exact mechanisms through which these causal effects occur may be too complex to be implemented in the field (Spencer et al., 2005). One implication, compared to lab experiments, is that it is substantially more difficult in field experiments to parse the underlying data-generating process to distinguish between alternative explanations, especially when results are inconsistent with initial predictions (Levitt and List, 2009). In such cases, complementary qualitative data may help shed light on underlying mechanisms (Maxwell, 2004).

In Study 1, the opt-out treatment did not result in the hypothesized decrease in idea quality. To better understand why this was the case, we subsequently administered a qualitative interview study. We randomly selected 12 participants (N = 12) (i.e.,

Table 6
Study 2: OLS estimations of idea quality.

	Model 1 Novelty Treatment	Model 2 Novelty Treatment & controls	Model 3 Novelty Treatment & IMR	Model 1 Useful Treatment	Model 2 Useful Treatment & controls	Model 3 Useful Treatment & IMR
Neutral-flyer dummy	−0.048 [0.638]	0.34 [0.691]	0.424 [0.637]	−1.567* [0.621]	−1.515 + [0.832]	−1.581* [0.732]
Age (in years)		0.043 [0.030]			−0.006 [0.040]	
Gender (female)		0.991 [0.866]			−0.44 [0.596]	
Level (senior)		1.447 [1.181]			0.245 [0.908]	
Inverted Mills ratio			3.508* [1.589]			−0.103 [1.447]
Intercept	2.714*** [0.396]	0.411 [1.401]	−1.535 [1.906]	3.500*** [0.542]	3.738* [1.882]	3.625 + [1.994]
N	29	29	29	29	29	29
Log Likelihood	−56.603	−52.934	−52.876	−54.817	−54.526	−54.814
Adjusted R2	0	0.224	0.227	0.193	0.209	0.193
Prob > F	0.94	0.348	0.083	0.012	0.204	0.035

Note: +0.1 *0.05 **0.01 ***0.001 denote levels of statistical significance.

The table reports coefficients with standard errors in parentheses (bootstrapped with 10,000 replications).

individuals whose *level* of motivation had been high enough to participate in the IC, six each from opt-in/opt-out) and interviewed them ex-post. The design of the interview study, the data coding procedures, and analyses are described in Section 2 of the Online Appendix.

5.3.2. Summary of the findings of Study 3

First, we explored how participants experienced the opt-in and opt-out registration by discussing the invitation to the IC. Participants indicated that the opt-out treatment signaled that higher management valued their participation or, at least, served as a trigger for them to hand in an idea. Thus, social norms for participation were highly salient in opt-out. For example, a mid-level consultant stated, “*This [the opt-out registration] is a very clear signal that there is some level of urgency. They [Division management] have signaled before that innovation is key nowadays, but I think this is different from the usual calls for innovation that we get.*” Another senior consultant told us, “*I’m not sure why I decided to submit a proposal to the IC and not to one of the other initiatives that have been organized in the past. Developing an idea into business proposal is not the problem since we are constantly exposed to new ideas and technologies on the job. It is just that you are so busy with your existing clients and assignments and you have to manage your time... I guess the automatic [opt-out] registration made it look like this IC was more important.*”

Next, we explored if the salient social norm in opt-out, subsequent to recruiting additional submitters into the IC, also affected the type of motivation with which participants worked on the focal ideation task. Table 7 provides, per treatment, representative quotes that relate to the *type* of motivation of participants (Ryan and Deci, 2017; Gagné and Deci, 2005).

Although we anticipated that in both treatments (opt-in/opt-out) a mix of intrinsically and (extrinsically) motivated employees might participate, our ex-ante expectation of observing variance in idea quality across these treatments (as reflected by *H1b* and *H1c*) was based on the expectation that the distribution of types of motivation would differ across the two treatments, with a predominance of intrinsic (extrinsic) motivation in opt-in (opt-out). That is, by making social norms as the extrinsic stimulus more salient, we anticipated that the opt-out treatment would attract a comparatively larger number of extrinsically motivated employees, with adverse consequences for average idea quality. However, the interview data showed that, although saliency of the social norm determined how many individuals were recruited into the IC (higher participation in opt-out), it did not appear to strongly and/or systematically affect the way in which the group of responding individuals worked on the task itself: Not only did we observe both types of motivation—intrinsic and extrinsic—in both treatments but also the full range of underlying regulatory styles (see Table 7).

Regulatory styles capture the degree to which individuals integrate external pressures (e.g., obligations, norms, materialistic rewards) into the self, i.e., the extent to which external stimuli are internalized into personally endorsed values (Deci and Ryan, 1985; Devloo et al., 2016; Ryan and Deci, 2000). Refinements of SDT (Gagné and Deci, 2005; Ryan and Deci, 2017) propose a partition of different types of motivation within extrinsic motivation, based on the predominant regulatory style that is being used by the individual. At one end of the continuum is external extrinsic motivation: External rewards or punishments are highly salient, individuals consciously experience external pressure, and attribute their motivation externally (Kasof et al., 2007). At the other end of the range is integrated extrinsic motivation: Individuals internalize the external stimulus to such an extent that a congruence of personal and—originally—externally derived goals emerges. In between are introjected and identified extrinsic motivation (for further details see Gagné and Deci, 2005; Ryan and Deci, 2017).

In conjunction with our interview data, this fine-grained perspective within SDT hints at a possible explanation for the observed lack of support for *H1b/H1c* in Study 1, as well as pointing at a potentially underlying mechanism. Traditionally, external stimuli

Table 7
Interview quotes, motivation, and regulatory style per treatment.

Experimental treatment	Representative interview quotes	Type of motivation	Regulatory style
Opt-in	I really enjoy working on new stuff.	Intrinsic motivation	Internal regulation
	Innovation is important to me and to the company. Working on new developments is one of the best ways you can develop yourself as a professional... Although my job is very busy I try to attend most of the innovation sessions and entrepreneurship events that are being organized here. In the past I never participated in any of the events as a contestant, but this seemed like a good opportunity to finally do so.	Extrinsic motivation	Integrated regulation
	I told myself, “why would you not participate?” I do feel some kind of commitment towards the organization. Innovation is important to all of us and it will generate new work. So it is not just like helping yourself... In our team there is very high work pressure and my ideas might help in doing our client work in a more efficiently way... During the process I also might acquire valuable news skills that will help me during my career.	Extrinsic motivation	Identified regulation
	Given my position within [name division] I am expected to take the lead when it comes to these types of initiatives. Participation might result in a higher end-of-year evaluation	Extrinsic motivation	Introjected regulation External regulation
Opt-out	This [the Intrapreneurship Challenge] is a good way to gain visibility in the organization.	Extrinsic motivation	External regulation
	I get a lot of energy from working on new ideas.	Intrinsic motivation	Internal regulation
	I'm really concerned with the environment, we are wasting so many resources and there is so much more that we can do... In my position it is hard to develop new projects that clearly match with company objectives and allow me to combine my work with my passion. This [the Intrapreneurship Challenge] seemed like a good occasion to submit one of my ideas because of the opportunity to obtain support... It's also a nice opportunity to raise awareness among colleagues for this issue.	Extrinsic motivation	Integrated regulation
	It is good to further develop yourself. This helps you as a professional to do your job in a better way. Participating in these types of initiatives also helps to gain visibility and perhaps even a bonus... but the bonus is less important to me than professional development.	Extrinsic motivation	Identified regulation
	To continue developing myself it is important to work on innovative technologies. Technology is changing fast and we need to keep up with the developments... Additionally, it might help me to get more visibility in the organization.	Extrinsic motivation	Identified regulation
	What I did first was reaching out to my senior manager, because I was not confident about sharing my ideas with others just yet... He told me that the idea had value but he also stressed that participating would be good for my personal development. As a junior consultant it is important for me to gain visibility in the organization. Participating in this challenge provides me with the opportunity to do so and also to get in touch with higher management.	Extrinsic motivation	Introjected regulation External regulation

have been linked to extrinsic motivation in its basic, externally regulated form. Recently, scholars have proposed that these stimuli may also lead to more internalized forms of motivation, such as identified or integrated motivation, and, in particular, that some types of external rewards—especially those associated with the social sphere—may be more likely to trigger such internalization (e.g., Grant and Berry, 2011; Kasof et al., 2007; Zhou and Shipton, 2016). Appealing to social norms for participation, such as helping one's organizations to remain innovative, may thus facilitate the internalization of CE values among employees who are not intrinsically motivated. From our interview data, we indeed observed such effects. For example, some participants explicitly related the benefits of the IC to their own personal goals (e.g., “to continue developing myself, it is important to work on innovative technologies [opt-out]”) or concluded that developing an idea was consistent with their own values (e.g., an “opportunity to match my ideas with company objectives [opt-out]”). This process of matching company goals to personal goals and values implies that the motivation applied to the focal task, although it may have been externally triggered, was largely internalized. Consequently, those employees who were additionally recruited into participating in the IC by the opt-out treatment did not—as anticipated—overwhelmingly approach ideation with an external extrinsic motivation. Instead, the interview data show that the type of regulatory style being used was *not* contingent on the extent to which social norms were salient in the invitation, because regulatory styles appeared *not* to differ systematically across the treatments. In retrospect, the expectation underlying *H1b* and *H1c* likely underestimated the power of social norms to not only induce participation but to simultaneously abstain from suppressing more internally regulated forms of extrinsic motivation and, thereby, to retain idea quality.

6. Discussion and conclusion

Communication is essential to management (Green, 2004). However, the impact of CE-related managerial communication on the effectiveness of CE initiatives remains underexplored, in particular, regarding the mechanisms that underlie the effects of specific

characteristics of communication. This study addressed this gap by experimentally manipulating selected framing interventions related to a CE initiative, and by assessing employees' responses—in terms of participation and regarding the output quality of ideation.

6.1. Contributions to research

This study makes several contributions to CE literature. First, it complements prior research on individual-level factors in CE by analyzing the actual intrapreneurial contributions of employees and how these contributions are affected by managerial communication—an antecedent within the internal environment for which prior studies have established a general significance but without investigating specific effects (e.g., Park et al., 2014; Antoncic and Hisrich, 2001; Zahra, 1991). In so doing, this study examined how selected characteristics of this communication impact employees' participation in and the quality of their intrapreneurial ideation. These contributions are relevant as “the human element within the process of CE is what ultimately sustains or recaptures competitive advantage for the firm” (Corbett et al., 2013: 818). Yet, especially the contributions of lower level managers and employees—those groups of organizational members that this study focused on—remain significantly underexplored in CE research (Hughes et al., 2018).

Conceptually, this study adds to literature on the CE-communication nexus by integrating SDT with creativity research and literature on framing to derive hypotheses about the effects of framing variations related to the saliency of social norms (opt-in vs. opt-out registration) and related to providing a frame of reference ((non-)inclusion of examples that structure employees' ideation). Empirically, the study documents how a frame of reference indeed fosters usefulness of creative output, however, at the expense of novelty and participation. Framing communication in a way that appeals to social norms encourages, as predicted, employees to submit ideas—however, unlike hypothesized, without causing a significant decrease in the quality of submitted ideas. A complementary interview study revealed that while the higher saliency of social norms in the opt-out treatment might have stimulated non-intrinsically motivated employees to participate, many of these additional participants appeared to internalize or even integrate the external stimulus into their personal goals and value systems. This finding is aligned with studies that have pointed to differences between various types of external stimuli. In particular, social norms seem to function in specific ways: When a social norm is communicated by a relevant other (Deci and Ryan, 1985) or related to prosocial motivation (Grant and Berry, 2011), employees seem to internalize the external stimulus to a greater degree than would be the case for more materialistic types of stimuli. Prior studies have proposed that this mechanism might extend to social norms related to supporting one's organization in its efforts to innovate (Zhou and Shipton, 2016; Lindenberg and Foss, 2011) and this study empirically shows that this is indeed the case. Moreover, the observed set of nuanced and partly counterintuitive findings suggests a need for research into the CE-communication nexus that moves beyond aggregate assessments of communication frequency/quality, in order to identify precisely which framing variations have what effects on employees' responses to managers' efforts to foster CE.

Related, the pattern of effects for the different outcome variables (participation vis-à-vis performance in terms of idea quality) that we observed for signaling social norms through opt-out also suggests avenues for follow-up research on SDT. Framing and SDT have been combined in the past (e.g., Vansteenkiste et al., 2004), though not in a (corporate) entrepreneurship context. This study's application of a combined SDT/framing lens within a CE setting hinted at potential benefits of further refining conceptual accounts of individuals' responses to an external stimulus. In particular, external stimuli might exert distinct effects on different elements of task engagement, starting with the decision whether or not to participate in a voluntary focal task and including the process of actually working on this task.

Second, this study contributes to CE research in methodological terms. Firms structure and communicate CE strategies and initiatives in different ways, and understanding why some variations are more successful than others requires a causal explanation of the phenomenon under question (Corbett et al., 2013). The procedures and manipulations applied in this study illustrate how techniques from other research domains such as behavioral economics can fruitfully be applied within CE. Crucially, the treatments in this study are non-invasive, low cost, and retain the autonomy-oriented design structure of the original CE initiative. However, implementing subtle framing variations in the communication enabled us to generate exogenous variation and to test causal relationships. In doing so, we were able to capture actual behavioral responses and move beyond the predominant focus on self-reported measures (e.g., Park et al., 2014; Hughes et al., 2018). This is important because behavioral and perceptual measures can diverge considerably, even to the extent that they may have different implications for how to stimulate ideation (e.g., Kock et al., 2015).

Third, this study exemplifies how multi-method studies can overcome limitations of field experiments in CE. One of the main challenges when conducting field experiments in CE consists of the cooperating firm having objectives of its own, which may require researchers to make compromises in terms of the design (Levitt and List, 2009). The present study showed how supplementing a field study with a complementary online vignette experiment can edge the overall design closer towards an optimal experimental research design. Also, the field setting tends to limit the complexity of the experimental design that can be implemented (Spencer et al., 2005). Consequently, identifying the exact mechanisms that underlie these causal effects may be difficult, especially if alternative theories prevail or when the results in the field do not support the theoretical predictions (Levitt and List, 2009). This study illustrated how a field experiment can effectively be complemented with additional qualitative data to yield an overall design that offers more in-depth insights into the underlying causal mechanisms. Overall, this study thus provides valuable insights for future field experiments and multi-method studies in CE.

6.2. Practical implications

First, this study illustrates the importance of carefully framing any type of communication related to CE initiatives because this communication affects *if* and *how* employees engage in CE. Intrapreneurial behavior involves a certain level of (career-related) risk and makes considerable demands on employees' resources in addition to their regular jobs. Few employees may be intrinsically motivated to act as intrapreneurs. This study's results suggest that appealing to social norms can be effective in broadening the group of employees who engage in CE. Importantly, as opposed to studies that have focused on financial incentives (e.g., Gneezy et al., 2011), we found no evidence that appealing to social norms significantly lowered creative performance. This result points to the importance of triggering participation in ways other than by (solely) providing monetary incentives. Indeed, in the interviews, employees explained that “*innovation is important to me*” and that they “*might acquire valuable new skills*” during the process. Yet, despite valuing the behaviors associated with CE, many employees might still need a subtle “push” or “nudge” to act as intrapreneurs. By appealing to social norms, managers may trigger participation without adverse effects on motivation. Second, the findings suggest that providing examples of past CE projects can be effective in raising the usefulness of ideation output but may also reduce participation and novelty. Thus, managers must consider how they can address the secondary motivational consequences of their attempts to increase the usefulness of CE initiatives.

6.3. Limitations and future research

This study is subject to several limitations. The three most important limitations relate to external validity, the small number of observed proposals, and the exclusive focus on ideation. Because of their ability to test causal relationships, field experiments are often considered “the gold standard against which all other designs are judged” (Trochim, 2001: 191); however, this may come at the price of external validity, which can be limited by the specific context in which a field experiment is conducted (Aguinis and Lawal, 2012; Chatterji et al., 2016). While we believe that our setting is quite generalizable, among others, because of the widespread use of similar practices as the ones used by the Division in Study 1 (Boudreau et al., 2011; Leach et al., 2006), we cannot fully rule out firm-specific effects. Combined with the limited number of submissions, this problem creates a need for replication studies (also see Dipboye, 1990). Replication studies in the field are encouraged to make use of the procedures and protocols of this study. Also, lab experiments may allow for using more complex experimental designs (Spencer et al., 2005), to explicitly test the underlying mechanisms. Finally, the sole focus was intrapreneurial ideation, and implementation was not included (although given the design of the initiative, participants had to *anticipate* the subsequent need for it). Implementation involves distinct policies, practices, and dynamics (Klein and Sorra, 1996). While these dynamics are beyond the scope of this study, they constitute an important avenue for future research.

6.4. Conclusion

By focusing on the frames that managerial communications may entail, this study documented if and how appealing to social norms and providing a frame of reference affected the outcomes of a CE initiative. The findings reveal (1) that signaling social norms for participation in a CE initiative (through using opt-out rather than opt-in framing) increases participation without significant detrimental effects on idea quality, and (2) that providing a frame of reference (by referring to past CE projects) can be effective in increasing the usefulness of ideation but reduces both participation and the novelty of submitted ideas. These results have important implications for the way we think about managerial communications, and we encourage researchers to further explore how managerial framing affects the quantity and quality of CE activity within an organization.

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Declaration of interest

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Appendix A. Online appendix

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jbusvent.2018.11.002>.

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