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ENVIRONMENTAL DAMAGE: WHEN ANGER CAN LEAD TO SUPPLIER DISCONTINUITY

Dano ambiental: Quando a raiva pode levar à descontinuidade do fornecedor

Daño ambiental: Cuando el enojo puede conducir a la discontinuidad del proveedor

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ABSTRACT

This study analyzed the direct and indirect effects of controllability and responsibility on supplier discontinuity following environmental damage. Data were collected through a scenario-based experiment from 267 individuals with management experience. The results indicated that controllability has an influence on supplier discontinuity, as does anger (a negative emotion), when the supplier, rather than nature, has control over the environmental damage caused. The indirect effect of controllability was partially explained by anger. The direct and indirect effects of responsibility, on the other hand, were not significant, and were partially explained in a moderating role in the relationship between controllability and the non-retention of suppliers following environmental damage. The study contributes by identifying the behavioral role of the negative emotion that is experienced during management crises, thus having an influence on the decision making of individuals that is related to the discontinuity of suppliers following environmental damage.

KEYWORDS | Green purchasing, supplier discontinuity, controllability, supplier responsibility, experiment.

RESUMO

O estudo analisou os efeitos diretos e indiretos da controlabilidade e da responsabilidade na descontinuidade do fornecedor após dano ambiental. Os dados foram coletados junto a 267 indivíduos com experiência em gestão, por meio de um experimento baseado em cenários. Os resultados indicaram que a controlabilidade influencia a descontinuidade do fornecedor, bem como a ira do comprador, quando o fornecedor, e não a natureza, possui controle sobre o dano ambiental ocorrido. O efeito indireto da controlabilidade foi parcialmente explicado pela ira sentida. Já os efeitos direto e indireto da responsabilidade não mostrou significância, sendo parcialmente explicado de maneira moderadora na relação entre a controlabilidade e a descontinuidade do fornecedor após o dano ambiental. O estudo identifica o papel comportamental de uma emoção negativa experimentada durante crises gerenciais, influenciando as tomadas de decisões de indivíduos quanto à descontinuidade do fornecedor após a ocorrência de um dano ambiental.

PALAVRAS-CHAVE | Compras sustentáveis, descontinuidade do fornecedor, controlabilidade, responsabilidade do fornecedor, experimento.

RESUMEN

El estudio analizó los efectos directos e indirectos de la controlabilidad y la responsabilidad sobre la discontinuidad del proveedor después del daño ambiental. Los datos fueron recolectados de 267 personas con experiencia en gestión, a través de un experimento basado en escenarios. Los resultados indicaron que la controlabilidad influye en la discontinuidad del proveedor así como la ira del comprador cuando el proveedor, y no la naturaleza, tiene control sobre el daño ambiental ocurrido. El efecto indirecto de la controlabilidad fue parcialmente explicado por la ira sentida. Los efectos directo e indirecto de la responsabilidad, por otro lado, no fueron significativos y se explicaron parcialmente como una manera moderadora en la relación entre la controlabilidad y la discontinuidad del proveedor después del daño ambiental. El estudio identifica el rol conductual de una emoción negativa experimentada durante las crisis gerenciales, influyendo en la toma de decisiones de los individuos con respecto a la discontinuidad del proveedor después del acaecimiento de un daño ambiental.

PALABRAS CLAVE | Compras verdes, discontinuidad del proveedor, controlabilidad, responsabilidad del proveedor, experimento.

INTRODUCTION

The level of awareness of global warming and other environmental issues has increased significantly, causing companies to become concerned with sustainable purchasing (Chin, Malik, Tat, Sulaiman, & Choon, 2020). Sustainable purchasing, or green purchasing (GP), encourages the purchase of sustainable raw materials, and is the choice of suppliers that pursue pro-environmental policies (Jabbour, Jabbour, Govindan, Kannan, & Arantes, 2014; Tseng, Islam, Karia, Fause & Afrin, 2019). Recent studies reveal that investing in GP enables companies to improve their economic, social, and environmental performance (Ghosh, 2018; Yook, Choi & Suresh, 2017; Yu, Zhang, & Huo, 2019).

Sony, for example, has built a GP network and purchases all of its environmentally friendly components from suppliers that are called “green partners”. Similarly has the Volvo Group, which has implemented GP activities with its suppliers to improve environmental and economic performance (Yook et al., 2017). On the other hand, in 2010 consumers retaliated against Nestlé because of the unsustainable performance of its palm oil supplier, leading to consumers holding Nestlé responsible for environmental damage (Hartmann & Moeller, 2014).

Today, procurement professionals seek to select suppliers that are aligned with pro-environmental practices through GP (Foo, Kanapathy, Zailani, & Shaharudin, 2019). Environmental damage caused by the effect of responsibility or controllability issues, in addition to harming the environment, can affect the relationship between buyer and supplier. This research, therefore, aims to analyze the direct and indirect effect of controllability and responsibility on the non-retention of suppliers following environmental damage.

Previous studies did not analyze any of the possible direct or indirect effects of controllability and responsibility, or the indirect effects mediated by anger (a negative emotion/reaction), on discontinuing suppliers after the occurrence of environmental damage in the context of GP. Harth, Leach and Kessler (2013) examined the effects of anger of a group of individuals on types of environmental behavior and showed that holding the group accountable for environmental damage increased the guilt and anger they experienced. Polyviou, Rungtusanatham, Reczek and Knemeyer (2018) analyzed the direct and indirect effects mediated by anger, controllability and responsibility on interrupting the supply of critical components. The present study addresses a gap in the literature and differs from the study by Polyviou et al. (2018) because it adds sustainable aspects to its scope, and analyzes the level of anger experienced and its effect on the non-retention of suppliers following environmental damage, unlike the previous study that focused on the effects of supply disruption.

THEORETICAL FRAMEWORK AND DEVELOPMENT OF HYPOTHESES

Supplier selection and continuity

GP practices include selecting suppliers that offer environmentally friendly materials and services (Chin et al., 2020). Therefore, it is necessary to rethink the criteria for purchasing and selecting materials, and evaluating and developing suppliers that meet the company’s environmental objectives (Garzon, Enjolras, Camargo, & Morel, 2019; Teixeira, Jabbour, Jabbour, Latan, & Oliveira, 2016). This involves actively managing both sides in all aspects of the product, from the raw material to correct disposal.

Selecting the right suppliers is one of the essential tasks of purchasing, a process that directly reduces risk and maximizes overall value for the buying organization (Chin et al., 2020). This also strengthens the company's social and economic structure by minimizing its costs and ensuring consumer satisfaction (Zimmer, Fröhling, & Schultmann, 2016). Companies have increasingly sought to incorporate sustainable suppliers into their operations and processes, because they help improve their environmental performance and, consequently, their corporate image (Fong, García-Alcaraz, Maldonado, Ramírez, & Loya, 2019).

The factors associated with those negative impacts that affect the environment during the production and operation process have increased significantly (Rao, Goh, & Zheng, 2017). As a result, consumers have become increasingly concerned with purchasing sustainable products, which makes the relationship between companies and suppliers a vital part of supply chain management, making it necessary to adopt ecological criteria for a “green” supply chain (Ji, Ma, & Li, 2015). The first step in protecting the environment and implementing a “green” supply chain is to select sustainable suppliers and buy environmentally friendly raw materials (Kannan, Mina, Nosrati-Abarghoee, & Khosrojerdi, 2020). Suppliers, therefore, play a key role when implementing sustainable supply chain initiatives and achieving social, environmental and economic gains (Luthra, Govindan, Kannan, Mangla, & Garg, 2017).

When selecting a supplier, it is important to determine the risks inherent in supply continuity (Tsai, 2016). Supplier discontinuity due to natural or man-made disasters are catastrophic events albeit with a low probability of occurring, but when experienced in business they have negative impacts (Sawik, 2014). One example is the case of Ericsson. A fire at the factory of one of its microchip suppliers (Philips) destroyed a large amount of electronic components, in addition to producing serious environmental damage, causing Ericsson to suffer an approximate loss of € 400 million (Meena & Sarmah, 2016). When a supplier is held responsible for actions that are controllable, customers are likely to become angry and retaliate (Folkes, 1984; Sung & Yih, 2019). Negative critical incidents, such as environmental damage, can be perceived as determining factors of a company's dependence on the supplier.

Controllability and supplier discontinuity following environmental damage

Controllability is a relevant factor in responding to adverse events such as supplier discontinuity, and refers to an individual's assessment of whether the cause of the event could or could not have been controlled by the supplier (Folkes, 1984; Nikbin, Hyun, Iranmanesh, Maghsoudi, & Jeong, 2016). Studies use the term controllability to characterize sources of risk and failure that a company can avoid (Choi & Mattila, 2008; Grégoire & Fischer, 2006; Nikbin et al., 2016).

In the context of supplier discontinuity, controllability determines whether the supplier could have done something to prevent the supply interruption (Polyviou et al., 2018). When an unsustainable supplier incident is caused by uncontrollable factors (e.g., by nature), as opposed to internal and controllable factors (e.g., failures and disasters caused by the supplier), this leads buyers to attribute less responsibility to the supplier for the damage caused (Hartmann & Moeller, 2014). Supplier controllability therefore, (Polyviou et al., 2018) has an impact on supplier discontinuity and can produce strongly negative responses from buyers if they perceive that the supplier had the ability to prevent a negative event but did not (Nikbin et al., 2016). Thus, the following hypothesis is suggested:

H1: When the environmental damage can be controlled by the supplier, the effect on purchasing discontinuity is significant.

Responsibility and supplier discontinuity following environmental damage

Responsibility can be defined as the extent to which, when making a decision, someone has a sense of ownership of the result, giving him/herself credit for good results and blaming him/herself for bad results (Botti & McGill, 2006). Individuals are considered responsible for the occurrence of an event, of actions that have occurred, or that could have been foreseen (Munyon, Jenkins, Crook, Edwards, & Harvey, 2019). In the context addressed here, responsibility refers to the task of selecting suppliers before any environmental damage occurs. It deals with the fact that the person responsible for purchasing, or someone else (for example, their predecessor), recommended this particular supplier (Polyviou et al., 2018). Occurrence of the event, therefore, can be considered the responsibility of either another person, or of the person who currently performs the activity (Frijda, 1987).

Responsibility can introduce bias in purchasing decisions after environmental damage. When the person responsible for the purchases has recommended the supplier, the probability of continuing with this supplier after an interruption in supply will be great, because of expenses with financial and human resources, and because of the time required to search for, evaluate and select a new supplier (Polyviou et al., 2018). On the other hand, it is less likely that the person responsible for purchasing, but who did not recommend the supplier will maintain a relationship after the environmental damage, since he/she has not invested resources in the supplier, and therefore may be less committed to it. Thus, the probability that a person responsible for purchases will not continue with a supplier after environmental damage is greater when someone else, not he/she, recommended it. Thus, the following hypotheses are suggested:

H2: The effect of environmental damage on purchase discontinuity is greater when the supplier was selected by a third party rather than by the current manager of the department.

H3: Responsibility for supplier selection moderates the relationship between the controllability of environmental damage and supplier discontinuity.

Anger

Emotions in the field of psychology are generally divided into those that are negative, such as anger, fear, guilt, shame, sadness and disgust, those that are positive, such as happiness, pride, love and relief, and other emotional phenomena, such as hope and compassion (Lazarus, 1991). Anger, for instance, is considered one of the most powerful of the negative emotions that impact social relations (Lazarus, 1991) and organizational processes and results (Kumar, Kleef, & Higgins, 2019). Anger is often experienced during managerial crises (Lerner & Tiedens, 2006) and influences interpretations, judgments and individual decision making in relation to the perception of controllability and responsibility after the occurrence of a negative event (Lerner & Keltner, 2000; Lerner & Tiedens, 2006). Harth et al. (2013) indicated that the responsibility of a group of individuals for causing environmental damage should lead to less pride, and more guilt and anger. Hartmann and Moeller (2014) point out that individual reactions to negative incidents involving environmental issues are of an emotional and behavioral nature, so that buyers express anger on behalf of the organization they are responsible for, which thus influences their purchase decisions. Similarly, Liang, Hou, Jo and Sarigöllü (2019) claim that people feel anger towards a company's environmentally irresponsible behavior, and the effects caused.

One of the main dimensions of the evaluation that distinguishes anger in the context of consumption is responsibility, or close control over the negative event (Sung & Yih, 2019). Anger influences the most basic

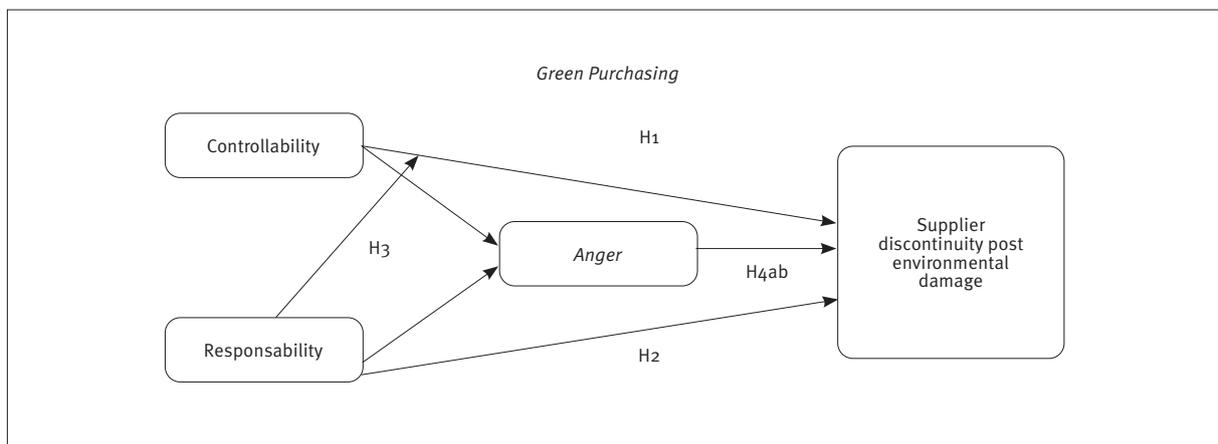
situational interpretations when it comes to judgment and decision-making: perceptions of control and responsibility remain even after critical events (Lerner & Tiedens, 2006). When negative critical incidents occur due to supplier failure, because of a lack of controllability and/or irresponsible actions, buyers experience anger and are likely to re-evaluate continuing with that supplier (Vidal, 2014). When negative critical incidents are attributed to actions that are controllable by the supplier, buyers are more likely to experience anger as a negative emotion with regard to the event (Folkes, 1984; Nikbin et al., 2016). On the other hand, when responsibility for selecting this supplier is attributable to other people, their anger is likely to increase because of the event that occurred (Rummelhagen & Benkenstein, 2017). Therefore, the following hypotheses are suggested:

H4a: The effect of controllability on supplier discontinuity following environmental damage is mediated by the amount of anger experienced.

H4b: The effect of responsibility on supplier discontinuity following environmental damage is mediated by the level of anger experienced.

Based on these hypotheses, the conceptual model of the research is now presented, indicating the direct and indirect effects of controllability and responsibility mediated by anger on supplier non-retention following environmental damage (Figure 1).

Figure 1. Conceptual Model



Source: Adapted from Polyviou et al. (2018).

METHODOLOGICAL PROCEDURES

In order to test the proposed hypotheses, we decided to carry out a scenario-based experiment manipulated by means of vignettes (Rungtusanatham, Wallin, & Eckerd, 2011). This method is ideal for studying human judgments, preferences and decisions involving complex phenomena that are difficult to observe in real time (Chen, Rungtusanatham, & Goldstein, 2019; Eckerd, 2016), as is the case with this study, which aims to verify the direct and indirect effects of manipulating controllability and responsibility on supplier discontinuity after an environmental damage situation, in the context of green purchasing.

Vignette design

Data were collected using a 2x2 factorial design (between subjects), which manipulated variables (controllability: nature and supplier; and responsibility: one's own and someone else's) involved four different vignettes and a common module (describing the situation around the experiment). The vignettes had been previously validated in English in the study by Polyviou et al. (2018), and adapted to the context of GP. They were reviewed by three professionals in the operations and supply chain areas, one of whom is a native English speaker. Pre-testing the vignettes was unnecessary, according to the research by Ro, Su and Chen (2016) and Chen, Ro and Su (2014), who similarly adapted validated vignettes from other studies into the interruption of the buyer-supplier relationship.

STIMULI FOR CONTROLLABILITY AND RESPONSIBILITY

The vignettes include descriptions for the two experimental factors, controllability and responsibility, which were adapted from Polyviou et al. (2018). For controllability, an environmental disaster situation at the supplier, Thai Electronic, is described as being either controlled by nature or by the supplier. For responsibility, the vignette describes two individuals in the role of Reliable Digital's purchasing director, the predecessor (someone else's responsibility), and the current director (own responsibility), and questions who had led the purchasing team that assessed and recommended Thai Electronic to the top management of Reliable Digital as its main supplier.

Dependent variables

At the end of each descriptive vignette, the subjects were faced with questions about the study's dependent variables: anger and supplier discontinuity following environmental damage. To measure anger, after reading the vignette the respondent was asked to determine how much anger he/she felt when they found out about the environmental damage caused by supplier, Thai Electronic. The variable was operationalized on a 7-point Likert scale, varying from 1 for "not at all" to 7 for "extremely". In order to assess supplier non-retention following environmental damage, after reading the vignette the subject had to make a decision on how likely he/she would retain Thai Electronic as the main supplier of one of the company's electronic components. The variable was also operationalized on a 7-point Likert-type scale, ranging from 1 for "unlikely" to 7 for "very likely".

Sample definition and collection

The research participants were defined through the use of an online platform, Prolific (www.prolific.co), which has been used by many researchers in recruiting participants for experiments in social and economic sciences (Palan & Schitter, 2018). For example, in the operations and supply chain domain, Nunes, Park and Paiva (2020) used the Prolific platform to recruit participants. The study's participants are professionals with management experience, who were born in the United States (USA) and are over 18 years old.

The final sample consisted of 267 participants, 134 of whom were female (50.02%), 132 were male (49.04%) and one was not informed (0.4%). The average age of the subjects was 37.33 (± 11.59) years old, and their familiarity with the purchasing area or supply chain management had an average of 4.16 (± 1.31) on a 7-point Likert-type scale,

ranging from 1 for "yes" to 7 for "no", and an average of 4.01 (± 1.32) for familiarity responses to environmental damage in the supply chain (using the same scale). The fitness of the sample size was subsequently assessed using the G * Power 3.1.9.4 software. Therefore, the following parameters were observed: (a) the recommended statistical power (0.80); (b) the effect size ($f = 0.25$); (c) the total of the groups ($2 \times 2 = 4$); and (d) the degrees of freedom for the numerator ($2 - 1 = 1$). The minimum sample calculated was estimated at 128 cases, indicating that the sample size in this study is adequate. A high statistical power ensures that a non-significant relationship ($p > 0.05$) is really refuted in the study, thus avoiding the occurrence of type 2 error (false negative) (Steiger, 2009).

Experimental procedures

After being recruited via the online platform, the 267 subjects were randomly assigned (random assignment) to one of the four experimental conditions by way of the A/B test provided by SurveyMonkey Inc. When faced with the vignettes, the participants had to assume the role of the Purchasing Director for Reliable Digital. While participants were reading the task, they were asked questions to check their attention to the information provided in the descriptive vignettes. When they had finished reading, they had to answer questions regarding the discontinuity of the supplier following environmental damage and anger. The experiment ended by collecting the answers with regard to the experimental verifications (realism and manipulation checks) and the demographic data of the participants.

Experimental checks

Two questions adapted from Polyviou *et al.* (2018) were asked with the intention of checking the participants' attention. The first questioned the respondent's role in the context of the vignette (if in that situation he/she was the Human Resources Manager or the Purchasing Director), and the second asked the subject whether Thai Electronic supplied hard drives or rubber. In both cases, 98.5% of respondents gave the correct answer. Although the attention error of respondents was low, participants whose answers were incorrect were eliminated, which explained the size of the final sample of 267 subjects.

To determine how realistic the experiment was, two questions that were also adapted from the study by Polyviou *et al.* (2018) were used, both operated on a seven-point Likert scale, ranging from 1 for "strongly disagree" to 7 for "strongly agree". The first question, asking whether "this scenario is realistic", averaged 4.99 (± 1.43) and the second question, "I seriously took on the role designated as Purchasing Director for Reliable Digital", averaged 6.25 (± 1.10), showing that the participants considered the scenarios to be realistic.

Although this study used previously validated vignettes, a manipulation check was used. For the controllability variable, subjects were asked to assess the extent to which the environmental damage caused by Thai Electronic was under the control of nature or of the supplier, on a seven-point Likert-type response scale, ranging from 1 for "the supplier was controlling the damage" to 7 for "nature was controlling the damage". The ANOVA results indicated significant differences between the subjects assigned to each group ($F_{1, 265} = 130,651$; $p < 0.000$), whose average for "supplier control" was 2.62 (± 1.72), and for "nature control" was 5.09 (± 1.80). For the responsibility variable, subjects were asked to indicate who they thought was responsible for evaluating and recommending the supplier, Thai Electronic, using a seven-point Likert response scale (1: "I was responsible"; 7: "Another person was responsible"). The ANOVA results also indicated significant differences between the subjects in each group ($F_{1, 265} = 362,787$; $p < 0.000$), whose average "own responsibility" was 1.70 (± 1.59) and "someone else's responsibility" was 5.79 (± 1.91).

ANALYSIS OF RESULTS

Control variables

The results of the control variables (Table 1), gender, age, familiarity with purchasing/supply chain management (Familiarity 1), and familiarity with environmental damage in the supply chain (Familiarity 2) presented only the variable “age” as negative and significant ($b = -0.02$; $p < 0.05$), indicating that the younger the participant, the greater the anger experienced (Model I). When the same control variables are analyzed in Model II, only the “Familiarity 2” variable was found to be positive and significant ($b = 0.28$; $p < 0.01$), suggesting that when the subjects are familiar with environmental damage in the supply chain, there is a greater likelihood of them continuing with the current supplier.

Table 1. Regression tests

Dependent variables	Model I		Model II	
	<i>Anger</i>		<i>Continuity of supplier</i>	
	b	SE	b	SE
(Constant)	5.4186***	0.5676	3.1159***	0.5778
Experimental variables				
Controllability	1.1886***	0.2142	-0.5291**	0.1984
Responsibility	-0.3567	0.2138	0.3134	0.1882
Interaction				
Controllability x responsibility	0.5685	0.4279	-0.3854	0.3759
Mediator				
Anger	-	-	-0.2266***	0.0544
Control variables				
Gender	-0.3819	0.2125	0.0470	0.1872
Age	-0.0221*	0.0094	-0.0036	0.0083
Familiarity1	0.0633	0.1060	-0.0553	0.0929
Familiarity 2	0.0489	0.1023	0.2763**	0.0896
R	0.3774		0.4144	
R ²	0.1424		0.1717	
R ² change	0.0058		0.0034	
F-statistic	1.7651***		1.0512***	
N	267		267	

Note: Significance level * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.
Estimated models using a confidence interval with 10,000 samples (*bootstrap*.)

EFFECTS OF CONTROLLABILITY, RESPONSIBILITY AND ANGER ON SUPPLIER DISCONTINUITY

To check the hypotheses, multiple regression analysis was performed using the Process macro (Hayes, 2018). Based on the results of Model II (Table 1), it was possible to identify that anger has a negative and significant effect on supplier discontinuity ($b = -0.23$; $p < 0.001$). The more anger experienced, the less likely he/she is to keep the supplier after the damage. The result of the direct effect of controllability on supplier continuity is negative and significant ($b = -0.53$; $p < 0.01$). When the environmental damage caused is under the supplier's control, the probability of discontinuity is greater, which supports hypothesis H1. On the other hand, the direct effect of responsibility on supplier continuity is positive and not significant ($b = 0.31$; $p = 0.09$), thus not confirming hypothesis H2. The probability of discontinuity after environmental damage is higher when the person who selected the supplier was someone else, but the relationship was not significant in the model.

Regarding the interaction between controllability and responsibility on supplier continuity, the results show a negative and non-significant relationship ($b = -0.39$; $p = 0.38$). Analysis of the conditional effect of responsibility on the relationship between controllability and supplier discontinuity (Table 2), however, using the Johnson-Neyman technique, shows that when responsibility is one's own, the effect is negative and significant ($b = -0.72$; $p = 0.01$). When the responsibility lies with someone else, the effect remains negative, but not significant ($b = -0.34$; $p = 0.22$), thus partially supporting hypothesis H3.

Table 2. Conditional moderator effects of responsibility

Responsibility	Effect	SE	t	p	LLCI	ULCI
-0.5000	-0.3364	0.2759	-1.2193	0.2239	-0.8797	0.2069
0.5000	-0.7218*	0.2707	-2.6670	0.0081	-1.2548	-0.1889

Note: Significance level * $p < 0.01$

Legend: -0.5 = someone else's responsibility; 0.5 = one's own responsibility.

The indirect effect of controllability on supplier continuity due to anger is negative and significant ($b = -0.27$; $p < 0.01$), suggesting that when subjects perceive that the environmental damage was under the supplier's control, they feel angrier and are more likely to discontinue the supplier. However, this indirect effect of controllability is less intense than its direct effect on supplier continuity ($b = -0.53$; $p < 0.01$), partially supporting hypothesis H4a. Thus, anger is a present condition, but not necessary for the decision to discontinue the supplier after environmental damage.

Responsibility, on the other hand, does not have a significant effect on anger ($b = -0.36$; $p = 0.09$), nor does it have a direct and significant effect on supplier continuity, which does not support hypothesis H4b. Therefore, responsibility has no significant direct or indirect influence on supplier continuity.

DISCUSSION AND IMPLICATIONS

The results of the controllability effect on supplier discontinuity after environmental damage confirmed hypothesis H1, providing theoretical and empirical evidence that when the environmental damage caused is under the supplier's control and not under nature's control, there is less probability of retaining this supplier. When the

buyer believes that an event could have been avoided by supplier controllability, the likelihood of discontinuity is greater (Nikbin *et al.*, 2016). Polyviou *et al.* (2018) pointed out that the probability of discontinuing the supplier after a supply interruption is greater when the purchasing manager realizes that the supplier, rather than nature, had control over the interruption event. Therefore, according to the results of Polyviou *et al.* (2018), the present study identified that when the environmental damage caused could have been controlled by the supplier, and therefore was not caused by nature, there was a greater probability of discontinuity. Buyers attribute greater responsibility for the supplier's unsustainable behavior when the negative incident could have been controlled at the company's internal manufacturing sites, rather than in external event situations such as, for example, natural events (Hartmann & Moeller, 2014).

The results associated with controllability indicate that individuals react negatively when they believe that the supplier could have avoided a negative event and did not do so (Choi & Mattila, 2008; Nikbin *et al.*, 2016), which can lead to supplier discontinuity after environmental damage. In events such as supply discontinuity, purchasing managers do not assign responsibility to the supplier when the event is uncontrollable (Timmer & Kaufmann, 2019). However, as Grégoire and Fischer (2006) pointed out, when the company is responsible for a failure that could have been controlled and prevented, there is likely to be retaliation on the part of the buyer due to the negative consequences. The present study observed that the supplier's lack of control over environmental damage is a decisive and influencing factor in the purchasing manager's relationship with the supplier that is being discontinued.

The effect of responsibility for a supplier not being retained following environmental damage was not significant. These results are in line with the study by Polyviou *et al.* (2018), who identified that supplier discontinuity is not a function of the current recovery leader, or even of someone else recommending the supplier before the supply interruption occurred. Although supplier selection is an essential purchasing activity (Chin *et al.*, 2020) and a primary GP activity (Garzon *et al.*, 2019), the results suggest that the association between supplier selection and its discontinuity following environmental damage cannot be explained by either one's own responsibility (the current purchasing manager) or someone else's for having selected the supplier involved with the environmental damage. Even within the context of GP practices, which value the selection of suppliers that meet sustainable objectives, the study's findings identify that the responsibility (own or someone else's) for indicating and selecting a supplier does not have a direct or indirect influence on its discontinuity after environmental damage. These results provide evidence that is contrary to psychology's Assessment Theory, which indicates that responsibility for an event causes anger (Lerner & Keltner, 2000), which in turn negatively influences an individual's behavior and their decisions.

The results of responsibility as a moderator in the relationship between controllability and discontinuing the supplier indicated that when the manager is the one responsible for recommending the supplier, there is a greater probability of not continuing with this supplier, so in this sense it is believed that he/she feels co-responsible for the environmental damage. These results, therefore, differ from the findings of Polyviou *et al.* (2018). This study contributes by identifying that the purchasing manager's responsibility has an influence on the decision of continuing with the supplier.

The results of anger had negative and significant effects on supplier discontinuity, indicating that the more anger that is experienced, the less probability there is of continuing with the supplier after the damage. Environmental values can influence these behaviors, since people concerned with environmental issues should be more likely to act against unsustainable environmental incidents (Hartmann & Moeller, 2014; Liang *et al.*,

2019). The results also indicated a significant effect of controllability on anger when the environmental damage caused is under the control of the supplier, which increases the anger felt. When participants assumed the role of the purchasing director, they felt more anger when the environmental damage was controllable by the supplier and not by nature. As [Nerb and Spada \(2001\)](#) pointed out, the actions that result in someone being responsible, for example, for controlling an injury, increase the anger felt. Anger is associated with the behavioral tendency to act against a partner in a business alliance, from merely expressing displeasure to more extreme cases, such as taking legal action or terminating the relationship ([Kumar et al., 2019](#)).

When the responsibility for selecting the supplier lies with someone else and not with the current area manager, anger tends to be greater. Studies like [Böhm's \(2003\)](#) indicate that emotions, like anger and outrage, are directed at someone, and therefore imply that responsibility is attributed to someone else. [Lerner and Keltner \(2000\)](#) explain that anger arises from assessing another person's responsibility for negative events, individual control and a sense of certainty about what happened. [Frijda \(1987\)](#) identified that another person's responsibility may cause anger and that personal responsibility does not.

The indirect effect of controllability on supplier discontinuity due to anger showed a significant result, suggesting that when subjects perceive that the environmental damage could have been controlled by the supplier, they feel angrier, and are subsequently more likely to discontinue the supplier. The indirect effect of anger on the relationship between controllability and supplier discontinuity, however, is smaller than the direct effect of controllability on supplier discontinuity. These results are in line with the findings of [Polyviou et al. \(2018\)](#), which indicated that the effect of controllability on supplier discontinuity after supply interruption can be partially explained by the amount of anger experienced due to the interruption event.

Finally, the results show that supplier discontinuity following environmental damage is based not only on rationality, but also on emotion through anger. Individual reactions are emotional and behavioral in nature, so consumers express anger about an organization they hold responsible for critical incidents ([Hartmann & Moeller, 2014](#)).

Theoretical and managerial implications

When the cause of the critical event was the supplier's lack of control, and not an event of nature ([Hartmann & Moeller, 2014](#)), there is a greater probability of not maintaining the relationship with the supplier. This implies applying environmental criteria when selecting suppliers through GP, either demanding sustainable behavior, or forming a panel of suppliers that are committed to environmental practices in supply chain management ([Teixeira, Assumpção, Correa, Savi, & Prates, 2018](#)). On the other hand, it does not matter who is responsible for having selected the supplier that caused the environmental damage, whether the current manager of the area or someone else, it has no influence on supplier discontinuity after environmental damage, although the occurrence of some undesirable event may be considered the responsibility of another person, or of the person who currently performs the activity ([Frijda, 1987](#)). Unlike [Polyviou et al. \(2018\)](#), we identified that when the current manager was responsible for selecting the supplier, the effect of controllability boosts supplier discontinuity. In this sense, when environmental damage occurs, the manager's own responsibility influences his/her own decision about supplier discontinuity.

The study also contributes by identifying the behavioral role of a negative emotion (anger) when it is experienced during managerial crises in a sustainable supply chain, which can influence the interpretations, judgments and decision-making of individuals in the perception of controllability and responsibility after

environmental damage. People exhibit an emotional affinity with nature and the environment (Liang *et al.*, 2019); negative emotions, such as anger, lead individuals to opt for punitive sanctions against the responsible party (Angie, Connelly, Waples, & Klignyte, 2011). As suggested by the results, the controllability of an event affects the buyer's negative emotion. In situations in which the environmental damage could have been controlled by the supplier, the buyer's anger is greater. Anger, in turn, reduces the probability of the supplier being retained, showing that this is an emotion that influences the continuity decision. This can also have important consequences that lead buyers to make other decisions and to take actions such as lawsuits, which can have a negative impact on the supplier's image in the market, as well as on other current or future contracts with suppliers.

In managerial terms, the study contributes to the literature by using scenarios that simulate a real situation in the organizational routine of decision-making by procurement professionals in their relationship with suppliers, and possible discontinuity after environmental damage, considering aspects of GP when selecting these agents, and anger as a negative emotion after an unsustainable accident. Considering the results of the influence of controllability, responsibility and anger on supplier discontinuity, the main practical implication of this study is that suppliers should focus on adopting a proactive and sustainable posture, by prioritizing sustainable practices, and avoiding environmental damage, especially controllable damage.

In this sense, first, the results with regard to controllability indicate that a direct and significant effect of controllable environmental damage caused by the supplier exists and influences the buyer's decision to discontinue the supplier. Second, the results indicate that the occurrence of environmental damage in a situation that could have been controlled by the supplier generates a negative emotion in the buyer, which in this study is anger. This negative emotion increases the likelihood that the buyer will discontinue the supplier. Third, there is a tension between controllability and accountability; the effect of controllability on supplier discontinuity is boosted when the buyer was responsible for developing the supplier. This possibly implies that a feeling of co-responsibility influences the buyer's decision to discontinue the supplier. In this specific aspect, the supplier's need to develop sustainable practices is greater.

The study also contributes by pointing out the importance of procurement professionals in the decision-making process in relation to suppliers that care about the environment in their operations, as this is one of the countless challenges in the transition to a circular economy (Sharma & Foropon, 2019). As Hopkinson, Zils, Hawkins and Roper (2018) pointed out, suppliers and purchasing professionals need to develop skills and abilities to manage the complex business model of the global circular economy. In order to achieve this, they must take into account the attributes of "green" products in an effective and efficient manner, thus avoiding damage to the environment.

FINAL CONSIDERATIONS

This study analyzed the effects of controllability (whether the supplier or nature had control over the environmental damage that occurred) and responsibility (whether the responsibility for selecting the supplier that caused the environmental damage was the current manager's or someone else's) on supplier non-retention following environmental damage. We also analyzed whether these effects are mediated by the amount of anger experienced by the purchasing manager due to supplier discontinuity after environmental damage.

The results related to controllability indicated that the probability of there being supplier discontinuity is greater when the supplier, and not nature, has control over the environmental damage. Subjects in the role of purchasing director also feel more anger when the environmental damage is controlled by the supplier than when it is controlled by nature. The indirect effect of controllability is partially explained by the amount of anger experienced by the purchasing manager, indicating that anger is a present condition, but not necessary for supplier discontinuity after environmental damage. The effect of controllability on supplier discontinuity is also boosted when the purchasing manager is responsible for choosing the supplier.

The study was limited to the quantitative analysis of the variables, controllability, responsibility, supplier non-retention following environmental damage, and anger as a negative emotion. The research, however, considered the effect of a negative emotion individually, only on the role of a company's purchasing manager. It did not analyze how this emotion would affect different stakeholders (Dufour et al., 2019). Other ways of measuring anger can be used; for example, Hartmann and Moeller (2014) measured anger using three items indicating the probability that customers of the firm would feel “angry,” “hostile,” and “offended”, and Pulles and Loohuis (2020) considered participants' frustration, irritation, and tension.

Future research could replicate the findings by exploring other types of supplier discontinuity, such as problems with supply logistics or quality incidents. Other emotions besides anger could also be analyzed in this context, using other negative emotions like fear, guilt, shame or sadness, or positive emotions like happiness and euphoria. In situations in which transaction costs are evident, there are long-term ties between supplier and buyer, and specific assets (tangible or intangible), which can affect the supplier's decision to continue in cases of environmental damage.

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AUTHORS' CONTRIBUTIONS

Josefer de Lima Souza, Vilmar Antonio Gonçalves Tondolo and Rosana da Rosa Portella Tondolo worked on the conceptualization and theoretical-methodological approach. The theoretical review was conducted by Josefer de Lima Souza. Data collection was coordinated by Vilmar Antonio Gonçalves Tondolo. Josefer de Lima Souza, Vilmar Antonio Gonçalves Tondolo, Rosana da Rosa Portella Tondolo, Guilherme Lerch Lunardi and Flávio Régio Brambilla worked together in the data analysis, writing and final revision of the manuscript.