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Resilience of information flow during restructuring: Characterizing information value being exchanged and the structure of a network under turmoil

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ABSTRACT

Based on a unique before-and-after research design for a study of a large financial services provider, this paper demonstrates how a sudden and substantial reduction in the number of formal positions affects an organization's voluntary ideation network in unexpected ways. The network of relations maintained to voluntarily (informally) exchange new ideas within a firm is more resilient to exogenous restructuring than the current literature suggests. Drawing on network theory, we show that the positioning of employees in an organization's instrumental workflow network prior to a major restructuring determines the degree to which they remain engaged with ideation activity. In addition, drawing on social exchange theory, we predict and find that the value of inputs provided to peers prior to downsizing positively moderates the likelihood that ideation activity persists. Thus, we contribute to research on organization restructuring and the evolution of social relations under conditions of uncertainty.

1. Introduction

Restructuring by means of downsizing is an important way for organizations to realign corporate strategy with organizational structure (Gulati & Puranam, 2009; Trahms, Ndofor, & Sirmon, 2013). However, laying off employees may also disrupt everyday routines and collaboration patterns of an organization (Aalbers, 2018; Guthrie & Datta, 2008; Van Dierendonck & Jacobs, 2012), resulting in unintended consequences. Key individuals may leave, and those who remain may reconsider their social interactions – they may for instance decrease the frequency and quality of their social exchanges within the organization (Parzefall & Kuppelwieser, 2012). While laying off employees is a common business practice that targets formal arrangements in an organization, remarkably little is known about its effects on intra-organizational collaboration patterns (Brauer & Laamanen, 2014) and specifically on the ideation ties between individuals in an organization engaging in the voluntary exchange of innovative knowledge (Cross & Cummings, 2004; Datta, Guthrie, Basuil, & Pandey, 2010). This is notable as voluntary ideation communities have been identified as the social cushioning of many organizations, informally propelling their future innovation potential (Aalbers & Dolfsma, 2015a, 2015b; Colombo, Laursen, Magnusson, & Rossi-Lamastra, 2011), while simultaneously being fundamental to individual level work engagement and performance (Mainemelis, 2010; Whelan, Parise, De Valk, & Aalbers, 2011).

Based on two theoretical approaches to the study of social relations – social network theory and social exchange theory – we shed light on which ideation ties are likely to continue despite downsizing and why. First, social network theory, which focuses on the overall structure of relations between individual nodes, examines the effects of the structure of ties in a network between individuals on a number of different dependent variables (Burt, 2004; Cook Emerson & RM, 1978; Rhee & Leonardi, 2018). On the one hand, scholars suggest that a major external shock to an organization will disrupt social relations, social network activity and organizational routines, detrimentally affecting an organization's performance (Shah, 2000). Such effects, however, on the other hand, might not be evenly spread throughout an organization. Prior work focusing on stable organizational situations points to the importance of the individual's network position in possibly influencing a number of different outcome variables, suggesting that individual positioning prior to an exogenous shock to an organization might also impact that person's contribution (Whelan et al., 2011; Aalbers, 2018).

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Second, social exchange theory, as an influential conceptual paradigm in organizational behavior, focuses on the content of *what* exactly is exchanged and how such content is valued by the parties involved (Cropanzano & Mitchell, 2005).

We draw on both of these relational approaches as we examine how, in particular, the position of an individual in the organizational workflow network prior to downsizing helps him or her to maintain ideation activities afterwards. Note that we explore ideation activities at the individual level. Individuals can be embedded in an organization's wider voluntary ideation network. The ideation network is the network of contacts that represents which employees voluntarily discuss new, innovative ideas that are *not immediately* relevant to be successful in their day-to-day activities, but which could develop into innovations (Aalbers & Dolfsma, 2015a, 2015b). We hypothesize and find that individuals who were well connected in the organization's workflow network prior to downsizing continue to exchange innovative insights afterwards. Based on an in-depth, mixed methods case study of a for-profit organization in the finance industry using a before-and-after research design, we suggest that individuals maintaining a strong 'betweenness' position in the instrumental workflow network - brokering between relatively separate sub-groups in a network - continue to contribute to ideation despite a sudden, disruptive downsizing event.

Our contribution to the management literature is twofold. First, extending on recent work on social network tie evolution and, in particular, tie decay, we show how an individual's earlier network position impacts the way in which their network relations and also performance develop afterwards (Kleinbaum, 2017), particularly in circumstances of heightened uncertainty in an organization. Recently, a number of studies have focused on understanding the change in the network structure over time, pointing to among others individual choices (e.g., Kleinbaum, 2017; Aalbers, 2018) and organizational outcomes (e.g., Alcácer & Zhao, 2012; Argote & Ingram, 2000; Dahl & Sorenson, 2012; Kleinbaum & Tushman, 2007). Certainly when one wants to understand the effects of restructuring a firm by means of downsizing, the overall network structure before the event should be considered.

Second, in combining the social network literature with social exchange theory (cf. Coyle-Shapiro & Conway, 2005), and exploring the micro-level dynamics of what leads individual employees to continue contributing to the overall goal of proper functioning for a downsizing firm, we also contribute to social exchange theory. (Datta et al., 2010; Ghosh & Rosenkopf, 2014). Despite the strenuous experience of downsizing for employees of a firm in particular, and contrary to widely held views in society and academia, social structures within an organization need not break down due to downsizing. Social structures can be remarkably resilient. The value attributed to a tie in the ideation network relate to the content exchanged as well – maintaining such a cannot be ascribed only to actor characteristics or organizational affiliation (cf. Kijkuit & van den Ende, 2010; Kleinbaum, 2017). Social exchange theory predicts a relationship will be maintained when an individual attributes (sufficiently) high value to doing so, even when the benefits are unclear as is the case for ideation relations where innovative knowledge is exchanged, and also when the cost of doing so is high as under sudden organizational uncertainty the, as. To better understand how network outcomes are affected over time (Kijkuit & van den Ende, 2010; Rogan & Mors, 2016), especially when organizations face uncertainty, insights from social network analysis and social exchange theory must be combined.

2. Conceptual framework and hypotheses development

2.1. Resilience of ideation ties

Sudden restructuring, such as through downsizing, typically targets an organization's formal structures, affecting the formal network, which provides information relevant for individuals to be successful at their jobs (Ibarra, 1993). Indeed, various studies have shown that corporate restructuring by means of downsizing results in unforeseen consequences (Brauer & Laamanen, 2014). Over the past several decades, various studies have indicated that, on average, a strategy of downsizing fails to achieve the expected benefits of reconfiguring the firm and restoring performance (Guthrie & Datta, 2008; Shah, 2000). This failure has mostly been attributed to the hidden costs of such instant restructuring, such as negative psychological effects and plummeting work engagement among the remaining employees (Parzefall & Kuppelwieser, 2012). Downsizing mechanisms are believed to inevitably disrupt reciprocal, trusting and respectful employee-employer relationships, jeopardizing post-downsizing firm performance (Aalbers, 2018; Budros, 1999; Carmeli, Dutton, & Hardin, 2015). While employees may have little influence over who will be let go, they do have the opportunity to alter their own voluntary behaviors (Brockner, Grover, Reed, DeWitt, & O'Malley, 1987; Schmitt, Borzillo, & Probst, 2012). It is thus expected that a number of employees will discontinue the largely extra-role or voluntary activity of ideation as reflected in the organization's voluntary ideation network (Shah, 2000).

In times of organizational turmoil, such as during downsizing, those who are well positioned in the instrumental network prior to a significant organizational change may be able to influence the allocation of 'critical' resources (Pfeffer & Salancik, 1978). In precarious knowledge-sharing circumstances, individuals who, prior to downsizing, were favorably positioned in the workflow network can leverage their position to enjoy advantages during and after downsizing (Shah, 2000). Workers in influential positions are found to be better able to obtain valued resources such as critical information and render status (Burt, 2004). They also enjoy greater access and uphold more valued relations across the organization, such as with senior management (Ibarra & Andrews, 1993; Aalbers, 2018).

Downsizing can make employees reluctant to share information with others, thereby slowing intra-organizational information exchange at large (Schmitt et al., 2012). This consequence applies to exchange in the instrumental workflow network but will be particularly applicable to a network with strictly voluntary participation, such as the network supporting (the early stages of) ideation in a firm (Oh, Chung, & Labianca, 2004). Individuals can, for instance, call in personal favors based on their relationships and continue to receive support for their innovative project or activity despite the organizational turmoil (cf. Dolfsma, Van der Eijk, & Jolink, 2009). Additionally, such individuals are also more likely to be better connected to management, which will help them to bring their innovative activity to management's attention, generating positive publicity and possibly hampering competing activity. In the turbulent circumstances of a downsizing event, this inclination might be more pronounced, and others may find it valuable to stay in touch with such well-positioned individuals (Tushman & Nadler, 1978; Bozionelos, 2008). At the same time, social exchange theory also suggests that employees who occupy advantageous network positions may, "because of their greater contributions, […] believe that they are owed more in return (i.e., belief in a greater employer obligation)" (Hu et al., 2006, pp. 461).

When facing the uncertainty that accompanies downsizing, employees can seek to strategically diffuse knowledge, to help or hurt others, including management (Parker, Halgin, & Borgatti, 2016; Schmitt et al., 2012). Individuals who maintain a strong betweenness or brokering position in the instrumental workflow network notably have more control over the flow of original information to a large group of others in the network than those who hold no such position. As the psychological contract that underpins the social exchange between employee and employer deals with an individual's beliefs regarding his or her obligations to the employer – and the employer's obligations in return – a strong betweenness position in the instrumental workflow network provides individuals with a structural advantage for acting upon the perceived need to either give back to the organization or to strategically withhold inputs instead. We expect employees who act as middlemen, holding a strong betweenness position within the

organization's instrumental workflow network, will be better able and more willing to maintain their ideation-related voluntary ties and to be perceived as valuable allies in times of organizational turmoil. Access to, and control over, the instrumental work-related flow of information allows an individual to generate organization-wide commitment to – and exposure for – innovative activities, for instance (Dokko, Kane, & Tortoriello, 2014; Ibarra, 1993; Parker et al., 2016). The diversity of information received by those maintaining a strong betweenness position in the instrumental workflow network allows them to be aware of the parameters of emerging problems at an earlier stage (Rost, 2011), to be more responsive and innovative (Burt, 2004) and to ensure that their (innovation-related) activities remain in tune with the strategic direction of the firm (Aalbers, Dolfsma, & Koppius, 2014). These individuals are thus favorably positioned to remain engaged with creative activity throughout a downsizing event (Ibarra, 1993). Downsizing and the ensuing individual uncertainty may indeed amplify the benefits of information control, making one's privileged position prior to downsizing a reason to remain connected with others (Shah, 2000). We thus propose the following hypothesis:

H1. An individual maintaining a strong betweenness position in the instrumental workflow network prior to downsizing is more likely to retain his or her ideation ties after downsizing.

2.2. Value of input exchanged and retention of ideation ties

While prior network position may determine the likelihood that social relationships persist even when an organization downsizes, not all relationships will continue, as employees face many uncertainties (Casciaro, Gino, & Kouchaki, 2014). Several studies have analyzed the effect of network structure on different performance outcomes (Brauer & Laamanen, 2014; Parker et al., 2016; Shah, 2000), but few studies have examined how someone's position in the overall network structure within an organization is affected by the value of what is actually exchanged (cf. Dokko et al., 2014). Indeed, network studies tend to largely ignore what exactly is exchanged in a network, focusing on the channels through which knowledge, in a broadly defined domain, is exchanged (Borgatti & Halgin, 2011; Casciaro & Lobo, 2014). A notable exception is found in the empirical work of Borgatti and Cross (2003), who report that a person who demonstrated knowledge and skills in a previous interaction is more likely to be approached again in the future for their input. Individuals who were valued in the past by those with whom they interacted for the quality of their inputs continue to be valued in the future (Cropanzano & Mitchell, 2005; Parker et al., 2016). When others express their appreciation for inputs received, they confer a sense of value and worth upon the donor, maintaining a respectful relationship that spurs future creative action (Carmeli et al., 2015; Rhee & Leonardi, 2018). Connection with valued individuals, social exchange theory suggests, must be maintained by reciprocal favors so that a balance is preserved over time. Those who provided valuable input prior to downsizing can be expected to benefit as the recipients of reciprocal behavior from those with whom they previously engaged (Cropanzano & Mitchell, 2005). The decision to maintain, deepen, expand, or sever one's voluntarily upheld relationships is thus related to the receiver's willingness to absorb the costs of the relationship relative to the expected benefits to be derived from it (Borgatti & Cross, 2003; Ghosh & Rosenkopf, 2014).

We draw on social exchange theory to suggest that the value of input provided in the past by an individual determines whether others will continue their connection with that individual. The higher the value of input offered, the more likely the benefits of the relationship outweigh the costs of investing in it and the more likely that the connection will be maintained (Kleinbaum, 2017). Recent work on information processing in relation to the generation of new ideas, for instance, suggests that positive interpersonal emotions – such as being valued for one's inputs – broadens a person's capacity to adapt, strengthens them from within, and equips them to be more resourceful and resilient (Carmeli et al., 2015). Although this is perhaps not surprising intuitively, the social capital and the social network literature rarely approach network tie persistence based on the value of information obtained from these ties as triggers for social capital dynamics (Parker et al., 2016).

During a downsizing event, individuals can be selective about which relationships to preserve. The decision to maintain an ideation tie despite an organizational downsizing event rests mostly, if not fully, with the individual instead of with management. Individuals who provided input perceived as valuable through the instrumental workflow network in the past will have developed a positive reputation with the recipients and perhaps with others and will be a person of interest to those establishing, maintaining, or strengthening contacts (Borgatti & Cross, 2003; Tiwana & Bush, 2005). Recent work on reciprocal behavior indeed suggests that those who provide valuable input may not only experience direct reciprocity but be rewarded by third parties for their helpfulness (or, alternatively, may be punished if reputedly unhelpful) (Baker & Bulkley, 2014). This may especially be true during downsizing, when there is a heightened need among employees for enhanced information exchange as a means of countering uncertainty. Social exchange theory suggests that under such conditions, the value of inputs provided in the past predicts whether others will seek to preserve ideation-related voluntary ties with these individuals (Casciaro & Lobo, 2014). Social exchange theory further suggests that when one party makes a valued and beneficial resource available to another, it renders an obligation on the part of the recipient to offer a beneficial resource in the future (Cropanzano & Mitchell, 2005). As individuals engage in a series of interdependent interactions and exchanges, continued interaction is thus ensured (Cropanzano & Mitchell, 2005).

Employees who maintain a strong betweenness position in the instrumental workflow network can exchange the valuable input received through reciprocal interactions with future exchange partners. The information such an individual receives can thus be used in future social exchanges, perpetuating and potentially further strengthening their position. This may entice others who are not yet connected to those with a strong betweenness position to seek to establish a connection. Drawing on social exchange theory, we suggest that the more valuable the input an individual maintaining a strong betweenness position in the instrumental workflow network has provided to others in the past, the more likely it is that this individual will maintain or even enhance his or her ideation-related voluntary activities in the future. In the uncertainty of a downsizing, even more so than in periods of stability, those maintaining a strong betweenness position in the instrumental workflow network will be sought out by others seeking to maintain, strengthen, or even establish a new relationship.

Hence, we suggest the following hypothesis:

H2. The likelihood that an individual maintaining a strong betweenness position in the instrumental workflow network prior to downsizing retains ideation ties after downsizing is positively moderated by the perceived value of his previously exchanged input.

3. Research design and methods

3.1. Setting and data

Original fieldwork at the Dutch headquarters of Alpha Company provided the opportunity to establish the empirical value of our arguments on relations among employees engaged in ideation in the context of a substantial downsizing event. Alpha Company is an international information technology company oriented towards financial services. Organized as a classical machine bureaucracy, the company pairs financial services with the most recent advancements in biometrics and wireless mobile technology, providing state-of-the-art technology solutions to its customers. The company employed almost 1000

employees at the time of first measurement, with a large community involved in ideation activity. The company is one of the leaders in terms of market share in the European payments area but has also been experiencing fierce competition over the past decade in a consolidating market. Although innovation is recognized as central to future competitive advantage, most revenues still come from long-established and therefore low margin activities (mostly payment processing).

Access to the company was negotiated through the new Senior Business Development Manager, operating directly under the supervision of the Board of Directors. Exploiting a rare and unanticipated research opportunity, we collected network data and additional qualitative contextual data before and after the corporate downsizing. The workforce downsizing was executed using a typical top-down approach implemented over a period of several months that reduced the workforce by > 30%. Because Alpha Company is not a publicly listed firm, announcing the downsizing event was not intended as a signal (Bergh & Gibbons, 2011) to strategically influence competitors. Given the societal and legal scrutiny that firms in the financial sector face, Alpha Company was not keen to invite public scrutiny. We verified that the groups of individuals identified for layoff were actually downsized. We further checked interviews with both management and employees at $t = 2$ (after downsizing) for alternative payroll constructions whereby individuals were not laid-off but rather offered a temporary contract instead. We can affirm that in 6 months, the workforce was reduced by 30% (see Appendix 1, Fig. 1 for additional information).

This downsizing followed a long period of corporate and social stability at Alpha Company and introduced corporate uncertainty into the organization. The downsizing program was planned and executed in close collaboration with a strategic change consultancy firm.

We study the company as it downsizes in response to an overall business downturn pointing to a need to increase efficiency – Alpha Company did not downsize to realign strategy and organization structure – its operational procedures and organizational structure remain unaffected, while the number of employees drops substantially. Dutch labor law dictates that downsizing should follow the proportionality principle, thereby dictating the order in which the employer should consider employees for dismissal, unless evidence can be provided to show why departure from this guideline is required. Employees with comparable positions are divided into age groups to ensure proportional dismissal across age categories is reached. Furthermore, the seniority principle (last-in, first-out) is applied within each age group. Redundancies must affect all age groups among employees equally. The principle of proportionality allows for some selection *within* specific age categories based on individual performance, but this must be evidenced and potentially argued in court. The exact downsizing plan must be agreed upon within management and the labor unions – departure from the plan may lead to litigation in court. Firms may have several labor unions represented among their employees. Management and labor unions may agree on a mandatory review of the downsizing by a sector committee, but no such exception was requested in the case of Alpha Company. Because of the way in which laid off employees are identified, we can be confident of a fair and equitable layoff. Fig. 1 in the Appendix depicts the timeline of the downsizing and captures the main events.

3.2. Network sampling context

Companies can be reluctant to participate in a network study, particularly in times of reorganization, due to the sensitive nature of the information involved (Shah, 2000). Through a recurrent network survey and repeated semistructured interviews during the entire downsizing process, we collected data at different times. The interviews served two purposes: familiarization with the organization and a better understanding of our quantitative findings in the context of the focal company. Given the voluntary nature of the ideation community, a community with evident and initially undefined boundaries, we implemented a snowball-based survey starting with an initial set of respondents reporting on their network alters. These additional individuals were then invited to participate in the survey to report their alters until no new names were mentioned (Illenberger & Flötteröd, 2012). When the target population is not clear from the beginning, which is frequently the case for research on ideation communities, the snowball approach is suitable for data collection (Aalbers et al., 2014). To exclude the risk of ignoring isolated relevant respondents who are involved in ideation but not well connected, we purposefully targeted respondents with differing backgrounds in our first round of data collection (Rogers & Kincaid, 1981). The collection of the second dataset ($t = 2$) took place immediately after the downsizing was conducted. In between, over a period of 6 months, the company downsized, laying off 30% of the workforce. Our dependent variable is continued engagement with ideation activity within the organization through the network, in which individuals freely choose to share new ideas (Mainemelis, 2010). Collection of the first network dataset ($t = 1$) identified an ideation-related voluntary network of the organization comprising a community of just over two hundred individuals, which was finalized in the month prior to the formal announcement of downsizing. The voluntary ideation network was uncovered by asking individual respondents who they voluntarily discussed new innovative ideas relevant to the company with – specifically ideas that are not part of usual day-to-day activities (Aalbers et al., 2014; Borgatti & Cross, 2003; Rogers & Kincaid, 1981). In lieu of the survey instruments used in prior network studies, we adopted an egocentric approach to derive interaction partners (Rhee & Leonardi, 2018; Sosa, 2011; Tortoriello, 2015).

Parallel to the identification of the ideation network at Alpha Company, we uncovered the formally mandated instrumental workflow network tapped into by ideating individuals to carry out their daily tasks. Specifically, we asked respondents associated with the ideation community at Alpha Company to identify the individuals they interacted with to successfully carry out their prescribed or mandated daily activities within the organization at both $t = 1$ and $t = 2$. This questioning revealed respondents' instrumental workflow relations. The explicit focus of the instrumental workflow network is on *daily activities* related to the workflow of existing products and services or to established relations, which follow from the respondent's assigned role or position in the organization. The selection of names to initiate this snowball approach was validated by the heads of the different units involved in innovation activity. To reduce ambiguity, network questions were formulated in the respondents' native language – Dutch and English. We did not set a limit on the number of contacts respondents could enter, as that might unduly affect the uncovered network structure (Friedman & Podolny, 1993). The first data collection cycle resulted in a response rate of 92%. In the second cycle, a response rate of 78% was achieved, and 152 individuals were identified as part of the innovation community by one of these two cycles. Response rates of this caliber limit the possible negative effects of missing data points in the social network analysis and are considered to be acceptable response rates for a whole network approach (see Grosser, Lopez-Kidwell, Labianca, & Ellwardt, 2012). In addition to the network data, a series of 20 semistructured interviews were conducted with employees experiencing downsizing and those carrying out the downsizing program. This provided contextual input in addition to the network data collected via the online questionnaire. The interviews were recorded and transcribed and typically lasted 1 h; they were conducted with survivors, implementers, and departing employees and completed by t = 2. The reported samples at t = 1 ad t = 2 represent nearly 20% of the entire population of the company at times of observation, capturing the company's ideation community in full, as cross verified through the series of semistructured interviews to gauge for the informal side of the community and interviews with new business development management to verify its formal community side. In addition to the scheduled interviews, we studied formal communication on the downsizing as posted on an intranet portal hosted by Alpha Company and background

program information based on the initial program plans, further validating the logical network boundary of the ideation community at Alpha Company.

3.3. Variables

Our dependent variable is the number of ideation ties (in-degree centrality; see explanation below) an individual employee maintains in the voluntary ideation network after downsizing. The voluntary ideation network is a network of relations that are not mandated by management. Voluntary social relations here are those relations through which new ideation information is exchanged that is not part of individual employee's day-to-day job activities (Aalbers et al., 2014; Rodan, 2010). Based on snowball sampling, individuals reported how they connected with each other in the company's formal-workflow network and voluntary ideation network. The latter network includes those voluntary contacts that are useful because they help foster creativity and innovation in one's work, such as helping to generate new ideas (Rodan, 2010; Aalbers et al., 2014). Specifically, we asked each identified individual a name generator question: "With whom do you voluntarily exchange new ideas relevant to the scope of the organization that are not part of their day-to-day activities?"

Our independent variable is an individual's betweenness centrality in the separate instrumental workflow network prior to downsizing, which is the extent to which he or she is positioned on the geodesic paths between *all* actors involved in the total network. Individuals are considered to be connected with each other in the instrumental workflow network prescribed by the organization to support daily work activities (see Cross & Cummings, 2004; Aalbers et al., 2014; Parker et al., 2016) when they are mentioned in this name generator question by a contact: "Who are the key people that you connect with to successfully carry out your daily activities within the organization, the contacts that are prescribed or mandated by the organization?" Betweenness centrality assesses the proportion of edge-independent paths that involve a given node, measuring paths in the network that would not exist if the particular node were not present (Borgatti & Everett, 2006). In other words, it provides a measure of how often a node in the instrumental workflow network of Alpha Company at $t = 1$ is located on the shortest path between other nodes in the network, thus providing an indication of the control an employee has over the diffusion of workflow-related knowledge or information in the total network. We calculated this betweenness measure for each individual in the organization's instrumental workflow network prior to downsizing. The number of times something reaches a node in a certain flow process (namely, when things flow along the shortest path or with equal probability along one of several short paths). This measure is defined by the formula shown in Eq. (1), where bk is the betweenness of node k, gij is the number of geodesic paths from i to j, and $gikj$ is the number of geodesic paths from i to j that pass through k (Borgatti & Halgin, 2011):

$$b_k = \sum_{i,j} \frac{g_{ikj}}{g_{ij}}, \tag{1}$$

Our moderator variable, value of input, is the value of the input offered for exchange by the focal actor as reported by those who received it in the instrumental workflow network (Casciaro & Lobo, 2014; Tiwana & Bush, 2005). It is calculated as an average value corrected for the number of relations an individual maintains at $t = 1$. The nature of the interactions of an actor with alters will differ based on the value of the actor's knowledge for exchange compared to that of others irrespective of the number of relations. In response to the question "Interactions with this person are useful to my work" (cf. Casciaro & Lobo, 2014), the value of input is measured on a 7-point Likert scale ranging from *no value added* to *adding high instrumental value*.

3.4. Control variables

We follow Shah (2000) and control for functional work group membership, hierarchical rank, and tenure. We included *tenure*, measured in years employed with the company, to control for the amount of time an individual has had to develop relations over the years (Gundry, 1993). Prior studies leave little doubt that, as pointedly articulated by Parise et al. (2006, p.32), "... an employee who has been with a company for 10 or so years can't simply be replaced by another individual even by someone with very similar skills—without incurring disruptions in the web of formal and informal relationships that get work done." *Hierarchical rank* is included to control for one's formal power base as well as access to information and resource flows (Ibarra, 1993). Hierarchical rank is measured based on five hierarchical levels, increasing in the level of managerial responsibility and accountability. As a third control variable, we include the *number of voluntary ideation ties at $t = 1$* (before downsizing), that is, prior to the downsizing event. Those laid-off between t = 1 and $t = 2$ report a zero score on *number of voluntary ideation ties after downsizing*, whereas those retained by Alpha Company may either report a positive count value or zero, depending on their decision to continue or discontinue involvement with ideation activities. Controlling for *number of voluntary ideation ties at $t = 1$* allows us to examine whether the retention of voluntarily maintained ties after downsizing is affected by the prior volume of ties to account for one's prior voluntary engagement with ideation. This control is included to test the relative magnitude of ties lost at the individual level. Thus, including the *number of voluntary ideation ties at $t = 1$* as a control allows us to compare the relative damage done to one's voluntary ideation networks, as we regress the value of this control variable against our dependent variable, the number of ideation ties (in-degree centrality) an individual employee maintains in the voluntary ideation network after downsizing.[1] Given the relative large number of zeros in our network-derived count variable we opt for the use of directly comparing both absolute values (pre and postdownsizing tie counts) instead of a ratio variable on this point, as regressing with ratio components of this type have been found to produce more outliers and a lower noise reduction, making the significance of other variables more difficult to detect (Lien, Hu, & Liu, 2017; Musumeci & Peterson, 2011). In-degree centrality, as a measure of the number of times that others report having a relation with someone, is regarded as more reliable than the self-reported out-degree measure and thus considered in this study as the indicator of the *number of voluntary ideation ties pre and post downsizing* (c.f. Costenbader & Valente, 2003). As arguments of gender inequality are not new to the field of downsizing, *gender* is also included as a control for the presence of such selection mechanisms, as is *tenure* (Couch & Fairlie, 2010; Kalev, 2014).

3.5. Model selection and selection bias considerations

In a field experiment, ideally, the manager or researcher randomly assigns half of the employees to a treatment condition (i.e., managerial intervention) and half of the employees to a control condition. This is not a viable option for an organization undergoing downsizing, and even if it were willing to approach downsizing in such a manner (which does injustice to the severity and ethical complexity of a downsizing event), European and Dutch labor law would not allow for such methodological deviation. The Dutch labor law conditions applicable to Alpha Company at the time of downsizing explicitly require a random draw from the overall labor force when a company is downsizing to the degree observed in this study (a substantial downsizing that implies laying-off > 5% of the labor force at once by default falls under such

[1] We thank one of our anonymous reviewers for emphasizing this important aspect of relative network damage, as we compare pre- and post-downsizing ties.

legal charter). Lay-offs of this magnitude require equal representation across functional and demographic categories within the organization, resulting in a comparable likelihood for all employees that they could be identified for layoff. Infringement of this principle can lead to prosecution of the company in open court. Socioeconomic considerations form the backdrop of this legislation, and this may be unlike the layoff conditions encountered in most Anglo-Saxon countries, where selective firing based upon managerial discretion is an option. In terms of the risk of selection hazard, such socially considerate and randomized downsizing conditions do not suggest a selection hazard in our sample, yet to statistically control for such an occurrence, we apply zero-inflated negative binomial (ZINB) modeling to distinguish between those who are laid off and those retained by the company between $t = 1$ and $t = 2$ in the zero-inflation section of the modeling procedure.

3.6. Zero-inflated negative binomial (ZINB) modeling – preventing biased results

We test our hypotheses using negative binomial modeling because the count of no (0) ties between individuals in the ideation network (after downsizing), as our dependent variable, is overdispersed, which would otherwise introduce a bias in our results. In addition, our dataset contains observations of the organization's voluntary network over time, which violates the assumption of independence across observations, another reason to apply ZINB modeling. This modeling assumes that the data come from a mixture of two populations, one where the count is always zero and another where the count has a Poisson distribution. In this case, the former group consists of employees engaged with ideation at t = 1 but who were then laid off, and the latter consists of employees also engaged with ideation at t = 1 who were retained by the company. Members of this second group may or may not opt to continue their engagement with ideation at t = 2. To statistically compare individuals' before and after position in the relevant network as well as innovation contribution, we can only include individuals in our analysis who were innovation active at both moments in time (t = 1 and t = 2). The first model is a binary model that predicts the probability of belonging to the retained group engaged with the ideation community at Alpha Company at t = 2. The second model comprises a negative binomial model that provides the determinants of the event count, the number of voluntary ties retained at t = 2 by those constituting the ideation community at Alpha Company at t = 1 (in this case, conditional on the predicted outcome of continued engagement with ideation at t = 2). The expected count is expressed as a combination of the two processes (Burger, Van Oort, & Linders, 2009; Greene, 2005). Hence, we model the two mechanisms acting simultaneously and independently.

The variables included in the zero-inflated model are based on their theoretical likelihood of distorting results across the population. *Employee retention*, indicating retention of an employee by the organization following downsizing, indicates one's ability to continue ties following downsizing. This variable is included as a dummy with a value of 0 for those who are laid-off (group 1) and a value of 1 for those who are retained by the organization (group 2). Based on the prior literature on downsizing selection mechanisms (Couch & Fairlie, 2010; Kalev, 2014), we also apply the variables *number of prior voluntary ties*, *tenure*, *gender*, and *hierarchical rank* as zero-inflation parameters in our inflated model to control for the likelihood of an employee reporting a zero number of voluntary ties at t = 2 in a way that may distort interpretation based on the count model. The ZINB model was estimated using the statistical software called 'R' (version 3.0.1).

4. Results

4.1. A description of the downsizing at Alpha Company

Clear objectives and a detailed strategic plan guided the downsizing at Alpha Company. Aimed principally at short-term cost reduction, downsizing was accomplished within a period of several months. The event reduced the labor force by 30%, decimating the organization's innovative ideation community. Of the 152 members of the ideation community at t = 1, 99 were retained by the company and present at t = 2. In other words, 53 employees who were part of the ideation network at t = 1 were no longer available at t = 2, resulting in excess zeros on the dependent variable. At the individual level, the downsizing event resulted in a drop of almost 28% in the average number of voluntary ties maintained by individuals (3.44 on average prior to and 2.78 on average after downsizing). The downsizing affected the entire organization, as captured in the following representative quotes and confirmed by comparing descriptive statistics of the labor force prior to and after downsizing. In the words of an operations employee: *"We had colleagues part with the company literally across all organizational levels, comprising colleagues who worked for us for decades as well as recent hires. Every hierarchical echelon was affected, certainly."* (Operations employee). A manager overseeing the downsizing event stated, *"The magnitude of the layoff event simply demands proper representation across all age and functional categories – as dictated by Dutch labor law - making this thing affect pretty much everything and everyone – but we just need to carry on for there is no other way really to get ready for the future."* Uncertainty among employees grew as the downsizing unfolded. One interviewee expresses this succinctly: "*People find it difficult to come up with, or even discuss, plans and new ideas since these might actually lead to redundancy."* Another employee from a different department reflected a broader sentiment of enhanced uncertainty as follows: *"I am convinced that intervention is essential if we want to secure a bright future for our company. But having to watch people leave is not easy for anyone. It might very well prove to be difficult for quite a few of them to get reemployed elsewhere… I could be one of them."* The uncertainty experienced by individuals who typically accompanies downsizing is abundantly clear in this case. An operations employee reflects this view: *"My direct colleagues and I are facing some extreme uncertainty at the moment. The only concrete certainty is that there will be people who will be asked to leave."*

Employees clearly perceive the importance of being in the loop in the instrumental workflow network, which is quantitatively captured by the betweenness centrality measure. A marketing employee observes: *"I experience boundaries in my day-to-day work which you don't just cut through now things are uncertain. Getting to know those who matter costs more time and effort. I am quite fortunate to have my formal contacts established and regard them highly in these times."* The common explanation by those interviewed for the decline in discretionary, voluntary activity is pointedly summarized by an employee in the new business development department: "*In the current climate of uncertainty, rowing upstream is unwise– further investing in my innovation contacts right now therefore feels like a waste of my efforts*."

4.2. Descriptive network and model statistics

Given the substantial exodus of personnel, the overall network structures in our study remained surprisingly stable (see Table 1). Network density, reciprocity, and transitivity were calculated as network-level indicators of network stability, robustness or cohesion (Van Duijn, Zeggelink, Huisman, Stokman, & Wasseur, 2003). Contrary to what one may expect, network cohesion does *not* increase over time as a result of downsizing. If anything, the opposite seems to happen. Neither clique formation in parts of the network nor stratification (also to be expected when the social fabric in an organization disintegrates (Tutzauer, 1985)) increases. Fig. 2 graphically illustrates the continued network integrity over time, suggesting a relatively stable network structure over time as the overall network reduces in size as employees part with the firm. We interpret this as a consequence of the "random draw" policy at Alpha Company as enforced by Dutch labor law and regard this as significant grounds for further network comparison between $t = 1$ and $t = 2$.

Table 3
Zero-inflated negative binomial modeling results.
DV: Number of voluntary ties retained after downsizing event (t = 1 to t = 2).

Negative binomial model (count model)	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	1.78*	2.03**	2.30**	2.47***	2.32**
	(0.73)	(0.73)	(0.70)	(0.71)	(0.71)
Independent variables					
Value of input (t = 1)		0.12		0.10	0.08
		(0.07)		(0.07)	(0.07)
Betweenness centrality workflow (t = 1)			1.95**	1.87**	1.58*
			(0.64)	(0.64)	(0.64)
Interaction effects					
Betweenness centrality workflow (t = 1) x Value of input (t = 1)					0.43**
					(0.16)
Control variables					
Tenure	0.02	0.02	0.02	0.02	0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Gender	0.50	0.49	0.30	0.30	0.35
	(0.29)	(0.28)	(0.28)	(0.28)	(0.28)
Functional group membership (2)	0.62	0.39	0.55	0.38	0.39
	(0.39)	(0.41)	(0.37)	(0.39)	(0.39)
Functional group membership (3)	0.61	0.24	0.42	0.15	0.23
	(0.39)	(0.44)	(0.37)	(0.42)	(0.42)
Functional group membership (4)	0.34	0.08	0.22	0.01	0.14
	(0.41)	(0.43)	(0.39)	(0.42)	(0.41)
Functional group membership (5)	0.16	−0.11	−0.05	−0.25	−0.21
	(0.38)	(0.41)	(0.37)	(0.39)	(0.39)
Hierarchical rank	0.27*	0.24*	0.36**	0.34**	0.32**
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Number of prior voluntary ties (t = 1)	−0.01	0.01	−0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Log (theta)	0.20	0.24	0.34	0.36	0.35
	(0.18)	(0.18)	(0.19)	(0.19)	(0.19)
Zero-inflation model	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	83.37	90.80	135.06	123.37	21.29
	(144.26)	(241.02)	(26,930.09)	(1297.61)	(185.49)
Independent variables					
Number of prior voluntary ties (t = 1)	1.55	1.78	2.20	2.17	−0.75
	(3.14)	(7.09)	(10.25)	(9.73)	(5.21)
Tenure	0.28	0.50	0.29	0.29	0.07
	(3.22)	(8.32)	(9.59)	(10.03)	(0.17)
Gender	0.28	0.50	0.29	0.29	0.07
	(3.22)	(8.32)	(9.59)	(10.03)	(0.17)
Hierarchical rank	15.32	16.48	22.57	21.97	1.06
	(27.91)	(39.38)	(116.04)	(100.49)	(1.19)
Employee retention (Y/N)	−84.05	−90.35	−115.60	−113.29	−41.45
	(202.01)	(274.45)	(503.92)	(456.53)	(193.19)
AIC	543.21	542.30	533.99	534.06	541.09
Log likelihood	−255.61	−254.15	−249.99	−249.03	−251.55
DF	16	17	17	18	19
Theta	1.2233	1.2657	1.4061	1.4377	1.4137
Num. obs.	152	152	152	152	152

*** $p < 0.001$.
** $p < 0.01$.
* $p < 0.05$.

Table 2 presents descriptive statistics. Applying OLS regressions, we also calculated the variance inflation factor (VIF) for each independent variable in the different models (cf. Faems & Subramanian, 2013). With VIF scores below 5, no indication of multicollinearity was detected. A Durbin-Watson score of 1.92 indicates no autocorrelation in the residuals.

4.3. Zero-inflated negative binomial regression results

Table 3 presents regression results based on ZINB modeling. An initial Vuong test ($z = 6.510$, $p < 0.000$) confirmed that ZINB regression provided a better fit than Poisson or zero-inflated Poisson modeling for our data. In addition, none of the models show a significant estimated theta parameter, a finding that supports the use of zero-inflated Poisson modeling for these data. The ZINB modeling procedure generates two separate models: a negative binomial count model and a logit model for predicting excess zeros (Hilbe, 2011). The logit model is first generated to capture the zeros for those individuals who reported their voluntary ideation activity prior to downsizing but were then laid off ("certain zeros"), predicting the probability of an individual falling in this category. Second, the negative binomial model is generated to predict the counts for those individuals who may have decided not to report their voluntary ideation after downsizing (not a part of the "certain zeros").

Treating employee retention as a zero-inflation parameter, we assess the likelihood of an employee retained by the organization producing a zero number of ties in the voluntary network after downsizing. To ensure that those who were not active with ideation prior to downsizing

are not more prone to being laid off, we also include the number of voluntary ties available to an employee at t = 1 in the zero-inflation model. The results of the combined negative binomial and logit models constitute the full zero-inflated negative binomial–logit model reported in Table 3. Looking at the inflated equation outcome, there appears to be no significant predictor for being in the "always zero" class. In the zero-inflation model, employee retention does not have a significant impact, indicating that employees who leave the organization do not influence the likelihood that those who remain with the organization are unable to retain their voluntarily established ideation ties after downsizing. Additionally, prior voluntary activity does not function as a differentiator.

In terms of the ability to continue one's ideation ties, notable differences are found in the group of downsizing survivors.[2] Specifically, significant advantages are found for employees with high betweenness scores in the workflow network prior to downsizing. Model 1 presents the effects of the control variables in isolation, indicating no significant relationship with our dependent variable aside from a modestly significant effect for one's hierarchical rank. The value of inputs is introduced to the equation in Model 2 but does not yield a significant effect, thus eliminating it as a separate explanatory variable for the number of retained voluntary ties after downsizing. Adding betweenness centrality to the workflow network at t = 1 in Model 3, while excluding the value of inputs, yields a significant effect for both one's betweenness position in the workflow network prior to downsizing and one's hierarchical position. As a precursor to Model 5, Model 4 separately includes the value of inputs and betweenness centrality in the workflow network at $t = 1$. Being on the shortest path in the workflow network prior to downsizing is positively and significantly related to being able to retain one's voluntary ties, while the value of inputs, by itself, is not. Model 4 reveals a significant effect for hierarchical position: an employee who is well positioned on the corporate ladder is better able to maintain voluntary ties after downsizing. The value of input provided to one's peers prior to downsizing does not yield a statistically significant effect.

Testing our second hypothesis, Model 5 presents the interaction effect, prior to downsizing, of betweenness centrality in the workflow network and the value of inputs provided to one's peers. The regression results of Model 5 show that betweenness centrality in the instrumental workflow network prior to downsizing results in the continuation of voluntary ties after downsizing. As expected, the positive effect of betweenness centrality in the instrumental workflow network is positively moderated by the value of the inputs provided by an individual maintaining a strong betweenness position in the instrumental workflow network. Notably, none of the models show a significant effect for the number of voluntary ties maintained prior to downsizing.

Both Models 3 and 4 support Hypothesis 1: Individuals who hold a strong betweenness position in the instrumental workflow network prior to a downsizing event are better equipped to retain voluntary ties after downsizing than those who do not maintain such a strong position. Based on the outcome of Model 5, we assert that Hypothesis 2 can also be accepted. Sharing valuable workflow-related input prior to downsizing positively moderates the relation between a central betweenness position in the instrumental workflow network prior to downsizing and the retention of voluntary ties after downsizing. It is noteworthy that Models 1, 3, 4, and 5 all indicate that hierarchy contributes to maintaining voluntary ties after downsizing.

To address potential distortions due to the selection of downsizing candidates within specific age categories based on individual performance, we controlled for individual performance in a robustness check that included promotability scores for the individual employees across the entire population (laid-off and retained), resulting in no significant effect in terms of either group being more likely to be laid-off. Layoffs occurred randomly across the employee population. As another control included in all models, number of prior voluntary ties does not affect the extent to which one is able to preserve ideation ties. This suggests that the relative magnitude of ties lost at the individual level in the voluntary network after downsizing is not affected by the initial number of voluntary ties available to an individual prior to downsizing.

[2] While not reported here, we also do not find any significant effect when adding the prior number of ties in the discretionary network available to those employed before the downsizing (these results are available from the authors upon request).

5. Discussion and conclusions

Downsizing, usually experienced as an exogenous shock, can have a significant detrimental effect on organizational performance and, in particular, innovation potential (Dougherty & Bowman, 1995). What in particular about downsizing explains the disruption of organizational networks and what might explain preservation of valuable connections and interactions remains poorly understood. Organization and network scholars recently identified the effect of exogenous shocks on organizational networks as an important task for future research (Rogan & Mors, 2016). Since both the formal, workflow network relations and the discretionary ideation network have a considerable impact on organizational productivity and innovative potential these are studied in particular (Aalbers et al., 2014; Cross & Cummings, 2004). While the formal network is typically on the radar of those directing a downsizing event, the discretionary ideation network is commonly overlooked. Downsizing potentially disrupts both of these networks, hampering organizational recovery (Aalbers, 2018; Shah, 2000). The disruption following downsizing blocks information exchange, frustrates management's attempts to steer towards the sustainable recovery of the organization and frustrates employees' engagement with voluntary activity (Susskind, 2007).

Drawing on a before-and-after event research design, we analyzed detailed data on a substantial downsizing event, observing how voluntary early-stage ideation-related collaboration changes over time (Brauer & Laamanen, 2014; Datta et al., 2010). Combining network theory and social exchange theory, we predict and confirm which types of voluntary intra-organizational ties are more likely to survive a downsizing event and under what circumstances. Specifically, employees who have a central betweenness position within an organization's instrumental workflow network prior to downsizing are more likely to maintain their engagement with voluntary activities after downsizing. In particular, when the input of these central employees is perceived as valuable by their peers, their voluntary ties persist: the perceived value of input positively moderates one's betweenness position, as predicted. If a negative impact on survivor attitudes occurs immediately after downsizing, employee attitudes towards job engagement may quickly return to predownsizing levels and may even improve (e.g., Baruch & Hind, 2000). The social fabric of an organization is more resilient to a downsizing shock than scholars commonly tend to believe (Datta et al., 2010; Dougherty & Bowman, 1995). Our first contribution thus is to downsizing research, which claims that the relational consequences of downsizing will be detrimental to a firm's social fabric. The broadly held view of the negative consequences of downsizing for intrafirm collaboration (Brauer & Laamanen, 2014; Van Dierendonck & Jacobs, 2012), we find, is not supported by our research. During downsizing relations between individuals in an organization can be more resilient than is often believed, our research suggests, offering a less bleak view of the effects of downsizing on social relations and social structures. Resilience of information flow in the course of restructuring comes from an individual level need to stay in tune with the informal going-ons in the organization when the formal structure falls short due to temporal readjustments. This preference to keep up informal, creative relations in times of corporate turmoil – prolonging existing relations as source of such intelligence – ties in with the literature on absorptive capacity. To reduce an individual's perceived

uncertainty as it experiences downsizing knowledge needs to be absorbed, developed and possibly transformed before it can be applied to such purpose. The informal network provides the necessary level of understanding as individuals have mutually experience with each other, speaking the same professional language and have established trust based on prior interaction. The ability to value, assimilate and apply new knowledge from these informal channels is helped by established relations and points to the relevance of a firm's voluntary ideation network to veer back from downsizing (Aalbers & Dolfsma, 2015a, 2015b; Colombo et al., 2011; Egbetokun & Savin, 2014). This finding adds to recent calls to pay more attention to informal agency effects at the individual level to better understand some of the key implementation factors for employee downsizing.

Our second contribution is to the organizational network and social exchange literatures. An individual who fulfills a central betweenness position within an organization's formal-workflow network will continue to be involved in ideation, especially when such individuals has valuable information to exchange. A person's position in the formal-workflow network, not generally associated with ideation, is an important predictor of their contribution to ideation after downsizing. As network studies almost exclusively place emphasis on structure over content (Casciaro & Lobo, 2014), the perceived value of that which is exchanged has been largely disregarded. The content of what is exchanged, however, may enhance the effects of the structural position of a person in a network. While conceptually the importance of studying the value of the content exchanged has been emphasized (Borgatti & Halgin, 2011; Casciaro & Lobo, 2014), empirical support has not yet been offered. The intricacies of the ways in which the content and structure of exchange are connected among individuals within organizations may require closer scrutiny in future research. Ensuring that individuals with appropriate knowledge are well positioned would seem to be an important managerial task.

Conceptually, social exchange theory argues that relations are established and will be maintained when the value of inputs exchanged outweighs the costs of maintaining the relation, and the exchange is seen to be balanced over time. In our study, however, the value of the inputs exchanged between employees does *not* separately contribute to an explanation of the variation in our dependent variable unless the exchange involves someone in a highly central network position. Our findings suggest that individuals who have valuable items to share because of their central position are those with whom alters would seek to establish and maintain a connection. The causality involved requires further research.

In addition to the contributions stated above, our study also provides insight into the role of hierarchy in relation to social exchange. Despite predictions by social psychologists such as Bezrukova, Jehn, Zanutto, and Thatcher (2009), who emphasize fault lines between hierarchical ranks, we find that those positioned higher in the organizational hierarchy continue to be involved in ideation despite a downsizing event. This finding is in line with prior network-driven research suggesting that those higher in an organization's hierarchy also have access to a greater breadth of information and possess a broader perspective than those who are lower (Cross & Cummings, 2004). Our study suggests that the effect of hierarchy on the resilience of an individual's ideation activities is distinct from the effect of a highly central betweenness position, advancing prior work that equals hierarchy to enhanced brokering. Both contribute to the resilience of ideation activity, but separately, it seems. The persistence of voluntary activity for individual employees higher in a firm's hierarchy is due to the diversity of information and insights they access rather than to any political positioning that could result in the same outcome. The fact that neither (a) the level of voluntary activity prior to the downsizing event, nor (b) tenure affects voluntary activity resilience underlines the distinct importance of breadth of information and possession of a broader perspective, both characteristics possessed by more senior employees. The level of prior voluntary activity and tenure could be argued to be sources of political influence but, as we find, it is not. Although others have also found that the diversity of information commanded by an individual in an organization is important (Faems & Subramanian, 2013; Kalev, 2014), and we are cognizant of the typical generalization constraints typical of a single case study design, such as ours, we add insight to show that the *reasons* an individual commands such diverse knowledge can differ. This difference may have an effect on the outcome of ideation activities – the nature and scope of our study does not allow us to determine this. More research of an ethnographic or anthropological nature is required to further explore this theme.

5.1. Managerial implications

Although downsizing is a radical intervention that reportedly has many negative consequences potentially even outweighing the initially predicted positive outcomes, it remains an instrument used repeatedly by managers. Despite its frequent use, however, managers have little understanding of a reorganization's actual effects on the organization, for instance through changes to its social networks. Indeed, while at times believed to be unavoidable, corporate downsizing is widely believed to affect ideation and subsequent innovation negatively both by academics and practitioners (Shah, 2000). This study shows that the positioning of employees in the organization's instrumental workflow network prior to downsizing determines the degree to which they remain engaged with informal ideation activity after downsizing. Managers could thus shape their downsizing efforts such that the expected positive effects are likely to be higher and negative effects lower.

Our research suggests which individuals should perhaps be reassured about the organizaton's commitment to them as a matter of priority during a downsizing event to safeguard ideation ex post: those well positioned and those who are said to provide valuable input. These individuals are the most likely to voluntarily continue with ideation-related activity after downsizing. The monitoring and screening of individual (communication) profiles prior to a downsizing event can help to direct the potentially limited support resources more effectively.

5.2. Limitations and future research

Downsizing is a frequently used method of strategic change for an organization, yet to date, its effects have not been comprehensively studied (Datta et al., 2010; Guthrie & Datta, 2008; Schmitt et al., 2012). If they are studied at all, ex-post data are used, and the impact as perceived by employees is generally considered to be an indication of effects. Future research should examine the effect of downsizing on voluntary activity among a wider variety of companies. Only recently has exploration of the evolution of organizational networks started to gain scholarly attention (Ahuja, Soda, & Zaheer, 2012). In this context, etailed insight into the relational consequences of downsizing is still lacking (Schmitt et al., 2012). The few studies that take the network consequences of downsizing into account are based upon retrospective data, making longitudinal assertions problematic (Shah, 2000), or they focus on structural characteristics with no concern for the factors driving individual network behavior (Susskind, 2007). Effects on the behaviors that constitute organizational innovativeness have not been studied, but this has not stopped researchers from *claiming* that these effects are negative (Dougherty & Bowman, 1995). The results of our study qualify that claim. Much, however, remains to be gained from a better understanding of how, conceptually and empirically, psychological variables, such as employee engagement, and network variables interrelate over time (Parker et al., 2016).

This study is exploratory in nature, and the unique opportunity provided by the in-depth and extensive data we were able to collect justifies the choice of a single case study (Siggelkow, 2007). Our single case study research design nonetheless may raise questions about the generalizability of the findings (Parker et al., 2016). The effects of downsizing could vary for organizations of differing knowledge

intensity or for those in different competitive environments (cf. Cascio, 2002) or with a different governance style (Perry & Shivdasani, 2005). Comparing radical and incremental forms of intervention by management will further our understanding of the effectiveness of each type of intervention. Here, the effect of positioning in the organization's formal-workflow network on an individual's continued involvement with voluntary activity was studied because the instrumental workflow network is the target of downsizing and within the remit of management to alter as it deems appropriate. Future research could include more networks and capture potential joint effects due to multiplexity (cf. Aalbers et al., 2014).

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jbusres.2019.03.003.

Appendix 1

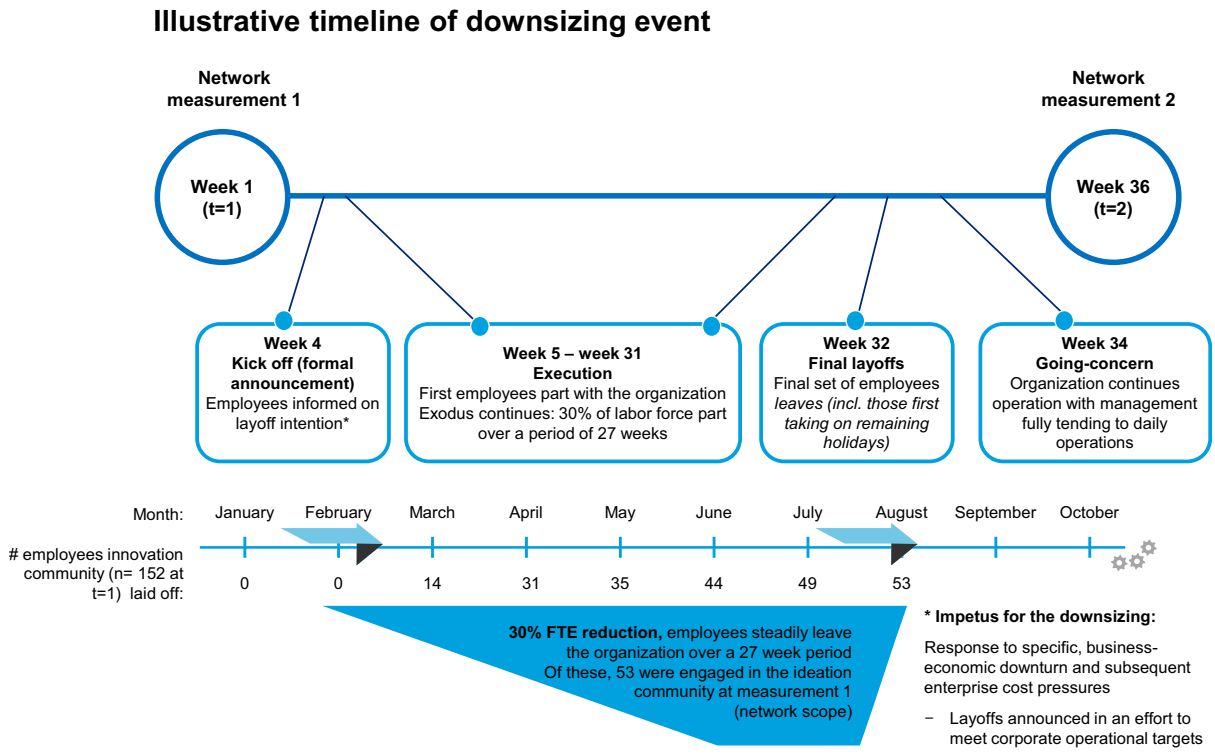

Fig. 1. Illustrative timeline of downsizing events at Alpha Company.

Table 1
Descriptive network over time ($T = 1$ and $T = 2$).

Descriptive	Before downsizing ($t = 1$)		After downsizing ($t = 2$)	
Density Avg value (SD)	Voluntary activity	0.01 (0.20)	Voluntary activity	0.01 (0.17)
	Instrumental workflow activity	0.02 (0.27)	Instrumental workflow activity	0.01 (0.21)
Reciprocity	Voluntary activity	0.13	Voluntary activity	0.11
	Instrumental workflow activity	0.13	Instrumental workflow activity	0.09
Transitivity	Voluntary activity	0.25	Voluntary activity	0.28
	Instrumental workflow activity	0.25	Instrumental workflow activity	0.27

Table 2
Descriptive statistics and correlations ($N = 152$).

	Variables	Mean	SD	Min.	Max.	1	2	3	4	5	6	7	8
1	Tenure	8.15	6.27	0.2	32								
2	Functional group membership	3.34	1.46	1	5	0.02							
3	Hierarchical rank	4.35	0.94	1	5	0.15	0.07						
4	Number of voluntary ties (t = 1)	4.43	7.47	0	36	−0.09	0.27***	0.02					
5	Value of inputs (t = 1)	2.25	2.31	0.5	6.1	0.01	0.38***	−0.14	0.56***				
6	Betweenness centrality workflow (t = 1)	0.12	0.41	0	3.9	0.09	−0.17*	0.06	0.13	0.09			
7	Number of voluntary ties retained (t = 2)	3.16	5.12	0	27	0.05	0.01	0.25**	−0.15	0.29***	0		

(continued on next page)

Table 2 (*continued*)

	Variables	Mean	SD	Min.	Max.	1	2	3	4	5	6	7	8
8	Employee retention (Y/N)	0.65	0.48	0	1	−0.13	−0.07	0.20*	−0.15	0.26***	−0.06	0.45***	
9	Gender	0.41	0.41	0	1	0.06	−0.09	−0.10	0.12	−0.05	0.08	0.10	0.06

***, ** and * indicates a significance level of 0.1%, 1% and 5% respectively.

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