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EDITORIAL

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Maria José Tonelli
Editora-chefe

THE FUTURE OF SCIENTIFIC JOURNALS

SciELO Brasil has published an updating of its document "Critérios, política e procedimentos para a admissão e a permanência de periódicos na Coleção SciELO Brasil" [Criteria, Policies and Procedures for the Admission and Permanence of Journals in the *Coleção SciELO Brasil*], which is valid as of May 2020. The criteria presented in the document are underpinned by the Open Science concept, which includes: i) open access; ii) open data; and iii) open reviewing. Although the first of those items is not universally accepted, since business interests are involved in this industry, it is already practiced by journals in Brazil. Discussion is in order as to the other topics, which entail some controversy.

I recently attended a meeting of scientific editors that was organized by Professor Fabio Frezatti, the editor-in-chief at *Revista Contabilidade & Finanças*, and by Professor Abel L. Packer, Director of the SciELO/FAPESP Program. I take this opportunity to publically thank for the meeting. The debate was clarifying about deep changes that scientific journals will have to implement in the next few years. While risking to advance misconceptions, I present below a personal summary of that conversation in order to continue reflections about these new policies on knowledge communication, with researchers, scientific editors and referees in the Administration academic community.

These transformations may have, in a few years' time, an impact on the organization and communication of scientific research, as well as on journal management itself. With the advancement of new technologies, journals' traditional management – which includes publication frequency, volumes and the whole journal production process, which is organized to meet that model – may be totally revised, with contents being continuously published in platforms that may be endlessly renewed in (almost) real time. Journals disappear, but the communication of scientific production grows more agile. In addition to data, other steps in the scientific communication production process may be open in the future: reviews may be published and scientific editors and authors may talk directly to each other.

Who are the ones responsible for this transformation? Periodicals are protagonists in this process, but the adherence and participation of researchers, editors and referees are necessary. The change does not have to be radical. In this new trajectory, positioning may be flexible, and the steps forward may be modular, along with the research community.

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RAE follows SciELO's guidelines and seeks paths to keep up with these changes in scientific communication. Below we selected a few links to further insight on this debate.

About Open Science:

Open Science and the new Modus Operandi of Communicating Research – Part I

https://blog.scielo.org/blog/2019/08/01/ciencia-aberta-e-o-novo-modus-operandi-de-comunicar-pesquisa-parte-i/#.XuO2iVRKi5s

Open Science and the new Modus Operandi of Communicating Research – Part II

https://blog.scielo.org/blog/2019/08/01/ciencia-aberta-e-o-novo-modus-operandi-de-comunicar-pesquisa-parte-ii/

About Open Evaluation

https://blog.scielo.org/blog/2018/02/28/sobre-as-vinte-e-duas-definicoes-de-revisao-por-pares-aberta-e-mais/#.XuOoz1RKi5s

https://blog.scielo.org/blog/2019/04/30/potenciais-vantagens-e-desvantagens-na-publicacao-de-pareceres/#.XuO2pFRKi5sE

https://blog.scielo.org/blog/2019/03/27/avaliacao-por-pares-aberta-a-publicacao-dos-pareceres-influencia-o-comportamento-dos-pareceristas/#.XuO2qFRKi5s

Enjoy the reading!

Maria José Tonelli[1] | ORCID: 0000-0002-6585-1493

[1] Fundação Getulio Vargas, Escola de Administração de Empresas de São Paulo, São Paulo, SP, Brazil

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INNOVATION IN THE REVERSE SUPPLY CHAIN OF ELECTRICAL AND ELECTRONIC WASTE: A STUDY ON INFORMATION SYSTEMS AND TRACKING TECHNOLOGIES

Inovação na cadeia reversa de resíduos eletroeletrônicos: Um estudo sobre os sistemasde informação e as tecnologias de rastreamento

Innovación en la cadena inversa de residuos electroelectrónicos: Un estudio sobre sistemas de información y tecnologías de seguimiento

ABSTRACT

In this study, the contribution of information systems and tracking technologies to the reverse logistics of electronic and electrical waste chains is analyzed. The research was based on a case study in the Brazilian context, incorporating the electronics supply chain. The results show that reverse logistics do not use the technologies and systems implemented in direct logistics. Although tracking technologies can make disassembly and recycling more efficient, the possibility of increased costs remains, and does not contribute to increased sales and profitability. Furthermore, resistance by representatives of the electronics sector to adhere to the sectoral agreement—established by the National Solid Waste Policy (NSWP) in 2010 but signed only at the end of 2019—contributed to companies postponing investments in information systems and technologies tracking in Brazil.

KEYWORDS | Environmental innovation, tracking technologies, supply chain, reverse logistics, waste electrical and electronic.

RESUMO

Esse trabalho tem como objetivo analisar a contribuição de sistemas de informação e as tecnologias de rastreamento para a logística reversa de cadeias de resíduos de eletroeletrônicos. A pesquisa foi realizada por meio de um estudo de caso incorporado em uma cadeia de eletroeletrônicos no contexto brasileiro. Os resultados da pesquisa mostraram que as tecnologias e sistemas implementados na logística direta não são utilizados na logística reversa. Mesmo reconhecendo as tecnologias de rastreamento como uma alternativa para tornar mais eficientes a desmontagem e a reciclagem, prevalece uma visão de aumento de custos, que não contribui para o aumento de vendas e a lucratividade. Infere-se que a resistência dos representantes do setor de eletroeletrônicos em aderir ao acordo setorial, assinado apenas no final de 2019 e estabelecido pela Política Nacional de Resíduos Sólidos (PNRS) em 2010, contribuiu para que empresas adiassem investimentos em sistemas de informação e tecnologias de rastreamento no Brasil.

PALAVRAS-CHAVE */ Inovação ambiental, tecnologias de rastreamento, cadeia de suprimentos, logística reversa, resíduos eletroeletrônicos.*

RESUMEN

El objetivo de este trabajo es analizar la contribución de los sistemas de información y las tecnologías de seguimiento a la logística inversa de las cadenas de desechos electrónicos. La investigación se realizó a través de un estudio de caso incorporado en una cadena de electrónica en el contexto brasileño. Los resultados de la investigación mostraron que las tecnologías y sistemas implementados en logística directa no se utilizan en logística inversa. Incluso reconociendo las tecnologías de seguimiento como una alternativa para hacer que el desensamble y el reciclaje sean más eficientes, prevalece una visión del aumento de los costos, que no contribuye a aumentar las ventas y la rentabilidad. Se infiere que la resistencia de los representantes del sector de electrónica a adherirse al acuerdo sectorial, firmado solo a fines de 2019 y establecido por la Política Nacional de Residuos Sólidos (PNRS) en 2010, contribuyó a que las empresas pospusieran inversiones en sistemas de información y tecnologías de seguimiento en Brasil.

PALABRAS CLAVE */ Innovación ambiental, Tecnologías de rastreo, Cadena de suministro, Logística inversa, Residuos eléctricos y electrónicos.*

ODAIR OLIVEIRA BERNARDO[1]
odair_bernardo@hotmail.com
0000-0002-7584-5898

MARIA TEREZA SARAIVA DE SOUZA[1]
mtereza@fei.edu.br
0000-0003-4514-2021

JACQUES DEMAJOROVIC[1]
jaquesd@fei.edu.br
0000-0001-6131-8790

[1]Centro Universitário da FEI, Departamento de Administração, São Paulo, SP, Brazil

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INTRODUCTION

Obsolescence processes have encouraged consumers to change electronic equipment such as smartphones, tablets, personal computers, and electronic games more frequently, contributing to the increased disposal of these products. These products contain substances with a high potential of causing health and environmental damage in case of improper disposal. Therefore, there are laws or guidelines that require manufacturers to seek efficient solutions in the development of reverse logistics (RL) programs (Demajorovic, Augusto, & Souza, 2016).

For the implementation of RL and green supply chain management (GSCM), the process improvement is related to investments in information systems (Ajamieh, Benitez, Braojos, Gelhard 2016), which manage and share environmental information in the chain (Olorunniwo & Li, 2010). Information technology (IT) has emerged as one of the best tools for technological innovation implemented in the supply chain, constituting an emerging research theme in chain management literature (Hazen & Byrd, 2012).

The main limitation is in the reverse flow, which is the exchange of information between manufacturers and disassembly sites. The use of tracking technology, such as radio frequency identification (RFID) (Kumar, 2014), barcode (Musa, Gunasekaran, & Yusuf, 2014) or integrated chips (Um, Stroud, & Suh, 2015), contributes to the sorting and classification of equipment for reuse, disassembly, remanufacturing or recycling (Nowakowski, 2018), improving process efficiency and reducing costs.

Despite the advantages of using IT in RL programs, there remains inadequate research on this topic in academic literature (Toyasaki, Wakolbinger, & Kettinger, 2013), and few companies have systems for this purpose (Hazen, Overstreet, Hall, Huscroft, Hanna, 2015).

In developing countries, the implementation of RL is faced with much significant challenges. The absence of economic incentives, legislation or low enforcement capacity by the public sector (Li, Jayaraman, Paulraj, Shang, 2016), reverse chain conflicts, and lack of awareness among the population (Demajorovic, Augusto, Souza, 2016; Zurbrügg, Caniato, & Vaccari, 2014) discourage business investment in these countries.

In Brazil, Law no.12.305/2010 instituted the National Solid Waste Policy (NSWP), which fosters RL and a set of actions and procedures for the collection and final disposal of waste, including electronics. Accordingly, it established regulations, sectoral agreements, and terms of commitment to achieve its goals (Ministry of the Environment, 2018). The resistance of the representatives in signing the sectoral agreement favored the low interest of the members of the electronics chain in investing and implementing large-scale programs of RL systems for electronic waste (Demajorovic, Augusto, Souza, 2016). Despite the low commitment and interest of the electronics sector in promoting RL, at the end of 2019, almost 10 years after the NSWP was promulgated, the sectoral agreement was signed.

During this process, the contribution of IT towards achieving the goals proposed in the sectoral agreement received little to no attention. Therefore, the aim of this study is to analyze the contribution of information systems and tracking technologies to the RL of electronic waste chains in the Brazilian scenario.

THEORETICAL FRAMEWORK

The importance of IT and tracking technologies in the implementation of RL programs is discussed in this section. The theoretical framework presents the development of an analysis model, data collection instruments, and the analysis and discussion of the results.

Information systems and tracking technologies in the supply chain

Green Supply Chain Management (GSCM) includes product design (Gmelin & Seuring, 2014), life cycle analysis, green operations that encompass RL, and solid waste management. The products are designed taking into account the conservation of resources, use of residues in remanufacturing, reuse and recycling (Liu, Zhu, & Seuring, 2017).

Three aspects are considered limitations to the implementation of the GSCM: high costs, coordination and complexity efforts, and insufficiency or failure of communication in the supply chain (Seuring & Müller, 2008). Green information systems provide the necessary information for decisions on eco-design, in terms of material and energy consumption, reuse, recycling and post-consumption destination (Li et al., 2016). These systems provide the interface to support sustainable management in a shared environment (Yang, Sun, Zhang, Wang, 2018).

To involve various departments of the organization, the flows of goods and information in the GSCM must be interconnected and coordinated. In addition, suppliers and customers should be interconnected and coordinated to improve the performance of the entire chain (Morgan, Richey, & Autry, 2016). Currently, information flows in the GSCM are expanding, and the combination of RL and IT skills is enhancing

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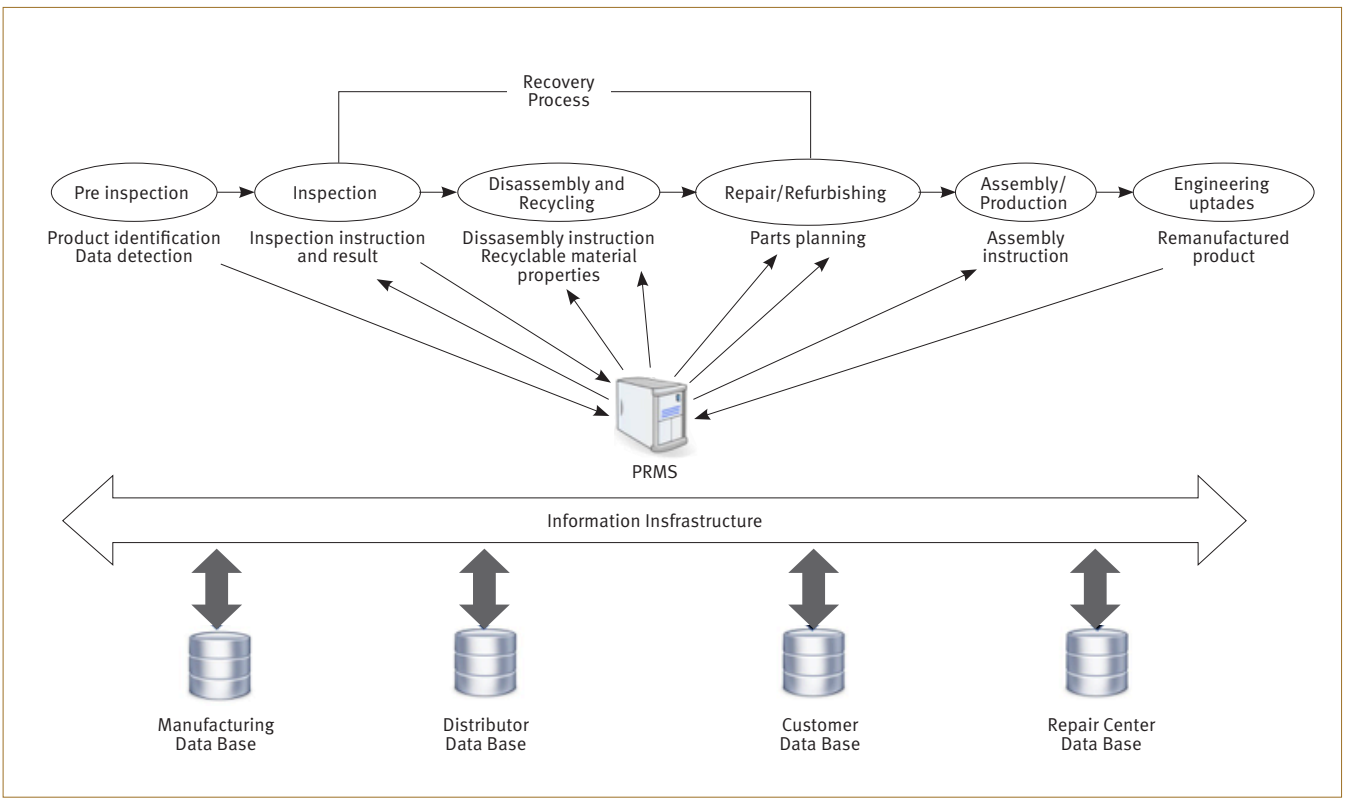
the performance of the reverse product flow (Morgan et al., 2016). Recycling processes have become more efficient and waste is being disposed of properly (Prajogo, Olhager, 2012; Morgan, Richey, Tokman, Deffe, 2018).

RL includes several activities, beginning with the return of the used product, which can be directed to resellers or manufacturers through return programs or public/private collection points. After collection, inspection is done for classification in various categories: repair, reuse, remanufacture or recycle (Agrawal, Singh, & Murtaza, 2015; Dhanda & Hill, 2005). In this area, there are several studies on the use of IT to improve efficiency in waste management (Król, Nowakowski, & Mrówczyńska, 2016). Managers can improve partner communication, integrate information about company activities and improve responsiveness (Daugherty, Richey, Genchev, Chen, 2005).

Studies show that loss of information is one of the main obstacles to recovering the value of returned products (Madaan, Kumar, & Chan, 2012). To return products at the right time and locations, IT provides accurate information on the status, location and condition of products in motion in the supply chain (Jayaraman, Ross, & Agarwal, 2008). Therefore, compatible systems that facilitate the exchange of information between organizations or units should be employed (Huscroft, Hazen, Hall, Hanna, 2013a).

In the product recovery management system (PRMS) (Toyasaki et al., 2013), there may be information-intensive product recovery systems (IPRS), which provide product information to enable recovery, automate manual processes, and reduce sorting time and costs. These systems require highly accurate information on the product identification, use and condition to enable a more efficient RL process (Toyasaki et al., 2013). Figure 1 shows the function of the PRMS in establishing the integration between databases and all activities in the RL chain.

Figure 1. **Product recovery management system**



Source: Um et al. (2008, p. 1182).

PRMS needs to be further developed to give access to databases by all stakeholders, enabling integration of systems through standardized information, and use of tracking technologies such as RFID, barcodes, or integrated chips. In disassembly, the PRMS can provide information on the materials that make up the product. Remanufacturing information must have repair and reassembly instructions

(Um et al., 2008), and generate decision making reports that are effective in improving the chain's environmental performance as well as meeting targets (Green, Zelbst, Meacham, Bhadauria, 2012a).

These technologies, which have always been used in the automation processes of direct logistics, can now provide reverse flow information and reduce product classification time (Toyasaki et al., 2013). One of the advantages of RFID is the remote simultaneous identification of several items, without the need to target each item (Kumar, 2014; Parlikad & Mcfarlane, 2007). Although RFID tags have a higher cost, their use in assembly lines and distribution centers has increased (Um et al., 2015). The barcode is an optical technology for reading data only, which means that data cannot be changed once printed, and the barcode reader needs to be close and directed to the product or packaging. It is a technology widely used in low cost direct logistics, and is universal (Musa et al., 2014). Integrated chips are the most advanced and one of the most expensive technologies, and are present in several electronic products. The captured information can be used in research and development areas to provide more eco-efficient products (Um et al., 2015).

The most accurate decision for the repair, reuse, refurbishing, or recycling of a product depends on several parameters, including product quality, date of manufacture and sale, and the conditions the product has been subjected to throughout its life cycle. These conditions include ambient temperature, humidity, utilization rate, and maintenance (Parlikad & Mcfarlane, 2007). In the monitoring process, RFID technology begins by defining the life cycle stage of the product, that is, the beginning of life (BOL), middle of life (MOL), or end of life (EOL). Defining the stage of the product's life cycle makes it possible to select its destination among the alternatives of reuse, remanufacturing or recycling. If a product is in the BOL, it can probably be selected for reuse if repaired. If it is in the MOL, the likely destination is remanufacturing, and in EOL it would be selected for recycling (Um, Stroud, Suh, 2015).

Information sharing strategies via RFID allow for more accurate stock and inventory control, with real-time monitoring (Shin, Suh, Stroud, Yoon, 2017), which helps coordinate inventory policies between recycled material suppliers and manufacturers in the supply chain, reducing environmental and economic costs and adapting quickly to changes in the system (Green, Zelbst, Sower, Reyes, 2012b; Nativi & Lee, 2012).

Analysis model

This study assumes that the recovery systems for information-intensive products can collaborate with RL, to increase efficiency and decrease costs (Daugherty et al., 2005; Jayaraman et al., 2008; Olorunniwo & Li, 2010; Toyasaki et al., 2013). The PRMS starts by integrating the systems and databases of all those involved in the GSCM, as manufacturers, distributors, resellers, technical assistance and collection and recycling centers, and uses sensors such as RFID, or barcode, and integrated chips to identify and obtain product information. Figure 2 shows the direct and reverse flow of products, using tracking and information collection technologies, with information captured in all the main areas (Nativi & Lee, 2012; Nowakowski, 2018). The purpose of this analysis model is to present a synthesis of the application of tracking technologies and information systems in the reverse flow, as discussed in the theoretical framework.

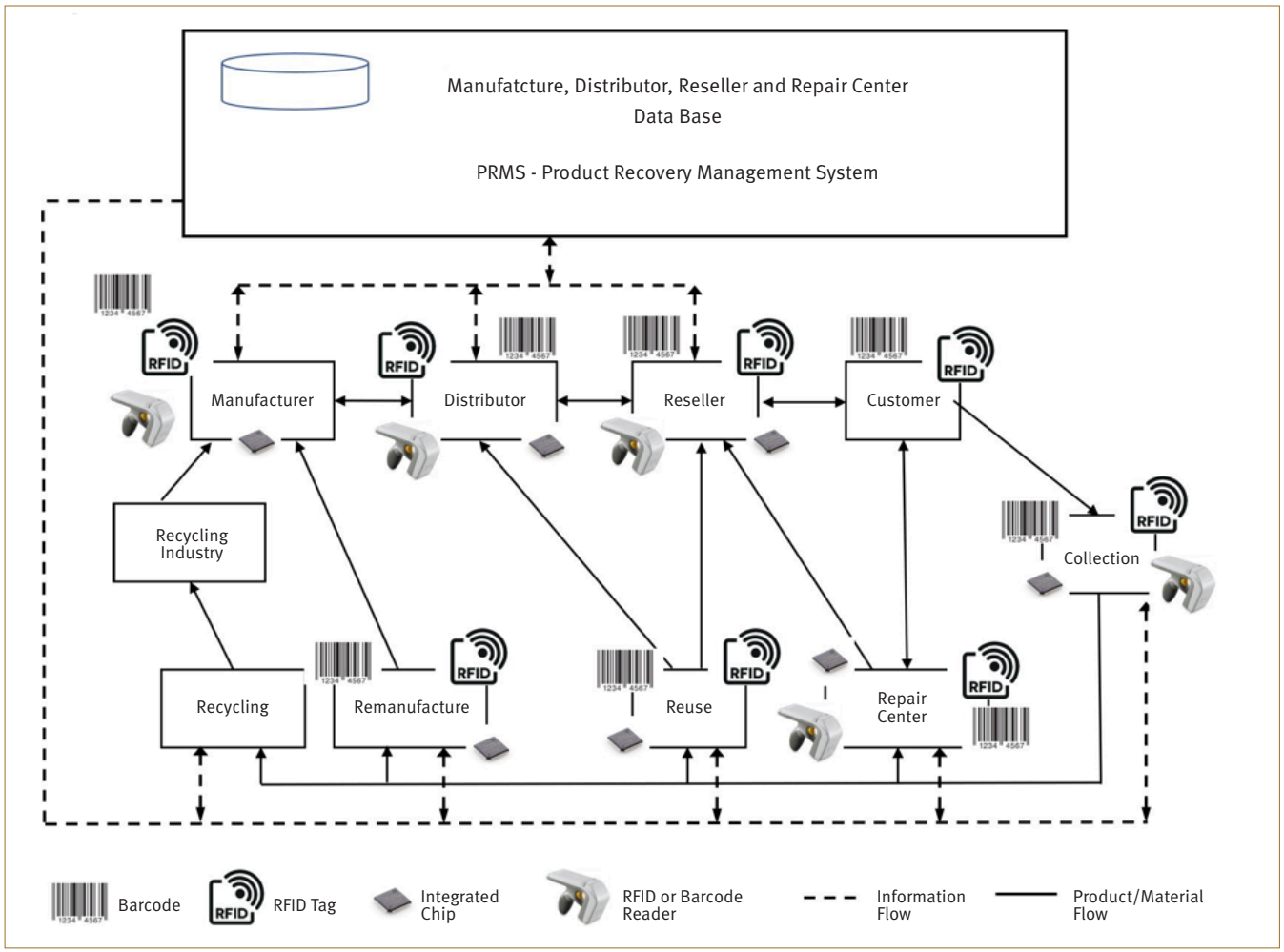
In direct logistics, the sensors are used in the manufacturing process with the introduction of tracking technologies in products (Nowakowski, 2018; Um et al., 2015). Products are tracked and systems updated with information about deliveries in the distribution process. For the resellers, the information collected provides the systems with sale levels, which provide feedback on the stocks of distributors and manufacturers that can plan production (Um et al., 2015).

Information systems with product information collectors also contribute to the development and planning of the RL network (Green et al., 2012a; Liu et al., 2017; Müller & Seuring, 2007). In the collection, inspection and disposal centers, information systems can identify hazardous materials and the quantity and weight of various components, and provide instructions for disassembly or proper disposal (Nowakowski, 2018). These systems can also benefit from poorly automated manual processes (Nativi & Lee, 2012; Parlikad & Mcfarlane, 2007; Toyasaki et al., 2013). The information captured in the collection centers updates the databases and provides data for the development of reverse flow goals (Li et al., 2016; Olorunniwo & Li, 2010). The use of IT for tracking and capturing information, such as RFID (Nativi & Lee, 2012; Nowakowski, 2018), makes it possible to evaluate the most suitable destination according to the product's characteristics and its lifetime. It can be directed to the factory, in the case of remanufacturing, to technical assistance for repair, or to a distributor or reseller for reuse (Nativi & Lee, 2012; Nowakowski, 2018; Srivastava, 2008; Um et al., 2015).

The collected data can also be fed back to the research and development database of new products, providing important information for improving products, packaging, and eco-design (Agrawal et al., 2015; Gmelin & Seuring, 2014; Green et al., 2012a; Li et al., 2016). For this purpose, the bases shared between the main participants in the chain for decision making, and the creation of management reports must be integrated and accessible (Green et al., 2012a; Um et al., 2015).

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Figure 2. **Conceptual analysis model**



RESEARCH METHOD

Case studies can be used for different types of research, such as exploration, theory building, theory and extension testing, and theory refinement (Voss, Tsikriktsis, & Frohlich, 2002). In this study, the methodological approach involved a single case study integrated with several incorporated analysis units (Yin, 2017). The theoretical sample was composed of analysis units on which the study data was collected (Yin, 2017). The validity of the study requires the selection of at least four cases that should be chosen based on determined standards (Eisenhardt, 1989), with the aim of predicting similar or contrasting results (Yin, 2017). The researched organizations were chosen to represent the main participants in the reverse waste electrical and electronic equipment chain (WEEE) in the Brazilian scenario in the segments of personal computers, notebooks, tablets, and printers. Thus, the analysis units involved two manufacturers, a distributor, a retailer, an RL management company, an RL innovation center, technical assistance, a recycling company, and a cooperative. The characteristics of the companies and respondents are shown in Exhibit 1.

For all the analyzed units, the research focused on the technologies involved in capturing and tracking products for reverse flow, and the existing information systems for processing this information. Manufacturer A is present only in the corporate market, whereas Manufacturer B operates in the corporate and domestic markets. The evidence sources used for data collection were documents, semi-structured interviews and direct observation. The use of multiple evidence sources guaranteed the validity of the research construct and the different sources of information, when converging, thus contributing to the reliability of the data (Yin, 2017).

For case studies, documents are important as they corroborate and increase evidence from other sources (Yin, 2017).

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The documents used in this case study were sustainability reports, company websites, and documents provided by the interviewees. Moreover, direct observation is often useful to provide additional information on the study topic and is applied during field research (Yin, 2017). Direct observation was carried out at the cooperative, recycler, retailer, and innovation and recycling center. The semi-structured interview questions were based on the theoretical categories presented in the literature review. These include the flow of products in direct and reverse logistics; RL network; processing, storage and capture of product information; system integration between departments and members of the supply chain; use of capture technology for product information, such as RFID, barcode or integrated chips, as shown in Exhibit 2.

Exhibit 1. **Characteristics of the researched companies**

Researched Company	Characteristics
Manufacturer A	US-based company with approximately 9,000 employees worldwide. In Brazil, it has approximately 300 employees based in São Paulo and operates in the corporate market throughout the national territory. It has several distributors and resellers.
Manufacturer B	US-based company with approximately 55,000 employees worldwide. In Brazil, it has approximately 500 employees based in São Paulo and operates in the corporate and domestic market throughout the national territory. It has several distributors and resellers.
Reverse Logistics Manager	Brazilian company based in São Paulo with approximately 30 employees and national coverage. Serves major WEEE manufacturers.
Innovation and Recycling Center	Brazilian company, with the participation of multinationals in the technology area, headquartered in São Paulo, with approximately 90 employees and national coverage. Serves major WEEE manufacturers.
Distributor	Technology distributor of products based in the USA and controlled by a Chinese group, with 33,000 employees worldwide. In Brazil, it is headquartered in São Paulo with approximately 600 employees and national operations. Its customers are manufacturers in the areas of technology and electronics.
Retailer	Brazilian retailer with approximately 5,000 employees and operating throughout the national territory, it is multi-branded.
Technical assistance	Technical assistance for computer equipment based in São Paulo and operating in the greater São Paulo with approximately 60 employees, it is multi-branded.
Cooperative	Electronics recycling cooperative, with operations in Greater São Paulo, with 30 employees, and is multi-branded.
Recycler	Electronics and metals recycler with operations in greater São Paulo, and with 60 employees. Serves the cooperative market and major WEEE manufacturers.

Exhibit 2. Interview questions related to theoretical research categories

Category	Questionnaire
Manufacturing	Does the production system use any tracking technology such as RFID, barcode or integrated chip?
	Which products or product lines use this tracking technology for production control?
	Is any type of recycled material used in manufacturing? If so, in which products? Are these materials from the company's recycled products or from the recycled market?
	Do the systems allow product tracking to the final customer?
	What information fed by the factory into the system can be viewed along the chain (distributor, retail, technical assistance, cooperatives, recyclers, etc.)?
	Are products with malfunctions returned to the factory by the distributor, retailer or technical assistance?
	Are damaged products recovered or discarded?
	Are there policies and processes for remanufacturing or refurbishing products?
	Are the production, and research and development control systems fed back with information on returned products or technical assistance? If so, what kind of information?
	Is the information useful for product recovery?
	Is there currently the generation of reports that enable management monitoring, decision making and goal control?
Distribution	Are systems and databases updated with manufacturer's product information?
	Are products returned from retail, technical assistance or consumers forwarded to the distribution center?
	Are they integrated with the manufacturer and supplied with distribution information?
	Is there a policy for returning products returned because of customer dissatisfaction not related to any defect or obsolescence? If that is the case, at which point in the supply chain is the responsibility for collecting these products? Is there access to product information returned by the retailer or resellers in the system?
Resellers/ Retailers	Are systems and databases updated with product information from the manufacturer or distributor?
	Are products returned from customers or technical assistance routed to resellers or retailers?
	Are they integrated with the manufacturer and supplied with distribution information?
	Is there a policy for returning products returned because of customer dissatisfaction not related to any defect or obsolescence? If yes, at which point in the supply chain is the responsibility for collecting these products? Is the product information returned by customers fed into the system?
Repair Center – Technical assistance	Is there a process for capturing product information, such as RFID readers, bar codes or integrated chips that support technical assistance?
	Is there access to systems and databases with information about the manufacturer's products that facilitate the repair process or correct destination? Are the systems integrated with the manufacturer or can they be supplied with information from the repair center?
Reverse-Collection Logistics Network – Cooperative	Are there cooperatives where customers can return obsolete/damaged products?
	Is there a process for capturing product information, such as RFID readers, bar codes or integrated chips?
	Is there access to the systems and databases with the manufacturer's product information to facilitate collection, identify product components and disassembly? Are the systems integrated with the manufacturer or can they be fed with information from the cooperative?
	Can cooperatives identify products with any of the tracking technologies, such as RFID, barcode or integrated chip?
	Can cooperatives access the systems and obtain information for disassembly and proper disposal of components and materials?
Reverse-Collection Logistics Network – Recycler	Are there recyclers where customers can return obsolete/damaged products?
	Is there a process for capturing product information, such as RFID readers, bar codes or integrated chips?
	Is there access to the systems and databases with manufacturer's product information to facilitate collection, identify product components and disassembly? Are the systems integrated with the manufacturer or can they be fed with information from the recycler?
	Can recyclers identify products with any of the tracking technologies, such as RFID, barcode or integrated chip?
	Can recyclers access systems and obtain information for disassembly and proper disposal of components and materials?

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The managers responsible for the companies' sustainability area, RL and operations were the targets for the interviews and questionnaires. The interviews were recorded and transcribed. The documents used in this case study were sustainability reports and company websites. Additionally, during the interviews, some managers completed the verbal information with records in the files of the researched company. Direct observation was carried out at the cooperative, recycler, retailer, and innovation and recycling center, applying an observation protocol developed specially for this study. The codification of the interviews, documentary analysis and direct observation (interviews, document analysis and observation) presented in Exhibit 3, allowed the chaining of evidence and contributed to the validity of the construct (Yin, 2017).

Exhibit 3. **Coding of interviews, documents and observation**

Researched Company	Interviewee	Time in the function	Interview Time	Interview Code	Document Code	Observation Code
Manufacturer A	Reverse Logistics Manager	4 years	40 min	FAB-A-ENT	FAB-A-DOC	
Manufacturer B	Operation Manager	6 years	43 min	FAB-B-ENT	FAB-B-DOC	
Reverse Logistics Manager	Sustainability Manager	5 years	49 min	GEST-ENT	GEST-DOC	
Innovation and Recycling Center	Operation Manager	6 years	42 min	INOV-ENT	INOV-DOC	INOV-OBS
Distributor	Operation Manager	5 years	35 min	DIST-ENT	DIST-DOC	
Retailer	Operations supervisor	3 years	37 min	VAR-ENT	VAR-DOC	VAR-OBS
Technical assistance	Technical Assistance Manager	20 years	29 min	ASSISTEC-ENT	ASSISTEC-DOC	
Cooperative	CEO	2 years	45 min	COOP-ENT	COOP-DOC	COOP-OBS
Recycler	Operations manager	2 years	33 min	RECI-ENT	RECI-DOC	RECI-OBS

Because the data obtaining process generates a large amount of information, the analysis allows researchers to deal with this volume of information (Eisenhardt, 1989). For this study, we used the strategy of following the theoretical categories established in the case study research.

ANALYSIS AND DISCUSSION OF RESULTS

The research indicated a gap between the analysis model that synthesized information on information systems and tracking technologies obtained in the literature review, and the empirical data. The main results of the interviews, document analysis, and direct observation are coded and presented in Exhibit 4.

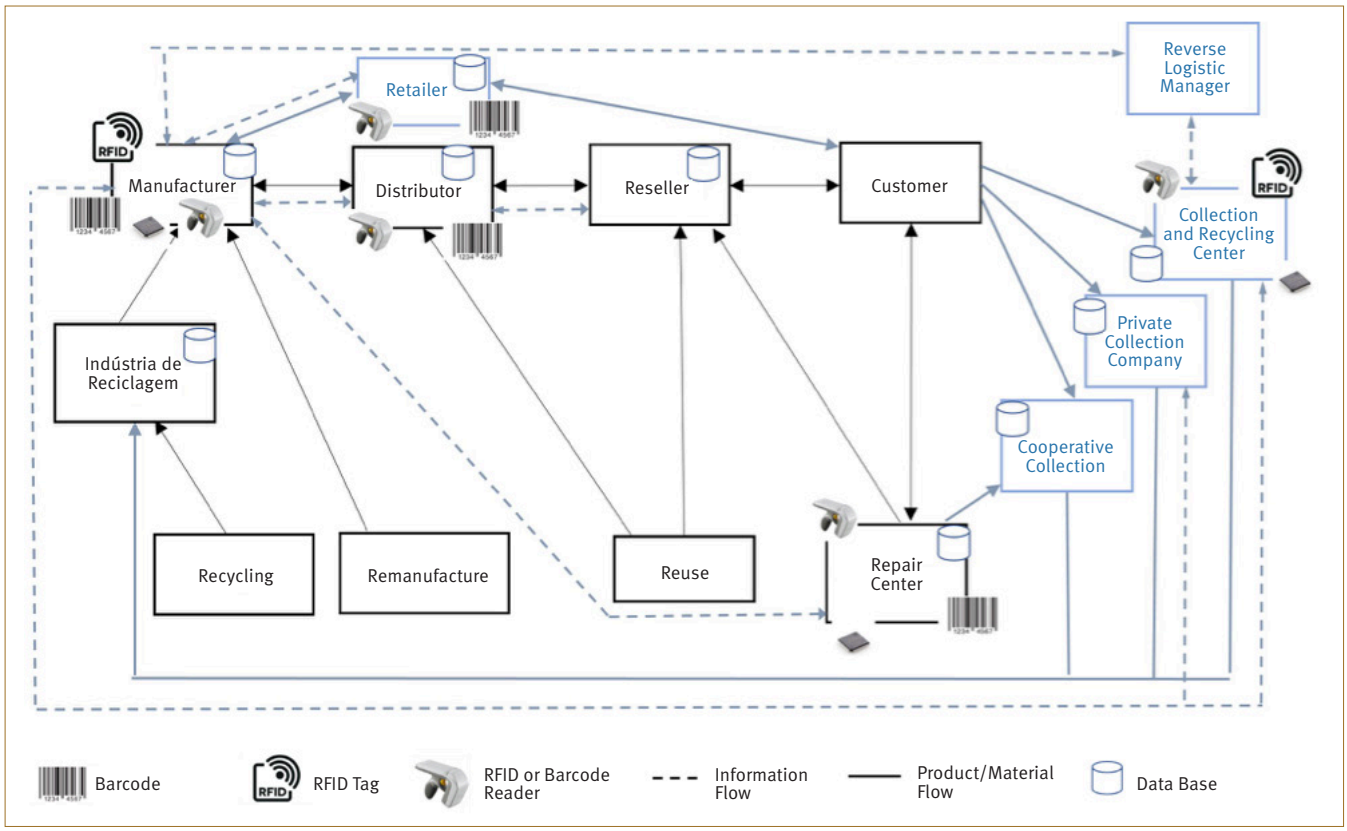
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Exhibit 4. **Summary of research results in analysis units**

Category	Analysis Units and Data Collection Instruments	Summary of Research Results
Direct Logistics	**Manufacturers** FAB-A-ENT/FAB-B-ENT/FAB-A-DOC/FAB-B-DOC	It uses RFID for manufacturing process control.
		Maintains product information system but does not share information with other members of the supply chain.
	Distribution DIST-ENT/DIST-DOC	It does not use RFID but uses bar codes in packaging for inventory control. It uses product barcode when the product is after-sale or post-consumer. There is no interconnection of systems; information is shared through forms.
		It uses products returned in trade-in negotiations that are in useable conditions. It does not recondition.
	Retail VAR-ENT/VAR-OBS/VAR-DOC	It does not use RFID but uses packaging barcodes for inventory control. It uses product barcodes when the product is after-sale or post-consumer. It has a B2B system for manufacturers' access.
		It resells after-sale products in case of an incorrect sale. It does not perform post-consumer reconditioning.
Reverse Logistic	**Reverse Logistics Manager** GEST-ENT/GEST-DOC/INOV-ENT INOV-OBS/INOV-DOC	The innovation and recycling center uses the RFID and integrated chip, but does not use barcodes. It obtains information from the chips integrated in the toner and ink cartridges.
		The innovation and recycling center provides access to systems for opening collection requests and providing recycling production reports. The reverse logistics manager provides information by forms and does not have access to manufacturers' systems.
	Cooperative and Recycler COOP-ENT/COOP-OBS/RECI-OBS COOP-DOC/RECI-ENT/RECI-DOC	The cooperative and recycler do not use any tracking technology. RFID is not present in most products, and bar codes are damaged with the use of equipment.
		They do not integrate with any manufacturer's systems and have adapted market systems for use in their operations.
	Technical Assistance ASSISTEC-ENT/ASSISTEC-DOC	They do not use RFID. They use barcodes on both the packaging and product.
		Access manufacturers' systems for training, warranty calls and support. Defect information feeds the manufacturers' R&D bases.
		Reuse for rental and service contracts, without the manufacturer's participation.
		Remanufacturing or reconditioning for rental and service contracts, without the participation of the manufacturer.

Research has shown that information systems are present in all areas of the direct and reverse supply chain. However, they are still far from interconnected solutions that could allow efficient information sharing. The flow of information should provide the necessary details to make recycling processes more efficient and enable the proper disposal of waste, as indicated in existing literature (Morgan et al., 2018; Olorunniwo & Li, 2010). Figure 3 illustrates the synthesis of the results obtained in the field research.

Figure 3. **Synthesis of the results obtained in the field research**



Note: retailers buy directly from manufacturers and sell to consumers. Resellers buy from distributors and sell in all markets

In direct logistics, the distributor and manufacturers use controls, which are reports developed by the distributors. The sensors are used in the manufacturing process with the introduction of tracking technologies, such as RFID, bar codes or embedded chips, corroborating several aspects raised in the literature review (Nowakowski, 2018; Um et al., 2015). Manufacturers have developed a system for accessing technical assistance to expedite the repair of equipment under warranty. Technical assistance accesses the manufacturers' system when there is a need to purchase parts or provide support for products under warranty. These integrated systems can improve the responsiveness of partners, as mentioned in other studies (Daugherty et al., 2005).

The retailer's need to keep their inventories stocked and in the right quantity. To avoid increasing storage costs, a business-to-business (B2B) system was created for online and real-time access by manufacturers. This quickened the movement of inventory and supply of products. However, the system is still considered inefficient by users, considering the speed of current commercial transactions. Studies show that systems with information collected through tracking technologies contribute more effectively to location, delivery, and sales (Nativi & Lee, 2012; Shin et al., 2017), providing up-to-date information for enhanced inventory control (Green et al., 2012b) and production planning (Um et al., 2015).

This study demonstrated that the development of systems and their interconnection occur when there is an impact on sales. Each participant develops its own structure interconnected with other links in the chain to serve specific purposes. The databases are not yet interconnected, meaning they lose significant information to recover value as presented in existing literature (Madaan et al., 2012). Previous research shows that technological development is necessary (Ajamieh et al., 2016; Huscroft, Hazen, Hall, Skipper, Hanna, 2013b) for companies to develop skills related to the integration and dissemination of information (Huscroft et al., 2013a; Toyasaki et al., 2013), and support environmental management (Yang et al., 2018).

With regard to RL, there are no ready systems on the market, meaning every company has to adapt or create their own system. The study revealed a very early stage of adoption of these technologies in the national market. The process of controlling parts and components is not covered by the available logistics

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software solutions, hindering reverse flow and remanufacturing, which corroborates previous studies (Morgan et al., 2016). Even in these conditions, the innovation and recycling center offers online access for customers, who can request collections and have access to the weighted quantity of processed products. Additionally, the RL manager passes production information to customers in the form of reports; however, a system that allows online and real-time access is still being developed. The cooperative and recycler also adapted their systems to improve decision-making related to the reverse flow of products, as suggested in existing literature (Green et al., 2012a; Liu et al., 2017), without interconnection with the chain, which does not contribute to the efficiency of the process as a whole.

In Brazil, systems that provide information for identification and lifetime, such as PRM and IPRS discussed in the theoretical framework (Toyasaki et al., 2013), are still far from being used. According to some authors, these systems would make reusing, reconditioning, and remanufacturing programs more efficient (Agrawal et al., 2015; Dhanda & Hill, 2005). In technical assistance, repair or reconditioning is defined by the availability and cost of parts. The distributor buys and refurbishes products from corporate customers, without the participation of manufacturers. As pointed out in previous work, IT is a major obstacle for companies, owing to the lack of resources and adequate knowledge in the area (Bouzon, Miguel, & Rodriguez, 2014), which causes communication failure in the chain and inefficient processes (Seuring & Müller, 2008).

The cooperative reconditions some products in small volumes for resale or own use. Repair information that can assist in product development is provided by technical assistance. According to the Brazilian Consumer Protection Code, distributors and retailers only communicate on defect information when the product is returned within seven days. The recyclers do not provide feedback for the development of eco-design products, which facilitate disassembly and non-use of materials that contaminate others. This information feedback, unlike (Gmelin & Seuring, 2014; Li et al., 2016), does not happen between electronics manufacturers and recyclers, which increases the costs of remanufacturing and recycling. Product components that use welding or screws, for example, increase the disassembly time and, consequently, the labor employed in the process.

The study showed that the use of tracking technology like RFID for RL, presented in studies on the topic (Um & Suh, 2015), exists in only one product line from Manufacturer B, and the innovation and recycling center reads it when the product arrives at the recycling center. Manufacturers A and B use it in production; however, no other supply chain participant uses this technology for inventory control. The cost issue is still highlighted as the main limitation, and companies do not implement information systems for this purpose and do not prioritize this technology for supply chain activities (Hazen, Overstreet, Hall, Huscroft, Hanna, 2015). Other participants in the chain infer that, in the future, this technology may be used for products with greater added value, mainly because it facilitates distance reading (Kumar, 2014). Studies show that the use of RFID technology allows better control of inventories with real-time monitoring and information sharing (Green, Zelbst, Sower, Bellah, 2016; Nativi & Lee, 2012) for greater environmental and economic benefits (Jayaraman et al., 2008).

The barcode is widely used in direct logistics, mainly in packaging. The product barcode is widely used in technical assistance, and post-sale or post-consumer situations for retailers and distributors. The barcode is not used in RL. Because there is no interconnection with manufacturers' systems, the barcode does not identify the product, and consequently, there is no information, such as the model, manufacturer, weight, types of materials and disassembly information, which could be useful information for recycling, as suggested by Musa et al. (2014). Additionally, the product barcode is often damaged.

For the cooperative manager, the use of a universal barcode or RFID by manufacturers would facilitate the identification of products for recycling and help in the operation, which would increase productivity with scale gain. With quick identification, the company could obtain information on disassembly, identification of hazardous materials and components, thus reducing costs and simplifying the process, as suggested by some studies (Nativi & Lee, 2012; Nowakowski, 2018; Parlikad & Mcfarlane, 2007).

The manager of the innovation and recycling center pointed out that RFID could be used for planning the supply of recycled materials and better stock control. The manufacturer, having prior knowledge of the amount of recycled material available, adjusts the stock with the input supplier and, consequently, decreases the consumption of virgin raw material, as concluded in a previous study (Nativi & Lee, 2012).

The use of the integrated chip was observed in toner cartridges and inks. The technical assistance that provides this products to customers with a service contract or the innovation and recycling center that has a contract with Manufacturers A and B controls and audits the supplies by reading the information on the chip to pass on to manufacturers. Manufacturers have a special interest in recycling these supplies to prevent reconditioning and returning to the black market. The study did not identify the use of integrated chips in any other electronics, at least with the intention of traceability aimed at the RL, as pointed out in previous literature (Um et al., 2008).

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For some participants in the chain, signing the sectoral agreement will be a catalyst for the significant expansion of investments in the structure of tracking systems and technologies implemented to meet targets, which corroborates studies on the topic (Dou, Zhu, & Sarkis, 2014; Green et al., 2012a).

CONCLUSIONS

The objective of this study was to analyze the contribution of information systems and tracking technologies to the RL of electronic waste chains in the Brazilian context. The results from the study showed that information systems are present at all points in the direct and reverse supply chain. However, the interconnection of systems is not effective in the chain, and the implementation of these technologies is still incipient in the Brazilian market. Some participants in the chain acknowledged the potential of tracking technologies with universal coding for product identification, and access to systems that give information on the model, the estimated useful life, characteristics such as weight, types of materials and hazardous components. These technologies are also regarded as alternatives for reducing costs in the process, making disassembly and recycling more efficient, as well as providing an opportunity for use in production planning and inventory control of recycled materials.

On the other hand, the main limitation identified in the study is that tracking technologies used in reverse flow are perceived quite differently from their use in direct logistics. From the case study, it is inferred that the use of such technologies in the reverse flow does not contribute to increased sales and profitability for all companies in the chain, but raises operation costs and causes a shortage of resources for investment. Additionally, because there is no system in the market that integrates the entire chain, many companies had to develop their own system. Finally, at some points of the chain, it was observed that the managers lacked knowledge regarding these reverse flow tracking technologies. These limitations hinder the flow of information and render processes inefficient, slowing the investments and strategic partnerships of companies in developing countries like Brazil.

In this regard, the identification of the main limitations of using tracking technologies in reverse flow is a significant managerial contribution of this research. The recent signing of the electrical and electronics sector agreement in October 2019 may have been an important element to enhance the benefits of tracking technologies and overcome the limitations identified in this study for the large-scale implementation of WEEE RL in the Brazilian scenario.

The theoretical contribution of this study is the analytical model, which summarizes the main elements that constitute the advantages of using these technologies and systems. The literature review showed the contribution of information systems and tracking technologies in several aspects, for the implementation of RL programs, which are already used in some countries, with the potential to increase efficiency and overcome limitations in developing countries.

Thus, for future work, the development of new research on investment and cost evaluation of information systems and tracking technologies in RL programs as an emerging and important theme is recommended.

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AUTHORS' CONTRIBUTION

The Odair Oliveira Bernardo and Maria Tereza Saraiva de Souza participated in the conceptualization and theoretical-methodological approach. The theoretical review and data collection was performed by Odair Oliveira Bernardo. All authors worked together in the data analysis, writing and final revision of the manuscript.

ARTICLES

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COGNITIVE BIASES IN MERCHANDISING ACTIVATION AND EFFECT ON SUPERMARKET SALES

Uso de vieses cognitivos em ativações de merchandising e o efeito nas vendas nos supermercados

El uso de sesgos cognitivos en activaciones de merchandising y su efecto en las ventas en supermercados

DANTE AVANZI[1,2]
dante.avanzi@espm.br
0000-0002-4715-1696

LEANDRO ANGOTTI GUISSONI[1]
leandro.guissoni@fgv.br
0000-0003- 1193-9251

JONNY MATEUS RODRIGUES[3]
jonnymateus@usp.br
0000-0002-4301-7553

RAFAEL D'ANDREA[4]
rafael.dandrea@toolboxtm.com.br
0000-0003-3773-4350

[1] Fundação Getulio Vargas, Escola de Administracao de Empresas de Sao Paulo, São Paulo, SP, Brazil

[2] Escola Superior de Propaganda e Marketing, São Paulo, SP, Brazil

[3] Universidade de São Paulo, Faculdade de Economia Administração e Contabilidade de Ribeirão Preto, Ribeirão Preto, SP, Brazil

[4] Grupo Toolbox Marketing & Tech, São Paulo, SP, Brazil

ABSTRACT

Competition among different brands in supermarkets motivates consumer goods companies to develop and implement and activate merchandising materials at the point of sales (POS). These merchandising materials attempt to influence shoppers and promote sales. On the other hand, behavioral economics studies the decision-making of individuals based on their preferences and beliefs, influenced by cognitive bias. This study attempts to understand the effect of loss aversion and mental accounting biases in POS materials on supermarket sales. We conduct two experiments with a consumer brand in a supermarket chain. The results reveal a positive and significant effect on sales only for the cognitive bias of loss aversion, applied to the POS materials.

KEYWORDS | Shopper marketing, merchandising, cognitive bias, retailing, behavioral economics.

RESUMO

A competição entre marcas disponíveis nos supermercados motiva os esforços das empresas na elaboração e ativação de materiais de comunicação no ponto de venda (MPV). Os MPVs objetivam influenciar o shopper e gerar vendas. A economia comportamental, por sua vez, estuda como um indivíduo toma uma decisão de acordo com as suas próprias preferências e crenças, influenciado pelos vieses cognitivos. O objetivo deste trabalho é compreender os efeitos nas vendas a partir do uso dos vieses aversão à perda e contas mentais nas mensagens de materiais de comunicação ativados em supermercados. Para isso, foram realizados dois experimentos de campo aplicados a uma marca de alimento em uma rede de supermercados. Os resultados mostram um efeito positivo e significativo nas vendas apenas quando foi utilizado o viés de aversão à perda na mensagem dos MPVs.

PALAVRAS-CHAVE */ Shopper marketing, materiais de comunicação, vieses cognitivos, varejo, economia comportamental.*

RESUMEN

La competencia entre marcas disponibles en supermercados motiva los esfuerzos de las empresas en el desarrollo y activación de material de comunicación en el punto de venta. Este material de comunicación tiene como meta influenciar compradores y generar ventas. La economía conductual, a su vez, estudia cómo un individuo toma una decisión de acuerdo con sus propias preferencias y creencias, influenciado por sesgos cognitivos. El objetivo de ese trabajo es comprender los efectos en las ventas a partir del uso de los sesgos cognitivos aversión a la pérdida y contabilidad mental en el material del punto de venta activado en supermercados. Se realizaron dos experimentos con una marca de alimento en una cadena de supermercados. Los resultados revelaron un efecto positivo y significativo en las ventas solo cuando se utilizó el sesgo cognitivo aversión a la pérdida en el material de los puntos de venta.

PALABRAS CLAVE */ Shopper marketing, material de comunicación, sesgos cognitivos, comercio minorista, economía conductual.*

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> It's extremely difficult to change the way people's brains are wired. Instead, change the environment in which they make decisions. (Gino & Beshears, 2015, p. 46)

INTRODUCTION

Consumer goods companies have invested effort and resources to influence consumer decisions at various points in the product purchasing journey, with special attention to marketing stimuli in physical stores (Deloitte, 2009; Shankar, Inman, Mantrala, Kelley, & Rizley, 2011; Silveira & Marreiros, 2014). The point of sale (POS) has been highlighted in academic research as a major influencer of shoppers' decisions, and particularly for non-durable consumer products (Bell, Corsten, & Knox, 2011; Feijó & Botelho, 2012; Guissoni, Consoli, & Rodrigues, 2013; Shankar, 2011; Silveira & Marreiros, 2014). Further, the supermarket shopping environment can influence shoppers by activating their purported "shopping trigger" (Löfgren, 2005). Consumer goods manufacturers activate this trigger through in-store marketing stimuli, which compels the merchandising within stores to influence shoppers' purchase decision-making at the POS (Shankar et al., 2011).

Previous studies have demonstrated the subject's influence on and relevance in sales by investigating the various stimuli that occur in the POS environment. For example, research has been conducted on communication materials, product exposure, promotions, and product locations on gondolas and other types of displays (Bell et al., 2011; Chandon, Hutchinson, Bradlow, & Young, 2009; Court, Elzinga, Mulder, & Vetvik, 2009; Feijó and Botelho, 2012; Venkatesan, Farris, Guissoni, & Neves, 2015). Research on the subject has also incorporated behavioral economics with the cognitive biases of loss aversion (Hardie, Johnson, & Fader, 1993), and later, mental accounting (Stilley, Inman, & Wakefield, 2010a, 2010b). Cognitive biases are the mental and emotional filters on which one relies to understand and respond to external events. Thus, they represent distortions of judgment that can affect one's ability to evaluate information objectively and logically (Tversky & Kahneman, 1974). Understanding them is important, as cognitive biases can influence purchasing and consumption decision-making (Kahneman & Tversky, 1979; Thaler, 1980).

Consequently, academic research has examined the relationships involved in cognitive biases from the consumer behavior perspective, with an emphasis on sales promotion and price discount stimuli (Moran & Montero, 2014; Nunes & Park, 2003; Stilley et al., 2010a, 2010b; Thaler, 1985). Generally, such studies have presented evidence regarding the benefits of using these biases in sales promotion strategies and have indicated greater chances of impulse purchases in supermarkets. Regarding the "loss aversion" bias, for example, literature has addressed whether shoppers reacted differently if the prices of products shown to them were presented as gains or losses (Fabrizi, Lippert, Puppe, & Rosenkranz, 2016; Kalwani & Yim, 1992; Kalyanaram & Winer, 1995). Academic studies of the "mental accounting" bias have revealed its effects when the shopper mentally allocates different budgets for purchases in the retail environment; further, researchers have discovered a relationship between this bias and impulse purchases (Reinholtz, Bartels, & Parker, 2015; Stilley et al., 2010a).

While previous studies traditionally investigated promotional incentives for consumers by using specific cognitive biases (Fabrizi et al., 2016), no consensus exists regarding whether the use of merchandising activities without price incentives could also influence sales of a product in supermarkets. Stilley et al. (2010b) observe the behavioral economics field as applied to shopper marketing to note that "further research could consider activations without price promotion" (p. 45). In closing this gap, this study intends to contribute to such literature by investigating whether applying cognitive biases in changing a brand's communication message at the POS—or specifically, through banners and displays—could influence a product's sales without the promotional stimuli widely present in previous studies.

Existing literature on the subject does not point to evidence that the results found in the price promotional field would also apply to the use of these biases to activate POS that do not present promotional stimuli, which are important in industry and retail practices. Business practices have also highlighted the subject's potential combinations, such as using cognitive biases based on behavioral economics principles with marketing communications (Welch, 2010). Therefore, this study proposes the following research question: What is the effect on sales from applying the premises of cognitive biases to communications, and to the messages in supermarkets' communication materials developed to influence shoppers' purchase decisions?

A quantitative and experimental research approach was used to answer this research question based on two field experiments with Ovomaltine, a chocolate powder and a brand of non-durable consumer goods. The experiment was conducted in a supermarket chain; two cognitive biases were selected based on in-depth interviews with the brand's executives and a literature review on the subject: "loss aversion" and "mental accounting." Retail literature has expressed interest in these biases as evidence has been revealed regarding their implications for shopper marketing at the POS (Stilley et al., 2010a, 2010b). Unlike previous studies that emphasize promotional incentives, this study uses both cognitive biases in communications and in

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the messaging in point of sales materials, or specifically, special displays and communication totems without promotional stimuli.

THEORETICAL FOUNDATION AND HYPOTHESES

The subject of shopper marketing has received increasing attention in both academic and professional literature, but especially since early 2005, with evidence provided on the importance of shoppers' decisions not only at the POS, but also during their purchase journey (Chandon et al., 2009; Court et al., 2009; Löfgren, 2005; Shankar et al., 2011). The present study relates to shopper marketing research's emphasis on the marketing factors and stimuli that occur within the store environment, such as merchandising activations. Literature has traditionally highlighted these from the purported "first moment of truth" (Chandon et al., 2009; Shankar et al., 2011; Venkatesan, Farris, Guissoni, & Neves, 2015), or the moment the shopper observes the gondolas and makes a purchase decision (Silveira & Marreiros, 2014; Stilley et al., 2010b).

This study uses the cognitive biases in point-of-sale materials to analyze the influence of consumer sales from shopper marketing strategies. Cognitive biases are the mental and emotional filters on which one relies to understand and respond to external events, and they affect objective and logical decision-making (Tversky & Kahneman, 1974). When applied to activations at the POS, cognitive biases can influence the shopper to choose which brand to purchase (Wansink, Kent, & Hoch, 1998). Thus, retail literature has emphasized the "loss aversion" and "mental accounting" biases chosen for this study (Stilley et al., 2010a, 2010b).

The "loss aversion" cognitive bias

The prospect theory emerged with a study of how individuals decide between alternatives that present risks regarding the use of money (Kahneman & Tversky, 1979). One principle in this theory is represented by the "loss aversion" cognitive bias, in which the impacts of directly compared or weighted losses are greater than gains of the same magnitude (Kahneman & Tversky, 1979; Thaler, 1980). Subsequently, researchers have studied loss aversion in multiple applications and contexts. For example, when comparing the price of a product with its reference price in a retail setting, the consumer perceives the variation in price as a "gain" or "loss," with their sensitivity to a perceived loss greater than an equally intense gain (Fabrizi et al., 2016; Hardie et al., 1993; Mayhew & Winer, 1992; Putler, 1992).

The loss aversion cognitive bias can also arouse feelings and emotions (Novemsky & Kahneman, 2005). For example, a consumer's feeling of guilt may influence their decision to purchase an indulgent product or one that is not actually needed; however, they were influenced by persuasive communication in a marketing campaign that emphasized a potential loss if he or she did not buy the product (Burnett & Lunsford, 1994; Han, Duhachek, & Agrawal, 2014; Huhmann & Brotherton, 1997). However, such studies addressed stimuli related to the value of money, such as prices and promotions. In contrast, this study anticipates that communication based on the "loss aversion" bias can result in better sales performance without a promotional incentive, which has been widely tested in previous research on the subject:

> H1: Communications developed based on the "loss aversion" cognitive bias and applied to supermarkets' point-of-sale materials will create positive, significant variations in sales.

The "mental accounting" cognitive bias

The "mental accounting" cognitive bias is also associated with the prospect theory. Thaler (1985) demonstrated that consumers use a type of mental budget, in that they allocate money through a mental accounting process and try to resist further purchases when the estimated budget is depleted. Stilley et al. (2010a) later presented evidence that consumers perform such mental accounting during their supermarket purchases, although part of their mental accounting is not attributed to a particular product before they reach the POS. This results in impulse purchases in supermarkets, and those purchases can be encouraged by promotional stimuli.

Regarding consumer and retail products, this study investigated an application of the "mental accounting" bias to shopper marketing, namely temptation bundling. This bias implies a combination in which the shopper is presented with a stimulus that offers a positive result in terms of potential satisfaction, and a negative one, in the same mental accounting process (Milkman, Minson, & Volpp, 2013). The negative result is linked to a potential instant and short-term satisfaction that involves what the shopper desires, but can result in feelings of guilt, as it may not present the best long-term benefits. The positive result is then potentially linked to something the shopper should do; specifically, it is not necessarily what he or she desires, but it brings long-term benefits, such as having a healthy diet. Through the "temptation bundling" bias, the shopper may be able to reduce or even omit the negative result from an instant satisfaction due to the positive result being presented, which concerns a long-term benefit in the

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same mental accounting process. Thus, the consumer's feeling of guilt may decrease (Duke & Amir, 2018). This study considers the "mental accounting" bias to anticipate that an increase in sales will occur without the promotional incentive widely tested in previous research on the subject:

> H2: Communications developed based on the "mental accounting" cognitive bias and applied to supermarkets' point-of-sale materials will create positive, significant variations in sales.

RESEARCH METHODS

Two experimental studies were conducted involving a product purchase scenario at the POS by means of a field experiment to test this study's hypotheses. Hypothesis H1 was tested to determine whether the "loss aversion" effect can lead to increased sales by using premises of that bias to influence the shopper's decision at the POS through POS without promotional incentives. Hypothesis H2 was tested to detect that effect with premises of the "mental accounting" bias. The experiments were applied to Ovomaltine, a "powdered chocolate" brand; the brand category was for its relevance in Brazil, generating approximately 1.9 billion reais in 2015 (Nielsen, 2015), and for shoppers' low interactions with the brand in supermarkets (Shopper Marketing Group, 2014), which motivates the need to change shopper behavior in the category. Such changes can be triggered by the influence of POS. Second, the Ovomaltine brand was also chosen for its small market share within the category (Nielsen, 2015). According to Fazio, Powell, and Williams (1989) and Nedungadi (1990), supermarket shoppers tend to be more influenced by in-store marketing stimuli promoted by brands with a small market share. This is because it is assumed that brands with a large market share invest more in advertising and are more accessible in the shopper's memory; therefore, such brands receive less attention in specific messages promoted by POS.

The experiments were conducted in an independent retail chain of supermarkets with eight stores in the region of the city of Mogi Mirim in the state of São Paulo, and were divided into three stages. In the first stage, all stores displayed the products without any treatment (pre-experiment period), in that the chocolate powder was available for purchase on the shelves without any communication from March 13 to April 30, 2016. In the second stage, all stores had a week of pre-tests to validate the communication materials and decide on their location within the stores, from May 14 to 22 in the same year. The third stage occurred in two waves (post-experiment period), with each lasting seven weeks and each week beginning on a Sunday, with two-week intervals between them. The first wave tested Hypothesis H1 ("loss aversion"), and spanned June 12 to July 30, while the second wave tested Hypothesis H2 ("mental accounting"), and spanned August 14 to October 1. The seven-week period per wave was necessary to expand the sampling base, as the studied brand's market share is small (Nielsen, 2015); this also reflects the supermarket chain in which the experiment was conducted. The experiment was applied in a supermarket chain because literature has conceded that shoppers are more susceptible to the stimuli of in-store marketing factors within a self-service store environment (Bell et al., 2011; Stilley et al., 2010a).

A field experiment allows the researcher to observe significant behaviors; moreover, its structure and results are typically easier to explain to a wider audience (Samson, 2014). This also enables an examination of cause-and-effect relationships, which allows companies to better understand the relationship between a change in strategy and their customers' behavioral reactions (Andersen, Ertac, Gneezy, List, & Maximiano, 2013; Davenport, 2009). On the one hand, a recent article published in the *Journal of Marketing Research* (Gneezy, 2017) emphasizes the importance of using field experiments in marketing research. On the other hand, it also demonstrates the difficulties in such experiments, including the need for collaboration with and approval from companies that allow interventions in their actions according to the researcher's recommendations.

This study collaborated with companies that allowed a field experiment to test our research hypotheses, as well as in developing the study. Consequently, this involved collaborations with three companies: (1) a supermarket chain in the state of São Paulo that allowed the activation of materials in its stores according to the researcher's guidance and monitoring; (2) Ovomaltine in Brazil, whose brand managers approved the communication materials according to the brand's guidelines and allowed for intervention in their brand's communications at the retail stores selected for the field experiment; and (3) Toolbox, a shopper marketing agency that designed and produced the materials based on the researcher's guidance. Figures 1 and 2 illustrate the implementation of each treatment of the two hypotheses. Each hypothesis' results were assessed through a treatment, which was conducted and analyzed for each cognitive bias studied in the experimental store groups. These treatments illustrate the activation of communication materials for the experiment and control groups, as well as the locations of all materials in the stores. The brand and supermarket chain both approved all communications and messages presented in the materials.

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Figure 1. **Loss Aversion**



Figure 2. **Mental Accounting**



CHECKING THE EXPERIMENT'S MANIPULATION

Field experiments are routine in several companies. One advantage of such experiments is that participants are seldom aware that they are part of an experiment, and thus, the data collected is more likely to represent predominant market realities. Alternatively, it is difficult to accurately manipulate all inputs and ensure controls for extraneous variables (Venkatesan, Farris, & Wilcox, 2015, p. 189).

The experiment's design should guarantee the independence of observations and the independent variables' effects on the dependent variable (Price, Jhangiani, Chiang, Leighton, & Cuttler, 2017), thus isolating the influence of exogenous factors to establish causality among the studied variables. Building on Venkatesan, Farris and Wilcox's (2015) work, a given action can be considered effective when it establishes a causal relationship, such that: the treatment increases the product's sales, the non-use of material does not alter sales, the use of communication materials impacts sales in subsequent periods, and no other external factors contribute to the effects on sales.

Thus, it is necessary to determine how non-observed factors influenced the experiment. Although factors external to the POS can influence the shopper's purchase decision-making, such as the brand's marketing stimuli that occur outside the store environment (Bell et al., 2011), the present study isolates these due to its focus on the communications conveyed within the store environment in POS. Thus, the experiment aimed to observe the variations in the brand's sales by considering only the POS context and comparing control and experimental groups in which the independent variable—the cognitive biases—has been manipulated.

The use of control stores first allows for the management of the effects of sales growth or a decrease in the market; and second, to determine whether the stores are similar or differ regarding their sales behavior. The use of several periods and pre- and post-experiment differentiations help to meet the conditions of causality; thus, any increases in the short-term and in subsequent periods can be assessed. Table 1 presents the results for the control and experiment stores in Stage 1, or when the treatment stimulus had not yet been applied. The statistical procedure for analyzing the control stores and the hypotheses was based on an analysis of average sales between the experiment and control groups. Further, sales were analyzed based on weekly variations relative to the store's average to control for the store size's effect on the results.

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Table 1. **Comparative tests with the control group, before and during the experiment**

Hypothesis	Before the experiment, experiment and control groups (Chi-square; p-value)	Control group, before and during the experiment (Chi-square; p-value)
H1	0.762; 0.382	5.069; 0.024**
H2	0.135; 0.713	3.378; 0.066**

*, **, and *** indicate significance at p < 10%, p < 5%, and p < 1%, respectively.

The results do not demonstrate significant differences between the control and treatment stores. Thus, evidence exists that the stores do not present significant differences in their sales. The second step involves establishing that only the experimental group's stores experienced a significant increase from one period to the next. As competitors can easily observe field experiments, their reactions can obscure the results. However, field experiments are still recommended as they allow marketers to test campaigns with clients in a natural environment (Venkatesan, Farris, & Wilcox, 2015, p. 189).

Experiments among people are often used to determine whether a treatment works. Subsequently, a treatment is defined as any intervention designed to change an individual's behavior (Price et al., 2017). In this study's treatment, the in-store marketing factors chosen for the application of cognitive biases were communication materials—namely, special displays and communication totems—and their locations within the stores, as these significantly influence shoppers' decision-making (Inman, Ferraro, & Winer, 2009; Wilkinson, Mason, & Paksoy, 1982). The communications and message applied to the communication materials in the experiment group were based on the characteristics of each cognitive bias addressed in this study and according to the research hypotheses.

The messages used to test Hypotheses H1 and H2 were designed by the Toolbox group's shopper marketing agency, and the researchers monitored this process. The brand company also provided secondary research on the studied category, which was used in the process of designing the communication materials. The messages designed based on the studied biases were then evaluated by a consumer panel in the agency's focus group room. The goal was to qualitatively determine—and according to the market practices of the company collaborating with the field experiment—whether the messages were consistent with the studied biases' premises. The authors then submitted the messages suggested by the agency to the brand company's executives and to the employees of the supermarket chain conducting the experiment. Thus, the authors' qualitative assessment as supported by individual conversations determined whether the messages were consistent with the desired ideas for testing the studied biases according to Hypotheses H1 and H2.

Ultimately, the authors evaluated their final messages to ensure their consistency with relevant literature on the subject, or with the biases' premises. The researchers also had individual conversations with consumers during the pre-test stage, and according to the previously described steps, to assess the consistency of the communication materials with the studied biases. Such conversations focused on the perceptions of guilt and loss (loss aversion), and positive and negative outcomes within the same mental accounting process (mental accounting). Moreover, both materials for Hypotheses H1 and H2 were directed to parents to encourage them to buy the product for their children for the same consumption occasion (breakfast). Such decisions followed the brand's guidance and secondary research on the category, which notes that most shoppers in the "powdered chocolate" category buy the product for their children's breakfast. Figures 1 and 2 display the communications used that resulted from this process. In contrast, the communications applied to the control group were based on those already in use by the studied brand and without the premises or elements of the biases studied in behavioral economics.

In executing retail field experiments, poorly trained store employees can either produce or interfere with the results, creating inaccuracies. Thus, disturbances are controlled through a mediation plan (Price et al., 2017); specifically, staff training was conducted, and included presenting technical details of the experiment and increasing the supermarket managers' awareness of the importance of not directly interfering with the treatments' results. According to Thomke and Manzi (2014), store managers and employees can impact experiment groups' homogeneity, as their awareness of the experiment may influence them to be more or less inclined to improve the applied treatment's quality. Consequently, the present study's methodology allowed for an understanding of the variations in sales in the different store groups (dependent variable) caused by the application of cognitive biases (independent variable) to the communication materials.

Some precautions were also taken to preserve homogeneity between the control and experimental groups: First, the cities where the supermarket chain stores are located are near each other and have highly similar HDI-income indexes (PNUD, 2013). This helps minimize factors that could impact homogeneity, such as more abrupt climate changes or an increased unemployment rate (Moran & Montero, 2014). Second, the average sales for

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the "chocolate powder" category has no significant variation across all eight stores in the chain. Third, collaboration with the retail chain during the field experiment controlled for the main in-store marketing factors for all brands in the "chocolate powder" category, such as homogeneous price changes, promotions or visual stimuli, and a guaranteed supply of products on all stores' shelves throughout the periods before and after the experiment. The in-store displays and communication totems were developed with exactly the same configuration and dimensions. Fourth, the researchers in loco monitored the evolution of treatments; fifth, training sessions were conducted with all store managers before the beginning of the experiment, and were reinforced throughout, to ensure correct execution in all stores.

Thus, the following sales analyses were considered: (1) a comparison of average weekly sales variations within the experiment group stores between the pre- and post-experiment periods; (2) a comparison of average weekly sales variations between the pre- and post-experiment periods, between the experiment and control groups; and (3) a comparison of average weekly sales variations between the pre- and post-experiment periods, between the studied brand and the entire "powdered chocolate" category within the experiment group's stores.

ANALYSIS OF RESULTS

A Shapiro-Wilk normality test was used prior to analyzing the sales comparisons in the main procedure and assessing the hypotheses. This test is important in understanding whether the values are distributed along curves for the periods before and after the experiment, as the curves for the experiment and control groups are close to a normal distribution (Callegari-Jacques, 2003). All tests reject the null hypothesis at a 10% level of significance, which suggests that no evidence indicates that the curves follow a normal distribution. Therefore, for the sales comparison tests, the Mann-Whitney-Wilcoxon (MWW) non-parametric test of means was used, which is applied to curves without a normal distribution.

Another factor in the data analysis is that the cumulative effect on sales can influence the experiments' results. To avoid any interference, intervals without any intervention should be included between one treatment and the next (Paksoy, Wilkinson, & Mason, 1985). Thus, the periods were separated by a two-week interval to prevent any cumulative effects on sales and ensure that the results of one wave did not impact sales results in the next. This interval is sufficient, as the average purchase frequency for the "powdered chocolate" category shopper is one to two times a month (Shopper Marketing Group, 2014). The other effects of co-variables were analyzed using a test of means for the "powdered chocolate" category and for the control stores between the pre- and post-experiment periods; in all cases, no significant variations were found that corroborate a need to correct for seasonality and other effects.

TESTING HYPOTHESIS H1

Regarding Hypothesis H1, which is based on the "loss aversion" bias, losses seem greater than gains of the same intensity (Kahneman & Tversky, 1979). In the treatment, the materials were applied to the experiment group with the aim of using the communication to explore a situation in which the "powdered chocolate" category shopper—or parents, in this case—loses by not buying the studied brand for their children. Thus, the activation material for testing Hypothesis H1 emphasized the loss and guilt elements by saying, "*Vai deixá-los sem um sorriso logo cedo?* [Will you leave them without a smile early in the morning?]" Table 2 displays the results of the total sales variations as percentages, as revealed between the pre- and post-experiment periods for the treatment of Hypothesis H1, as well as the *p*-values for the non-parametric test of the means.

Table 2. **Comparative tests of weekly sales variations before and after the experiment for Hypotheses H1 and H2**

	Within the experiment group		Between the experiment and control groups		Experiment group, discounting the category's sales; same stores	
Hypothesis and treatment	Total sales variation (%)	MWW test P-value	Total sales variation (%)	MWW test P-value	Total sales variation (%)	MWW test P-value
H1: Loss Aversion	75.4%	0.001***	31.1%	0.048**	87.7%	0.001***
H2: Mental Accounting	66.2%	0.001***	22.7%	0.312	64.8%	0.001***

*, **, and *** indicate significance at p < 10%, p < 5%, and p < 1%, respectively.

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Regarding the treatment of Hypothesis H1, or the "loss aversion" cognitive bias, the results of the three MWW tests were significant, with all *p*-values less than 5%. The brand's sales performance within the experiment group before and after the experiment was 75.4%, with significant differences in *p*-values at less than 1%. The difference between the brand's and category's sales was 87.7% ($p < 0.01$). The difference between the experiment and control groups was 31.1% ($p < 0.05$).

Thus, given the significance of the three tests' results and the positive variation in the brand's sales, Hypothesis H1 is validated and accepted. This result is consistent with the theory regarding the "loss aversion" cognitive bias and its applications in consumer marketing (Inman et al., 2009; Kahneman, 2011; Mayhew & Winer, 1992). These results also suggest that the "loss aversion" bias can be effective in activating the shopper's "shopping trigger" at the POS when applied specifically to supermarket POS at the "moment of truth." Applying this bias also presented positive results for communications focusing on an emotional and affective relationship, such as that between parents and their children.

TESTING HYPOTHESIS H2

Regarding Hypothesis H2, which is based on the "temptation bundling" cognitive bias, positive and negative results are presented within the same mental accounting process (Milkman et al., 2013). The materials were applied to the experiment group to present an indulgent image of the studied brand (Shopper Marketing Group, 2014) with negative results in connection with the consumption of healthy, nutritious fruits, which was presented as a positive result. This cognitive bias was applied to not only the communications in the materials, but also in locating the special display, which was set up in each store's produce section. Thus, the activation material to test Hypothesis H2 emphasized the positive and negative elements by saying, "*O café da manhã saudável fica ainda mais delicioso*" [A healthy breakfast becomes even more delicious], with the image of a breakfast including fruit and Ovomaltine chocolate powder (Figure 2). Table 2 presents the results of the sales variations found between the pre- and post-experiment periods for the treatment of Hypothesis H2.

Further, sales within the experiment group grew by 66.2% ($p < 0.01$) after the experiment testing Hypothesis H2 based on the temptation-bundling bias, and performed 22.7% better than the control group, although with no significance ($p = 0.312$). Compared with sales in the "powdered chocolate" category, the brand's sales performance within the experiment group was 64.8% higher ($p < 0.01$). Thus, the communications' and special display's location in the supermarket's produce section suggests that the shopper's same mental accounting process does not allocate perceptions of the studied brand as indulgent as a negative result (short-term satisfaction), with nutritious fruits as a positive result (long-term benefits). Therefore, Hypothesis H2 was not supported given the influence on sales from the "mental accounting" bias in the communication materials.

One possible explanation may relate to the non-use of a promotional element. Evidence suggests that positive effects occur from cross-merchandising activations of products with similar value propositions for the consumption occasion (Bell et al., 2011). For example, discounts and joint activations can be offered for purchases of peanuts and beer, instead of activations for products with different benefits to balance the consumer's mental accounting bias, such as powdered chocolate and fruits as investigated in this study. Thus, Hypothesis H2 could not be supported or be used to validate the influence on sales from the "mental accounting" bias in communication materials, while Hypothesis H1 was validated. While literature has validated mental accounting's effects in the supermarket environment using stimuli related to pricing and promotional benefits, no consensus has been reached on the use of this bias for stimuli without price activations (Stilley et al., 2010a). Such literature suggests that the "mental accounting" bias is associated with the consumer's budget forecast, for example, for use in supermarkets. Thus, emphasizing only the message communicated at the POS without a price stimulus is apparently insufficient for observing a positive, significant effect on sales. Alternatively, loss aversion literature points to evidence that this bias could have positive results, even without the price stimulus (Thaler, 1980), and this study corroborates such previous literature.

CONCLUSIONS, LIMITATIONS, AND MANAGERIAL IMPLICATIONS

This study contributes to current literature by demonstrating the potential combinations of shopper marketing and cognitive biases—the basis of behavioral economics—in the search for evidence on how to better develop POS to influence shoppers. As a complement to previous studies that emphasize the relationship between the "loss aversion" and "mental accounting" biases and promotional incentives, the present study investigated the adequacy of messages conveyed in POS without such incentives. The two treatments in the field experiment revealed variations in sales, thus complementing previous studies focusing on

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consumer behavior and price promotions based on laboratory experiments.

The results indicate that using the "loss aversion" cognitive bias in POS created significant, positive results in sales, while no such influence was observed for the "mental accounting" bias. As the "mental accounting" bias emphasizes the idea of a consumer budget (Thaler, 1985), working with promotional triggers as discussed in previous studies (Stilley et al., 2010a) may be more important than simply changing the message communicated through POS. In other words, price and promotional stimuli should not be overlooked when basing messages on the mental accounting bias. Alternatively, using the loss aversion bias in this study presented greater chances of success when applied to communication materials without price stimuli. These results indicate opportunities for further research to test the relationship between messages in POS and prices for cognitive biases of interest.

In the treatment of Hypothesis H1 regarding the "loss aversion" bias, we considered the relationships between premises to emphasize the feeling of guilt in the communication if the consumer did not buy the product (Novemsky & Kahneman, 2005), which was reflected in the POS design. In contrast, the treatment of Hypothesis H2 regarding the mental accounting bias used an activation that could reduce the consumer's guilt (Duke & Amir, 2018). Therefore, the results observed only supported Hypothesis H1, in that communication materials emphasizing elements regarding feelings of guilt may better influence sales without price stimuli than elements that can minimize such feelings, as in the premise for testing Hypothesis H2. As this study aimed to observe the effects on sales from two field experiments including these biases, further research could investigate these consumer marketing aspects—including behavioral economics, risk, and guilt—with a focus on POS from a consumer behavioral perspective. For example, research could focus on guilt-related literature to assess consumers' associations with different types of communication. Further research could also consider other retail formats with different value propositions for the consumer, such as small retailers, hypermarkets, and drugstores; or integrate communication within and outside of the store, such as through advertising in media outside the store environment.

However, this study has some limitations. Considering the researchers' access, the field experiment was conducted using products of a brand with specific characteristics, as previously described. Thus, further research could consider products from other brands in different categories and with different levels of market share. Additionally, the experiment was conducted using a particular POS environment—supermarkets—which limits its generalizability and conclusions for other types of retail. Developing a field experiment like the one proposed in this study has both advantages and limitations, as the researcher must reconcile the multiple interests of the companies involved, limited resources, executives' time, and the manipulated brand's guidelines while seeking theoretical contributions, methodological rigor, and validation of the experiment. Nevertheless, the field experiment can provide important contributions by conveying the effects of variables of interest in real situations, such as behaviors rather than the perceptions, intentions, and attitudes emphasized in laboratory experiments (Gneezy, 2017).

Regarding any managerial implications, this study addressed research opportunities from a business perspective, such as identified by Welch (2010), about the importance of gaining further insights into the use of behavioral economics principles in marketing. Consequently, this study provides contributions for consumer goods professionals and retailers who seek new possibilities for improving sales results; this can be accomplished by activating POS while applying cognitive biases to their communications. This work's primary managerial implications stem from the fact that consumer brands' traditional communication practices are not necessarily the best alternative. Traditionally, brands have used generic messages at the POS or among many promotional appeals. This study revealed that using the "loss aversion" bias can influence sales without the need for a promotional incentive that might harm the retailer's margins and the consumer industry's returns given the costs of merchandising activations in supermarkets.

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AUTHORS' CONTRIBUTIONS

The authors declare that they participated in all stages of development of the manuscript. From the conceptualization and theoretical-methodological approach, as well the theoretical review (literature survey), and finally, writing and final review the article.

ARTICLES

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IMPROVISATION: NEITHER JAZZ NOR THEATER, BUT ITINERANT METAMORPHOSIS

Improvisação: nem jazz, nem teatro, mas metamorfose itinerária

Improvisación: Ni jazz ni teatro, sino metamorfosis itineraria

ALEXANDRE DE PÁDUA CARRIERI[1]
aguiar.paduacarrieri@terra.com.br
0000-0001-8552-8717

EDSON ANTUNES QUARESMA JÚNIOR[2]
edsontunes@hotmail.com
0000-0001-9450-9753

JOSÉ VITOR PALHARES[1]
titopalhares@hotmail.com
0000-0002-9190-3875

ANA ROSA CAMILLO AGUIAR[1]
rosacamillo@gmail.com
0000-0001-6488-5651

[1]Universidade Federal de Minas Gerais, Centro de Pós-Graduação e Pesquisas em Administração, Belo Horizonte, MG, Brazil

[2]Instituto Federal do Norte de Minas Gerais, Montes Claros, MG, Brazil

ABSTRACT

This article aims to understand how the improvisations performed by circus artists fit into the daily routine of circus and show management. Applying the qualitative research approach to multiple case analysis, data were collected through asymmetric observations of the routine of 31 traveling circuses in southeastern Brazil and semi-structured interviews with 116 circus artists. The data were analyzed using the narrative analysis method. The improvisations occur in both the management and performance of the circus show and are linked to its power to affect (or to not affect) audiences and fill a void in the conduction of the circus performance, which creates the conditions for potential plots. Therefore, the circus spectacle morphs into various possibilities, whether shortened, expanded, rushed, or split into parts, and these assemblages ingeniously allow the occurrence of improvisations and different show designs.

KEYWORDS | Improvisation, circus, management, assemblage, Deleuze.

RESUMO

O objetivo deste artigo foi compreender como a improvisação realizada pelos artistas circenses se insere no cotidiano da gestão do circo e do espetáculo. Sob a perspectiva qualitativa de investigação aplicada na análise de multicasos, os dados foram produzidos mediante observações assistemáticas no cotidiano de 31 circos itinerantes localizados na região sudeste do Brasil e de entrevistas semiestruturadas com 116 artistas circenses, e a análise de dados foi feita por meio da análise de narrativas. As improvisações aparecem tanto na condução do espetáculo como dentro deste. Elas estão vinculadas ao poder de afetar ou não o público que assiste às peças e de preencher um vácuo na condução da performance circense, que cria condições para possíveis enredos. O espetáculo se metamorfisa, então, em várias possiblidades: encurtando, empurrando, apressando, picotando. Agenciamentos esses que possibilitam maliciosamente a improvisação de ocorrer, desenhando outros espetáculos.

PALAVRAS-CHAVE *| Improvisação, circo, gestão, agenciamento, Deleuze.*

RESUMEN

El propósito de este artículo fue comprender cómo la improvisación realizada por los artistas circenses se inserta en la rutina diaria de la gestión del circo y del espectáculo. Desde la perspectiva cualitativa de la investigación aplicada en el análisis multicaso, los datos se produjeron a través de observaciones no sistemáticas de la vida cotidiana de 31 circos itinerantes de la región sudeste de Brasil y de entrevistas semiestructuradas con 116 artistas circenses, y el análisis de datos se realizó por medio del análisis de narrativas. Las improvisaciones aparecen tanto en la conducción del espectáculo como dentro de este. Están vinculadas al poder de afectar o no al público y de llenar un vacío en la conducción de la performance circense, lo que crea condiciones para posibles tramas. El espectáculo entonces se transforma en varias posibilidades: acortadas, expandidas, apresuradas o desmembradas, y estos agenciamientos permiten maliciosamente la aparición de improvisaciones y diferentes modelos de espectáculos.

PALABRAS CLAVE *| Improvisación, Circo, Gestión, Agenciamiento, Deleuze.*

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INTRODUCTION

This article reflects on the concepts of management and improvisation and aims to investigate how the improvisation of circus artists relates to the everyday management of the circus and its show, especially given that circus artists' work allows them to travel the world. To this end, we adopted Deleuzian observations as our conceptual foundation and the idea that social (or power) relationships enable people to create cunning ways of being in the world (Deleuze, 2006, 2013; Deleuze & Guattari, 1997). We observed the everyday management of itinerant circuses in the southeastern region of Brazil, which resulted in a search that was based on more differences than regularities and novelty rather than stability.

Despite its status as a complex, interdisciplinary concept that acquires different meanings, improvisation is typically associated with the notion that intuition spontaneously guides one's actions (Crossan & Sorrenti, 1997), considering aspects such as novelty, resource availability, knowledge, spontaneity, and flexibility. Improvisation has increasingly been recognized as a relevant research topic in administration, and the works of Weick 1979) have been regarded as pioneering for their focus on the role of improvisation in management theories (Leybourne, Lynn, & Vendelø, 2014). However, the number of empirical studies and conceptual structures that address the subject is still limited (Hadida, Tarvainen, & Rose, 2015; Leybourne et al., 2014; Vera, Nemanich, Vélez-Castrillón, & Werner, 2016). Furthermore, the literature on improvisation has typically focused on its antecedents, type of stimuli, and the typification of constructs, and has devoted scant attention to its process (Abrantes, Passos, Cunha, & Costa, 2018). We also emphasize that Brazilian studies on the subject are restricted to a traditional organizational context and theoretical scope; therefore, relevant empirical studies are scarce (Arantes, Freitag, & Santos, 2018), which demonstrates a gap in the field.

This article contributes to this field by seeking to fill such gaps. Further, it also aims to advance the debate on improvisation, which has proven increasingly important today, given the existence of international financial crises and social change. The learnings from this work can support efforts to understand organizational processes in turbulent times, during which the relevance of improvisation increases, even as it relates to business survival. This research is also theoretically justified by the expansion of studies on improvisation undertaken by authors such as Deleuze and Guattari. It also advances the search for intermediate structures that involve improvisation, as proposed by Cunha, Clegg, Rego and Neves (2014) and Cunha, Clegg, Rego and Story (2013).

Traditionally, research on improvisation in organizational studies has been associated with metaphors, particularly jazz and theatrical arts. However, as pointed out by Zourabichvili (2005), we believe that despite its ability to facilitate understanding and appearance, the metaphorical use of improvisation gives rise to pseudo-concepts that delude us into perceiving management through the lens provided by models, writing, or thinking, which pertain to a specific social class or the administrative mainstream. According to both Zourabichvili and Deleuze, the metaphor is therefore a hoax, as it reduces the world's richness and complexity to a single image. In this sense, metaphors guide our senses and create an image that continuously evolves, thus simplifying the world's reality.

Given this fact, we took the understanding of circus know-how and the contributions of Deleuze as our theoretical frameworks and adopted the concept of metamorphosis to address that of improvisation. DeLuca, Rocha-de-Oliveira, and Chiesa (2016) and Kravchenko (2017) have explored the concept of metamorphosis and express reflections similar to those of Deleuze and Guittari (1997) when they highlight the field of possibilities that ultimately emerge for subjects. "It is something that is given, but which, at the same time, undergoes reinterpretations in different contexts, thus demonstrating the individual's potential for metamorphosis" (DeLuca, Rocha-de-Oliveira, & Chiesa, 2016, p. 460). This paper addresses improvisation and management along these lines, that is, it explores them as fields of possibilities that are presented to subjects, derived from socio-historical processes, and allow the creation of new meanings.

We begin with the idea that reality is a convolution of forces engaged in persistent interaction. In this sense, its operation arises from two spheres: that of the organization (or molar) and that of immanence (or molecular). While the rigid or break lines predominate (crystallized and stratified lines enabling norms and standards) in the foreground, and are responsible for the norms and binary perspective of the phenomena (right or wrong; men and women; art and management), a flow of forces capable of elucidating life, differences, and novelty predominate in the background. The authors understand the importance of the two spheres' existence but problematize the risks presented by the progressive rigidity of the organizational sphere, which, in turn, holds space for immanence, that which is different, and the circulation of life (Deleuze & Guattari, 1995a, 1995b). From an organizational standpoint, one possible interpretation holds that this creates a situation in which structured management models are increasingly favored to the detriment of more inventive perspectives regarding everyday management.

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The itinerancy of the circuses surveyed in this study allows circus subjects to alter their plans along their respective trajectories and negotiate their reality, which is mediated by the other plans created by individuals or groups encountered along the way. Parker (2011), Quaresma, Silva, and Carrieri (2014) and Aguiar and Carrieri (2016) have demonstrated that without a fixed address or headquarters to which an organization may return, its management is metamorphosed based on power relations, land conditions, and legal impositions by municipal bodies, the lack of an audience, weather conditions, etc. Meanwhile, improvisation is based on the circus art tradition, that is, the know-how of those living and working in the circus and interacting with the most varied audiences. Improvisation "results" from these interactions with the social element and the possible (re)cognition of a scenario that demands the invention of something new.

NEITHER MUSIC NOR STAGING: TRANSFORMATION AS THE FOUNDATION FOR UNDERSTANDING IMPROVISATION

Typically, the primary device used to address improvisation within organizations is the metaphor. According to Cornelissen (2005) and Cassell and Bishop (2018), metaphors are a valuable resource for the development of knowledge, especially in the scope of administration and organizational theories. In organizational studies, references to metaphors are often adopted to achieve certain interpretations, a didactic or critical effect, and even the adaptation of a historical context. For example, when conducting research in the field of organizational strategy, Sanabria and Moreno (2018) resorted to improvisation as a primary topic of study when they contrasted the concept of planning with that of musical improvisation.

The jazz metaphor is commonly used to investigate improvisation (Cunha, 2002; Flach, 2012; Weick, 2002). Indeed, several studies have adopted this metaphor to bridge musical and managerial improvisation. Nevertheless, metaphors are accompanied by a significantly sexist and elitist bias (Hatch & Weick, 1998). The idea of elitism is associated with the production of knowledge for the appreciation and comprehension of a given social class. Meanwhile, sexism arises from the reproduction of a sexist/patriarchal paradigm in which white men hold primacy over improvisation.

The theater is another metaphor that is often used in studies regarding improvisation. In this regard, improvisation is more closely related to conceptualizing a structure as the context in which improvisation occurs through the various processes involved (Vera & Crossan, 2004). According to Buras (2017), replacing the jazz metaphor with theater has resulted in positive gains. The theater metaphor is associated with collectivity and team performance, rather than individual performance, the latter of which is almost always the case with jazz.

However, recent studies (Afkhami & Shakiba, 2018; Müller, 2018) have criticized both streams. These works do not reference jazz or theater metaphors, but instead focus on the limitations inherent to an explanation of the improvisation processes via the adoption of metaphors. Furthermore, in this view, metaphors provide a naive means of addressing the topic, as no improvisation is politically neutral, and all constitute a simplification of the reality of organizational life. In addition to simplifying social relations, the use of metaphors is also perceived as a form of domination or oppression. Likewise, this prerogative has been used to disqualify all forms of knowledge except that related to science, and, more precisely, the administrative mainstream.

In Deleuze's view (2013), metaphors portray historically dated visibilities and enunciations and are the product of a historical formation defined by their enunciated truth and based on a regime of self-statements. Therefore, the image of the metaphor references a certain manner of perceiving an object, which generates a classification or norm when enunciated, hence defining the object in question at that very moment and in that specific place. In this sense, the visibilities serve as the conditions, because all that is done in a given era presupposes a regime of light while all that is thought during that same period presupposes that of statements and truths.

Thus, conceptualizing improvisation as a metamorphosis supports us in considering everyday management as a possibility for change. Authors such as Costa (2006) have shown that by resorting to Deleuze and Guattari (1997), we produce the ethics of improvisation. That is, these ethics arise from the idea of an ongoing daily improvisation in which the subjects continuously experience creative acts arising from their quest for survival.

For these authors, unforeseen events can provide a field of possibilities that emerge in everyday interactions. According to DeLuca, Rocha-de-Oliveira, and Chiesa (2016), subjects can change their trajectories in this field of possibilities, as well as their plans and decisions, and create new forms, actions, and approaches to management because "when a series of possibilities is exhausted and the impossible is obtained, everything becomes an event, and each movement is a metamorphosis" (Agostinho, 2017, p. 620). Improvisation predominates at the molar level (the sphere of immanence), which pervades the organizational sphere. In this sense, we draw on the Deleuzian idea which asserts that art does not reference the creation or reproduction of pre-

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existing forms, but the capturing of forces which, owing to their free-flowing nature, can allow the emergence of that which is new and different (Deleuze, 2006).

However, we do not discuss metamorphosis as it is presented by Kafka (2000), that is, as "the weight of suffering in repetitive work and the effects of precarious employment in a society of the pasteurization of acts, which are devoid of meaning and loaded with boring automation and repetitions" (Soler, 2016, p. 133), by which contemporary work relations almost necessarily culminate in the massification and elimination of creative spaces. We construe metamorphosis as a form of creative transformation that is based on possibilities arising from the actions of (circus) subjects.

Along these lines, improvisation is based on the appropriation of this field of possibilities (and impossibilities) by subjects and takes place and depletes in everyday life. The unforeseen produces the deterritorialization of subjects, albeit momentary, and improvisation reterritorializes them (i.e., the former territory) or even produces a neoterritorialization (the creation of a new territory). Deleuze and Guattari (1997) address aspects of territorialization in the sense that the meanings attributed by subjects are transformed into their everyday reality.

This process of territorialization (including both the forms of "de" and "neo") occurs amid the assemblages, which constitute the meeting of the forces that comprise reality. In this sense, these encounters can, on the one hand, concretize already stratified life forms (the established laws and norms) or, on the other hand, enable other new and possible forms (Deleuze & Guattari, 1997). Along these lines, according to Zourabichvili and Goldstein (2004, p. 16), the assemblages can lead to relatively stable social forms, which are endowed with a reproductive functioning that reduces the field of experimentation and defines the socially available ways in which individuals can model their existence based on the status quo. Nevertheless, this does not prevent the introduction of small irregularities; thus, possibilities for improvisation are created. The so-called identity assemblages, that is, how one can participate as part of a group, family, organization, ethnicity, or gender lead subjects to experience and negotiate their decisions and actions with other subjects and change their trajectory of experimentation, while also allowing the various manners of being in the world to metamorphose.

According to Carvalho (2011, p. 29), this potential to affect and be affected creates the possibilities for improvisation and innovation. Through the power to affect and be affected, which is given by the conditions of society, history, work, gender, ethnicity, family, and the various ways of being in the world, as well as the depletion of the meanings associated with everyday life, we devise other possibilities. These possibilities "show a situation of need and something to be invented," that is, transformed, or metamorphosed. For Deleuze (2006), every thinking act is also a creative one; further, it is an act of improvisation.

Therefore, examining improvisation in the context of itinerant circuses is consistent for three fundamental reasons. First, the number of studies on improvisation has grown in the field of management. Therefore, as an organization in its own right, the circus also justifies the adoption of this approach. Second, previous studies have revealed the significant indebtedness of theories on improvisation to certain artistic fields, such as music and theater, which are crucial elements of circus shows. The third reason regards the very development of the debate on improvisation, which has drawn increasing attention to its processes and the power relations involved therein (Cunha et al., 2014).

THE RESEARCH BACKGROUND

This article is based on the qualitative tradition of research applied to multi-case analysis. The research subjects are artists and employees of 31 itinerant circuses located in the four states of the Southeast region of Brazil: São Paulo, Rio de Janeiro, Minas Gerais, and Espírito Santo. The circus organizations in the sample were selected through snowball sampling, which is a widely used technique in qualitative social surveys (Suri, 2011). Therefore, participants were identified based on the recommendations made by individuals who maintain relationships with circus art, whether they are crew members, artists, people working with the circus language, or representatives of artists' unions.

During their visits to the circuses, the researchers systematically observed the everyday lives of the circus crew members. To this end, notes were taken on their daily chores to capture the ways of being and doing that such social actors attribute to the practices in which they engage. These practices were then described in field diaries. At a later stage, we conducted unstructured and semi-structured interviews with 116 circus artists regarding the organization of their lives; research subjects ranged from circus owners (who also worked in the shows) to their relatives and hired artists. Data were collected from June 2015 to February 2016, and further visits were conducted in 2017 with at least half of the circuses in the sample to ensure the continued relevance of the data.

The respondents were identified by the codes R01, R02, and R03, etc., in which the R indicated "respondent" and the number indicated the specific participant, who was otherwise treated as anonymous in the dataset. They were invited to discuss circus life in interviews that addressed various themes, beginning with the

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following "provocative statement": "Tell us about the circus life." The few predefined questions following the initial statement left the research subjects free to improvise during their interviews. All interviews were recorded in both audio and video formats when allowed. The data from the interviews and unsystematic observations were transcribed and analyzed verbatim to preserve the discursive structure produced by the subjects. Therefore, the selected fragments and their translations are grammatically and semantically faithful to the circus workers' statements.

The collected material was treated through narrative analysis (Matos, 2017) by articulating narrative temporality and Deleuzian theory. The analysis entailed reflections on the construction of the narrative created by the respondents themselves. Given the corpus of speeches obtained regarding everyday life of the circuses surveyed, several readings were performed to identify certain discursive fragments. Meaning categories were created to connect the stories and events that related to similar themes. In this sense, the analysis of the discursive statements was conducted specifically based on the systematic identification of the lexicon, the primary discourses present in the text, the themes and figures, the implicit and explicit aspects of the discourses, the discursive syntax, and the ideological aspects present within the fragments, as described in the next two sections.

LADIES AND GENTLEMEN... PLEASE WELCOME THE ITINERANT CIRCUS!

It is paramount to understand that the product of a circus is its show and the service it sells is entertainment. Thus, when improvisation occurs during a performance, there is a risk that an unrequested service will be provided. The circus also sells the maintenance of a way of existing, i.e., the itinerant and nomadic life. Like Deleuze and Guattari (1997), Costa (2018) has shown that "the nomad is a deterritorializer *par excellence*; he may even settle in a given territory, but only to extract bodily experiences from that space, along with the colors, the sounds, the dreams of existing and becoming another, and what is to come. But soon, they will leave for other experiences, other spaces, other worlds, other dreams to be dreamed" (p. 8). In this specific case, these reference future audiences that will be reached and shows that will be created.

The circus always sells a (visible) service, which is entertainment. However, it also sells the implicit ideas of itinerancy, life on the road, journeys, places, and a life without a routine.

> (001) The circus provides the show that everyone sees. [...] but there's [also] what you don't think about, which has always been the idea of a life without a routine, and without stops (laughs). (R86)

In the fragment above, the owner and manager of a circus discusses the visible theme of the show and the (utterable and pondered) idea of a life without breaks or an established routine. However, in the respondents' view, this does not correspond to the truth (as indicated by the laughter at the end of the sentence), as, before performing a show, it is first necessary to put it together.

> (002) The show, our performance, that's what we are circus artists for. However, before it can take place, we always have to think about the journey, where to assemble the canvas, get permits, and even kiss the priest's hand. (R02)

This fragment reveals how itinerancy is planned, as well as the places to which a show travels. It constitutes a strategy that can involve requesting the local priest's blessing to perform the show, because, as pointed out in (001), the circuses and their members have an established social imaginary. According to Morais-Storz et al. (2018), these strategies emerge from the manager's knowledge and a form of management that metamorphoses based on power relations. Moreover, these reveal an identity assemblage between a person's role as a circus artist and the show itself. In turn, this assemblage defines the ways of being associated with the circus life, which are not commonly accepted, even by the city priest.

> (003) You know when an artist doesn't come from a circus family, when he's got no tradition. He has no sand in his blood. He may have the mojo, but he's not a circus guy. [...] To be a circus [person] is to have the tradition of traveling, family ties, working as a collective. (R25)

The fragment above depicts the construction of an identity discourse. Family, tradition, itinerancy, and collective work comprise the circus show and its everyday life and were mentioned as relevant elements by almost all respondents. For the traditional circus artist, the circus is an identity assemblage and a way of being and existing.

> (004) [...] There are several artists in a circus. There are big and small circuses. There are variety show artists. Some circuses have musical bands, while others perform a staged play. There

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> are circuses in which the clown is the soul of the circus. (R31)

R31 lists the artistic possibilities of the circus, and the types of shows that may be presented are implied. Bolognesi (2005) created a characterization to differentiate circuses based on their shows. The theater-circus is understood as that in which several theatrical genres are performed. According to the author, the circus of attractions is the most conventional category, in which various circus skills are presented, such as acts of juggling, contortion, acrobatics, illusion, trained animals (now outlawed), etc. Finally, a circus featuring a variety show is characterized by the presentation of skilled acts, along with musical shows, comic sketches, etc.

The shows are designed and maintained by a group of people whose members range from the very families who live in the circuses to freelance artists hired specifically for certain shows. Quaresma et al. (2014) remind us that today's circuses make strategic alliances to associate the names of famous and trendy artists and characters with their shows and thereby attract audiences. These alliances, in turn, emerge as a means of ensuring the survival of circuses confronting the advancement of television and the Internet. Therefore, children in the city of Crato, Ceará, for example, were able to see the characters Lottie Dottie Chicken, Peppa Pig, and even *Turma da Mônica* ("Monica's Gang") performed live.

In a show attended by the researchers, a performer played the character of Lottie Dottie Chicken "cover to cover." As he danced, he he succeeded in impressing the children's audience with his performance, but at another moment of the show, Lottie Dottie Chicken fell off the platform that was mounted onto the circus ring. The audience became scared, the narrator screamed, the music stopped, and an almost sepulchral silence ensued. However, shortly thereafter, the Chicken stood up (with difficulty, because of the costume) and danced away with members of the audience. When asked about this incident, the respondent argued that everything that transpired was a function of improvisation, as falling off the stage was not part of the scene:

> (005) The actor fell from the ring and scared the audience to death. Some people screamed, the children cried, but the actor improvised, got up, and "chicken-walked" away with the children in the audience. We ended up incorporating that into the show and it was an improvement, wasn't it? But it wasn't there before. (R57)

IMPROVISATION AS AN IDENTITY ASSEMBLAGE IN CIRCUSES

> (006) You know... There's this charm about circuses. But it's not just about music and variety, music and shows, music and theater, or music and laughter. It's magic, but not only that. (R20)

In the above fragment, R06 explains how staging and music are important in the design of circus shows. The respondent summarizes the various interviews in which music, theater, and variety shows operate as co-producers of the laughter and magic that circuses convey. In general, the surveyed circuses offered a blend of music and theater and short comic sketches, as well as various performances involving the body, such as dance and acrobatics. Music and theater create an atmosphere that captures the audience's attention and can define how the show will impact them. However, respondent R20 also reminds us that circuses not only relate to charm and enchantment. They are organizations in which people live and work, and are embedded in power relations, labor contracts, and the management of an everyday itinerary, which, in turn, creates a routine of "disassembling the canvas-traveling-assembling the canvas," visiting local authorities, advertising, eating, dressing up, rehearsing, and finally, performing.

One discourse that was rendered more explicit during the narrative on screen, and also in several others, concerns the extent to which improvisation is focused on the audience. Indeed, some challenges faced by the artists (particularly the clowns) during their performances draw attention, as they must interact directly with the audience.

> (007) Clowns are the soul of the circus, aren't they? (R35)

> (008) The clown [...] exchanges with the audience all the time. (R11)

> (009) You have to be ingenious [...] you have to have a natural-born talent. (R6)

> (010) [...] This is the most difficult thing for clowns to learn, that interactivity between the audience and the artist, because you have to know how to make fun of people without insulting them, without making the person... It's about interpreting it as mockery, not as an insult,

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> so you have to have this timing, you know? You have to know how far the mockery can go. (R22)

The fragments above call attention to temporal and spatial dimensions. In the scope of the utterance, the temporal location is anchored in the present and pertains to having the correct "timing" "all the time." Nonetheless, having the correct timing all the time is more than a simple indicator of temporal awareness, as it is a metaphor that relates to a set of know-hows. R6 and R22 advocate different ideas about how "maliciousness" and artfulness are acquired, as well as how to set limits on the interaction. When improvisation takes place during a performance, there is a risk that the wrong service will be provided, as evidenced in the fragment by 010. Mockery and insult can be two sides of the same coin, and this ambiguity creates difficulties for artists during their shows. Mockery and insult are devices (Deleuze, 1991; Foucault, 1979) that the clown can use to cause the audience to (re)act. This audience (re)action reterritorializes the clowns, who can either continue with the act by creating new jokes, or deterritorialize it by improvising such that the audience is also deterritorialized, which then allows them to continue with the performance.

The time between the deterritorialization and reterritorialization must be as short as possible. The audience should not ponder the insult. The answer has already been given, and the clown must lead his audience on to the next charade. The audience's reaction forces the artists to proceed with another charade (reterritorialization); otherwise, they will have to retreat. If this happens, their freedom to act will be curtailed, and the artists will be deterritorialized. Therefore, timing operates as a limitation that can also constrain the artist subjects (in this case, the clowns), thus hindering their action.

The clown balances on a tightrope between mockery and insult, and that balance is learned from the circus experience itself, as explained by R22, when commenting on the possibility of learning the clown craft in practice. Alternatively, R6 claims that such talent is a gift, which, in turn, presupposes the idea of innate talent that is implicitly associated with one's birth, or is even a form of identity assemblage. Contrasting perspectives aside, both respondents conclude by using the same modality, words, and imperative vocabulary: "You have to have it." This is the requisite premise for an artist's ability to "mock them without insulting them" and "know how far the mockery can go." For both respondents, the present, or the moment in which the decision regarding the future is made (that is, knowing how far the mockery can go), requires a trajectory constructed within and alongside the circus. It is either "something you're born with" or something that can be learned, which has taken place and continues. Regarding learning, Crossan and Hurst (2006) clarify that improvisation requires a certain solid basis of technical skills and experience in the domains in which it will be applied. Moreover, the issue of time is relevant to improvisation, as it references spontaneity.

During the shows, it became clear that the physical dimension of space can intensify embarrassment. In the surveyed circuses, the stage was in the center of the ring surrounded by chairs arranged in a semicircle to maximize the visibility of the audience. During the shows, the circus artists wear their own outfits, with sparkles and colors that are highlighted by the different shades of stage lighting during the performance. The level of intensity is high and flashing lights flicker, which draws even more attention to the stage. The backstage, also called *reservado* ("the private room"), is covered by a curtain that prevents the audience from seeing the artists before they go on stage. While the artists perform, the audience remains in darkness the whole time, which even makes it difficult for the viewers to see those sitting next to them.

However, the stage is not only physically central; it is also the center of attention and is therefore the focus of the audience's gaze. While performing their acts, the artists are continuously and intensely exposed. In this sense, this overexposure has disciplinary effects, as illustrated by Foucault (1979), for it submits the artists to control, which, in turn, causes them to control themselves. In this case, the control is exerted by members of the audience, who restrict the artists' freedom during their performance. They, in turn, remain under permanent "interactivity" and exposure.

In other words,

> (011) If the clown doesn't feel the exchange with the public, if you can't feel that, you can't connect with people, you are defeated. You think: "Man, [...] nobody looked at me, nobody laughed at me." (R11)

Indeed, failing to attract audience members' attention or interact with them is synonymous with defeat, because this means that the sketch did not produce the desired response. In this case, members of the audience have deterritorialized the artist, for they have not gazed at him or her, nor have they taken part in the act, much less laughed at him or her or the performance. According to R11, a game is played implicitly between the audience and the artists and, like all games, it has losers and winners. From the hyperboles "nobody looked" and "nobody laughed," it is clear that to be gazed at (i.e., to keep the spectators' attention) and to make people laugh means to win. In this game, the clown

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mocks members of the audience to attract their gaze and smiles in return: this is the "exchange."

Meanwhile, despite experiencing feelings of awkwardness and embarrassment because "nobody laughed," the artists can always improvise and regain the audience's attention. In other words, they can reterritorialize the show, as some of the clowns participating in this research shared with us:

> (012) [...] So you mock them, you mock the children. You mock the people. (R6)

> (013) I mock them, I mock the children. I go up to the bleachers and play with one or another, even when I'm doing a comedy, I play with one or another, I interact [...] (R45)

The verbs chosen by respondents R45 and R6 denote the character of their interaction with the different audiences. The restrictions perceived as imposed by the audience are intended. By mocking the children (and even some adults), the performer can proceed with the show's initial planning. Indeed, the circus magic seems to work best on children, who respond more spontaneously to mockery.

Once they are on the stage, the respondents proved capable of guiding the interactions in several possible ways within the length of time permitted for the show; in the circus, art is constrained by a certain space and time:

> (014) I think the only thing that still worries people is the time because our show lasts two hours [...] But you have the freedom to do things in that [length of] time. If you want to do a thousand things during that time, that's fine, I think you have to fill the time, especially because there's a lot of improvisation. Sometimes you can't, as I said, you can't know how the crowd will react. (R21)

> (015) [...] If you take too long, you end up "growing a tummy in the audience," as we say here, right? The audience is there, then you delay things, then people will sit there and "grow a tummy," so you've already lost the audience. (R52)

> (016) When I see that the empty space is... If the act is not pleasing too many, we go ahead and chop or cut it. There are people that we don't even try to please if we see that it isn't... We'll have to work faster, you know? So that it doesn't get tiresome for the audience. You have to be ingenious. If it's pleasing [the audience], you can keep on pushing. (R46)

The fragment above reveals how the circus subjects relate differently to the duration of the show. Both R21 and R52 reveal the existence of a third agent that is collective in nature, which is "the crowd" or "the people," who manage the show and is concerned with its length. The time limitation for circus artists concerns their perception that the show may or may not be pleasing to a given audience. The idea is to please the audience or the crowd, regardless of its size, at all costs. Therefore, the show can be metamorphosed into several possibilities, whether it is shortened, delayed, or edited. These forms of assemblage allow artists to ingeniously improvise and "do a thousand things within that period of time." In turn, R46 arranged his sentences to convey the idea of public perception without referencing a third agent, who could potentially be concerned with the fact that the performance may or may not be delayed.

Due to the complexity of everyday circus life, improvisation emerges from several groups of artists, as shown by the following statement from R08: "The ringmaster is there... If something goes wrong, you have to improvise; you have to find a way for the audience not to notice." The performance is indeed a collective work. While the ringmaster, who is also known as *mestre de pista* ("stage master") may improvise a new sequence without the audience realizing it, the artist knows that if "[...] the song was played and someone didn't go on stage, the clown must always be ready for anything, [...] If there's an accident or something, he must do all that he can to fill that empty space. He's got to be ready for anything" (R26).

Therefore, the improvisation discourse is again associated with the artists' potential to read (or not read) the audience's affectation. In the case of ringmasters, adaptations to the initial plan are necessary. If previous plans go wrong, they must devise other possibilities, improvise new sequences, and carry out metamorphoses so the show can continue without negatively affecting the audience's perception. Among the aspects that can potentially go awry, the statement by the clown enumerates the absence of someone who should have gone on stage but did not, and even a potential accident. The mistakes created an "empty space" and affected the planned pattern, but also created new possibilities. It is necessary to remember that these possibilities are replaceable and interchangeable.

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> That which is possible is always limited and condemned to be repeated within a margin of variation, which, intending to encompass the one and the other, is always dual, but never multiple. Suddenly, when a series of possibilities is exhausted and the impossible is achieved, everything becomes an event and each new movement is a metamorphosis. (Agostinho, 2017, p. 623)

The empty space and the audience's affectation (or lack thereof) creates possibilities for the show to metamorphose according to projects, preferences, objectives, identities, the number of artists, and the circus's size, as well as the presence of artists who are "ready for anything" in the crews. Agostinho (2017) reminds us that such possibilities are limited but interchangeable, and imply the exclusion, substitution, or adaptation of an element of the everyday life of that social group, whether the group is a circus, an NGO, a private or public organization, etc. Here, the fact that the artists are "ready for anything" denotes a demand for adaptation, which is admittedly a form of improvisation. However, adaptation and improvisation are independent processes; occasionally, the need for adaptation is so urgent that the circus artists have no time to organize a new plan before implementing it. In this case, they must simultaneously merge planning and execution, that is, they must improvise (Abrantes, Passos, Cunha, & Santos, 2018).

This study has empirically addressed improvisation using a sample of itinerant circuses, their management, and their shows. The preferences adopted in this study follow a different form of writing that is more coherent with everyday circus life, more focused on the sites at which improvisation takes place, and closer to the artists' lives. The unforeseen events that happen in everyday circus life experienced by the subjects produce a momentary deterritorialization, but also allow the subjects to improvise and reterritorialize the circus; after all, the show must go on. Further, such continuity offers two possibilities: one emphasizes that the itinerancy must go on, while the other dictates that the show must begin and end at a given scheduled time.

FINAL REMARKS

This article has proposed a reflection on improvisation, which is an important topic for management that has commonly been anchored by metaphors in the relevant literature. In organization studies, jazz and theater have been used the most widely as metaphors to address improvisation. Nonetheless, this paper has revealed the limitations of relying on metaphors to explain the improvisation processes. Metaphors, whether they related to jazz, theater, or other disciplines, constitute a naive approach to addressing the topic, as no improvisation is politically neutral.

Given this, we have adopted the concepts of metamorphosis and transformation to approach improvisation. Based on Deleuze, we have articulated the idea of assemblage and the possibilities of everyday life, not to confine management to a model but to open the potentialities of know-how, as well as the potential to affect and be affected in and by people's everyday lives.

Along these lines, we have concluded that improvisation in itinerant circuses emerges from the nomadism that is inherent in this art form. Itinerancy produces multiple circuses that may be the same, but change according to their socio-historical conditions. Further, circuses constantly deterritorialize themselves, although they provide a territory for the circus artists. Every day, circus workers manage contradictions related to the extent to which they are welcomed by local authorities (including the local priest), the availability of a location in which they may put up their canvas, the presence of an audience, whether they are applauded or booed, and also whether they experience laughter or sadness, surprise or sameness, and confidence in their art form or suspicion conditioned by prejudice. These contradictions result from the power relations according to which the circus agents and management coexist in their itinerancy. In this sense, itinerancy, family, tradition, and collective work comprise the everyday routine of circuses and their shows. As an identity assemblage, the circus creates several possibilities for being and working as an artist, as well as creating dissimilar shows in distant places with different audiences.

Improvisation may arise from either a sort of "gift" or a learning process. It connects with research on improvisation in organizational studies, as it constitutes a compression of the past, present, and future; in other words, it depends on previous learning (the past), at a given moment in the present, and aims for future results. This foundation of techniques and developed skills conditions the extent to which artists affect their audience. Artists "must have" a notion of how far mockery can advance, as well as the extent to which external restrictions can be subverted, reframed, and understood as an insult. A specific element lies between learning and innate talent: the challenge and the need to achieve a sense of "timing," or the right balance between mockery and insult, which often occurs through improvisation on the stage.

The embarrassment transmitted by the audience, in combination with the architectural design of the stage, reference the power device developed by Foucault (1977, 1979). Regarding

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the effects of power, similar to that found in prisons, the stage induces a form of internal control over artists' performance, which takes place during the interaction and in each moment of their relationships. During the artists' performances, the audience hinders their freedom by embarrassing them, such that the artists are constantly interacting and overexposed. Therefore, the stage and the audience create a device through which a game is played; a clown mocks members of the audience to attract their gaze and smiles in return. Nonetheless, this is also the context in which behavioral elements are introduced. Therefore, the reciprocal relationship of giving and receiving defines the possibility for artists to emerge from the game victorious or defeated. Meanwhile, artists are also embarrassed when they "tease" members of the audience.

Whether they are a ringmaster or a clown, a hole or empty space in the show allows the artists to create and rearrange the show into a different one. This process constitutes a metamorphosis that may not affect the audience but is (re)cognized by those working in the circus, who must also be prepared for anything. This metamorphosis produces improvisations that can be repeated and learned from other experiences and shows, but which nevertheless hold the potential to create a different show.

In order to contribute to the literature, we have confirmed the exhaustion of the existing management models based on Deleuze and Deleuze and Guattari. However, the failure of those models may simply serve as a condition for the emergence of new possibilities and other management modalities. Failure and exhaustion reveal a demand for the invention or creation of something new. By framing improvisation in this way, one can devise resistance strategies from that which has been instituted, that is, the hard line. In this regard, improvisation constitutes a line and an act of flight from that which is established, existing standards, and norms, and seeks to elude convention or do things differently. In drawing from the works of these authors, one can contemplate the ethics of improvisation. That is, one can reflect on what it means to begin with the notion of continuous improvisation on a daily basis, in which subjects constantly experience creative acts throughout their everyday lives, work, and survival.

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AUTHORS' CONTRIBUTIONS

The authors declare that all authors have contributed to the development of this study. The conceptualization and the theoretical-methodological approach were mainly conducted by Alexandre Carrieri and Ana Rosa Aguiar. The theoretical review (literature survey) and data collection were performed by all authors. Data analysis was mainly conducted by Edson Quaresma Júnior. All authors worked on the writing and final revision of the manuscript. We would also like to thank Professor Raquel Barreto.

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MANDATORY IFRS ADOPTION, CORPORATE GOVERNANCE, AND FIRM VALUE

Adoção obrigatória de IFRS, Governança Corporativa e Valor da Firma

Adopción obligatoria de las NIIF, gobierno corporativo y valor de firma

JOELSON SAMPAIO[1]
joelson.sampaio@fgv.br
https://orcid.org/0000-0001-6560-2481

HUMBERTO GALLUCCI[2]
humberto.gallucci@unifesp.br
000-0001-7905-1879

VINICIUS AUGUSTO BRUNASSI SILVA[3]
vinicius.brunassi@fecap.br
0000-0002-1299-321X

RAFAEL FELIPE SCHIOZER[4]
rafael.schiozer@fgv.br
ORCID: 0000-0003-3890-6345

[1] Fundação Getulio Vargas, Escola de Economia de São Paulo, São Paulo, SP, Brazil

[2] Universidade Federal de São Paulo, Departamento de Ciências Atuariais, São Paulo, SP, Brazil

[3] Fundação Escola de Comercio Alvares Penteado, Instituto de Finanças, São Paulo, SP, Brazil

[4]Fundação Getulio Vargas, Escola de Administração de Empresas de São Paulo, São Paulo, SP, Brazil

ABSTRACT

We study whether financial and accounting disclosure affect firm value by focusing on the full adoption of International Financial Reporting Standards (IFRS) in Brazil in 2010. We compare firms with ex-ante lower accounting quality (firms in the Regular and Level 1 tiers of corporate governance) with otherwise similar firms that had already complied with higher-quality accounting standards (firms in the Level 2 and Novo Mercado tiers). IFRS adoption has a positive impact of approximately 30 percentage points on Tobin´s Q and 26 percentage points on market-to-book ratios for firms in the lower governance tiers, and substantially reduces the valuation gap between firms in the higher and lower tiers of corporate governance. This reduction in the valuation gap after IFRS adoption is explained by the relative increase in foreign ownership and stock liquidity of firms in the lower governance tiers.

KEYWORDS | IFRS, corporate governance, firm value, accounting quality, information asymmetry.

RESUMO

Estudamos se o nível de disclosure contábil e financeiro afeta o valor da firma, focando a adoção do padrão IFRS no Brasil em 2010. Comparamos firmas com pior qualidade contábil ex-ante (no nível regular e nível 1 de governança corporativa) com firmas similares que já adotavam o IFRS antes de se tornar mandatório (Nível 2 e Novo Mercado). A adoção do IFRS tem um impacto positivo de aproximadamente 30 pontos percentuais no Q de Tobin e 26 pontos percentuais na razão entre valor de mercado e valor patrimonial para firmas nos níveis mais baixos de governança, e reduz substancialmente a diferença de valuation entre firmas nos níveis altos e baixos de governança corporativa. Essa redução na diferença de valuation é parcialmente explicada pelo aumento relativo na participação de estrangeiros no capital acionário e na liquidez das ações das firmas nos níveis mais baixos de governança corporativa.

PALAVRAS-CHAVE *| IFRS, governança corporativa, valor da firma, qualidade contábil, assimetria informacional.*

RESUMEN

Estudiamos si la divulgación financiera y contable afecta el valor de la empresa, considerando la implementación en Brasil de las Normas Internacionales de Información Financiera (NIIF) en 2010. Comparamos las empresas con una contabilidad de menor calidad (empresas en el Nivel Regular y Nivel, 1 niveles de gobierno corporativo) con empresas similares que ya cumplían con los estándares de contabilidad de mayor calidad (empresas en Nivel 2 y Novo Mercado). La adopción de las NIIF tiene un impacto positivo de aproximadamente 30 puntos porcentuales en la Q de Tobin y 26 puntos porcentuales en la relación de precio/valor en libros para las empresas de gobierno corporativo de bajo nivel. La adopción de las NIIF también reduce sustancialmente la diferencia en la valoración entre compañías en los niveles más altos y más bajos de gobierno corporativo. Esta reducción en la diferencia de valoración después de la adopción de las NIIF se explica parcialmente por un aumento relativo en la propiedad extranjera y la liquidez de las acciones de las empresas en los niveles más bajos de gobierno.

PALABRAS CLAVE *| IFRS, Gobierno corporativo, alor de la empresa, cualidad contabilidad, asimetría de la información.*

INTRODUCTION

International Financial Reporting Standards (IFRS) became mandatory for all Brazilian firms in 2010. We compare the heterogeneous effects of its adoption on firms with ex-ante low and high standards of corporate governance and conclude that IFRS decreased the pre-existing valuation gap between the two firm types.

Numerous studies have focused on the economic consequences of increased firm financial disclosure. In particular, the European Union's (EU) 2005 adoption of IFRS has become a popular area of inquiry (see George, Li, and Shivakumar (2016) for a thorough review of IFRS adoption studies). However, the benefits of IFRS may not be fully assessed because most studies have examined their adoption effects in countries where the existing information environment was already rich. In addition, the EU required pre-approval by the European Commission for any changes in reporting standards that were to be mandatorily enforced. This has resulted in piecemeal adoption of IFRS (KPMG, 2008) in the EU; therefore, changes in European firms' financial disclosure environment after 2005 do not fully capture the benefits of adopting IFRS.

The focus on Brazil aids identification for several reasons. First, IFRS represent a substantial improvement in accounting standards relative to the previous Brazilian generally accepted accounting principles (BRGAAP). Because Brazil's legal system is derived from Code law tradition, BRGAAP was strongly influenced by tax legislation and favored form over essence. Compared to BRGAAP, IFRS improved the information available to foreign investors by providing greater transparency and unifying accounting standards. IFRS adoption was enacted by Law 11,638 in 2007 and was implemented in a relatively short time compared to other jurisdictions. The law was passed in December 2007 and was followed by a "hybrid period" in 2008 and 2009 during which accounting practices gradually converged to IFRS (Pelucio-Grecco, Geron, Grecco, & Lima, 2014), with full implementation in the first quarter of 2010.

Second, Brazil offers a set of firms with heterogeneous ex-ante accounting quality. Before the general IFRS adoption in Brazil, firms in the upper corporate governance tiers of the São Paulo Stock Exchange (Novo Mercado and Level 2) had better disclosure than firms in the lower tiers. Therefore, IFRS adoption results in greater improvement in transparency and disclosure for lower-tier firms than upper-tier firms. These two features allow for variation in accounting quality, both cross-sectionally (i.e., between firms), as well as through time, allowing for a better identification strategy. Finally, the focus on a single country eliminates micro and macroeconomic cross-country differences that might otherwise confound empirical identification.

Uniform standards such as IFRS reduce information asymmetry. We analyze the efficacy of these standards by studying the decrease in the existing value discrepancy among Brazilian listed companies under different corporate governance requirements before IFRS adoption. In 2000, the São Paulo Stock Exchange created three special governance listing tiers (Level 1, Level 2, and Novo Mercado) to improve governance practices and differentiate firms listed in the special governance tiers from regular listed firms. Firms listed in the Novo Mercado present the highest corporate governance standards, while companies listed in Level 2 have most of the Novo Mercado requirements, except they are allowed to have non-voting shares. All firms with Level 2 and Novo Mercado status were required to use IAS/IFRS starting in 2000. Firms listed in Level 1 and the Regular level were not subject to this mandatory requirement and were able use BRGAAP until 2007.

The passage of the law in 2007 required all publicly traded firms to adopt IFRS, but this change affected only the required reporting practices for Level 1 and Regular-level (hereafter "treated") firms because firms in the Novo Mercado and Level 2 tiers ("untreated" firms) had already adopted IFRS. Therefore, this law offers a quasi-natural experiment design: providing a source of variation in disclosure that is heterogeneous across firms and almost exogenous.

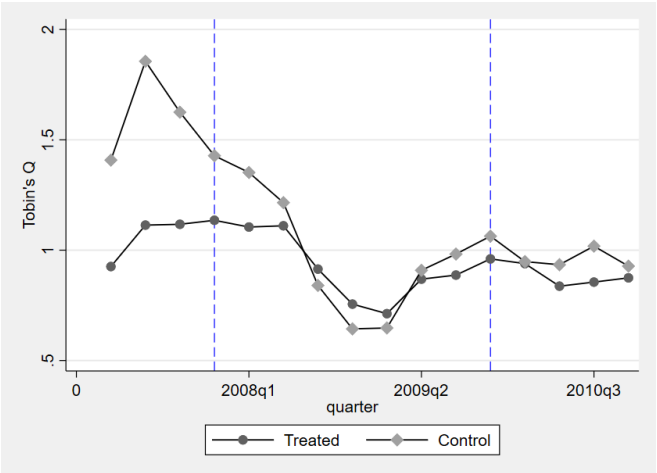
Our results show that mandatory adoption of IFRS has a positive impact on Tobin´s Q and the market-to-book ratio for firms with ex-ante lower disclosure quality. As Graphs 1 and 2 suggest, implementing IFRS almost completely eliminates the pre-existing valuation gap (Tobin's Q and market-to-book ratio) between firms in the upper and lower corporate governance tiers. Our tests confirm that the differential reduction in Tobin's Q and the market-to-book ratio is statistically significant, with magnitudes as large as 30 and 26 percentage points, respectively (corresponding to approximately 20% of the pre-shock measures of these variables). This result is consistent with that of Black, Carvalho, Khanna, Kim and Yurtoglu (2017), who find that a one-standard-deviation increase in disclosure predicts a 19% increase in Tobin's Q. Our matching estimators assure the comparison is made between treated and untreated firms that are otherwise similar in terms of observable features such as industry, size, and leverage.

We also present evidence on the mechanism that drives the decrease in the valuation gap between treated and untreated firms after IFRS adoption. First, we show that the difference in foreign investors' equity ownership between treated and untreated firms is significantly reduced after IFRS adoption. Nenova (2003) points to low accounting standards as one of the weaknesses inhibiting

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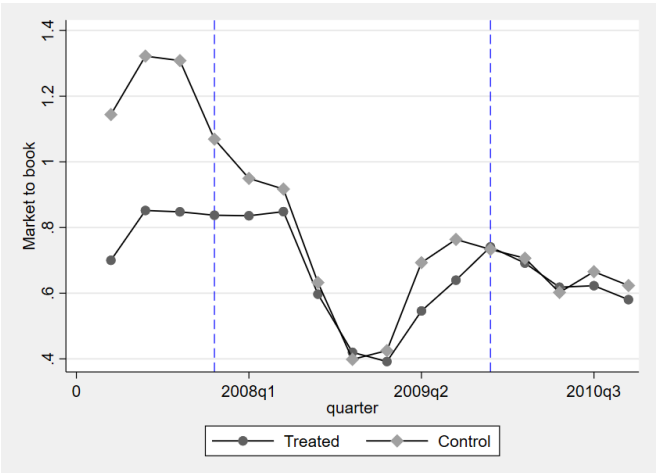
foreign investments in Brazil. IFRS adoption provides a set of standards that allow foreign investors to acquire information more efficiently (Amiram, 2012). Second, we find the difference in stock liquidity also declines after IFRS adoption.

Graph 1. **Median Tobin's Q**



Note: Quarter median for each group. Tobin's Q is winsorized at the 5% level. Treated are firms in Regular and Level 1 governance tiers; Non-treated are firms in Level 2 and Novo Mercado governance tiers. Sample comprises 76 treated and 76 control firms.

Graph 2. **Median market-to-book**



Note: Quarter median for each group. Market-to-book is winsorized at the 5% level. Treated are firms in Regular and Level 1 governance tiers; Non-treated are firms in Level 2 and Novo Mercado governance tiers. Sample comprises 76 treated and 76 control firms.

These two pieces of evidence are consistent with the notion that controlling shareholders of treated (low-governance-quality) firms were disincentivized to migrate to IFRS prior to its mandatory adoption because they could obtain private control benefits by using BRGAAP. Therefore, the smaller valuation gap between treated and untreated firms after IFRS adoption is plausibly related to controlling shareholders' reduced power to expropriate minority shareholders and debtholders. Therefore, our research adds to the literature that associates increased accounting disclosure with a decrease in expropriation by controlling shareholders.

This study contributes to the existing literature in at least two ways. First, it is the first study to investigate the interplay between corporate governance, accounting transparency, and firm valuation in an emerging market context. While several authors have examined the effect of accounting on valuation in developed economies (Armstrong, Barth, & Riedl, 2010; Daske, Hail, Leuz, & Verdi, 2008), and the relationship between corporate governance and accounting quality and transparency (Verrecchia, 2001; Verriest, Gaereminck, & Thornton, 2012), this is the first study to link these three features in a quasi-natural experiment design in an emerging economy. Second, compared to previous work on the subject, the characteristics of the Brazilian market (full adoption of IFRS and ex-ante heterogeneity in accounting quality) offer a better empirical identification strategy for evaluating the effects of accounting transparency on firm value.

Our inferences withstand a number of robustness checks. A potential concern in our empirical strategy is that the period of IFRS adoption (2008 to 2010) partly coincides with the financial crisis. If the treatment assignment is correlated with macroeconomic variables that were affected by the crisis and are important for firm valuation (for example, if firms with better corporate governance are more exposed to shocks in the financial sector), the observed effect on valuation would be erroneously attributed to IFRS. We tackle this concern by checking whether operational and financial metrics (earnings, income, and leverage) were affected by the crisis differently for treated and untreated firms and find no significant differences between the two groups. Because the Brazilian Real suffered 30% depreciation right after Lehman Brother's demise, we also use a placebo test to check whether firms in the two groups had different exposure to foreign currency, and find no evidence of difference. Moreover, we include controls in our estimations for a series of variables that have been found in the literature to affect firm valuation. Our results are consistent with previous literature.

Another possible concern in our identification strategy is that, before mandatory IFRS adoption, firms may have self-selected into the treatment and control groups; since firms could choose whether to comply with the Novo Mercado or Level 2 segment requirements, the treatment assignment may not be random. Our matching procedure ensures the firms we compare in the treated and control groups are otherwise similar.

The remainder of the paper is organized as follows. The second section places our contribution in the context of related literature and describes the Brazilian institutional setting. The third section provides details about the data, while the fourth section explains our identification strategy. The fifth section presents the results, and the sixth section discusses the mechanism behind the change in valuation gap and a series of robustness checks. The last section concludes.

Related Literature

This study relates most closely to "association-based" studies in the financial literature on disclosure, which generally attempt to document the effects of reduced information asymmetry on trading volume, stock liquidity, and firm value (Kanodia, 2006). Previous theoretical and empirical research suggests a negative relationship between information asymmetry, trade volume, and stock liquidity (Admati & Pfleiderer, 1988). For example, Leuz and Verrecchia (2001) consider voluntary commitment to increased disclosure levels in Germany. They find trade volume increases for firms that switch from German GAAP to IAS or US GAAP, suggesting disclosure decreases the information asymmetry component of the cost of capital. Similarly, Beatty, Chamberlain, and Magliolo (1996) find improvements in accounting quality are associated with lower contracting costs and less managerial rent extraction.

Previous research illustrates the benefits of higher levels of financial reporting quality. In general, improvements in accounting quality are related to a lower cost of capital and positive abnormal returns (e.g., Baiman & Verrecchia, 1996; Barth, Konchitchki, & Landsman, 2013; Daske, Hail, Leuz, & Verdi, 2013; Diamond & Verrecchia, 1991; Karamanou & Nishiotis, 2005; Leuz & Verrecchia, 2001). Botosan and Plumlee (2002) highlight that the firm implied cost of capital is negatively related to better governance practices, and Charitou, Karamanou, and Kopita (2018) find analysts' stock recommendations become more informative after IFRS adoption.

Daske et al. (2008) evaluate the economic consequences of mandatory IFRS adoption in an international setting. They show that market liquidity, equity valuation, and the cost of capital improved after IFRS adoption (market liquidity and equity valuation increased, whereas the cost of capital decreased). Lepone and Wong (2018) find IFRS adoption reduces the bid-ask spread of Australian stocks, and Charoenwong, Chong, and Wang (2014) show the relationship between asset liquidity and stock liquidity is reduced due to improved transparency after IFRS adoption.

According to Coffee (1984), Dye (1990), and Lambert, Leuz, and Verrecchia (2007), investors can better compare companies internationally due to IFRS reporting. Moreover, Verrecchia (2001) and Lambert et al. (2007) find higher-quality financial reporting and better disclosure help mitigate adverse selection problems.

In spite of improvements provided by better governance practices, Jeanjean and Stolowy (2008) point out that IFRS provide necessary but not sufficient conditions for creating a common business language. In addition, some investigators of reporting incentives, such as Ball, Kothari, and Robin (2000), Ball, Robin, and Wu (2003), and Daske et al. (2008), question the impact of better reporting policies. Santos, Schiozer, and Ponte (2019) show that country features, such as legal origin, law enforcement, and capital market scrutiny, are important determinants of the disclosure level, even years after IFRS implementation.

Effective IFRS implementation in firm reporting also plays an important role (Armstrong et al., 2010; Ball, 2006). Daske et al. (2008) show the cost of capital and Tobin's Q are affected by accounting rule changes. Verriest et al. (2012) explain that in a mandatory increased disclosure setting, compliance is associated with previous signs of higher-quality governance.

IFRS and corporate governance in Brazil - institutional settings

Our focus on a single country, Brazil, allows us to better identify the effects of IFRS on valuation. Under BRGAAP, receivables and payables were recorded at nominal value, whereas IFRS require that assets and liabilities be discounted to present value if material. Furthermore, BRGAAP did not distinguish between ordinary (voting) versus preferred (non-voting) shares. By contrast, under IFRS, a firm must calculate diluted earnings per share for ordinary shares, including dilutive potential (options and convertible instruments) if they meet certain criteria. Rodrigues, Schmidt, and Dos-Santos (2012) describe in detail the changes due to IFRS adoption and the changes it made in Brazil.

Previous authors analyze some effects of IFRS adoption in Brazil. Figlioli, Lemes, and Lima (2017) indicate reduced synchronicity levels (i.e., an increase in the proportion of company-specific information that affects returns) of shares traded after mandatory implementation of IFRS in Brazil, and Pelucio-Grecco et al. (2014) argue that IFRS implementation improves accounting quality by reducing earnings management, particularly for regulated companies.

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Silveira and Barros (2008) investigate the determinants of corporate governance in Brazil and find ownership concentration is negatively related to corporate governance levels. Black and Carvalho (2010) show that the São Paulo stock exchange created three high-governance listing tiers in 2000 with optional governance rules providing additional protection to minority shareholders. Black, Carvalho, and Sampaio (2014) show that creating the three high-governance listing tiers significantly improved investors' rights, ultimately resulting in a boom in initial public offerings in Brazil between 2004 and 2008. Most newcomers listed in one of the high-governance tiers, while some older companies adjusted procedures and bylaws, allowing them to migrate to higher corporate governance tiers. Previous research has also addressed the effect of corporate governance on firm value in Brazil before IFRS implementation. Silveira, Barros, and Famá (2003) find evidence that firms have higher values when the CEO is not the chairman.

Our study advances in these aspects and specifies an identification strategy for studying foreign investor shareholdings and improvements in stock liquidity after IFRS adoption. It stands out from previous studies as we examine the effects of improving accounting quality using a case where improvement is mandatory and uniformly applied across a well-defined set of firms. We use a quasi-natural shock and exploit the ex-ante distinction between the tiers' accounting standards requirements in Brazil. This setting allows us to identify the effects of IFRS adoption using a specific group of firms and to compare the effects of improved accounting standards on firm value by comparing these firms to otherwise similar (i.e., matched) firms that had already adopted IFRS. We follow Klapper and Love (2004), Durnev and Kim (2005), and Black et al. (2014), and use Tobin's Q as a proxy for firm value.

DATA

We collect financial statements and company information about Brazilian publicly listed firms from 2004 to 2015 from Economatica. Our main tests use data around the adoption of IFRS (between 2007 and 2010), while other periods are used for robustness and placebo tests. Table 1 provides the operational definitions of our financial variables.

We hand-collect firm ownership data from the Brazilian Securities and Exchange Commission (CVM). We analyze the Annual Information Report (IAN) and Reference Form (FR), which provide information about foreign investor stock ownership for every firm each year during our sample period. Finally, we collect bid-ask spread data (used to calculate liquidity measures) from Capital IQ.

Table 1. **Variable definitions**

Tobin's *Q*	**(book value of debt + market value of common stock)/ book value of assets**
Market-to-book	(market value of equity) / book value of assets
ln (assets)	natural logarithm of book value of assets
Leverage	(Total debt)/total book value of assets
Net Income/assets	(Net income)/total book value of assets
EBIT/sales	(Earnings before interest and tax)/total sales
PPE/sales	(Property, plant, and equipment)/Total sales
EBIT/assets	(Earnings before interest and tax)/total book value of assets
Industry dummies	Three-digit NAICS

Table 2 presents our sample selection procedure. Observations are excluded using the following filters: i) firms that changed corporate governance tiers during the sample period; ii) over-the-counter foreign firms listed as BDRs (Brazilian Depositary Receipts) and "Bovespa Mais" listed companies (firms similar to Novo Mercado, but smaller and with some restrictions); iii) firms in the Regular or Level 1 tiers with American Depositary Receipts (ADRs) and firms with any changes in ADR status, because these firms could arguably be subject to more strict disclosure requirements due to cross-listing; iv) firms facing financial reorganization; v) firms in NAICS sectors 522, 524, 525, and 551 (finance, insurance, and management companies); vi) companies without missing information in 2007 or 2010. Our final sample consists of 132 companies, with 56 in the untreated group (Novo Mercado and Level 2) and 76 in the treated group (Level 1 and Regular tiers).

Table 2. **Process and sample selection**

Number of firms in 2007	**444**
Drop firms with:	
Changed corporate governance listing levels between 2007 and 2010	1
BDR and OTC	7
Regular or Level 1 firms with ADR	14
NAICS Sectors 522,524,525, and 551	59
Firms facing corporate reorganization	11
No sales information	14
No data in 2007 and 2010	206
Total	**132**
Novo Mercado and Level 2 firms (untreated firms)	56
Level 1 and Traditional level firms (treated firms)	76

Note: Process and sample selection applied to Economatica data.

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We match pairs of firms in the treated and untreated groups based on their 3-digit industry classification, size, and leverage; there are 76 treated and 76 control companies. After this, our main sample includes quarterly information from the first quarter of 2007 to the fourth quarter of 2010. Our pairing/matching procedure is done with replacement, following Roberts and Whited (2013). Therefore, an untreated firm may be a match for more than one treated firm. In most of our empirical examinations, we use data from 2007 (prior to mandatory IFRS adoption) and 2010 (after full implementation of IFRS). We also perform a series of checks using the periods from 2006 to 2015.

Panel A of Table 3 presents the descriptive statistics for the main variables of interest, splitting the sample into treated firms (i.e., firms from Level 1 and Regular corporate governance tiers that were forced to adopt IFRS after 2007) and control firms (firms in Level 2 and Novo Mercado that adopted IFRS before 2007). We observe no striking differences between treated and control firms regarding these variables. Treated firms are only slightly smaller than control firms, with similar average levels of leverage, net income/assets, and EBIT/assets. Control firms have slightly higher average levels of PPE/sales and EBIT/sales. Panel B of Table 3 shows the correlation matrix for these variables.

Table 3. **Descriptive statistics and correlation matrix**

Panel A – Descriptive Statistics					
Treated (n=76)	**Mean**	**Median**	**Standard Deviation**	**Minimum**	**Maximum**
ln (assets)	14.04	13.88	1.99	10.46	17.78
Leverage	0.25	0.23	0.14	0.00	0.61
Net Income/assets	0.04	0.04	0.09	-0.32	0.20
EBIT/sales	0.15	0.11	0.23	-0.42	0.94
PPE/sales	1.44	0.81	2.31	0.12	11.23
EBIT/assets	0.09	0.08	0.09	-0.16	0.27
Control (n=76)					
ln (assets)	14.60	14.53	0.99	12.60	16.74
Leverage	0.25	0.23	0.14	0.00	0.45
Net Income/assets	0.05	0.05	0.04	-0.03	0.20
EBIT/sales	0.21	0.12	0.30	-0.48	0.74
PPE/sales	2.24	0.81	2.89	0.12	11.23
EBIT/assets	0.08	0.07	0.06	-0.05	0.27
Panel B – Correlation Matrix					
	***ln* (assets)**	**Leverage**	**Net Income/ assets**	**EBIT/ sales**	**PPE/sales**
Leverage	**0.15***	1.00			
Net Income/assets	**0.35*****	-0.01	1.00		
EBIT/sales	**0.27*****	**0.45*****	**0.33*****	1.00	
PPE/sales	0.01	-0.05	-0.14	0.11	1.00
EBIT/assets	0.29***	0.15*	0.71***	0.62***	-0.21**

Note: This Table presents the descriptive statistics and correlation matrix for treatment and control groups. Both groups have 76 observations. The symbols *, ** and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

Identification Strategy and matching procedure

We exploit the distinction between the listing tiers' accounting standard requirements. Level 2 and Novo Mercado tier firms were required to use IAS/IFRS starting in 2000, while Level 1 and Regular firms used Brazilian GAAP until 2007. The law required all publicly traded firms to adopt IFRS, but, in practice, required a change in reporting only for Level 1 and Regular firms (treated firms).

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Selection into governance tiers was originally made by the firms themselves, meaning group assignment is not random. However, firms' self-assignment into different corporate governance tiers seems unrelated to the passage of the law making IFRS mandatory for all Brazilian firms, because for most firms, tier assignment was made seven years before the law was passed. The long period between group assignment and law passage makes implausible the assumption that firms decided to comply with the higher governance tier requirements because they anticipated future mandatory IFRS adoption.

To further mitigate concerns about non-random assignment, we follow Almeida, Campello, Laranjeira, and Weisbenner (2011) and adopt a less parametric strategy that is more closely related to the notion of a "design-based" test. In this framework, we match firms in the treated group to otherwise similar firms in the control group to ensure treated and control observations belong to the same industry and have similar features along observable dimensions. We match treated to untreated firms using a propensity score technique based on industry (3-digit NAICS), size, and leverage as of the last quarter of 2007. We also perform alternative matching procedures using other covariates, such as net income/Assets, EBIT/sales, PPE/sales, and EBIT/assets. We follow Angrist and Pischke's (2008) recommendation and use a parsimonious model containing only the covariates that actually predict the treatment. Because there are more treated than untreated firms in our sample, we match every treated firm to a single non-treated firm, following Almeida et al. (2011). We also follow Roberts and Whited's (2013) suggestion and use replacement in our matching procedure. After matching, the sample includes 76 treated and 76 control (untreated matched) firms.

Table 4 provides median comparison tests for our main covariates, following Almeida et al. (2011). We compare treated and control firms regarding within-firm changes in the matching variables (size and leverage), as well as net income/assets, EBIT/assets, EBIT/sales, and PPE/sales as of the last quarter of 2007. These tests allow us to capture time-invariant heterogeneity by comparing within-firm changes in these variables. We find no significant differences between treated and control groups in the variable medians, suggesting our procedure successfully matched treated and control firms along these dimensions prior to the law passing.

Table 4. **Medians for treated and control firms in 2007**

	ln (assets)	Leverage	Net Income /Assets	EBIT/ Sales	PPE/ sales	EBIT/Assets
Treated (n=76)	13.88	0.23	0.04	0.11	0.81	0.08
Control (n=76)	14.53	0.23	0.05	0.12	0.81	0.07
Difference	-0.65	0.00	-0.01	-0.01	0.00	0.01
Pearson's x2 statistic p-value	0.42	0.87	0.63	0.87	0.87	0.63

Note: Medians for Treated and Control Firms in 2007. The treated firms are defined as firms in the Regular and Level 1 segments at B3. Control firms are defined as firms in the Level 2 and Novo Mercado segments. The sample consists of 76 treated and 76 non-treated firms. The test for a difference in the medians of a firm characteristic across two groups is conducted by calculating the Pearson's X2 statistic, with the p-values of this test reported at the bottom row of each column.

Inferences about the effect of IFRS on valuation (Tobin's Q and market-to-book value) are based on differences in the post-treatment outcomes of treated and control groups. We use the following specification:

$$Value_{i,t} = \omega(LowGov_i \times Póst_t) + \tau Póst_t + \varphi LowGov_i + \beta' X_{i,t} + \varepsilon_{i,t} \quad (1)$$

where:

$$Value_{i,t} = Tobin'q_{i,t} or \frac{Market_{i,t}}{Book._{i,t}} \quad (2)$$

$LowGov_i$ is a dummy variable for treated firms (firms in the lower governance tiers), and $Pós_t$ is a time dummy that equals 0 for 2007 and 1 for 2010. In alternative specifications, we use data from different years and $Post_t$ equals 0 or 1 for different years.

$X_{i,t}$ is a matrix of pre-adoption control variables (size, leverage, net income/assets, EBIT/assets, EBIT/sales PPE/sales, and NAICS sector); and ω, τ, φ, and β' are parameters to be estimated. Our main coefficient of interest is ω, and we refer to it as the ATT (average treatment on the treated) effect.

In all regressions, standard errors are clustered at the firm level, and robust to heteroskedasticity.

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RESULTS

Panel A of Table 5 presents our estimates of the average effects of IFRS adoption on the treated (ATT) firms, indicated by the coefficient ω in equation 1. Our estimate shows the ATT effect of mandatory IFRS adoption is a 0.301 increase in Tobin´s Q, statistically significant at the 5% level. This effect is economically significant, as it corresponds to approximately 20% of the pre-shock mean value of Tobin's Q. We also estimate a positive ATT effect of 0.262 on the market-to-book ratio, equivalent to almost 20% of the mean pre-existing levels of the control group's market-to-book ratio; this result is statistically significant at the 10% level. These results are at the heart of our analysis of the effects of accounting practices on firm value. Since our matching procedure guarantees our treated and control groups are similar, we claim to find a causal relationship.

Because some IFRS features were adopted as early as 2008, we also check for an immediate adoption effect by comparing the changes in our variables of interest for the treated and control firms between 2007 to 2008. Our ATT estimates, reported in the third and fourth columns of Panel A, are only slightly smaller than our previous estimates.

The results for our control variables are consistent with the previous literature: firms with higher net income are more likely to have a higher Tobin´s Q and market-to-book, as expected. In addition, we find a negative relationship between firm value and size, EBIT/sales, sales growth, and PPE/sales.

We test for a possible anticipation effect by setting the post-treatment dummy equal to 1 in 2007 and 0 in 2006 (first two columns), to verify if investors anticipate IFRS benefits for firm valuation before adoption. The results reported in Panel B of Table 5 show that more than half the Tobin's Q effect and almost all the market-to-book effect occurred as early as 2007, even before low-governance firms actually adopted IFRS. In the third and fourth columns, we use data from 2007 (pre-treatment) and 2008 (post-treatment) and find the ATTs are positive, but not statistically significant at the usual levels. The fact that we observe an anticipation effect rules out the possible alternative explanation that the pre-existing differences between the valuation of high and low governance firms were simply due to different accounting procedures (IFRS versus BRGAAP).

The combined results in Panels A and B of Table 5 suggest investors anticipated the positive effects of IFRS on firm value, which may have happened for several reasons. The reduced likelihood of expropriation by controlling shareholders given the more stringent disclosure rules of IFRS or simply more transparency for foreign investors (we return to this point in the next section) are both plausible explanations.

We also perform a number of placebo checks, using different time windows for our treatment and alternative dates to match treated to control firms. Our ATT estimates are not statistically significant in any of these placebo tests, suggesting our results are not driven by unobservable features that simultaneously drive firm choice of corporate governance tier and valuation.

CHANNELS REDUCING THE VALUATION GAP AND ROBUSTNESS CHECKS

Foreign stock ownership and stock liquidity

We compare the share of foreign investor ownership for both groups of firms. We follow Colombo and Caldeira (2018) and hand-collect ownership structure from the CVM. The data provide information on ownership of investors with participation equal to or greater than 5% from each class of issued shares. We use this information to compute the proportion of foreign investor ownership for each share class of every firm each year.

We run the regression in Equation (1) using the proportion of foreign investor ownership as our dependent variable. The results are reported in Panel A of Table 6. Our estimates indicate foreign ownership of common (voting) shares of treated firms relative to control firms increases by approximately 19.3 percentage points between 2007 and 2010, which is statistically significant at the 10% level. In the first row of column 2, we use foreign ownership in all shares (voting and non-voting) instead of voting shares, and the effect is slightly smaller (16.3 percentage points). As shown in Table 6, Panel C, untreated firms had more foreign ownership than treated firms as of 2007: 16 percentage points in common shares and 14 percentage points in total shares. We also check for the immediate effect of IFRS adoption by comparing the change in foreign ownership for treated and control firms from 2007 to 2008. Our estimates, reported in the second column of Panel A, are slightly smaller than our previous estimates. IFRS adoption for low-governance firms is associated with an increase of approximately 13.9 percentage points in total foreign equity ownership (statistically significant at the 10% level). The coefficient for foreign common equity ownership is statistically insignificant, but its magnitude is comparable to the other coefficients in Panel A of Table 6.

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Table 5. **Difference-in-differences tests – Tobin's Q and market-to-book**

Panel A – Main Results				
	2007-2010		**2007-2008**	
	Tobin's Q	**Market to book**	**Tobin's Q**	**Market to book**
LowGov × Post	0.301**	0.262*	0.271**	0.228*
	(0.128)	(0.132)	(0.121)	(0.127)
LowGov	-0.196	-0.155	-0.217	-0.175
	(0.151)	(0.144)	(0.155)	(0.151)
Post	-0.582***	-0.549***	-0.551***	-0.507***
	(0.112)	(0.120)	(0.107)	(0.116)
ln(Assets)	-0.045	-0.037	**-0.082****	**-0.076****
	(0.035)	(0.033)	**(0.037)**	**(0.034)**
Leverage	0.432	-0.541	**1.196*****	0.229
	(0.405)	(0.399)	**(0.356)**	(0.334)
Income to assets	1.772**	1.989**	3.274***	3.134***
	(0.842)	(0.834)	(0.878)	(0.813)
EBIT to sales	-0.109	-0.201	-0.100	-0.191
	(0.218)	(0.202)	(0.247)	(0.226)
PPE to sales	-0.006	-0.009	-0.003	-0.003
	(0.019)	(0.019)	(0.018)	(0.017)
EBIT to assets	1.117	1.002	0.579	0.769
	(1.076)	(1.032)	(1.189)	(1.110)
Industry dummies	Yes	Yes	Yes	Yes
observations	1,216	1,216	1,216	1,216
# Treated firms	76	76	76	76
Adj-R^2	0.49	0.52	0.48	0.49
Panel B - Anticipation Test				
	Tobin's Q	**Market to book**	**Tobin's Q**	**Market to book**
	2006-2007		**2007-2008**	
LowGov × Post	**0.202****	**0.239*****	0.059	0.066
	(0.091)	**(0.084)**	(0.065)	(0.068)
Controls	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
observations	1,052	1,047	1,216	1,216
# Treated firms	76	76	76	76
Adj-R^2	0.49	0.55	0.45	0.41

Note: This table presents the Difference-in-differences of firm Tobin's Q and Market-to-book before and after the mandatory IFRS adoption in Brazilian firms. The control variables are: ln(Assets), Leverage, Income to assets, EBIT to sales, PPE to sales and EBIT to assets. The symbols *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.

Table 6. **Difference-in-differences tests - Foreign investment, liquidity, and average differences between treated and control**

Panel A - Foreign Investment		
	2007-2010	**2007-2008**
Common Shares	**19.267***	16.487
	(11.169)	(10.570)
observations	304	304
# of treated firms	76	76
Adj-R^2	0.24	0.24
All Shares	16.282*	13.974*
	(9.221)	**(8.001)**
observations	304	304
# of treated firms	76	76
R^2	0.36	0.38
Panel B - Liquidity Measures		
	2007 x 2010	**2007 x 2008**
Bid-Ask Spread	-0.017*	-0.015*
	(0.010)	**(0.009)**
observations	981	971
# of treated firms	76	76
R^2	0.47	0.43
Amihud Illiquidity	**-4.127****	1.434
	(1.825)	(1.791)
observations	1.203	1.199
# of treated firms	76	76
R^2	0.32	0.32
Share Turnover	0.689	**0.929****
	(0.608)	**(0.454)**
observations	1.216	1.216
# of treated firms	76	76
R^2	0.48	0.51

Panel C – Average differences between treated and controls			
Foreign ownership	**2007**	**2008**	**2010**
Common Shares (pp)	-16.04	-0.43	2.32
Total Shares (pp)	-14.06	-0.70	1.69
Liquidity Measures			
Bid-ask spread	0.059	0.049	0.047
Amihud	7.73	9.26	4.09
Share turnover	-1.21	-0.29	-0.68

Note: Panel A presents the difference-in-differences of firm percentage of foreign investors (common shares and total shares) for each year. Panel B presents the difference-in-differences of firms considering liquidity measures (Bid-Ask Spread, Amihud Illiquidity and Share Turnover). The control variables are: ln(Assets), Leverage, Income to assets, EBIT to sales, PPE to sales and EBIT to assets. Panel C presents average difference for treated and control firms for each year (treated minus control firms). Variables for Foreign Investors are annual. Liquidity measures are the average of the original quarterly variables for each year. Difference between treated and control firms. Amihud variable is multiplied by 1,000,000. The symbols *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

Our results indicate the reduction in the valuation gap between firms from high and low corporate governance levels after mandatory IFRS adoption may be, at least in part, due to an increase in foreign investors' demand for low corporate governance firms. Accounting convergence allows foreign investors to improve firm monitoring, mitigating the expropriation by controlling shareholders. This evidence is also consistent with the pre-IFRS valuation gap between treated and untreated firms and explains why low-governance firms self-selected into not adopting IFRS prior to 2008.

To further investigate the channels that reduce the valuation gap, we analyze stock liquidity. This is not necessarily a separate channel from foreign ownership; in fact, it is plausible that increased foreign ownership improves stock liquidity. We calculate three different liquidity measures to evaluate market trading improvements due to IFRS adoption. First, we use Chung and Zhang's (2014) measure to obtain the closing percent quoted spread of stock *i* on day *d*. The measure is specified as follows:

$$Spread_{i,q} = \frac{1}{D}\sum_{d=1}^{D}\frac{Ask_{i,d} - Bid_{i,d}}{M_{i,d}} \quad (3)$$

where $Ask_{i,d}$ is the closing ask price of stock *i* on day *d*, $Bid_{i,d}$ is the closing bid price of stock *i* on day *d*, $M_{i,d}$ is the mean of $Ask_{i,d}$ and $Bid_{i,d}$ per quarter, and D is the number of days in a quarter, as reported by Capital IQ. For dual-class shares, we use the most liquid. The closing percent quoted spread is the best spread proxy for capturing changes in effective and quoted spreads (Fong, Holden, and Trzcinka, 2017).

Second, we follow Amihud (2002) and measure stock illiquidity as the absolute percentage price change per dollar of daily trading volume. This ratio directly measures the impact of a monetary unit of trading volume on stock returns. The Amihud (2002) illiquidity ratio is defined as follows:

$$V_{i,q} = \sum_{d=1}^{D_{i,q}}\frac{|R_{i,d,q}|/V_{i,d,q}}{D_{i,q}} \quad (4)$$

where $R_{i,d,q}$ and $V_{i,d,q}$ are, respectively, the return and monetary trade volume of stock *i* on day *d* at quarter *q*, and $D_{i,q}$ is the number of days stock *i* is traded in a quarter.

Finally, we compute the turnover ratio, which captures the average holding period of stocks (Atkins & Dyl, 1997). It is defined as the ratio of the number of shares traded to the number of shares outstanding, and is computed as follows:

$$Turnover_{i,q} = \sum_{d=1}^{D_{i,q}}\frac{Vol_{i,d,q} / Share_{i,d,q}}{D_{i,q}} \quad (5)$$

where $Vol_{i,d,q}$ is the trading volume for stock *i* in day *d* of quarter *q*, $Share_{i,d,q}$ is the number of shares outstanding for stock i in day *d* of quarter *q*, and $D_{i,q}$ is the number of trading days for stock *i* in quarter *q*.

Panel B of Table 6 presents the results of estimating Equation (1) using these three liquidity measures as our dependent variable. The first coefficient in the first row indicates the bid-ask spread of low-governance firms decreases by approximately 1.7 percentage points compared to high-governance firms after IFRS adoption (statistically significant at the 10% level). Most of this effect takes place immediately in 2008, as shown by the coefficient of -0.015. In the second row of Panel B in Table 6, we report the results for the Amihud (2002) illiquidity measure (Eq. 4), which indicates the difference in stock liquidity of low versus high-quality governance firms decreases after IFRS adoption (statistically significant at the 5% level). However, the regression for the differential change in this measure between 2007 and 2008 yields statistically insignificant results.

Finally, the last row in Panel B of Table 6 shows the regression results using share turnover (Eq. 5) as the dependent variable. The coefficients are positive, as expected, but the ATT between 2007 and 2010 is statistically insignificant at the usual levels, whereas the ATT between 2007 and 2008 is statistically significant at the 5% level.

Taken together, the results in Table 6 confirm the decline in the valuation gap between low-and high-governance firms after IFRS adoption is at least partially explained by a reduction in the difference in foreign ownership and stock liquidity between the two groups of firms.

Further robustness checks

One concern is that high-governance firms are more sensitive to a financial crisis, due to omitted firm features, such as greater operational or financial exposure to global economic cycles than low-governance firms. We claim this is implausible for a number of reasons. First, industry-matching captures most of the sensitivity to business cycles. Second, to dismiss the concern that low-and high-governance firms may have different sensitivities to the crisis, we perform a series of difference-in-differences (DID) regressions in which we use operational and financial covariates as dependent variables. The logic behind these tests is that, if some unobserved

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firm feature causes treated and control firms to be heterogeneously affected by the crisis, we should observe different changes in operational and financial performance metrics around the crisis period. More specifically, we run the following regression:

$$Y_{i,t} = y(LowGov_i \times Post_t) + \delta_0 Post_t + \delta_1 BaixaGov_i + \beta' X_{i,t} + \varepsilon_{i,t} \quad (6)$$

where:

$Y_{i,t}$ is one of the following variables: size, leverage, net income/assets, EBIT/assets, EBIT/sales, or PPE/sales.

$LowGov_i$, $Post_t$ and $X_{i,t}$ are previously defined, and γ, δ_1, δ_2, and β are coefficients to be estimated.

Our main parameter of interest in the DID regression is γ. A non-significant γ indicates that, for that particular dependent variable *Y*, the effect of the treatment between treated and control firms is homogeneous. The results in Table 7 report the coefficient γ for the regressions estimated with each of the dependent variables. For example, the dependent variable in the first row of Table 7 is *ln(assets)*. In the second row, it is the leverage ratio, and so on. The difference between the first and second columns of Table 7 is that the first column uses data from the four quarters of 2007 and 2010, whereas the second column uses data from 2007 and 2008 (and $Post_t$ is adjusted accordingly). None of the coefficients reported in Table 7 are statistically significant, strongly suggesting treated and control firms do not have different sensitivities to the financial crisis, on average.

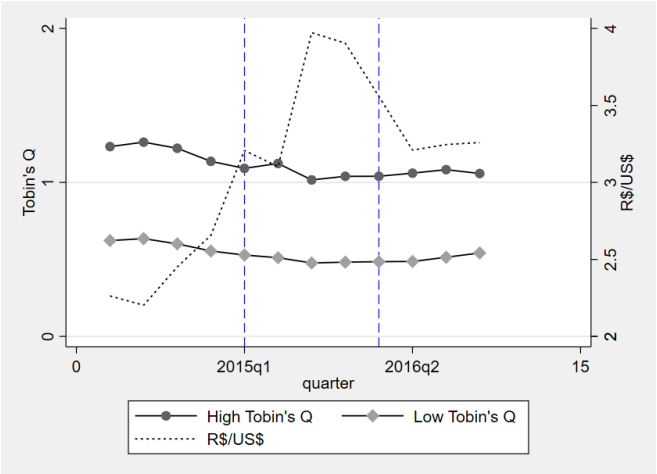
Table 7. **Robustness checks – change in covariates**

	ln(Assets)		Leverage		Income/assets		EBIT/sales		PPE/sales		EBIT/assets	
	07 vs 10	07 vs 08	07 vs 10	07 vs 08	07 vs 10	07 vs 08	07 vs 10	07 vs 08	07 vs 10	07 vs 08	07 vs 10	07 vs 08
Coefficient	-0.144	-0.082	-0.064	-0.033	0.001	-0.003	0.029	-0.005	-0.085	0.108	-0.012	-0.001
standard error	(0.117)	(0.092)	(0.047)	(0.039)	(0.010)	(0.005)	(0.031)	(0.031)	(0.254)	(0.308)	(0.009)	(0.006)
observations	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216
# treated firms	76	76	76	76	76	76	76	76	76	76	76	76
R^2	0.69	0.71	0.45	0.52	0.66	0.65	0.73	0.74	0.73	0.68	0.80	0.80

Note: This table presents the difference-in-differences of covariates before and after mandatory IFRS adoption in Brazilian firms.

Another confounding factor is the possibility that the different changes in firm valuation in the treated and control groups stem from their different sensitivities to the exchange rate. Because the Brazilian real appreciated approximately 25% from late 2007 until the third quarter of 2008, one could be concerned that high-governance firms were hurt more by this appreciation than low-governance firms. We claim the results from our DID regressions in Table 7 help eliminate this concern, because any such difference in exchange rate exposure would show up either in firm income or EBIT in those regressions. However, to further mitigate this concern, we use the depreciation of the Brazilian Real in 2015 (when no change in accounting requirements took place) as an experiment. We split our sample into low (below median) and high (above median) Tobin's Q as of December 2014, and check if their valuation was affected differently by the depreciation of the Brazilian Real. Graph 3 shows that the median Tobin's Q of the two groups follows roughly parallel trends throughout the entire period, from 2014 to 2016, indicating firms with high and low Tobin's Q are similarly exposed to the exchange rate, on average.

Graph 3. **Robustness Check – Median Tobin's Q and exchange rate shock**



Note: This graphic presents the result of a sample split into high and low Tobin's Q firms during the 2015 Brazilian exchange rate depreciation.

Another concern might be that the untreated firms selected to serve as matches (control) have special features that cause selection bias, or that the matching procedure "artificially" attributes too much weight to specific control firms that appear more than once as a match for treated firms. To mitigate this concern, we run a series of DID regressions without matching. The coefficients of interest (not reported to conserve space) have the same order of magnitude as those in Table 5 and remain economically and statistically significant.

Finally, we perform a number of unreported robustness checks, such as changing the matching procedure and covariates and running regressions with and without firm-level and macroeconomic control variables. Our inferences withstand all these robustness checks.

CONCLUSION

This study investigates whether accounting transparency affects firm valuation. The focus on Brazil during mandatory IFRS adoption between 2008 and 2010 allows us to mitigate the endogeneity concerns present in cross-country studies, while taking advantage of the ex-ante heterogeneity in accounting quality and corporate governance of Brazilian firms. The Brazilian market's institutional features, such as low enforcement and the formalistic approach of the pre-existing BRGAAP, results in a greater accounting transparency improvement after IFRS adoption compared to developed economies.

We use a matching technique that allows us to compare firm valuation between companies listed in the lower corporate governance tiers of the São Paulo Stock Exchange that had to adopt IFRS in 2008 to otherwise similar firms listed in the higher corporate governance tiers of the exchange, which had already adopted IFRS before it became mandatory. Our results indicate the improved transparency provided by IFRS adoption increases Tobin's Q by as much as 30 percentage points and the market-to-book ratio by 26 percentage points, virtually eliminating the pre-existing valuation gap between firms listed in the high and low corporate governance tiers. We also show two channels that drive the reduction in the valuation gap: the reduction in the difference in foreign equity ownership and stock liquidity. We acknowledge, however, that given the very large magnitude of the effect of IFRS adoption on firm value (30 percentage points in Tobin's Q), there may be other channels at play.

Our results add to previous evidence that transparency improves firm value. While most previous studies rely on cross-country heterogeneity in transparency, our identification strategy, which uses a quasi-natural experiment and matching techniques, allows us to better identify the causal relationship between accounting quality and firm value. Our inferences shed light on the role of regulation in providing transparency to protect minority shareholders. While our study does not directly investigate the reasons driving the pre-IFRS valuation gap between high-and low-governance firms, previous research shows this pre-existing gap may have been due to expropriation between controlling shareholders and minority shareholders. Because the decision not to adopt IFRS until required by law was essentially a choice by managers and controlling shareholders, we speculate this decision may have been driven by these players extracting private benefits from reduced transparency. Therefore, our findings suggest improving accounting quality mitigates expropriation and therefore improves minority shareholder returns.

Expropriation from minority shareholders by controlling shareholders is particularly relevant in emerging markets, where ownership tends to be more concentrated, non-voting shares are more common, and investor protection tends to be lower than in developed markets. To guarantee a healthy investment environment, regulators should focus on improving accounting quality and enforcing transparency rules.

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AUTHORS' CONTRIBUTIONS

The authors declare that they participated in all stages of development of the manuscript. From the conceptualization and theoretical-methodological approach, the theoretical review (literature survey), data collection (except professor Rafael Felipe Schiozer), as well as data analysis, and finally, writing and final review the article.

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NETWORKS OF DESIRE OR ENJOYMENT? CONSUMPTION EXPERIENCE AND NEW TECHNOLOGICAL AGENCIES

In the international debate on consumer studies, the literature on "consumption experience" has been available for more than three decades since its beginning with the seminal study of Hirschman and Holbrook (1982) on hedonic consumption, and that of Holbrook and Hirschman (1982) on the experiential aspects of consumption. These studies aimed to define a consumption experience as a search for fun, fantasy, sensory excitement, and pleasure, all resulting in a magical, extraordinary, and memorable experience.

The importance of esthetic, symbolic, and emotional aspects in consumer studies goes back to the 1950s, with works by Gardner and Levy (1955), Levy (1959), and Levy and Czepiel (1974). However, consumption experience only became the dominant theme when studies by Hirschman and Holbrook argued in favor of retrieving the feelings and emotions involved in the consumption process. Holbrook (2006, p. 259) even criticized the number of publications that failed to mention the research on the theme that had already been created, and insisted that the theme of consumption experience was already present in analyses, such as those by Alderson (1957) and Abott (1955). He suggested that the roots of the concept might be traced to the contributions made by classic economic scholars as mentioned in the treatise on happiness by Lebergott (1993). Even so, Holbrook and Hirschman were repeatedly cited as the founders of a new era in which consumer experience had become "a key element in understanding consumer behavior and, for some, a basis for the economics and marketing of the future" (Carù & Cova, 2003, p. 267).

Although the roots of the "consumer experience" concept appeared before the 1980s, something was happening in the historical context that gave new meaning to the debate on this topic and transformed Hirschman and Holbrook's articles into founding texts in the field of consumer and marketing studies. I am referring to the moment when a new type of social life started to take shape as the result of a new economic order on one hand, and a new type of time–space experience on the other. The latter was called the "postmodern experience" by the American cultural critic Fredric Jameson. The emergence of a "post-industrial or consumer society, the society of the media or the spectacle, or multinational capitalism" (Jameson, 1998, p. 3) was related to a cultural about-turn that transformed consumption into "an act of producing experiences" (Firat & Dholakia, 1998, p. 96). Under these circumstances, consuming experiences became a new approach in the field of consumer and marketing studies (Carù & Cova, 2003; Gilovich, Kumar, & Jampol, 2015; Jantzen, Fitchett, Ostegaard, & Vetner, 2012; Lanier & Rader, 2015; Pine & Gilmore, 1999; Schmitt, 1999; Woodward & Holbrook, 2013).

ISLEIDE FONTENELLE[1]
isleide.fontenelle@fgv.br
ORCID: 0000-0001-5607-324X

[1] Fundação Getulio Vargas, Escola de Administração de Empresas de São Paulo, São Paulo, SP, Brazil

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Hirschman and Holbrook's articles do not highlight the importance of the historical context of the 1980s in their proposition of the notion of consumption experience. However, they do reveal the importance of this new moment when they show an interest in discussing the experiential aspects of consumption based on a specific class of products, namely, cultural and esthetic products. According to Hirschman and Holbrook, these products are more akin to the concept they propose, given the capacity of these products to generate strong emotional involvement. The authors were interested in presenting the limits of the "information processing model"—considered to be the hegemonic model of consumer research—to understand the new type of consumption that was emerging. In the two above-mentioned articles they ended up condensing two objectives that are directly related to the debate on consumption experience: On the one hand, they proposed a way of understanding this category that is epistemologically and methodologically different from the way of understanding it based on the dominant model. On the other hand, they suggested mobilizing the consumption experience concept to understand the aforementioned specific class of products. They insisted that "all products can be hedonically experienced by consumers" (Hirschman & Holbrook, 1982, p. 96). However, the emphasis they placed on the consumption of immaterial goods ended up generating a certain conceptual overlap between the two fields of analysis of a consumption experience. The first field proposes the understanding of a "consumption experience" as constituting any consumption practice; the second field regards the consumption of an experience as a specific type of consumption, in which what is being sold is a conception of an experience as a commodity (Campbel, 2007; Lanier & Rader, 2015).

In their search for a differentiation that they considered necessary for "consumption experience," Carù and Cova (2003) attributed a more sociological conception to it, which would accommodate simple, ordinary experiences outside the market—whatever it might be that people enjoy in their family lives, with their friends, or as citizens. As a counterpoint to this, they proposed the concept of "consumer experience," meaning experiences emanating from the market, particularly those aimed at the extraordinary and memorable, which is the focus of "experiential marketing." When Woodward interviewed Holbrook, however, the latter claimed that this differentiation made no sense, since "consumption experience" defines the whole of our experience of life (Woodward & Holbrook, 2013).

In my opinion, "consumption experience" is already being used as a marketing category, and it makes no sense to extrapolate its meaning beyond the bounds of the market. Although Holbrook emphasized that there are experiences outside the market, the term "consumption experience" already has its own particular birthmark, in the sense that it has redefined the concept of experience in the context of consumer and marketing studies. According to Holbrook, the proposition of this category generated resistance in the academic field from those who still insisted on "the good old days when we were concerned with the behaviour of buyers" (Woodward & Holbrook, 2013, p. 326). However, the term was novel for a field in which an understanding of the consumer as a mere rational being was no longer enough. The "consumption experience" category also finally shaped a new way for the market to operate, which was based on "selling experiences." Despite insisting that this was not his intention, Holbrook admits that the idea of consumption experiences fueled a trend toward experiential marketing.

When Pine and Gilmore (1999) proposed a new type of experience economy, it was not a coincidence that they argued that the sensations and emotions involved in consumer experiences already existed but that they had not yet been understood as capable of generating value. When the authors wrote a book that, according to Holbrook (2006, p. 259), followed the Harvard Business Review's best practices style, they were aiming at new ways of adding value to companies by focusing on the various business opportunities created when sensations and emotions are marketed. Pine and Gilmore managed to go beyond the initial academic analyses of Holbrook and Hirshman. The reason was that while the latter were busy recovering the academic marketing field's lost focus on the experience of consumption, the former were already seeking to transform experience into merchandise. This stage was served well by the concept of "consumption experience." I now return to Holbrook's statement that "**ALL** experiences are consumption experiences and that these consumption experiences constitute most of what we do during our waking and even non-waking lives" (Woodward & Holbrook, 2013, p. 325 – my emphasis). This sentence was a premonition of a time, the present time, where it is the market that has invested in transforming all human experiences into consumption experiences.

The term "consumption experience" contains a complex word, "experience," the meaning of which cannot be understood without digressing significantly and examining the thought tradition to which the concept belongs (Carù & Cova, 2003; Jay, 1994; Lasch, 2006). Although Holbrook and Hirschman (1982) do not propose a definition of experience, they create a new concept category, "consumption experience," and assign a meaning to it. That meaning, according to the authors, is related to an "experiential perspective" that is "phenomenological in spirit and considers consumption as a mainly subjective

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state of consciousness, with a variety of symbolic meanings, hedonic responses, and esthetic criteria" (p. 132). To indicate the theoretical bases of this category, although the authors do not provide any details, they mention the Freudian concept of the "pleasure principle," emphasizing its importance from an "experiential perspective" that aims to understand consumption as a search for satisfaction, which in turn is understood as fun and pleasure. If we follow the Freudian analysis, however, the pleasure principle does not fully explain one's search for the experience of satisfaction. To do so, Freud developed his "beyond the pleasure principle" (Freud, 1996). This referred to an incessant search for satisfaction, understood as a repetition compulsion that is not always synonymous with pleasure, or that might lead someone to find pleasure in displeasure; there are certainly several gradations between these two poles. I shall return to this point because it is central to the argument I develop in this essay.

Before that, however, it is important to highlight that it was from the idea of pleasurable, memorable, and extraordinary experiences that an entire field of research was developed around the concept of consumer experience, although some critical voices indicated the need to consider the risks of excesses that the idea of extraordinary could lead to (Carù & Cova, 2003). Recent analyses show excessive types of consumption, which are experienced in the form of pain (Scott, Cayla, & Cova, 2017) or charged with negativity (Raymen & Smith, 2017; Smith & Raymen, 2017). These challenge the positive conception of "consumption experience" and raise new questions with regard to the idea of pleasurable and extraordinary experiences (Arnould & Price, 1993; Belk & Costa, 1998; Kozinets, 2002), or even to our understanding of what ordinary consumption experiences are (Carù & Cova, 2003).

The current circumstances include an expansion in marketing that promises endless experiences (Loose, 2015) and technological transformations that indicate an increase in our passion for consumption that also tends toward the extreme (Kozinetes, Patterson, & Ashman, 2017). Thus, I believe that the consumption experience concept is necessary if we are to examine this excessive appeal to a type of satisfaction that can also become excessive. Research into forms of excessive consumption, however, does not use the concept of consumption experience; it has been limited merely to analyzing the magical universe of consumption and its pleasurable forms. These are two thematic currents that do not intersect; it is as if they belonged to different epistemological and theoretical fields. Therefore, the purpose of my essay is to propose a relationship between these two forms of consumption. I argue that the excessive consumption analyzed in the aforementioned research refers to the same search for satisfaction that is found in the consumption experience concept proposed by Holbrook and Hirschman, and that the difference may be only one of degree. I suggest, therefore, that we understand consumption experience as a search for drive satisfaction, or for enjoyment (*jouissance)*. Thus, this essay begins by discussing what drive satisfaction is: a Freudian concept that was later extended by Lacan (1998), based on enjoyment (*jouissance)*. This theoretical path is necessary for us to understand the role that certain cultural forms play in containing or summoning this search for satisfaction/*jouissance*. We shall see how, throughout the 20th century, consumer culture has been transformed into a privileged *locus* for summoning *jouissance*, especially in the final decades of the 20th century with the emergence of new technologies and the rise of the digital era. It is under these circumstances that the excessive call for a consumption experience that is also excessive begins to flourish. To illustrate the theory, I shall be using some empirical examples, particularly from the research conducted by Kozinets *et al.* (2017) on the passion for consumption in the form of sharing images of food online. That research is based on the Deleuzian theory of desire and on its conception of agency—understood as the network itself, the articulation between bodies, machines, algorithms, statements, affects, and others. Therefore, the essay ends by proposing a necessary interconnection between the psychoanalytic notion of drive and the notion of desire in Deleuze (David-Ménard, 2014; Zizek, 2011). Technological agencies can be understood as a way of summoning the *jouissance* that the culture of contemporary consumption has been promoting. Rather than simply being a more in-depth examination of a specific theoretical field or a contribution to it, this essay aims to contribute by proposing certain possibilities for analyzing the field of critical consumption studies. It proposes an interrelation between the experience of consumption and excessive consumption through the concepts of drive and *jouissance*. At the same time, it also argues that the concept of drive satisfaction/*jouissance* has a great deal to contribute to a critical perspective of contemporary studies on consumption and the new technological agencies being supported by the Deleuzian theory of desire.

Consumption experience as a search for drive satisfaction or a search for *jouissance*

I now return to the part where I mentioned the use of Freud's theory of the pleasure principle in Holbrook and Hirschman's initial studies on consumption experience. As already mentioned, when discussing the Freudian pleasure principle, Freud's proposition of a "beyond the pleasure principle" must be addressed. This

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is because, as a psychoanalyst, Freud believed that the human search for satisfaction would always result in paradoxical satisfaction: satisfaction that is partial and momentary, that might not result in pleasure, and that would always appeal to excess, with this being reflected in the culture of the time. This search for satisfaction is what Freud called drive.

Drive is one of the most important and complex concepts in Freudian metapsychology and refers to something that operates in a zone of indeterminacy, one of indistinction between the body and the psychic apparatus. This is its source is always somatic, and it only becomes accessible through its psychic representative (Freud, 2014a, 2014b; Ianninni, 2014). According to Zizek (2011), this was the Freudian theory that first raised the fundamental question of the "eroticized body, sustained by libido, organized around erogenous zones; precisely the non-animalistic, non-biological body" (p. 137). That is why this body drive becomes the object of psychoanalysis: the body "as a surface for the inscription of traits of trauma and excessive pleasure, the body through which the unconscious speaks" (p. 138). In the final articles that form the compendium of psychoanalysis (Freud, 2014b), the concept of drive gains a central epistemological status from which all other concepts are derived, such as the unconscious, for example. Freud considered drive to be the main object of psychoanalysis because it determines the human way of desiring, having pleasure, and suffering, involving a body that is formed and transformed by culture.

Drive is characterized as a constant force emerging from inside the body, and the subject has no possibility of escaping from the resulting state of tension. Removing internal excitation, relieving the tension, is what drive aims for, so as to become satisfied, but as this force is constant, satisfaction is always temporary, and the relief that is felt as drive satisfaction can also lead to sensations that are considered unpleasant. When faced with this paradox, Freud developed his concept of "beyond the pleasure principle" (1996), to represent something that takes the individual beyond pleasure and that is not linked to forms that are culturally determined as objects of satisfaction. Being beyond pleasure means that the individual can be led "to not seek their own good" (Copjec, 1994, p. 87). It is due to the development of this "beyond the pleasure principle" that Freud's initial names for drives - the ego, or self-preservation drive, and sexual drive (Freud, 2014a) – have been changed and renamed as life and death drives. In this essay, I study the death drive notion in more depth, for two reasons: (1) because Freud indicated the association between this concept and "repetition compulsion," and (2) because of the way the concept was absorbed and explored in greater depth by Lacan (1998), which in turn allows it to be connected to contemporary culture.

Jacques Lacan returned to the problem of the Freudian "beyond the pleasure principle," starting from the *jouissance* category. Assuming that "the use of the drive function has no other value than that of questioning what is satisfaction" (Lacan, 1998, p. 158), the French psychoanalyst defined drive as the search for *jouissance*, a search that always leaves a vestige of dissatisfaction. He insisted on the impossibility of an empirical object that is capable of fully satisfying the drive, which, "on reaching its goal, learns somehow that this is precisely not the way to achieve satisfaction" (Lacan, 1998, p. 159).

Therefore, drive is always bypassing an unreachable object that is configured as a remnant of a *jouissance* to be recovered. *Jouissance* can be understood as the impossible satisfaction that every drive aims for, which is why for Lacan there is only one drive. This is the death drive, since even libido—which Freud considered to be a life drive—is found in this repetitive circuit, in this compulsion to repetition, and in the search for an impossible satisfaction. In line with this perspective, Zizek (2011) argues that the Freudian death drive, in the sense of the "beyond the pleasure principle," means the radical "insistence of an organism on endlessly repeating the state of tension" (p. 46).

It is the symbolic instance that bars access to *jouissance,* and thus allows the emergence of the subject of desire and maintains the imaginary coherence of the ego. In other words, to desire, one must accept a loss of *jouissance*. If drive cannot be fully satisfied, it is because the entire assembly of drives and their destinations are in a permanent relationship with the drive inscription in the culture register, the latter understood as being a depository of law and language. For this very reason, Freud developed his thesis of malaise in civilization, based on a central aphorism: that civilization is the result of the renunciation of the direct satisfaction of our drives (Freud, 2011). Lacan insists on this perspective, indicating the symbolic instance that acts as a barrier to *jouissance* and the operation necessary for the emergence of the subject of desire. *Jouissance* is only accessible when the subject becomes lost. It is no coincidence that in Lacan, "the emergence of drive is constantly surrounded" "by the theme of an enjoyment that flirts with the formless enjoyment beyond the pleasure principle, which means, at bottom, enjoyment beyond the submission to representations" (Safatle, 2007, p. 170). This is why Lacan states that "the course of the drive path is the only form of transgression that is permitted to the subject in relation to the pleasure principle" (Lacan, 1998, p. 174). The satisfaction that drive achieves, and that is always partial, is the only possible way to a form of satisfaction that does not abolish one's being. Therefore, drive can have many destinations and a variety of objects, in the search for something that is invariable: its satisfaction. The barrier to *jouissance* thus

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constitutes the subject of desire, which, supported by the pleasure principle, fantasizes about full satisfaction and repeatedly seeks substitute objects and satisfactions to accomplish that impossible satisfaction/enjoyment. Among such objects are the objects of consumer culture.

Drive theory, therefore, is relevant to studies on the theme of "consumption experience," insofar as the search for drive satisfaction is constitutive of any form of consumption, whether commercial or non-commercial, material or immaterial, and solid or liquid (Bardhi & Eckhardt, 2017). For this reason, I consider that the search for drive satisfaction has been the raw material in consumer culture ever since consumer research and marketing became established as a field of knowledge aimed at understanding "what consumers want." After all, consumer studies have always tried to understand and provide what consumers seek, namely sensory, esthetic, and psychic satisfaction. We have already seen that it was with this objective in mind that the concept of "consumption experience" emerged, including only experiences that were considered "pleasurable" in the extraordinary and positive realm of consumption. What would happen to a culture, however, and to its members, if, instead of barring experiences, this culture were to stimulate experiences of excessive consumption?

Management of enjoyment by consumption: The cultural way in which the operator provides drive satisfaction

Drive theory has rarely been used directly in the field of consumer studies. An exception is Loose (2015), who analyzes the use of art by commercial advertising based on the relationship between drive, consumption, and excess. The author questions how the relationship between science and the market has been sought as a way to guarantee satisfaction beyond the pleasure principle. According to Loose, this involves a logic that operates through addiction, which has become a contemporary response to the search for drive satisfaction through consumption.

In Freud's drive theory, culture has always been the shield against excess, but it is important not to confuse culture as a symbolic instance—in which prohibiting enjoyment is structural—with the cultural forms that develop under this instance (Lacan, 1998). Our cultural form encourages excessive production and consumption, and promotes satisfaction so that it is constantly consumed. We live in a society of "commanded enjoyment"—an excellent expression used by McGowan (2004, p. 7)—whose functioning logic is organized on the basis of summons to enjoyment in the form of merchandise. This cultural form is a direct result of a stimulus for consumption that intensified in the second half of the 20th century and gained new impetus with the innovations promoted by technology.

This push toward excess through multiple calls to enjoyment has already been a subject of analysis in the field of consumption in the following ways: (1) in the form of material consumption, or cases of violence in extreme purchasing experiences (Smith & Ramen, 2017); (2) in specific forms of experiential consumption through a strange search for feeling pain (Scott *et al.*, 2017); (3) in the addiction that arises from new modalities of technological consumption, such as in the relationship between electronic games and deviant leisure (Raymen & Smith, 2017); or, (4) in the phenomenon of sharing images of food on social networks (Kozinets *et al.*, 2017). Although such approaches do not use Freud's drive theory, some of them are based on theoretical fields that derive directly from this perspective (Raymen & Smith, 2017; Smith & Raymen, 2017), or are related to it (Kozinets *et al.*, 2017). In the former case, the authors, aided by the Lacanian approach to enjoyment and based on the interpretation of Slavoj Zizek (2002), analyzed the relationship between capitalism, consumption. and excess. Kozinets *et al.* (2017), on the other hand, drew on Deleuze and Guattari's (1983, 1987) desire theory to discuss how technology has increased people's desire for consumption and pushed it to extremes.

These studies illustrate well how contemporary consumer culture calls people to enjoyment. Kozinets *et al.* (2017) reveal these calls occur in the form of new technological agencies, through which the experience of material consumption has been increasingly driven by the virtual world, while simultaneously feeding it. There is an overlap between these forms of consumption through the flow of data and passions that circulate between the virtual world and the real world, driven by the interests of a technological capitalism that, in turn, relies on the "high levels of passionate consumer engagement" (Kozinets *et al.*, 2017, p. 678). The authors delineated what they call the desire production circuit—food consumption, or images of it—in which consumers, software, algorithms, and corporations are engaged in a complex and dynamic feedback system that results in the constant circulation of consumerist passions. The example they provide is consumers sharing their desire for a particular type of food through an image and other consumers reacting to this. Software and algorithms come into play and promote other connections involving food-related companies, from agribusiness firms to supermarkets, and specialty stores to restaurant menus. New images and products are offered, awakening new consumer desires in an immensely wide circuit. This is a process in which

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social networks have played a fundamental role in organizing and appealing to people's passions/drives.

In the specific case of the search for satisfaction through the production and consumption of food images, the authors identified a push toward excess, which they called "food porn," in the sense of pornography as something that is excessive. This excess can occur both in its physical and its imagery sense. There is, however, a biological limit to how much one can eat, and if this is exceeded, the body suffers. The virtual, on the other hand, promotes unlimited consumption, freeing the body from its physical constraints. It conveys images of food—either ordinary or extreme—and channels a flow of desires that extend beyond food or images of food; one craves the spectacle itself—the fantastic event that one must share. This circuit goes from the real to the virtual and vice versa—because there is no longer a way of separating an online version of life from its offline version, as the authors rightly indicate–. In this circuit, the consumer is invited to enjoy so as to set in motion a machine that "passionately devours food, not only with the mouth, but also with the eyes, thumbs, and ears. The machines consumes food and images linked to other desiring-machines such as cameras, smartphones, Instagram photos, friends, bloggers, websites and corporations" (Kozinets *et al.*, 2017, p. 672). In the end, it is what is excessive in terms of its call (Prado, 2013) in the context of techno-capitalism that has been transforming the nature of consumption, consumer research, and marketing, as well as the human search for satisfaction through consumption.

Kozinets *et al.* (2017) provide a good illustration of consumption experience as the search for drive satisfaction that I have proposed in this essay. The authors do not use the "consumption experience" category but there are numerous passages in the text that consider the relationships among experience, consumption, and the search for excessive satisfaction. Some of these passages reveal that the authors are aware of the use this concept has acquired in marketing, in the sense of to what extent "an experience design mentality underlies the intimate intertwining of information and consumer technology, capitalism and consumer behavior" (p. 663). Other references highlight a more psychoanalytic use of the concept of experience and its relationship to drive, as when they argue that "the virtuality of technology raises open-ended possibilities for new experiences of body and passion, and its hunger for attention-grabbing images elicit transgressive extremes in order to build a liberated flow of energy" (p. 675). This conception of experience is supported by the desire theory of Deleuze and Guattari's (1983, 1987), who understand desire as energy and flow. Freudian psychoanalysis, however, also introduces a conception of energy through the drive concept. Drive in Freud is a constant flow of energy in search of satisfaction. It is intensive and always excessive. Desire is formed precisely due to the barrier to this search for total satisfaction. Therefore, although a greater elaboration was necessary to establish the theoretical affinities between the conceptions of desire as energy in Deleuze and Guattari, of drive in Freud, and of *jouissance*/enjoyment in Lacan, we can state that there is a profound interrelation between their meanings, as Zizek (2011) and David-Ménard (2014) argued. Thus, when Kozinets *et al.* (2017) state that the current technology network is the complete realization of the idea of desire as an incessant movement of energy, one can link this idea with that of the movement of drive. This is a machine for producing enjoyment, an "impassioned and commercially-directed collective connection," that, according to the authors, represents the current state of consumer culture (p. 679).

If we assume the psychoanalytic perspective as expressed in this essay, however, the promise of enjoyment does not mean surrendering to it; even in a culture that calls on its subjects to enjoy, full enjoyment is structurally forbidden. However, what happens to the subject's experience when nothing changes from the point of view of the barrier to enjoyment/*jouissance*, but from the point of view of what is on offer, everything changes? On the subjective level, if we return to the definition of drive as a search for full but impossible satisfaction, a cultural form structured around the promise of enjoyment does not allow the subject any more relief, even if it is temporary. The reason is that the more drive satisfaction is promised, the "more frustrated and, therefore, reinitiated it becomes, as happens with all addition mechanisms" (Dufour, 2013, p. 386), being characterized by a compulsion for repetition. This is precisely what feeds the "network of desire," in the sense attributed to it by Kozinets *et al.* (2017).

Final considerations on the short circuit of drive in consumption experience

Throughout this essay, I have argued in favor of theorizing consumption experience as being a search for drive satisfaction or enjoyment. Based on this, I have proposed to expand the concept of "consumption experience" to include analyses of the forms of excessive consumption present in consumer studies literature, especially those studies that have examined virtual consumption. Such analyses have shown how much these forms of consumption have invested in extreme satisfaction experiences.

The drive for satisfaction was presented as transgressive in repressive cultural forms, which explains the belief of Deleuze and Guattari (1983, 1987) in human emancipation through the release

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of desire as flow of energy. In a culture of enjoyment, however, this drive is short-circuited in the service of a technological capitalism of consumption that places transgression on another level and promises to deterritorialize the body's desire by appealing to the unlimited, offering consumers the possibility of losing themselves in a flow of images and fantasies. The latter are used "for exhibiting one's life to the network and witnessing their reactions, for consuming the displays of others' private worlds exhibited in real-time, for being the first person in your networks to post something new, just as it is about to go viral" (Kozinets *et al.*, 2017, p. 679).

This push to enjoyment has resulted in greater consumption, which is increasingly expanding its sphere similar to how it has led to processes of infinite repetition. This phenomenon poses unprecedented epistemological, theoretical, and ethical challenges for the field of consumer studies. Herein, in an attempt to help in identifying these challenges, I proposed that we understand consumption experience as a search for drive satisfaction or for enjoyment. I argued that the concept of consumption experience appeared in a historical context that allowed it to serve as the foundation of experiential marketing, aimed at producing increasingly intense forms of satisfaction that have continued to accelerate with new information technologies. Using drive theory, I went beyond the phenomenological understanding of consumption experience, indicating to what extent satisfaction may not result in something pleasurable or fun, especially when one is constantly driven to a search for extreme satisfaction. From an ethical perspective, I questioned the benefits of this search for satisfaction urged by a culture that appeals to the excessive; thus, I arrived at contemporary analyses of online consumption in social networks/media, which have been praised for their passionate engagement of consumers, without discussing the consequences of this more critically. Kozinets *et al.* (2017) warn that researchers in the consumer field must be cautious and not hesitate to examine the ontological and axiological abyss that these new technological agencies have been creating. To do so, the concept of consumption experience is fundamental, provided it is removed from its definition as pleasures that are thought to be positive.

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AUTHORS' CONTRIBUTIONS

The author declare that they participated in all stages of development of the manuscript. From the conceptualization and theoretical-methodological approach, the theoretical review (literature survey), data collection, as well as data analysis, and finally, writing and final review the article.

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BOOK REVIEW

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WHAT DO WE NEED TO KNOW ABOUT THE ANTHROPOCENE?

O ANTROPOCENO E A CIÊNCIA DO SISTEMA TERRA

José Eli da Veiga. São Paulo, SP: Editora 34, 2019. 152 p.



After years of there being very few reactions to the implications of organizations on issues such as global warming, changes in atmospheric composition, and the acidification of the oceans, it seems that in 2019 the field of Organizational Studies (OS) finally began to reflect on the Anthropocene to a meaningful degree [1]. The delay in joining the chorus of scientists who have been studying the impacts of human actions on planet Earth and denouncing its effects makes it seem that we have reached this moment perhaps more because of the availability of information than because of political commitment. After all, as environmental disasters that are increasingly being associated with human actions have become more frequently perceived and reported upon, it seems that we are becoming more attentive and more likely to adhere to the subject in our research agendas (perhaps without the awareness that we can be influenced by the readiness with which catastrophic events now come to mind and inform public opinion). Still, the sudden interest in the topic represents a flash of consciousness, and we cannot miss the moment[2]. As DeCock, Nyberg, and Wright (2019) point out, the time has come to develop OS as a discipline that fits the Anthropocene. If we want OS to be part of the solution of the environmental crisis, rather than being one of its sources, we must not only engage quickly with scientific debates about the Anthropocene, but must also act promptly.

By

MARINA DANTAS DE FIGUEIREDO [1]
marina.dantas@gmail.com
0000-0003-3273-8176

FÁBIO FREITAS SCHILLING MARQUESAN [1]
marquesan@unifor.br
0000-0002-2456-4914

[1] Universidade de Fortaleza, Programa de Pós-Graduação em Administração, Fortaleza, CE, Brazil

[1] In the EGOS conference in Edinburgh, the Anthropocene was addressed explicitly in the title of a sub-theme (Critical Anthropocene studies), and was the central focus of the discussion of at least one other (Discursive and material struggles over the natural environment). It was also the central theme of a crowded subplenary (Grand challenges: Organizations and the Anthropocene). Before that, in 2018, the journal *Organization* published a special issue dedicated to the theme "Organizing in the Anthropocene." The OS of Latin America and Brazil can boast of having arrived at the topic in a pioneering way (although not quicker than to other scientific fields). Spaces for discussion about the Anthropocene emerged in the 2018 and 2019 editions of CBEO (in the sub-themes "Organizational Studies in the Anthropocene" and "Organization-nature relations in the Anthropocene: epistemic crisis of anthropocentrism and the emergence of new biosocialities," respectively). The same occurred at the international conference of Red Pilares in Chile, in 2018 (in the round table "Cambio climatico y otros riesgos del Antropoceno para América Latina"). Also, before the Europeans, the journal Desacatos: Revista de Ciencias Sociales, organized by the Centro de Investigaciones y Estudios Superiores en Social Antropología (Ciesas) of Mexico, launched in 2017 the number 54 – "Cambio Climático y Antropoceno" - available at this link: http://desacatos.ciesas.edu.mx/index.php/Desacatos/issue/view/102/showToc.

[2] We emphasize that the critical reflection on the relationship between organizations and the environment has been on the agenda of OS since the 1990s, as attested to by the chapter by Egri and Pinfield (1996) in the Handbook on Organizational Studies. In 2006, after the proposition of the term Anthropocene, the chapter written by Jermier, Forbes, Benn and Orsato (2006) updated the discussion, but did not address the issue. We do not ignore the contributions that critical studies to the perspective of sustainability and sustainable development have made to problematizing the impact of human action (enhanced by organizations) on planet Earth. However, we want to specifically highlight the lack of engagement with the Anthropocene. This word expands the vocabulary of the area, introducing a new concept that can help to explain reality in a more attuned way with contemporary problems, and the way they are being placed in other scientific domains.

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Veiga's book is a shortcut for Brazilian researchers, which allows them to grasp the history and vocabulary surrounding the issue. The text comprises the Prologue (The new Epoch), three sections that are reasonably independent of each other (Overflight, Zoom, and Findings), and Epilogue (The Promise). In going through this text, the reader not only becomes aware of the facts surrounding the proposition of the new Epoch (in capital letters, as Veiga points out to be the correct spelling), but also remembers (and learns) distant concepts for OS scientists, who may possibly be unaware of the methods of Geology (such as stratigraphy, which is very important to understand the disputes regarding the proposal of a milestone for the beginning of the new Anthropocene Epoch). By avoiding costly forays into other sciences, Brazilian OS scholars can find out about the current debate on the Anthropocene from important scientific entities (such as IGBP, IPCC, and IPBES , among many other acronyms cited in the book), and they can also get to know the behind-the-scenes operations and idiosyncrasies of Earth System Sciences. The book brings knowledge about the Anthropocene to a glocal context, mentioning the contribution of some Brazilian scientists dedicated to the issue (although we would have liked to see more references to other Brazilian authors throughout the book).

Although Veiga does not propose a dialogue with the study of organizations, he hints at this possibility by showing the connections between Earth System Sciences and Social Sciences. The shortcut that this book provides could also be indicative of new paths, if we take the epistemological issue raised by Veiga between the lapsing of systemic perspectives in the face of complexity, or the ontological ones, such as anthropocentric thinking and its overcoming, and even the cosmological ones, such as the contradictory narratives of Gaia and Medeia in explaining the collapsing Earth. However, it is necessary to escape some of the pitfalls left by the author. These are only sketched thoughts or digressions, and they do little to make the book seem more than an introductory guide, to be cited more for its peremptory (and localized originality, after all, it is one of the only Brazilian books of its type) than for stimulating the development of the Anthropocene science in Brazil in different fields of knowledge.

Scrutinizing the text in its parts, in the chapter Overflight we see, from the first paragraph, the spectral reference to the civilizing process, by Norbert Elias. It is known that theories about the beginning of the Anthropocene refer to a certain idea of civilization. However, the meaning used by Veiga is vague and contradictory. For example, the author highlights two current and trendy references, which elaborated on different ideas about "civilization." First, Kate Raworth (2017), whose proposals are enthusiastically described (even with the reproduction of the donut graphic representing the planetary limits and the limits of human action). Then, Yuval Harari (2015, 2016, 2018) is accused of being one of those who "distort the initial idea" (Veiga, p. 31) of the term Anthropocene, in a criticism that may sound unfair to those who have already gone through these works without finding the same figure to the Anthropocene perceived by Veiga. At the end of the chapter, one does not know why Raworth is exalted, or why Harari is condemned, for referring, each in their way and according to different purposes, to the impacts of human civilizations on planet Earth. Throughout the book, Veiga diminishes the importance of discussions about the definition of the Anthropocene from a stratigraphic framework (although he makes his reader know and understand the issue), by making explicit (without explaining) his adherence to the Great Acceleration Thesis. His sympathy for Raworth seems to corroborate the idea that the "civilizing processes" of developed countries is the main cause of the state of affairs of the Anthropocene, but this is not clear. Even more delicate is the vague mention, without a theoretical anchor, to "the psychic propensity of humans over nature," or "human nature," combined with the "civilizing process."

Another trap is an incursion into complexity departing from Edgar Morin. The epistemological debate on Earth-System Sciences, which starts in the Zoom chapter, gives us an idea of the difficulties of integrating science(s) into understanding the Anthropocene and its challenges. Veiga explains that some researchers in this field are more inclined to approach humanities than others. In the next chapter (called Findings), however, he reduces the melting-pot of complexity to Morin's proposals. He makes sure to describe the concepts and criticize some particular elements of this author's work. The reduction of complexity to Morin is limited, not to say outdated, if we think about the complexity of the Anthropocene (dynamic problems of planetary magnitude that reveal the integration of the Earth in an amazing way). Although Veiga elaborates on the distinction between Gaia and Medeia in earlier parts of the text, he does not return to this cosmological perspective to enrich the debate, or to expand the text's view on complexity. Likewise, although the author cites important references for understanding the contribution of Social Sciences to the definition of the Anthropocene, he does not address these sources, choosing instead to elaborate on the debate on the complexity by focusing only on Moriny.

OS researchers will also have to deal with the fact that Veiga has restricted the definition of the new Anthropocene Epoch to the scope of Earth History in the concluding paragraphs of the book. After embracing the promise of integrating the

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humanities into the Earth-System Sciences (through the "indispensable emphasis on human nature and the civilizing process," so that the new science can finally take off, as stated on p. 122), Veiga is categorical in stating that the conception of the Anthropocene "in no way depends on the current transdisciplinary uncertainties about complex knowledge." He then further states that the science of the Anthropocene "does depend on the fruitful joint work of researchers from two well-established scientific disciplines: History and Geology" (p. 123). In restricting the debate, Veiga seems to circumscribe the Anthropocene issue to an elaboration on the time of Earth or human life, taking into account the preciosity of describing the new Epoch to the detriment of exploring the consequences of the concept in the here and now, in the political field. To this end, the work of OS researchers is timely and valuable. At the present moment, environmental degradation is being added to other complex issues, such as problems regarding refugees and migrants, decisions about the future of the planet given the possibilities of geoengineering ecosystems, the transition to other forms of production that are less dependent on fossil fuels, and theoretical and practical changes towards economic and organizational models that are able to deal with environmental crises. These, among other challenges, demand ethical attitudes on the parts of researchers and managers; a new idea of management, aligned with the new geological Epoch whose effects are already being felt; and new management concerned with the environmental issue.

Finally, the concept of Anthropocene, with its trajectory of debates and controversies in the Earth-System Sciences, should not be taken as an abstraction for the field of OS, but should serve as scientific resource for academics in this field to deepen their reflection about how organizations are transforming nature and shaping the ways that society responds to environmental crises. One of the actions to be taken concerns critiquing the past and reimagining the future, to devise alternative paths to ecological collapse (Ergene, Calás, & Smircich, 2018; Nyberg & Wright, 2019). The engagement of OS with Anthropocene issues can also permeate actions that can be taken so that organizations become part of the solution to the environmental crisis. For now, they have been proposed as movements around the following questions: how do we see our relationship with nature; how our language conforms to the environmental problem and how it can become disruptive; how can we promote more democracy in environmental policy; how can we apprehend the value of nature beyond market relations; how can we develop an environmentalist identity beyond consumption; and how can we promote positive emotional dispositions to action, in favor of the necessary changes, to overcome the environmental crisis (Wright & Nyberg, 2015)?

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AUTHOR'S CONTRIBUTION

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