

HIGHLIGHTING OCCUPATIONAL HEALTH AND SAFETY (OHS) PRACTICES IN MANUFACTURING AREA: A BIBLIOGRAPHY REVIEW

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Abstract *Despite the perception of the restrictive impact on performance, occupational health and safety (OHS) practices offer effective mechanisms of improvement of performance. Additionally, the costs relate to OHS practices had been increase in Brazil, almost get 15% of total cost in manufacturing area. Based on literature review, this article exposes the studies about OHS practices, during the period of 2010 to 2015. The main objective is to show what the main studies related to OHS practices are. What are the relationships of OHS variables with the operating area? How those can improve the performance? Originally, there are not manuscripts about this issue in Brazil. The following keywords were chosen: safety, social responsibility, sustainability and manufacturing in journals in the area of production and manufacturing classified as QUALIS A1 and A2 of WebQualis' list. A total of 24 articles were selected. As a result of the work, it was demonstrated the relationship of importance of OHS practices with operational practices such as quality, integration with customers, aspects of leadership and empowerment and the role of technology. We have demonstrated the main capabilities the companies should development to reduce the social risks.*

1. INTRODUCTION

During 2002 to 2014, according to data the Ministry of Labor of Brazil, the number of workers involved in accidents at work not decreased significantly (IBGE, 2015). In 2010, 4.2 million workers were involved in accidents, an amount far greater than most developed countries like the US, which got 3.1 million people during the same period (PAGELL et al., 2014).

In 2013, the annual cost of occupational accidents in Brazil was approximately \$17 billion. In the manufacturing area, the number of accidents corresponds to 40 % of total registrations in Brazil.

In this sense, depending on the number of registered accidents, there is an urgent need for another operating management model whose decision-making involves, broadly, the safety and health at work. It is also worth noting that operations managers can be summonsed, sued and having to pay for operational decisions whose cases may cause accidents with fatalities or permanent injuries. Previous research of occupational health and safety (OHS) practices of organizations has expanded too many disciplines and topics such as sustainability, social responsibility, supplier management, and safety and health at work (SARKIS, 2012).

Therefore, within the operations area, social practices are activities related to products or processes that affect the safety and well-being of human being, community development and protection against damage influenced by supply

chain or operational functions (KLASSEN; VEREECKE, 2012). According to Elkington (1998) social practices should be thought from the supplier to the end consumer, i.e. for the entire supply chain, including its disposal.

We declare that during the last decades of the twentieth century, occupational health and safety (OHS) practices attracted debate and discussion, but related to the supply chain are far from demonstrating results (KLASSEN; VEREECKE, 2012; PAGELL et al., 2015). The limited understanding is the difficulty of accessing their effects on various aspects, such as: operational and financial performance, interaction with operational and environmental practices (SHAFIQ et al., 2014).

Many surveys only evaluate the influences on operating results, categorizing risk management to the workers in the background area. Similarly, researches that seek to assess the occupational health and safety (OHS) at work leave the typical operating results, as productivity, without explanation. Thus, these studies only show the great distance between these two themes, in which even the companies and safety regulators evaluate social problems separately from operational issues.

It is inferred that the research on the subject presents an oxymoron between the achieved levels of safety and operational performance (PAGELL et al., 2014). In summary, the research in this area is separated into two streams on the social and operational practices: one that analyzed as additive and another that pronounces these are

complementary (WU et al., 2012). In Brazil, there are not publications about this context in management area.

In this context, the problem is: which are the main studies related to OHS practices? What are the relationships of OHS variables with the operating area? How those can improve the performance?

So, the objectives of this research are to analyze the occupational health and safety (OHS) practices that ensure and influence the safety and worker well-being related to operational performance. Thus, the academic contribution of this paper is related to the presentation of themes that were previously presented on a segmented way. At the same time, realizes the opportunity to assess and discuss organizational theories, interfaces with the theme and if they can be improved practices for superior performance and sustainable.

The manuscript presents after the introduction, the Brazilian context about safety and health practices. After that, it shows the method used to achieve the literature review, identification of articles and presentation related to the study public. Later, it exposes themselves initially discussion about the social practices and the development of operational capabilities. Far ahead, it discuss about organizational theories that underlie managerial actions. Finally, the manuscript presents remarks on the topic and some possible future studies.

2. BRAZILIAN CONTEXT

In Brazil, health and safety issues at work had their main legal framework in 1943 with the promulgation of the Brazilian Consolidation of Labor Laws - CLT, which in Chapter V set matters relating to Safety and Occupational Medicine. Only in 1978 that the Ministry of Labor and Employment - MTE published Ordinance 3214 legalizing a number of Regulatory Standards - NR aimed to specify the matters relating to safety and occupational health in Brazil. Only in 2011 that Brazil formalizes, through Decree 7602, the National Plan for Safety and Health at Work, which aims to promote health, improve the quality of working life and the prevention of accidents and damage to health arising from these by promoting actions that seek to eliminate or reduce risks in the workplace (BRASIL, 2012).

According to the National Institute of Social Security (INSS), the main causes of absence are due

to ergonomic factors such as diseases repetitive strain and posture. In the period from 2000 to 2011, diseases motivated by ergonomic hazards and natural and traumatic overload accounted for over 40% of all social security universe. According to Towers-Watson Consulting (2014), health expenditures amount to 10% of GDP, and an increasing cost to organizations. The real increase 50% in private health spending on payroll (7.6% to 11.4% in 2014 to 2015) and the forecast will increase further in coming years, especially for automobile industry in the country. The employees of the same organization may have different perceptions about the risks in the workplace (OLIVEIRA; VEIGA, 2013). The perception of occupational risks is directly linked to the level of education focused to the ability of each individual to identify the hazards and recognize the risks in their work environment.

Given this fact, it is necessary that organizations develop permanent educational activities focused on the prevention of accidents and diseases at work (PESENTE, 2011). This fact requires the adoption of a set of measures such as qualifications and training of the workforce, identification programs, communication and reducing occupational hazards, use of safety equipment, equipment maintenance, mechanical integrity programs of equipment used during work, among other measures preventers (SILVA; FRANCA, 2011).

The support of managers in the effective implementation of the management systems of safety and health at work focusing on the sharing of knowledge ensures that there will be an increasing level of improvement actions for the prevention and protection of people in the workplace (ILO, 2011). In a constructive and participatory way, many information are arising from the real scenario view of employees, technical staff, society and other stakeholders coordinated by managers as an opportunity for organizations to significantly reduce the risk of accidents and diseases at work (MENEZES; SANTOS, 2014).

Health and Safety programs at work need to be studied and constantly analyzed by the leaders of the companies to be updated and expanded to meet the new demands of the legislation, expansion of prevention focus of the organization or the investigation of incidents or accidents, among others measures (SILVA; FRANCA, 2011).

Unfortunately, the work accident is a serious social problem and the inappropriate use of methods

of their investigation indicates that the origins of these are linked to the behavior of workers. In many cases, they omit the actual risk situations, which they were involved without addressing the safety and health at work assumptions necessary for carrying out professional activities (ALMEIDA; JACKSON FILHO, 2007). The same authors did not withdrawn the responsibility of Brazilian universities to deepen the teaching of safety and health at work in the various fields of knowledge and the need for improvement and expansion of scientific research aimed at improving the safety and health of workers.

3. METHOD

The research on the topic was based in main journals on operations and manufacturing (CAPES, 2015). The following keywords were chosen for the research: safety, social responsibility, sustainability and worker. It was found twenty four articles reporting on the topic in the period 2010 to 2015, as can be seen in Table 1.

Table 1: The name of the journal, abbreviation and number of articles was found

Ref.	Name of the journal	Abbreviation	Number of articles
1	International Journal of Production Economics	IJPE	07
2	Journal of Cleaner Production	JCP	04
3	Transportation Research Part E:	TRE	04
4	Journal of Operation Management	JOM	03
5	Production and Operations Management	POM	02
6	Decision Sciences	DS	02
7	European Journal of Operational Research	EJOR	02
		Total	24

Source: authors (2015).

The International Journal of Production Economics was the journal with the largest number of articles on the topic. According to Table 2, it was found a variety of authors in the production of these articles, with only an author articles appeared in five and four other authors appeared in two articles.

We found a lot of articles that deal with social responsibility and sustainability (triple bottom line). Other articles also add the cultural factor as another variable to analyze the social practices and the organization's performance (FLYNN; SAKAKIBARA; SCHROEDER, 1995). Brown (1996) is considered as a pioneering paper on the subject of social practices in operations in the manufacturing sector.

During the examination of the sample, the articles were described according to the goals, methods and main findings (BAUMEISTER; LEARY, 1997), in Appendix 1. Also, it shows the alignment with organizational theories debated in topic 7.

At least, there are four areas of research: climate security, integrated control system, health and safety system and operational sustainability (FAN et al.; 2014). In addition, the cultural factor is considered

as a mediator variable to analyze the relationship among occupational health and safety practices and organizational performance (POWER et al., 2015; ROMEIRO FILHO, 2015).

Additionally, social practices should be assessing in three areas in supply chain issue: who will be reached, which practices and how they are being applied. In this context, stakeholders can be seen in the form of three levels of interest groups. The internal level is where the firm's operations happen, which directly controls the hand of diversity of work and security management.

The outer level has direct external relations of the company, such as suppliers, customers and others, and with the internal form the supply chain. Externally, other stakeholders, is the community, non-governmental organizations (NGO's) and the market.

In the second phase of this manuscript, we present a discussion about the social practices and operational capabilities (KLASSEN; VEREECKE, 2012; SHAFIQ et al., 2014). The main objective is show how the managers can improve performance.

4. THE DISCUSSION ABOUT THE SOCIAL PRACTICES

The research indicates that the search for greater operational effectiveness can put workers at risk of accidents, stress and occupational diseases, and therefore places the operational improvements and health and safety as contradictory (PAGELL et al., 2015). Nevertheless, Anzanello et al. (2014) highlight the evaluation of the processes, complexity and task can provide a stress lower level for workers in mass production environment and hence better performance levels. Armenti et al. (2011) also assess the improvement of worker safety and welfare from reduction of exposure to toxic substances.

Additionally, Pagell et al. (2015) state that the best operating practices are related to increased complexity and increasing unforeseen accidents risk. In addition, the practices aimed at increasing operational performance may reduce well-being worker. It creates indirectly overloads to the employee by removing your time to complete the tasks and makes him feel pressured (SHAH; WARD, 2003).

When the operational effectiveness and security are complementary, the performance is analyzed separately. The safety, for the most part, is not directly accessible and cannot be justified. As far as, the research about performance has the focus on quality of products and services to consumers (PAGELL et al., 2015).

A solution to the conflict between social practices and operational practices is to create a JMS - Joint Management System, which is aimed at internal integration, from a standpoint of the workers (PAGELL et al., 2015). The adoption of this system provides opportunities to develop integrated management tools that generate stable, whereby there will be reduction or elimination of tension between being effective and being safe.

Organizations work best when everyone, both suppliers and customers, have full understanding of: purpose, mission, strategy and routines of the company (HAYES; WHEELWRIGHT, 1984). This authors affirm that the greater the difference in interpretation of the routines for individuals in the organization, larger the variation in performance.

Therefore, it is necessary that these routines have a preventive and communicative character, so passing information and knowledge to workers,

highlighting the objective of improving the safety and productivity and enhancing human capital (GOVINDAN et al., 2013; PAGELL et al., 2015).

Examples of these practices has been the study of Xia et al. (2015), which reported that the practices related to social responsibility provide increased competitive advantage and economic performance. Nonetheless Sobhani et al. (2015) show social practices represent an increase in the total cost of the system because the managers need to evaluate the risk factors.

In this context, Gimenez et al. (2012) asserts that social practices not statistically significantly influence the economic criteria, but act as significantly to environmental and social criteria. However, Longoni et al. (2014) positively reinforce the role of training in operational performance. As for the social aspects, the authors state that the involvement of the worker confirms the social performance. The second topic discusses the relationship of the operational powers that interfaces with the theme and how they contribute to the improvement of operational performance.

5. THE DISCUSSION ABOUT CAPABILITIES

For Golini et al. (2014) capabilities development is an antecedent in the adoption of sustainable programs as the environmental and social pillars in order to improve performance. According to Klassen and Vereecke (2012), social capabilities will be in three dimensions: monitoring, collaboration and innovation. These represent a corporate social responsibility in seeking to reduce operational risks and improve performance.

The monitoring varies from firm structure (local supplier, size, and properties) and it is designed for worker safety in their activities. Companies must understand the influence of relationship with suppliers and the risks involved, for example, contract conditions and large purchase volumes increase the risk for the company. From this, there is a basis for management decision making and its results will then be monitored for new information.

The collaboration is related to the commitment between the company and its suppliers to create production and design specific safe products flow. This ability can be established from contracts and

certificates with these suppliers for them to visit the company to see the facilities and possible improvements in their training.

Social innovation seeks to meet all stakeholder groups involved, enabling improved brand, consumer confidence, and increase revenues, among others. Their results are difficult to measure, since the initial costs increasing with the implementation, while the long-term vision is dependent on the aggregation of customer value and reduce operational risks. It also seeks to build bridges with new stakeholder groups.

6. THE DISCUSSION ABOUT THE COMPETITIVE CRITERIA

Over the past two decades, social and environmental issues have increased discussion and debate. Many companies have had many difficulties in defining and implementing social issues, however, without mentioning them in their competitive benefits (KLASSEN; VEREECKE, 2012).

Thus, evaluation of operations is addressed to all four competitive priorities: quality, cost efficiency, delivery and flexibility (CUA; MCKONE; SCHROEDER, 2001). However, research involving safety, technology, operating environment and trade union variables associated are more likely to drive better collaboration with researchers from various disciplines (BROWN, 1996).

According to Brown (1996), the safety and health at work are significantly important for employees. Companies seeking to retain people get and cherish for the welfare, safety and occupational health, as some American organizations, select the social criteria as the first process to be deployed.

Thus, the safety and occupational health related problems are very important to prevent major accidents or disease at work, being a point where the unions look and require businesses, even those with low rates and with greater care. As operations researches, one must consider the views of trade unions because they consider that, in practice, organizations feel they can produce more when they do not follow productivity standards or limitations with respect to security indices.

In the second part of this manuscript, it realizes organizational theories, interfaces with the theme and how managers can improve practices for superior performance and sustainable.

7. ORGANIZATIONAL THEORIES

The discussion of this section is related to the following contents: Institutional Theory, Contingency Theory, Resource-based view (RBV) and finally, the theory of Relational Coordination. Those theories were cited by the bibliography review. It asserts that the first two theories discuss the relationship between organizations along the supply chain, while the last two discuss the role the resources as a differentiating factor and sustaining competitive advantage.

7.1 Institutional Theory

The institutional theory enables the understanding of the influence of rules and norms in organizations, which includes culture factors, economic incentives and legal environment (DIMAGGIO; POWELL, 1983). The practices of the managers, in general, seek to serve to external pressures. This theory describes three forms that create isomorphism in strategy, structure and organizational processes.

First, the coercive isomorphism occurs in influences of power position within the supply chain. These pressures are crucial for managing of environmental issues and hence the sustainability. Another form of isomorphism is the normative, it causes that ensure the organizational compliance regarding the social rules and their responsibilities. The influence is for the social obligation to follow others organizations, rooted in the needs or the belief of managers about what they have to do.

Finally, the mimetic isomorphism occurs when a company imitates the actions of others, most likely the successful competitors in industry, searching for explain the path to success and legitimacy.

It is inferred that this theory also says that institutions create expectations and work in the dominant logic, in other words, managers care about issues and solutions that others successful companies demonstrate, and hence, the decisions of some affect the decisions of others within the same logic.

7.2 Contingency Theory

These studies show how the principles of management are practiced in organizations and how technology and social structure affecting organizational performance (SOUSA; VOSS, 2008). It reveals that the various structures and practices exist for various organizations, so the methods and ideas applied within companies dependent on structural factors, such as the technology.

The changes in companies were most significantly when it came from changing technologies. If the technology involved was quite complex, it was required then a greater control of management from the companies. In this context, it ranks the mass production companies, for example, as having an average complexity and a stronger hierarchy, because there are many direct workers and less office staff.

The Contingency Theory has as its central focus, the contingency in firms viewed individually, forming contingency variables, or crises and changes in the organizational environment. The “standard line” is an ambiguous term because it was not covered by the school, nor their relationship with the company’s performance, which may represent, for example, both a productivity way or a production decline. The setting for adjusting the contingencies is placed as an external condition organization and influencing internally.

Power et al. (2015) assert that from the contingent focus it was found the organizational context in which factors influence managers in decision-making. Also according to these authors, especially the cultural factors of the sample organizations in 24 countries in the world, it was found that there are differences between them based on investments in safety and environmental practices. These contingent variations may be differences in the regulations for each region, the demands of the community for performance and accountability and appreciation of the worker to his job.

Also according to Power et al. (2015), investments in environmental and safety practices are higher in organizations with larger plants, multinationals and major reinvestments in such practices. However, reinvestment in sustainable practices is not related to the potential gain in investing (productivity). In less developed countries, in which companies are oriented to profit, investments in environmental practices, safety and occupational health are smaller

because they do not invest in programs they believe to be peripheral to the central operation of the organization (SARKIS; GONZALEZ-TORRE; ADENSO-DIAZ, 2010).

On the other hand, in developing countries, small and medium enterprises are responsible for most jobs (ROMEIRO FILHO, 2015). The authors highlight the cultural factor as a cornerstone for ensuring the sustainability and conclude that local traditions and workers’ skills should be important for product development.

7.3 Resource-Based View (RBV)

The resources of a firm are all goods, services, skills, information, attributes and other elements that demonstrate the strength of the organization to implement strategies that increase efficiency. These features can be divided into three categories: physical (include raw materials, technology, plant and equipment), human (including training, experience, and relationships) and organizational (control systems, planning, and structure) (HART, 1995).

A sustainable competitive advantage occurs when you create a value that isn’t implemented simultaneously by competitors with the impossibility to duplicate its benefits. It is necessary that incoming competitors can’t obtain such an advantage for a long period of time. The first firm to implement a strategy can have more sustainable competitive advantage than others that implement later. Thus, it is necessary that this organization have features that the others do not have, in order to create such an advantage from an opportunity.

If industries from a sector have the same features, it can be an advantage if there are barriers to incoming enterprises, since these resources are spread unevenly and are not perfectly mobile. These characteristics of the resources can be indicated by four organizational attributes: they must be valuable, rare, imperfectly imitable and non-substitutable (VRIN).

The resources will be valuable when the company has the ability to create and implement strategies to improve their performance. It’s necessary to take the opportunities and neutralize threats to get the competitive advantage, and none of competitors having these resources to achieve this. The rarity and not imitability are also characteristics of a resource

that can't be easily gotten from others. For a resource to be imperfectly imitable, the organization can combine its abilities to raise funds and the difficulty for companies to know which of these generate competitive advantages. Finally, another attribute that prevents a competitive disadvantage even in a case of a rare resource, not replicable and valuable, is not having a replacement.

Companies seek, from the analysis of its resources, a strategic system of formal planning, which recognizes threats and opportunities in their environment. Although this mechanism be valuable to the organization, it can't be rare and highly imitable. Informal strategies can be made from the assessment of processes thought as resources and their attributes. These are already rarer and more difficult to imitate by other companies.

Finally, the level of development of resources is important because you should know what to expect on occupational health and safety (OHS) practices (HART, 1995; BARNEY; KETCHEN; WRIGHT, 2011).

7.4 Relational Coordination Theory

This theory shows that the performance improvement occurs in three ways: through the goals of sharing, knowledge and mutual respect (GITTELL; DOUGLASS, 2012). This form does not discuss only the risk of accidents and standardization, but the respect for colleagues, managers and production system. The general understanding of what to do or why an activity is more appropriate than another is the ability to create stability (PAGELL et al., 2015).

According to Gittell and Douglass (2012), the relational coordination is one of three managerial processes of reciprocal inter-relationship between workers, worker/client and employee/manager. Workers practice complementary functions when they are divided horizontally at work, but each has a different understanding process about a situation and, likewise, has its ability to respond to it. To solve this problem, some schools had models to achieve relational coordination and reduce costs with more mechanized and bureaucratic tools.

These authors state that the notion of coordination should be presented to participants as a collective mind, which strengthen communication and consequently environmental reinterpretation by its members. The shared knowledge is the key to this process. In practical cases, lead workers to increase

attention to the other contribute to the creation of a collective mind, especially in emergency situations.

8. LIMITATIONS AND FUTURE STUDIES

The culture of a society is one of the most important points both in studies and in the interpretation of organizational theories. This is due to the fact that, with a strong safety culture and rooted in a region, companies tend to use the health and safety factor as sustainable competitive advantage valued and inimitable. This study contributes to the discussion of articles that try to relate the operating performance and the level of occupational safety and health.

Another factor that influences the results regarding safety and occupational health in the manufacturing sector is technology and structure involved in the organization. The use of technologies requires a high control and monitoring routines. Therefore, it identifies and quantifies the results about the manufacturing issues with the social practices of health and safety at work.

The currents of social practices studies in manufacturing approach with the recent inclusion of the integrated management of operations. With the possibility of achieving greater efficiencies in operations and competitive advantage for businesses, it is important to study the feasibility of a system that integrates various organizational areas.

For future studies, the investigation of an integrated security and operations system can provide the opportunity for achieving the objectives expected in favor of future capabilities both for companies and for society. In other words, seeking constant innovation, monitoring of practices and the development of capabilities (collaboration and continuous improvement) of those involved in business and industry, looking for thereby a long-term competitive advantage.

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APPENDIX

Ref.	Articles/Authors/journal	Objectives and Methods	Main Findings	Theory alignment
1	Anzanello et al., 2014, IJPE	Integration practices for sequencing batch groups of workers. Quantitative case study	Reduction of the employee saturation percentage (from 60% to 1%) and increased delay (between 2 and 4%).	Resources-based view (RBV), how to search skills for the execution of services.
2	Armenti et al., 2011, JCP	To evaluate the effect of Cleaner Production-Pollution Prevention (CPPP) on health and safety of the worker and environmental area, simultaneously. Case study	While CPPP / TUR programs reduce exposure to toxic substances in the environment in general, simultaneously it offers opportunities to affirm prevention principles in the workplace.	Demonstration of evaluation of human resources (RBV) and also of natural resources (NRBV) for the development of social relations among the agents
3	Asgari et al., 2015, TRE	Investigate sustainable performance (economic and environmental dimension) of 5 European ports. In order to meet the ISO14.001-2004 standard, the researchers also increase the assessment on issues related to the internal stakeholder, or port officials. For example, they assess the use of regulatory issues, training levels, and risk management in ports.	The method is unheard of in the area. The analysis checks the consistency of the data using the Analytical Hierarchy Process (AHP).	It is aligned with institutional theory, as it details how English ports seek to adjust to regulatory issues (regulation of ports' operations) and the dissemination of the best practices employed (mimetic issues). It is aligned with institutional theory, as it details how English ports seek to adjust to regulatory issues (regulation of ports' operations) and the dissemination of the best practices employed (mimetic issues).
4	Bendul; Skorna, 2015, TRE	Examine the impact factors in boots to implement risk prevention activities. Regression Analysis	Identify risk corporate culture and product vulnerability as key factors to implement the prevention practices in transportation area.	Contingency factors explain the adoption of practices to prevent accidents and improve worker safety and health.
5	Brown, 1996, JOM	Show the importance of safety at work in the field of operations and suggest future research. Sector manufacturing	All factors have increased the importance of the safety issue with management operations.	Seminal article that does not relate to the theories presented.
6	De Koster; Stam; Balk, 2011, JOM	Investigate what are the factors that influence accidents in warehouses. Survey of 78 managers and 1033 warehouse workers. Variables: Hazards Reducing Systems (HRS), Safety-Specific Transformational Leadership (SSTL) and safety consciousness (SC).	SSTL was what most affects safety performance, showing that leaders have great importance in the workplace.	The development of complex social relationships and search of the development of resources to achieve the goals (RBV) is a fundamental role of organizational leadership. At the same time, the relational coordination theory is evaluated because the evaluation of how employees interact in the workplace has a statistically significant influence on the safety indexes.
7	Drobetz et al., 2014, TRE	Construct a social responsibility index for loading companies. Technical MCMC.	Positive relationship between Social Responsibility (RS) and financial performance for each firm.	Accompanies the concept of institutional theory as it deals with issues based on social responsibility practices and the legislation in the international shipping company.

8	Fan et al., 2014, IJPE	Identify groups of articles in the literature on health security in the operational area. 128 articles	Found 4 research areas: climate security, integrated control system, voluntary system of health and safety and operational sustainability.	It does not fit into any specific theory because it is a work of a systematic and citation network analysis review.
9	Gimenez et al., 2012 IJPE	Analyze the impact of programs (environmental, social practices) for each dimension of the triple bottom line (environmental, social and economic). Quantitative 19 countries	Internal environmental programs and internal social practices impact on triple bottom line. There is no reflection with external programs.	Align the contingency theory because the study show the two important managerial contributions: (1) Managers have to be aware of the possible negative effects (on the short term) of social practices on manufacturing costs, and (2) they need to implement collaborative practices with their supply chain partners
10	Golini et al., 2014, IJPE	Fill the gap between site competence and social and environmental sustainability in the level of the plant perspective. Survey	The site competence is an antecedent of adoption of environmental and social sustainable programs and also improved performance.	In line with the Resource Based View (RBV) of firms, because the results from an international survey show that site competence — that is, having competences in operations beyond the production activities — is an antecedent of the adoption of environmental and social sustainability programs and, in turn, of higher performance improvement.
11	Govindan et al., 2013 JCP	Examine the problem of identifying the triple bottom line of sustainability for the selection of suppliers operations in supply chain. Qualitative	Sustainable supply chains as a social and environmental supplier collaboration can have significant benefits on the "triple bottom line" and to society.	Contingency theory, because it shows how the triple bottom line concept affects organizational performance.
12	Hsueh, 2015, TRE	It proposes a model in which the director of a supply chain determines the social responsibility performance in the company and compensation of the chain actors, and thus maximizing profits.	You can improve social responsibility performance and profit within the supply chain.	The proposal of decision-making to compensate supply chain actors for working together is related to relational coordination theory.
13	Klassen; Vereecke, 2012 IJPE	Understand the three social capabilities: innovation, monitoring and collaboration. Study of 5 multinationals.	The survey revealed there are four links that managers should do to mitigate the social risks, create opportunities and improve performance.	The article approaches the external environment (supply chain) and internal environment (the organization itself). In this way, it exposes the validation criteria of the mentioned organizational theories.
14	Longoni et al., 2014 IJPE	Check if the control of Human Resources and organizational practices should be implemented to improve sustainable performance (social and environmental). International survey of manufacturing strategy database 2009	Training has a positive effect on performance. Incentives and involvement worker have a Positive impact on social performance. Teamwork is a practice that enables environmental performance.	It approaches Resource-Based View (RBV) through an assessment of human resources and their performances. In addition, it presents in the relational coordination theory, the results regarding teamwork and employee involvement.
15	Odegaard; Roos, 2014, POM	Analyze the contribution of the quality of the work assigned to company productivity. Analysis Data envelopment	It was observed improvement in efficiency by 2 to 5%, half being attributed to improved health and psychological worker	The authors analyzed the framework on Item Response Theory (IRT) and, specifically, on the class of Graded Response Models (GRM).
16	Pagell et al., 2014, POM	Examine how organizations simultaneously manage their operations and areas of health and safety. 10 case studies.	You can manage together operations and security. On the other hand, organizations have failed to associate created culture and practices adopted.	It is evaluated from the perspective of the Resource Based View (VBR), since the text recognizes the need to evaluate the organizational culture about safety. In addition, the criterion of mutual respect of workers is being evidenced from the relational coordination perspective.
17	Pagell et al., 2015, JOM	Test whether an organization can use operations and security complementarily in an integrated Management System (JMS). Study of 198 industries.	The variables are related indirectly from the routine and simultaneous integration of operations management and security.	The authors highlight the theory of Relational Coordination (TRC). In this way, the TRC is used to predict how a JMS would enhance stability by creating shared understanding and contextual limitation.

18	Power et al., 2015, DS	Testing the influence of cultural characteristics present in investments in safety and the environment. Study with 1453 plants from 24 countries.	There is a positive bias when culture promotes consistent and formalized procedures and rewards the development of innovation. A preconception was formed when there are a strong presence of family members and coalitions and requirement results in the future groups. Investment in safety and environment are directly related to the role of the manager and the local culture.	The Contingency Theory, reflected by national culture, offers a different response, away from a simple rational response, about the investments in safety. In these conditions, highlights the importance about national culture to create conditions to improve environmental and safety investments.
19	Roca; Searcy, 2012, JCP	Identify indicators of corporate sustainability 94 Canadian reports.	585 different indicators. GRI found in 31 reports.	The multiple cases presented demonstrate how companies create and use the various types of performance indicators in line with the relational coordination theory.
20	Romeiro Filho, 2015, JCP	Investigate tools that support the design application to sustainable principles tailored to small and medium enterprises. Study with Brazilian companies from the triple bottom line of sustainability and culture.	It was identified risk factors in workers' activities with effects like diseases and pain.	Risk factors are contingent on Brazilian companies, presenting their effects on the workers' health. Thus, it presents the contingency theory.
21	Sarkis, 2012, IJPE	Identify some characteristics and dimensions of humanitarian operations. Sample Journal IJPE	Findings and directions for future research were introduced.	It shows the growing concern about social problems because of contingency factors such as man-made crises and globalization.
22	Shafiq et al., 2014, DS	Develop a multidimensional scale that links the stakeholder groups and the practices of social responsibility. Conglomerate analysis.	The practices are complementary and, when they are in a group, generate effects in others.	Using these stakeholder-derived constructs as taxons in a cluster analysis, the authors identify important patterns in the way that multiple groups of stakeholders are engaged in according the Relational Coordination Theory.
23	Sobhani et al., 2015, EJOR	Analysis of the assembly process as the risks and work-related diseases and the impact of this scenario total cost. Quantitative worker as stakeholder	There is an increase in the minimal total cost of the system by analyzing WIH (Work-related Ill Health). Although this new situation, the performance has increased after the implementation of WIH.	An analysis of resources and their competitive advantages was carried out over time, since the WIH system presented greater importance in spite of the costs.
24	Xia et al., 2015, EJOR	Analyze the impact of social performance in economic performance. Quantitative Consumer as stakeholder	Investments in social responsibility increases competitive advantage and economic performance.	Companies invest in safety and health practices as a way to replicate success (mimetic isomorphism). They use their resources as a form of competitive advantage (RBV).