

After the Triggering Event: A Phasic Perspective on Leadership during Supply Chain Disruptions

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ABSTRACT

What leadership style is best suited for handling supply chain disruptions? Literature on the topic is mixed and inconclusive. We consider patterns in leadership styles that enhance effective response and recovery efforts as they unfold. We examine data collected using a scenario-based experiment from 101 executives. Findings suggest that effective leadership is one that adjusts its style to fit the disruption's demands and the organization's reactions. The most effective leaders act decisively and commanding at the onset, yet apply a participative style in developing the path forward. Towards the latter part, they take on a task-oriented role to better delegate the response and recovery tasks. These findings propose that organizations should consider leaders who can flexibly and carefully adapt and contemplate trade-offs in their styles and decision patterns.

Key Words: Supply Chain Disruptions, Leadership Style, Disaster Management

Supply chain disruptions are unforeseen and unanticipated incidents that interrupt the ordinary flow of goods and materials within a supply chain (Hendricks and Singhal 2003; Kleindorfer and Saad 2005; Craighead et al. 2007) and, as a consequence, expose supply chain managers with idiosyncratic dilemmas on response and recovery (Stauffer 2003). In recent years, supply chains have become longer and more complex, while the severity and frequency of supply chain disruptions seem to be increasing (Culp 2013). As they unfold, SC disruptions can cause physical, financial, and emotional damage to a company and its constituents (Ellis et al. 2010; Speier et al. 2011). Leaders play a critical role in handling such events; because they are in charge of providing the road-map, offering assurance and motivation, and organizing resources to help with the company's recovery efforts (Sánchez et al. 1995; Howell and Shea 2006). While leadership is paramount in how an organization responds and recovers from SC disruptions, it is unclear what leadership approach will best ensure that ambiguous and stressful situations following a disruption are resolved effectively (Fiedler 1964; Devitt and Borodzicz 2008).

Leadership in the face of SC disruptions can be challenging. Varied and contrasting leadership styles have been shown to be effective in facing supply chain disruptions. For example, in what is now considered a classic product recall case, James Burke, chairman of Johnson and Johnson, made a decisive move to pull and replace the entire stock of Tylenol tablets off the market. It cost more than \$100 million for the recall and relaunch of the product but saved the company's reputation and potentially many lives (Prokesh 1986). Burke was widely admired for his "take charge" leadership style. In contrast, leadership at Renesas Electronics was praised for their participative and teambuilding leadership style during their unfortunate calamity. Renesas' Naka, Japan facility was heavily damaged as a result of the Great East Japan earthquake of 2011. During the recovery efforts, Renesas' leadership, employees,

contractors and supplier personnel worked for hand in hand to mend things. The leadership's primary focus was in developing a sense of unity and teamwork and eliminating barriers and obstacles that hindered recovery efforts (Matsuo 2015).

This paper explores leadership approach by diving deeper into how SC disruptions unfold. In line with process theories of organizational change (Van de Ven and Poole 1995; Dooley and Van de Ven 1999), the premise of the study is that SC disruptions are transient events that start, develop, dwindle and ultimately dissipate over a life-span (Fink 1986; Mitroff et al., 1997; Van Wassenhove 2005). By applying, Lewin's situational leadership model, we identify patterns in the progression of disruptions and leadership decisions (Lewin et al. 1939). Insights are derived from the analysis of 101 executive's responses from US companies. Using a scenario-based experiment, we identify patterns in leadership decisions and actions that were considered effective. These findings suggest that effective leadership hinges on applying distinct styles depending on the progression of events and type of challenge set forth by the SC disruption.

There are multiple contributions from this study to research in supply chain and leadership management. By considering dynamic nature of SC disruptions, this study offers a perspective that may not be discernible through "variance-based" theories (Poole et al. 2000). Most leadership studies are based on theories that abstract away the flow of events (Dooley and Van de Ven 1999; Langley et al. 2013). Aside from a handful of exceptions, research has not investigated the role of leadership in supply chain settings (Johnson and Leenders 2009; Overstreet et al. 2014). Second, this study highlights the importance of the decisions and actions conducted after damages from a SC disruption have started to materialize. While ample rigorous research has investigated risk preparation and mitigation before SC disruptions occur (e.g.,

Knemeyer et al. 2009; Bode et al. 2011; Ambulkar et al. 2016), few explore the nuances associated with handling disruptions beyond when actual damage begins (e.g. Bode and Macdonald 2016). Finally, this study contributes to literature in organizational leadership by exploring contextual variations where explanations from different leadership theories (e.g. situational, pragmatic or charismatic) may be a fit in explaining crisis leadership in a supply chain context (Pillai and Meindl 1998).

The remainder of the paper is organized as follows. First, a review of pertinent theoretical work and past studies on leadership during disruptions is provided. Data collection and analysis details are then explained. Next, an overall purview of the findings followed by more a specific explanation of each stage of the response and recovery strategy is described. The paper ends with a series of practical and academic implications.

BACKGROUND

Supply Chain Disruptions – A Process View

Supply chain disruptions are defined as unforeseen and unanticipated incidents that interrupt the ordinary flow of goods and materials within a supply chain (Hendricks and Singhal 2003; Kleindorfer and Saad 2005; Craighead et al. 2007). By now, it is well established that SC disruptions can be challenging and harmful (Hendricks and Singhal 2003; Hendricks and Singhal 2005). Perhaps the most critical concern during SC disruptions is their evolving and dynamic nature. Crisis management literature depicts this as a life cycle, where a disruption traverses through a number of intertwined phases (Turner 1976; Fink 1986; Herrero and Pratt 1996; Sheffi 2005). The damaging effects of disruption start at the acute stage (Fink 1986). For leaders, dealing with the acute stage requires leading the initial response to contain the disruption as

much as possible. This is followed by the chronic stage, where damage often accumulates. To be effective, leaders have to identify potential ways to reverse the course of events and select ones that are most effective. The last stage of disruption, the resolution stage, involves implementing the selected solutions and returning organizational processes to their regular status. This life-cycle model has been echoed in a number of studies in management research (Turner 1976; Herrero and Pratt 1996; Sheffi 2005). For instance, Mitroff ([1994](#)) suggests a sequence that includes damage containment, and recovery. Specific to SC disruptions, Bode and MacDonald ([2016](#)) classify the stages of SC disruptions based on problem recognition, information gathering and diagnosis, response development, and response implementation. Thus, based on the previous literature, we identify three disruption stages that include problem identification (acute or early stage), solution generation (chronic or middle stage), and solution implementation (resolution stage or latter stage). We set to explore this by looking for patterns in leadership styles across stages of a disruption.

Leadership literature has yet to explain how the dynamic nature of SC disruptions- as depicted in the life-cycle model- should be approached by leaders. Researchers have offered limited detail on how leadership addresses nuances associated with the progression of SC disruptions. As we detailed earlier, much of the leadership literature has taken a variance theory perspective and have abstracted from the progression of events from their analysis. Variance theory perspectives fail to consider the interactive dynamics of the situation studied. As we noted earlier, disruptions are transient events that start, develop, dwindle and ultimately dissipate over a life-span (Fink 1986; Mitroff et al. 1997; Van Wassenhove 2005). In studying company responses to SC disruptions, the ebb and flow of interactions between what the disruption has caused and how the company reacts can be important considerations. Process studies investigate

how and why things emerge, develop, grow, or terminate over time (Langley et al. 2013). By recognizing the importance of time process studies, this research offers a central contribution that is not available from variance studies. Process research focuses on the evolving phenomena and explicitly incorporates temporal progression of the activities as elements of explanation and understanding (Van de Ven and Poole 1995; Dooley and Van de Ven 1999). Understanding the process of leadership helps understand how to manage the different phases of a supply chain disruption.

Each stage of a disruption consists of diverse challenges that affect leader's decision making differently. Lewin's et al. situational leadership theory (1939) recognizes that one of the factors that determines a leader's choice of leadership style is the need to make decisions. In 1939, Lewin conducted a classic study of leadership, and this involved three styles of leadership: autocratic or directive, democratic or participative, and laissez-faire or task-oriented. Bass (1990) offers a comparative description of the three leadership styles. Bass writes that the democratic leader is socially close to followers. He or she is consultative, participative, relations oriented, and shares power. The authoritative leader is centered in a coercive mode of practice with followers. He or she initiates structure, is production oriented and directive. Finally, the laissez-faire leader is centered in a hands-off approach to leadership. He or she is delegative and uses task-oriented approach by breaking down the tasks and assigning responsibilities. The previous literature identifies that these three leadership styles are shown to be effective when facing a SC disruption depending on the type of challenge the leader is facing. Table 1 offers a summary of the literature review.

----Insert Table 1 Approximately Here---

Directive Leadership Style. Directive leadership is defined as an instructional type of

managerial style characterized by a leader who tells subordinates what they are expected to do and how to perform the expected tasks (Lewin 1939; House 1971; Ginter et al. 2006; Haddon et al. 2015). Scholars of business leadership often point to the need for leaders in a crisis to be directive, act decisively, have a plan, and address the needs of their followers (House 1971; Cavanaugh et al. 2008; DuBrin 2014). Yet another crucial matter that needs to be addressed by leaders when facing disruptions is the urgency of response and recovery. Often, fighting off a disruption is a race against time (Shenkman 2000; Tatham and Kovacs 2010; Stern 2013). No matter if human or operational issues are the center of attention, crises impel action. Particular to supply chain disruptions, delays in decisions and actions can lead to the widening of the disruption effects; or propagation (Wu et al. 2007). These time constraints require leaders to set bounds on the efforts devoted to information gathering, analysis, decisions, and final execution of their response plans. Overall, directive leadership style was found to be effective when leaders need to provide a quick immediate response, assess the situation, diagnose the challenge, and contain the damage (James and Wooten 2005; Ginter et al. 2006; Peterson et al. 2008; Van Wart and Kapucu 2011).

Participative Leadership Style. Participative leadership is defined as a type of managerial style in which the leader involves subordinates in goal setting, problem solving, and team building but retains the final decision making authority (Lewin 1939; Pillai and Meindl 1998; Uhl-Bien et al. 2007). The nature of the crisis inherently involves others and other systems to coordinate multiple pieces of information; collaboration and coordination are critical to a leaders' ability to address crises (Mumford et al. 2007). Crisis management literature often highlights the need for participative and integrative leaders in facing solution generation and collaboration challenges during disruption (Pillai and Meindl 1998; Hunt et al. 1999). Participative leadership

style allows and encourages members of the group to share, express their ideas, and take a more participative role in the decision-making process of the organization (Sheffi 2015). Disruptions rattle the operational norms and procedural stability of an organization and can be straining and affect personnel behavior (Pearson and Clair 1998). At the onset, personnel may act with lowered confidence, may seem confused, and be reluctant to follow orders and engage in the response and recovery efforts. It is especially at such times that participative leaders can prove effective (Uhl-Bien et al. 2007; Boin and Hart 2003). Participative leaders can leverage their ability to inspire confidence and offer hope about the future (Spekman et al. 1998; Yukl 1999; Youn et al. 2012). Figure shows different stages of the disruption and corresponding leadership styles.

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Task-oriented Leadership Style. Task-oriented leadership is defined as a type of managerial style in which the leader focuses on the tasks that need to be performed in order to meet certain goals, or to achieve a certain performance standard (Lewin 1939; Fleishman et al. 1991; Devitt and Borodzics 2008). Specific to supply chain disruptions, the damaging effects are, more often than not, serious financial and material harm (Craighead et al. 2007). To get things back to normal, leaders need to re-establish the movement of goods and services and to reverse the damaging effects of the disruption on organizational productivity. Previous research emphasizes that task-oriented leaders are essential when facing solution implementation and evaluation of processes challenges during disruption (Mulder et al. 1971; Kovoov-Misra 2002; Hunter et al. 2009). Leaders with task-oriented style apply hands-off approach by providing the tools and resources needed and allowing group members to make the decisions in their organization (Mumford and Van Doorn 2001; Devitt and Borodzics 2008). To implement the

solution during a crisis, a leader participates in planning and modifies plans if required in response to the situation, encourages task completion and checks that the tasks are being appropriately undertaken (Devitt and Borodzics 2008). Alongside addressing the needs of personnel, those leaders focus on examining the causes, and on resolving the issue based on the presented risks and available resources (Liu et al. 2009; Ambulkar et al. 2016). Task-oriented leaders rely more on rational persuasion than on inspirational appeals. They exert their social influence through an in-depth understanding and sensitivity to the social system (D'Aveni and Mac Millan 1990; Fawcett et al. 2010; Van Wart and Kapucu 2011).

The need to address multiple objectives, including temporal, human, and operational has been the topic of studies in the disaster management and crisis leadership literature (Halpin and Winer 1957; Fiedler 1964). Some suggest that leaders bring their own style, such that the selection of a leader is a predetermined choice (Devitt and Borodzicz 2008). Others suggest that effective leadership style is situation dependent, such that certain aspects of a disruption may require emphasis on particular styles. For instance, DeChurch et al. (2011) find that leaders with a strategically focused style are better suited for issue-identification and problem-solving. In contrast, a coordinating leadership style is fit for implementing the plan. A coordinating style helps facilitate work processes and orchestrate activities (DeChurch et al. 2011). Another stream of research suggests the need to combine leadership styles. Thomas and Bendoly (2009) distinguish leadership styles into those of enforcing and encouraging. Whereas an enforcing style focuses on formalized and explicit rules through penalties for violation, an encouraging style involves inspiring employees to interact, developing consensus, and suggesting solutions to specific problems. Their study suggests that effective leadership comes from focusing on either enforcing or encouraging style while augmenting the style with the modest use of the contrasting

one (Thomas and Bendoly 2009). The current paper takes a combination approach. Based on Lewin's et al. situational leadership theory (1939), we propose that even though each leader has a unique approach, the combination of several leadership styles depending on the challenge facing is essential. Overall, effective leaders face disruptions by adjusting their leadership styles to mirror the needs of the response and recovery process, whether that is identifying the scope of the impact, finding the right approach to respond with, or developing plans to execute the response approach. These observations suggest that effective leadership requires an application of several different leadership styles depending on the stage of SC disruption.

HYPOTHESES

Above, we noted that effective leadership requires adaptation to several different leadership styles. In the next section, we dive deeper into how effective leadership may not only be contingent on using different leadership styles, but that depending on the stages of a disruption, specific leadership styles can be particularly useful.

Early Stage (Problem identification). In the wake of a SC disruption, the ability to decide and act quickly is critical to limit the potential damage and to identify the underlying cause of the disruption. Effective leaders approach the early stages of a SC disruption by applying a directive and decisive leadership style. For example, previous studies show that police officers in charge of SWAT teams are required to reinforce and elaborate task activities, and make timely decisions (e.g., Bechky and Okhuysen 2011). A directive leadership style helps point managerial attention and company resources to determining the scope of the issue. Time is of the essence at this stage and allocating resources and organizational focus to quickly diagnose the problem and determine the extent of damage is imperative (Cavanaugh et al. 2008).

The leader's ability to avoid pushing off major or controversial decisions is crucial to the success at this stage. In situations where a lack of decisiveness can place others' lives in danger, quickly determining how to approach the matter is critical. More specific to supply chain disruptions, the well-known example of how Nokia and Ericson faced a supplier caused disruption offers further anecdotal evidence. In 2000, a lightning strike started a fire in a Phillips NV chip manufacturing plant which led to unforeseen long-term consequences. Nokia's chief component purchasing manager, Tapio Markki, quickly notified other company executives. As a result, the company kept a close eye on the situation, and as soon as it realized that the delay was going to be weeks or months, it took action. Ericsson executives reacted very differently. They believed that the delay would be a short one and they were content to let the situation play out. According to Sheffi (2005), Ericsson's lack of a Plan B cost the company around half a billion dollars. Faced with the same disruption, differences in managerial decisiveness during the early stage made a major difference in the recovery of these two competitors (Sheffi 2005; MacDonald and Corsi 2013). While Ericson suffered from its leaders' inability to exercise prompt judgment, Nokia's leadership took a series of immediate and proactive actions and recovered from the supply shortage. In short, it seems that during supply chain disruptions decisiveness is critical because the situation demands a quick call to action.

A directive leadership style at the onset carries other benefits as well. In the wake of a SC disruption, internal and external stakeholders (employees and suppliers) may become heavily concerned about whether the response approach is being directed correctly and whether the efforts will prove effective (James and Wooten 2005). Unless addressed, such questioning may lead to a loss of confidence and can further destabilize the response effort. A leader's decisiveness ensures the matter is in good hands. For example, in the case of responding to a

major product recall by Johnson and Johnson, James Burke, the company's chairman, made a decisive move to take the entire stock of Tylenol tablets off the market. This bold move cost more than \$100 million but saved the company's reputation and potentially many lives (Prokesh 1986). Burke was widely admired for his "take charge" leadership style.

During the early stage of a SC disruption, leaders, as keystones in the organization, need to evaluate the situation, communicate directions, and "rally the troops" as quickly as possible (Seo et al. 2012). Thus, we propose that at the early stage of SC disruption directive leadership style is the most preferred approach over participative and task-oriented styles.

H1a: At the onset of a disruption, a *directive* leadership style will be preferred over participative and task-oriented leadership styles.

Middle Stage (Solution generation). As containment and diagnosis efforts of the SC disruption get set and underway, a leader's focus shifts to determining the choice of resolutions that can help return things to normality quickly and effectively. Identifying the underlying causes and choosing how to resolve the issues triggered by the disruption is critical to effective recovery. Companies may have a number of counter-measures to use in mitigating the damage caused by the SC disruption. For instance, it is possible to use slack inventory, expedited parts using alternate suppliers, or to adjust the production schedule to postpone the production of less critical products (e.g., Tang 2006; Hu et al. 2013). However, there are trade-offs associated with any of the chosen remedies. Determining the right solution requires careful attention to detail and including the concerns from the numerous stakeholders that may have been affected by the disruption. In today's supply chains, there may be an endless number of possible interventions. Indeed, different groups are likely to offer different approaches to handling the disruption. We propose that effective leaders approach this stage of a SC disruption by applying a participative leadership style. For example, when an earthquake followed by a tsunami hit a General Motors

facility in Japan in March 2011, GM's assistant director Marc Robinson highlighted that everyone attempted to find solutions. Because GM employed a broad staff of skilled people, everyone had many ideas on how to tackle the crisis. Although GM Vice President Ron Mills wanted creative solutions from everyone, he did not want everyone implementing independent decisions that affected other parts of the organization. As a result, Ron Mills was a participatory leader who involved all parties and applied free-flowing and forthright communication to identify the best solutions to an issue, and to gain buy-in from all team members (Sheffi 2015).

Additionally, a participatory style helps search for alternatives by facilitating activities of information sharing among partners (Youn et al. 2012). Supply chain issues can be intricate enough to require the consideration of multiple perspectives. During the 2011 Japan disruption, Intel executives also used participative leadership style to find the solution. Intel organized several meetings with its Tier 1, Tier 2, Tier 3, and Tier 4 suppliers to come up with a joint remedy to respond effectively to the disruption event (Sheffi 2015, p.11). Participative leaders are expected to “knit the pieces” of this complex theatre together into a coherent whole (Parker and Anderson 2002).

Beyond identifying the right course of action, the second responsibility of leaders in this stage is to rally and motivate the parties involved to determine the plan as quickly and effectively as possible. During SC disruptions, it is hard for supply chain members to appraise their actions and judgments (Mumford et al. 2007; Uhl-Bien et al. 2007). Thus, leaders need to inspire and motivate employees to stay focused and look for resolutions. Studies show that when leaders act selflessly, caring more about the group than themselves, workers are more trusting, cooperative, dedicated, loyal, collegial, and committed (Seppala 2016). For example, after Samsung's failure of the fire-prone Note 7s, Samsung's Chief Executive Kwon Oh-Hyun addressed the employees

with an inspiring statement and suggested to use this crisis as a chance to come together and jointly find a solution (Kharpal 2017).

Overall, a participatory leader uses clear and forthright communication and involves all parties to surface the best solutions to an issue. Thus, we suggest that a participatory leadership style will be preferred over directive and task-oriented during a middle stage of a SC disruption.

H1b: At the middle stage of a disruption, a *participative* leadership style will be preferred over directive and task-oriented leadership styles.

Latter stage (Solution implementation). As resolutions to the SC disruption become clearer, effective leaders shift their attention to implementing the recovery. Leaders with a task-oriented view of the SC disruption seem particularly effective at this stage. These leaders can break down the recovery plans into delegable tasks, prioritize among the tasks, ensure that resources were being effectively applied, and keep an eye out for other potential mishaps during this stage. For example, PepsiCo CEO Craig Weatherup addressed the product contamination crisis by applying task-oriented leadership style. In 1993, reports from several sources surfaced that syringes had been found in cans of Diet Pepsi. After containment and solution generation issues were resolved, Weatherup formed a crisis response team to carefully analyze all potential means for foreign objects to enter the production stream across the value chain and to lead the company out of the crisis (Novak 2009).

Task-oriented leaders are able to conduct planning, implementation, and evaluation of problem-solving processes and knowledge acquisition (Harvey and Richey 2001). Fawcett et al. (2010) associate supply chain managers who carry rich task-oriented skills with those that can better identify, evaluate, and select supply chain partners. Specific to risk management, Ambulkar et al. (2016) suggest that a supply chain leader's ability to acquire external knowledge,

disseminate it, and use it, is related to his/her competency to mitigate risk. Task-oriented leaders can distinguish between what is essential and what is not. During recovery, there are always limited resources and personnel, which makes it essential to determine which issues, need more immediate attention. Effective leaders differentiate between critical and less-than-critical matters and allocate resources accordingly.

Effective leaders are able to stay on task and avoid being sidetracked. During SC disruptions, nothing is more painful than a set-back in recovery. A third important behavior of task-oriented leaders in this stage is the ability to anticipate and fix emerging issues. SC disruptions are demanding because they deplete resources (DeVries and Fitzpatrick 2006). Inventory stock-ups for unforeseen events are eventually used up, and personnel becomes tired of working overtime to get things back in line. Such a system-wide exhaustion can lead to secondary issues and possibly more breakdowns for the leader to address (Gill 2007). Indeed, the longer the recovery plan takes, the lower its improvement rate becomes (Yukl and Yukl 2005). For the leader, sustaining the company's ability to implement the recovery solution becomes part of the issue. Thus, we propose that a task-oriented leadership style will be more preferable than directive and participative leadership style during the latter stage of SC disruption.

H1c: At the latter stage of a disruption, a *task-oriented* leadership style will be preferred over directive and participative leadership styles.

METHODOLOGY

To verify the hypotheses proposed, we designed a scenario-based experiment that enquired about managers' leadership decisions during disruptions. A between-subjects scenario-based experimental methodology was employed, because it enables researchers to investigate the

situations where companies are normally unwilling, unable, or uncomfortable to share complete details. In particular, experiments offer ways of answering behavior research questions and offer a nuanced picture of managers' leadership choices as a response to our manipulations of stages of disruption (Eckerd and Bendoly 2011). Furthermore, scenarios allowed manipulating the stages of disruption that lacked the reliable measure at the time research was conducted. This methodology has been effectively utilized to investigate several supply chain phenomena and has recently gained increased application in the field (e.g., Croson and Donohue 2003; Thomas et al. 2011). Additionally, a scenario-based approach is often perceived to be more convenient for participants and allows for desired differentiation in levels of the variable through manipulation. Using a single factorial design (disruption stages at three levels), this experiment was designed to manipulate scenarios to collect responses in the face of early, middle and latter stages of SC disruptions.

Sample, Procedure, and Measures

Participants of this study included experienced executives and full-time managers whose positions in their companies enable them to make leadership decisions. They were operations, marketing, and financial management executives with several years of experience. An occupational selection of the participants was intentionally focused on these functions since relevant work experience and responsibilities in these fields was deemed necessary in order for respondents to reliably assess and react to the scenarios' content and manipulations. Other aspects of the sample base were randomized to increase variance, as responding managers represented a wide range of industries characterized by a variety of disruption characteristics.

The sampling frame for the study was drawn from the pool of two major executive conferences held in the Northeast of United. A total of 200 executives were contacted by the

researchers and asked to participate in the experiment. The data were collected over the period of three months between September 2017 and October 2017. From those contacted, 104 people agreed to participate. This resulted in a response rate of 52% and a balanced distribution of between 33 to 34 responses per scenario.

The majority of the participants were employed by the healthcare and pharmaceuticals industries. The majority worked as executive directors in supply chain, procurement and operations functions as well as product development management roles. Details about the sample are summarized in Table 2. Additionally, most of the participants were familiar with dealing with supply chain disruptions and previously made similar leadership decisions to the ones described in the experiment.

-----Insert Table 2 Approximately Here---

Scenarios and leadership descriptions that conveyed the manipulated variations were developed in line with steps recommended by Rungtusanatham et al. (2011). First, information about the context of disruptions stages and identified measurement factors was gathered. Second, We applied the principle of form postponement, which is comprised of two separate but related modules of information: a common module and an experimental cues module (Trentin et al. 2011). The common module of the vignette is composed of a short description of the company, disruption characteristics, and leadership descriptions. The experimental module of the vignette included written statements about three factors of interest (the three stages of disruption).

The example of common and experimental cues modules of the scenario are available in the Appendix. Afterwards, we carefully pretested the survey to ensure that the questions are correctly understood by the respondents. The details about pretest are available in the next section. During the last, post-design, stage the measures were taken to confirm that the scenario

is clear, realistic, and complete. Feedback was received from several academic scholars that resulted in updating the questionnaire to ensure clarity, simplicity, and content validity. The following process helped assess face and content validity. Next, feedback from five executive managers obtained via email and phone resulted in improving the realistic, comprehensiveness, and relevance of the survey questions and the scenarios. Specifically, we included a more detailed description of the disruption and updated several leadership style descriptions.

We controlled for factors that could influence leadership decisions in three ways. We selected these control variables to minimize confounding effects that are known to influence managerial experiences and a company's performance during SC disruptions. First, the common part of the scenario was kept consistent for all participants offering same settings in term of the (i) company, (ii) industry, (iii) disruption situation, (iv) disruption impact, and (v) disruption consequences. These factors are often considered to influence company's recovery time and response effectiveness when facing SC disruption. The second set of control variables concerns industry memberships and disruption frequency. Performance of the company during supply chain disruption can be affected by industry-wide factors, such as infrastructure, demand patterns, manufacturing processes, etc. Since the sample was small, we regrouped the 21 registered categories into six clusters using the first two-digit of their NAICS codes and industry similarities. Respondents were asked to indicate their company's industry. Additionally, we controlled for disruption frequency by asking how many times in a year their organization faces similar disruptions to the one described in the scenario. Furthermore, we included five control variables on the participants' real-world business environments. Their work experience, participants' confidence, familiarity with the hypothetical scenario, and social desirability biases were included as controls (Lorentz et al. 2012). These variables are known to affect their

leadership decisions making especially in case of disruptions response (Avolio et al. 2004). Moreover, to control for participants' understanding of the decision scenario and to assure that they encountered similar decision situations in their real work life are crucial for the validity of the findings. Finally, measurement of social desirability bias was conducted using a three-item scale adopted from Marlowe-Crowne scale (Hannah et al. 2013). The Cronbach's alpha for social desirability and realism checked were 0.76 and 0.66 that are acceptable as suggested by Nunnally and Bernstein (1994) for this explorative research.

Manipulation and Bias Assessment in the Data

Several steps were taken to reduce concerns over the realism of the scenario, transferability of the results to the real world, manipulation failure, measurement errors, non-response bias, and common method bias.

The dependent variables were leadership choice and response time. The participants were presented with three leadership descriptions and asked to indicate whom of the three leaders they will put in charge if the disruption happened. Additionally, respondents were asked to indicate how their selection will affect the recovery time from the disruption. The descriptions of leadership style are available in the appendix. The independent variables were disruption stage and choice of a leader. We conducted two pretests to ensure the clarity of the scenario as well as the leadership styles. First, a pretest study with 30 Executive DBA students was conducted to ensure the differences between three versions of the vignette, to verify the realism and accuracy of the scenario. Those students were majoring in Supply Chain and Logistics and represented a large public university in Southeastern USA. The use of the student sample was consistent with the recent trends described in the literature (Thomas et al. 2011). The students were asked to indicate whether the three scenarios differ regarding the stage and priorities. The answers were

presented as open-ended questions. After the pretest, all the necessary adjustments were made to the scenarios and a questionnaire.

Additionally, leadership styles were pretested in order to ensure clarity of the descriptions. Thirty Executive MBA students participated in the second pretest. The participants were presented with three leadership descriptions and asked to indicate on a five-point Likert scale their agreement that the descriptions represent the matching leadership style. Overall, participants came to an agreement that the leadership descriptions match the corresponding leadership styles ($M=4.00$, $SD=.85$ for directive style, $M=4.30$, $SD=.88$ for participative style, $M=4.17$, $SD=.75$ for task-oriented style). Thus, the three leadership styles were included in the scenario-based experiment. Finally, the extensive literature review, feedback from academics, and professionals plus a pretest study supported the content validity of the constructs (Bollen 1998).

To ensure the validity of the scenario, we asked the participants about their familiarity (one item on five-point Likert-scale) with the fictitious scenario and whether the scenario was realistic (one item on five-point Likert-scale). First, respondents were asked to indicate whether the situation review above and the expected decisions are realistic. Second, respondents indicated whether they encountered similar decision making scenarios. The means of 3.88 and 3.41 indicate that the participants have faced similar situations in their current business environment and that the situation presented was realistic to them.

To control for common method bias, we conducted a factor analysis using Harman's single factor test. Using factor analysis, all latent factor measures were loaded under constrained factor 1. The single factor emerged represents less than 50% of the variance (23%), thus, common method bias does not threaten the validity of the findings. Furthermore, the reverse-

coded item for social desirability bias was included to alleviate possible common-method bias. Additionally, response bias can pose threats to the validity of a survey. Non-response bias can potentially occur between respondents and non-respondents. We tested for non-response by comparing characteristics of the participants and their companies that responded (sample of 95) with those contacted but not agreed to participate (sample of 105) based on industry code (SIC code), age, work experience, and position in the company. No significant differences were noted. However, the problem with comparing just demographic characteristics between a group of known respondents and a group of non-participants for differences is that demographics do not represent “preference” differences in leadership styles. Therefore, we adopted the Mentzer and Flint (1997) approach. Some of the non-respondents were called after the data collection period and the responses acquired from them did not differ from the respondents.

Since the data for the experiment comes from self-reported measures, it is critical to control for social desirability biases (Fisher 1993). The scores were analyzed by applying Marlowe-Crowne scale-scoring key (Crowne and Marlowe 1960). All respondents had scores within an acceptable range, and the social desirability bias does not pose a threat for the current study.

Results

Responses from three managers were discarded due to excessive missing data. Thus, the total sample size is 101. First, the overall chi-square test was performed to indicate the difference between the conditions and leader choices. The results provide support that the choice of a leader significantly differs depending on the stage of a SC disruption ($\chi^2(2,101) = 18.82, p = .00$). Furthermore, test of between subjects effect indicated that the relationship between leader choice and recovery time depend on the stage of the disruption ($F=2.25, p<0.05$).

Then, the chi-square test was applied to test each of the hypotheses. Additionally, ANOVA was used to test the relationship between leadership choices and recovery time. The summary results from our analysis of the scenario-based experiment are presented in Table 3.

---Insert Table 3 Approximately Here---

Hypothesis 1a explored whether a directive leadership style will be preferred over participative and task-oriented leadership styles at the early stage of disruption. Overall, 62% of respondents indicated a directive leader as a first choice at the onset of disruption. The significant chi-square coefficient ($\chi^2 = 25.77, p = .00$) provides support for Hypothesis 1a. Furthermore, the mean value for recovery time are significantly different for each of the leader choices ($F=2.22, p<0.050$). Participants who choose directive leader for the first scenario indicated the higher influence on the recovery time than the participants who selected participative or task-oriented leaders for the early stage. ($M=5.53, SD=1.26$ for directive style, $M=4.55, SD=1.34$ for participative style, $M=4.85, SD=.71$ for task-oriented style).

In Hypothesis 1b, we looked at whether a participative leadership style will be preferred over directive and task-oriented leadership styles at the middle stage of disruption. Overall, only 46% of respondents indicated a participative leader as a first choice for the middle stage of a disruption, while 34% of respondents specified a directive leader as their first choice and 20% of respondents specified a participative leader as their first choice. The significant chi-square coefficient ($\chi^2 = 10.52, p = .02$) provides support for Hypothesis 1b. Furthermore, the mean value for recovery time is not significantly different for each of the leader choices ($F=2.22, p>0.05$).

Hypothesis 1c explored whether a task-oriented leadership style will be preferred over participative and directive leadership styles at the latter stage of a SC disruption. While 53% of

respondents indicated a task-oriented leader as a first choice for the latter stage of a disruption, 33% of respondents specified a directive leader as their first choice. The significant chi-square coefficient ($\chi^2 = 7.471, p = .02$) provides support for Hypothesis 1c. Therefore, we concluded that Hypothesis 1c is supported. While the mean value for recovery time are significantly different for each of the leader choices ($F=7.11, p<0.00$), task-oriented leadership style did not show the highest mean for the recovery time. Participants who choose directive leader for the third scenario indicated the higher influence on the recovery time than the participants who selected participative or task-oriented leaders for the latter stage. ($M=6.40, SD=.64$ for directive style, $M=3.73, SD=1.25$ for participative style, $M=5.52, SD=1.56$ for task-oriented style).

Post-Hoc Cluster Analysis

While the number of participants who choose participative leadership style is higher when compared individually to participants who choose directive leader and task-oriented leader, the number of participants who preferred participative leaders is lower when compared to combination of participants who choose directive leader and task-oriented leader. The analytical approach of the analysis of means may lead to a better understanding of the results for hypothesis 1b. Specifically, we compared means for familiarity with disruption, hierarchical position, and experience for each of the stages of the scenario for both respondents who confirmed the hypotheses or disagreed with proposed styles. The results of the analysis are available in Table 4.

----Insert Table 4 Approximately Here---

According to the analysis, while respondents that participated in the early and latter stages of the scenario are similar, participants' characteristics in the middle stage condition differ. Participants in the middle stage condition who disagreed with proposed hypotheses show significantly lower familiarity with the disruption described in the scenario than in other

conditions. Furthermore, the means for hierarchical position and professional experience are also lower in the middle stage for respondents who disagreed with proposed hypotheses compared to other conditions. The characteristic of the respondents might affected the results if the experiment.

GENERAL DISCUSSION

The real test of a supply chain leader is shown during challenging times. At no time this challenge is more laborious than during SC disruptions when the inter-organizational dynamics of a supply chain are further complicated by time-pressures, ambiguities, and high stakes associated with the disruption (Dooley and Van de Ven 1999; Dooley and Lichtenstein 2008). Such situations amplify decision-making behaviors and associated ramifications.

Our findings suggest that the directive leadership style is a critical trait for leaders facing early stages of SC disruptions. Decisiveness is particularly crucial in the face of disruptions, because of the inherent immediacy of the issues and the need to resolve promptly. These findings fall in line with those from a few studies in similar contexts (e.g., Van Wart and Kapucu 2011). This study was not able to find the support that a participative leadership style is preferable during the middle stage of disruption. Leaders that are swift and decisive seem to help their organizations minimize the detrimental effects of SC disruptions. Finally, the results of the experiment show that as the disruption is being resolved, the effectiveness of the decisive leader diminishes. During the latter stages of supply chain disruptions, the task-oriented leadership style becomes essential. Indeed, a large part of the leader's responsibility in a supply chain setting is how to get business operations and, thus, to consider setting specific task objectives, recovery plans and allocation of resources (Bode et al. 2011).

Empirical and Theoretical Implications

This research offers several significant theoretical and managerial contributions. First, the core contribution of this study from a theoretical perspective is that it analyzes the progression of events and effective leadership styles that help unveil how different phases of a SC disruption can be effectively managed, offering a depiction in line with the process based theory of organizational change ([Van de Ven and Poole 1995](#)). We detail how SC disruptions shift as events progress through the life cycle and empirically test the leadership traits essential at each phase of the lifecycle.

As related to leadership research, critiques have often noted that a missing aspect of leadership theories is in the sufficient specification of situational variables (Porter and McLaughlin 2006). SC disruption leadership can be viewed as the ability to solve complex problems by adapting very quickly to a fast-changing situation. While charismatic and transformational leadership theories offer a strong theoretical foundation that fits for explaining the long-term transformation of a company, what is needed for recovering from SC disruptions response may be more immediate and urgent. In our studied context, when confronting SC disruptions, the suitable leadership style does not adequately depict the need for being visionary. Instead, we highlight the need for leaders to swiftly decide, involve and orchestrate efforts. There is a stereotype of strong leadership in crisis management, with time pressure, an urgent need for making decisions, therefore involving autocratic leadership style in focus. (Dynes et al. 1981; Perrow 1984). In line with the literature cited above, we report that leadership during actual extreme events normally becomes more directive and transactional. Our findings confirm the importance of decisive leadership is effective in those contexts but only in addressing certain phases of the disruption. As events unfold, a decisive leadership style may hinder involvement and implementation efforts. Thus, leaders either need to be inherently adaptive and recognize

that they need to be open to ideas and potential solutions to SC disruptions or more than one leader is needed to handle a SC disruption.

Finally our findings offer contribution towards a special application of situational leadership ([Lewin et al. 1939](#)). Lewin's model proposes a taxonomy of three leadership styles, ranging from telling to delegating based on the maturity level of subordinates. Our findings suggest that the phases caused by the progression of SC disruptions can be the prime determining factor in leadership effectiveness.

Practical Contributions

Practically, our primary contribution is in highlighting the need for crisis leaders to be equipped with an arsenal of leadership styles. Effective leaders are ones that, toe-to-toe with the organization's disruption efforts, align their style to match the situation at hand. These observations suggest that there are potential shortfalls from having a leader that is only comfortable with one style or that has difficulties in adapting to other styles. Shortfalls may include controlling the situation when it is necessary to delegate, or being overtly removed from the battlefield when being decisive is necessary. This finding should not be undermined since adaptiveness in leadership does not come automatically. Research has shown that leaders naturally anchor into a preferred style (Lagadec 1993). As Devitt and Borodzicz note: "Leaders managing crises under stressful situations are likely to revert to the style which they are most comfortable" (Devitt and Borodzicz 2008; p. 212). Without leader adaptiveness, companies may end up placing attention on the wrong priority (Tichy and Bennis 2007). Based our findings, in order to effectively respond to supply chain disruptions potentially different leaders may be more suitable to a different stage of disruption.

Our observations point out the need developing talent that can step up when disruptions happen. Leaders not trained and prepared to function effectively during a crisis can create an

image of incompetence, chaos, or disorganization, even if the incident is being managed competently and effectively (Klann 2003; Kapucu and Van Wart 2008). These findings support the idea that developing potential crisis leaders may need to be part of the recruiting and training activities of organizations (Wansink et al. 2008). For instance, leadership response training programs that can develop confidence and help with empowering individuals to make independent, situational-based decisions would enhance the organization's ability to effectively respond to crises (Slattery et al. 2009). Leaders may need to understand that each disruption has various challenges that can be better addressed by several leaders with different leadership styles.

Future Research and Limitations

This study explored leadership approaches in response to varying stages of SC disruptions. The results of this study need to be considered alongside their limitations. We recognize the limitations of empirically based studies. First, there are inherent experimental design limitations related to the external validity and realism of the findings. Hence, the replication of this study may contribute to the generalizability of the results. As every method has its limitations, testing the same theory using different methods would be a good way to address limitations of experimental design methodology employed in this study. For example, a deductive case-based analysis might be particularly useful for delving more deeply into contextual factors influencing leadership and stages of supply chain disruption.

Several additional directions for future research should be noted as well. While past research in SCM has focused extensively on overarching strategic aspects of the discipline (Cousins et al. 2006), more recent research has called for attention to be paid to the "people" dimensions that contribute to supply chain functions (Wieland et al. 2016). To date, little research has examined the differences between leadership in supply chains, versus in other

management contexts in which it has been studied (Thornton et al. 2016). As supply chain managers continue to assume executive roles in the upper echelons of the corporate hierarchy, pointing to the increasing strategic importance of supply chain management (Wagner and Kemmerling 2014), we would argue for the need for future studies examining aspects of leadership within supply chain management.

Additionally, previous research highlighted that leadership traits in response to different types of SC disruptions may vary. For example, unexpectedness, complicatedness, and duration of SC disruption require variations on leadership emphasis (Lukina et al. 2017). Each SC disruption has the potential to be a uniquely unusual event such that the leader would need to customize the recognition, response, and recovery efforts (Anand and Ward 2004). Thus, future research might study whether the leadership styles vary based on the type and characteristics of SC disruption.

Finally, this study examines leadership styles to various stages of SC disruptions. Given the noted variability of disruptions, opportunities for future research might include an examination of other disruption types common to supply chain management. These could consist of stock-outs, natural disasters, and others, which can have detrimental effects that ripple throughout the supply chain. Moreover, the regulatory concerns of individual countries might partially affect the speed of a response. Leadership under conditions where the public-private partnership has an extensive role may be of importance to managers.

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FIGURE 1

Stages of the Disruption and Leadership Style

Disruption Life-Cycle

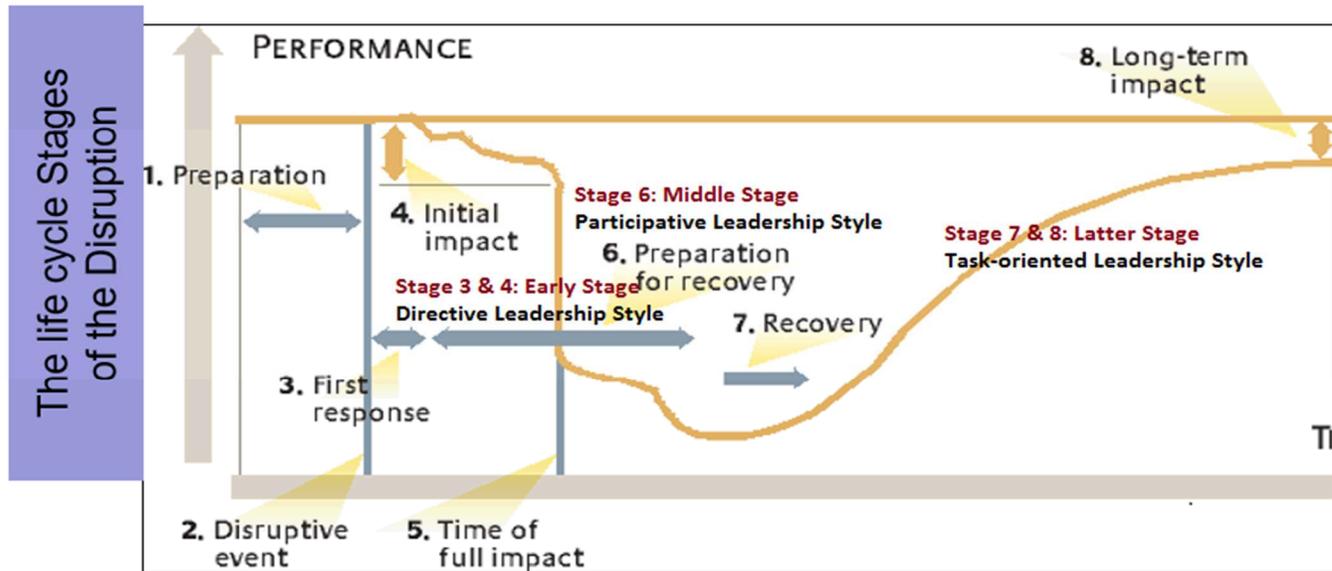


TABLE 1 How crisis management and supply chain literature explains the role of a leader

	Author (year)	Key Findings	Task performed
Directive Style	House 1971	A decisive decision making style is important for a leader during crisis to generate a precise assessment.	Situational Assessment
	Shenkman 2000	One of the qualities of a great president during crisis is decisiveness to direct quick immediate response.	Immediate response
	James et al. 2005	Effective crisis leadership involves the leaders' ability to make wise and rapid decisions to control the damage.	Containment
	Van Wassenhove 2005	When facing a humanitarian crisis, leaders often need to take actions quickly to direct all entities to respond.	Immediate response
	Ginter et al. 2006	When responding to crisis, high reliability teams need to have clear and decisive leaderships to guide.	Situational Assessment
	Cavanaugh et al. 2008	As the damage cause by disruption grows, the need for a directive and determined leader grows.	Containment
	Peterson et al. 2008	Nonprofit firms prefer leaders to use directive behavior to supportive behavior in a crisis to identify the issue.	Diagnosis
	Tatham et al. 2010	An effective crisis manager needs to emphasize immediate results and decisiveness over inclusiveness.	Immediate response
	Bechky et al. 2011	During emergencies, SWAT team officers are required to reinforce task activities, and make timely decisions.	Immediate response
	Van Wart et al. 2011	Decisiveness is the top competency for emergency managers to assess and determine the scope of damage.	Situational Assessment
	Stern 2013	Leaders need to immediately make crucial decisions in a timely fashion under difficult conditions.	Immediate response
	DuBrin 2014	Directive and decisive leaders are successful in extreme contexts to quickly spot the issue.	Diagnosis
Haddon et al. 2015	During financial crisis, employees expect leaders to take actions quickly and provide rapid response.	Immediate response	
Participative Style	Pillai et al. 1998	Leader need to engage in intensive interaction in group problem solving situations to find a crisis solution	Collaboration
	Spekman et al. 1998	SC managers' trust and commitment contribute to performance as the elements of collaboration.	Collaboration
	Hunt et al. 1999	An effective leader uses involvement by a broad representation of parties to surface the best course of action	Solution generation
	Parker et al. 2002	SC manager should be an integrator who coordinates activities from product concept to delivery across firm.	Coordination
	Yukl et al. 2005	During crisis, primary role of a leader is to help members come together in support to find a solution	Solution generation
	Mumford et al. 2007	The nature of the crisis presented to leaders inherently involves others and other systems to coordinate multiple pieces of information; collaboration and coordination are critical to a leaders' ability to address crises.	Coordination Information sharing
	Uhl-Bien et al. 2007	Leaders need a capacity to rapidly explore solutions by involving everyone to respond to environmental crisis	Solution generation
	Boin et al. 2008;	Crisis incidents require leaders to involve everyone in the extensive solution debate and information search	Solution generation
	Hannah et al. 2009	Extreme events often require collective and even multi-agency actions to identify the crisis resolution.	Collaboration
	Youn et al. 2012	Integrative leadership with shared goals improves intangible and value-based SC performance goals.	Information sharing
Sheffi 2015	Leader involves all parties and applied free-flowing communication to identify the best solutions to an issue	Solution generation	
Task-oriented Style	Mulder et al. 1971	Leader needs precise, active, regulated task-accomplishment skills to respond to emergencies.	Resolving the crisis
	D'Aveni et al. 1990	After the crisis hits, the managers of successful firms will be engaged in planning processes to resolve the issue	Resolving the crisis
	Fleishman et al. 1991	Effective leadership derives from the ability to facilitate group social needs alongside task-oriented objectives.	Resolving the crisis
	Kovoor-Misra 2002	In crisis, managers' task-role schemas pertain to the various tasks and roles that they are expected to perform	Evaluation of processes
	Mumford et al. 2001	During crisis, leaders need to break down the recovery plan into delegable tasks, prioritize among the tasks, ensure that resources were being effectively applied, and keep an eye for other potential mishaps	Evaluation of processes Resolving the crisis
	Devitt et al. 2008	To implement the solution during crisis, a leader participates in planning and modifies plans if required in response to situation, encourages task completion and checks that the tasks are being appropriately undertaken	Solution implementation Evaluation of processes
	Kapucu et al., 2008	The lack of planning and task coordination was one of major failures when resolving Hurricane Katrina	Resolving the crisis
	Hunter et al. 2009	Leaders who address issues objectively and systematically are better suited for returning firms to normalcy	Resolving the crisis
	Liu et al. 2009	A plan is necessary for successful crisis management to guide the actual process of managing a crisis	Solution implementation
	Fawcett et al 2010	SC manager needs to not only distribute tasks among key SC functions, but also keep them rolling in synch.	Resolving the crisis
	Van Wart et al. 2011	Leaders need to be able to delegate tasks and assign roles in order to guide crisis resolution effectively	Solution implementation
	Ambulkar et al. 2016	SC managers should have a greater level of ability to acquire, disseminate, and integrate external knowledge.	Solution implementation

TABLE 2

Demographics

<i>Respondents Characteristics</i>	<i>N of Subjects</i>	<i>%</i>	<i>Respondents Characteristics</i>	<i>N of Subjects</i>	<i>%</i>
Age	42.5*	9.3**	Hierarchical position		
Gender			Junior manager	10	9.90%
Male	63	62.38%	Senior manager	19	18.81%
Female	39	37.62%	Director	31	30.69%
Industry			Executive Director & higher	39	38.61%
Consulting	8	7.92%	Missing	2	1.98%
Defense and Security	17	16.83%	Professional Experience (at current position)		
Healthcare	18	17.82%	<2 years	33	32.67%
Pharmaceutical	39	38.61%	3-5 years	29	28.71%
Food production & distribution	15	14.85%	6-10 years	16	15.84%
All remaining	4	3.96%	>10 years	19	18.81%
Function			Missing	4	3.96%
Analytics	9	8.91%	Disruption Experience (Similar to the one described in scenario)		
CEO	17	16.83%	Never encountered	39	38.61%
Operations & Planning	19	18.81%	Encountered once	22	21.78%
Product development	12	11.88%	Encountered several times	19	18.81%
Procurement	19	18.81%	Encountered regularly	17	16.83%
Supply chain & Logistics	21	20.79%	Missing	4	3.96%
Missing	4	3.96%	Total	101	100%
Total	101	100%			

* Mean

** SD

TABLE 3

Summary of results

Hypotheses	Leadership Style	Disruption Stage	Statistical Value	Results
H1a	Directive Leadership	Early Stage	$\chi^2 = 25.77, p = .00$	Supported
H1b	Participative Leadership	Middle Stage	$\chi^2 = 10.52, p = .02$	Supported
H1c	Task-oriented Leadership	Latter Stage	$\chi^2 = 7.471, p = .02$	Supported

TABLE 4

Classification results (means) for three stages of SC disruption

Cluster N	Early Stage		Middle Stage		Latter Stage	
	Agreed****	Disagreed	Agreed	Disagreed	Agreed	Disagreed
Hierarchy*	1.90	1.85	2.30	1.61	1.87	1.78
Familiarity**	1.59	1.70	1.85	1.44	1.83	1.93
Experience***	1.97	1.84	2.21	1.61	2.02	1.81
Cluster Size	21 (61.8%)	13 (38.2%)	15 (45.5%)	18 (54.5%)	18 (52.9%)	16 (47.1%)

* 1=Senior and Junior Manager, 2= Director, 3= Executive Director

** 1=Low Familiarity, 2=Medium Familiarity, 3=High Familiarity

*** 1=Low Experience, 2=Medium Experience, 3=High Experience

**** Agreed/Disagreed with Hypotheses proposed

Appendix: Scenario-based Situation

Common module		
<p>You are the CEO for ABC Foods Corporation, a global multinational firm. ABC Foods is a food production and distribution company headquartered in North America. ABC Foods is one of the country's largest producers, distributors, and marketers of branded processed food for the U.S. retail market.</p>		
Experimental cues module		
<p>You have just been made aware of a product contamination in your manufacturing facilities. The product contamination has caused several of your suppliers, manufacturing distributors and warehousing operations to be affected. Some of your important tier 1 and tier 2 suppliers have already been affected. Several suppliers that provide raw material and components to your facility have announced that they will shut down production for several days because of contamination issues. However, your company is still operating and no actions have been taken yet. There is no information about the source of the contamination or the extent of the damage. It is unclear to what extent and for how long the suppliers' operations will be closed down and when they will resume operating at full capacity. However, delays in responding and resolving the disruption at your plant will accelerate the costs to recover from it at your tier 1 and tier 2 supplier level. Despite the criticality of the situation, there has been no loss of life or illness so far.</p> <p>This is the initial stage of your response and recovery effort. As it stands you are not aware of what caused the contamination or how severe it is. At the moment, there is no accurate information about whether the situation will get better or worse in the hours, days and weeks to come. Additionally, it is unclear how many products are contaminated and whether the contamination will occur at other plants. As far as you can tell, nobody has taken any actions so far and are waiting for the person in charge to direct them.</p>	<p>You were out of your office and unable to communicate with your staff for several days. You have just been made aware of a product contamination in your manufacturing facilities. The product contamination, which was acknowledged mid-last week, has caused several of your suppliers, manufacturing distribution and warehousing operations to be affected. Several suppliers that provide raw material and components to your facility shut down production for several days because of contamination issues. It is unclear to what extent and for how long the suppliers' operations will be closed down and when they will resume operating at full capacity. However, delays in responding and resolving the disruption at your plant will accelerate the costs to recover from it at your Tier1 and Tier 2 supplier level. Despite the criticality of the situation, there has been no loss of life or illness so far.</p> <p>This is the mid-stream stage of your response and recovery effort. While you are aware of what caused the contamination and how severe it is, how to resolve the issue is not clear. While you were gone, your company has been able to identify the cause of contamination and the extent of the damage that needs to be addressed. Initial efforts to contain the issue are already underway. Areas of facilities with potentially affected products have been quarantined. Additionally, your team identified the source of contamination and to stop it from spreading. Multiple departments are ready to continue working towards finding resolution to the issue, even though information about the possible solutions is incomplete. Additionally, it is unclear what directions should company take to effectively recover from the disruption.</p>	<p>You were out of your office and unable to communicate with your staff for over a week. You have just been made aware of a product contamination in your manufacturing facilities that was initiated a week and half ago. The product contamination has caused several of your suppliers, manufacturing distribution and warehousing operation to be affected. Some of your important tier 1 and tier 2 suppliers have been affected. Several suppliers that provide raw material and components to your facility shut down production for several days because of contamination issues. It is unclear to what extent and for how long the supplier's operations will be closed down and when they will resume operating at full capacity. To resolve the disruption at your plant requires collaboration among your suppliers and employees. Despite the criticality of the situation, there has been no loss of life or illness so far.</p> <p>You enter the scene in the latter stage of dealing with this disruption. A fair amount of effort in identifying the cause of the contamination and finding ways to address it have been completed. The extent of the contamination has been recorded and facilities with potentially contaminated product areas have been quarantined. Additionally, your team was able to identify the source of contamination and to stop the spreading of it. Several executive meetings internal to the organization and with suppliers have been held since early last week. During these meetings, the situation was analyzed, the executives were able to diagnose the issues and to identify the direction for the recovery. However, while you are aware of what caused the contamination and how to address it, there is need to take action to implement the plan and to get back to normal operations.</p>
Common module		
<p>The entire organization is waiting for you to make your decision. Given the critical nature of the situation, you are trying to determine the right person from the list of your executives to place in charge of this disruption. The person will be responsible for providing responses and recovery strategies. The individual will also work closely with tier 1 and tier 2 suppliers to re-establish the flow of goods and get the supply network back on line so that customers are affected minimally. You can change the leader later, but right now you need to place in charge the person you think is best suited in the current circumstances.</p>		