

ARTICLES

Dismissal: Important criteria in managerial decision-making

Fabrizio Stocker | Eduardo Guedes Villar | Karina De Déa Roglio | Gustavo Abib

Pessimism and uncertainty of the news and investor's behavior in Brazil

Fernando Caio Galdi | Arthur Martins Gonçalves

Barriers to green supply chain management in the automotive industry

Flávia Cristina da Silva | Fabio Ytoshi Shibao | José Carlos Barbieri | Andre Felipe Henriques Librantz | Mario Roberto dos Santos

Idort and Management diffusion in 1930s Brazil

Fábio Vizeu

Dimensionality and effects of information motivation on users' online social network advertising acceptance

Imran Anwar Mir

Social coupling and decoupling: Pastors as entrepreneurs

Victor Silva Corrêa | Gláucia Maria Vasconcellos Vale | Marcelo de Rezende Pinto

PERSPECTIVES

Copycat: Similarities and academic production in the digital age

Eduardo H. Diniz

***Déjà-vu* in academia: I have seen this before!**

Fábio Frezatti

BOOK REVIEWS

Social projects: Evaluation methodologies and instruments

Otávio Augusto de Oliveira Cruz Filho | Victor Rezende Teles | Wladimir Furuhashi Viana

What is the role of consumption in the contemporary capitalist society?

Vinicius Andrade Brei

BOOK RECOMMENDATION

Governance & charity: The benefits of corporate governance and charity association

Grazielle Rigotti da Silva

CONTENTS

EDITORIAL

- 114 **WOMEN IN SCIENCE**
Mulheres na ciência
Mujeres en la ciencia
Maria José Tonelli | Felipe Zambaldi

ARTICLES

- 116 **DISMISSAL: IMPORTANT CRITERIA IN MANAGERIAL DECISION-MAKING**
Demissão: Critérios importantes na tomada de decisão dos gestores
Dimisión: Criterios importantes en la toma de decisiones de los gestores
Fabrício Stocker | Eduardo Guedes Villar | Karina De Déa Roglio | Gustavo Abib
- 130 **PESSIMISM AND UNCERTAINTY OF THE NEWS AND INVESTOR'S BEHAVIOR IN BRAZIL**
Pessimismo e incerteza das notícias e o comportamento dos investidores no Brasil
Pesimismo e incertidumbre de las noticias y comportamiento de los inversores en Brasil
Fernando Caio Galdi | Arthur Martins Gonçalves
- 149 **BARRIERS TO GREEN SUPPLY CHAIN MANAGEMENT IN THE AUTOMOTIVE INDUSTRY**
Barreiras à gestão da cadeia de suprimentos verde na indústria automotiva
Barreras a la gestión de la cadena de suministro verde en la industria automotriz
Flávia Cristina da Silva | Fabio Ytoshi Shibao | José Carlos Barbieri | Andre Felipe Henriques Librantz | Mario Roberto dos Santos
- 163 **IDORT AND MANAGEMENT DIFFUSION IN 1930S BRAZIL**
Idort e difusão do management no Brasil na década de 1930
Idort y propagación del Management en Brasil en la década de 1930
Fábio Vizeu
- 174 **DIMENSIONALITY AND EFFECTS OF INFORMATION MOTIVATION ON USERS' ONLINE SOCIAL NETWORK ADVERTISING ACCEPTANCE**
Dimensão e efeitos da motivação da informação sobre a aceitação dos usuários de publicidade nas redes sociais
Dimensionalidad y efectos de la motivación de la información en la aceptación de la publicidad de las redes sociales online de los usuarios
Imran Anwar Mir
- 188 **SOCIAL COUPLING AND DECOUPLING: PASTORS AS ENTREPRENEURS**
Acoplamento e desacoplamento sociais: Pastores como empreendedores
Acoplamiento y desacoplamiento social: Pastores como empresarios
Victor Silva Corrêa | Gláucia Maria Vasconcellos Vale | Marcelo de Rezende Pinto

PERSPECTIVES

- 201 **COPYCAT: SIMILARITIES AND ACADEMIC PRODUCTION IN THE DIGITAL AGE**
O gato que copia: Similaridades e produção acadêmica na era digital
El gato que copia: Similaridades y producción académica en la era digital
Eduardo H. Diniz
- 206 **DÉJÀ-VU IN ACADEMIA: I HAVE SEEN THIS BEFORE!**
Déjà-vu na academia: Eu já vi tantas vezes esse filme!
¡Déjà vu en la academia: He visto tantas veces esa película!
Fábio Frezatti

BOOK REVIEWS

- 210 **SOCIAL PROJECTS: EVALUATION METHODOLOGIES AND INSTRUMENTS**
Projetos sociais: Metodologias e instrumentos de avaliação
Proyectos sociales: Metodologías e instrumentos de evaluación
Otávio Augusto de Oliveira Cruz Filho | Victor Rezende Teles | Wladimir Furuhashi Viana
- 212 **WHAT IS THE ROLE OF CONSUMPTION IN THE CONTEMPORARY CAPITALIST SOCIETY?**
Qual o papel do consumo na sociedade contemporânea capitalista?
¿Qué el papel del consumo en la sociedad contemporânea capitalista?
Vinicius Andrade Brei

BOOK RECOMMENDATIONS

- 214 **GOVERNANCE & CHARITY: THE BENEFITS OF CORPORATE GOVERNANCE AND CHARITY ASSOCIATION**
Governance & charity: Os benefícios da associação governança corporativa e caridade
Gobernance & charity: Los beneficios de la asociación gobernanza corporativa y caridad
Grazielle Rigotti da Silva

EDITORIAL

DOI: <http://dx.doi.org/10.1590/S0034-759020180201>

MARIA JOSÉ TONELLI
Editora-chefe



FELIPE ZAMBALDI
Editor-adjunto

WOMEN IN SCIENCE

In March 2018, more than a century after the first manifestations of gender equality, we observe that the participation of women in science is still limited. Moschkovich and Almeida (2015) analyzed the teaching career data at Universidade Estadual de Campinas (UNICAMP) and revealed that although competitive admission claims to allow for an egalitarian selection of teachers, women are less likely to occupy higher positions within the university; moreover, while men are found across different areas, women are concentrated in specific areas of the institution and take more time to reach the top.

Valentova, Otta, Silva, and McElligott (2017), in a study with Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) scholars, showed that the proportion of senior female scientists in Brazil is still below the average found in other countries. The authors analyzed 13,625 productivity fellows and 3,836 researchers who received funds from the CNPq *Edital Universal* (Universal Call for Proposals) and concluded that women are less likely to reach the top of the career, and if they do, they take longer time than men. The lower index was found in the field of Life Sciences and Biomedicine, with slightly better indicators for Humanities and Social Sciences. The reasons for this under-representation can be attributed to our cultural and institutional roots. These data on the Brazilian reality are also observed in other countries, even though in this case, meritocracy seems to standardize the development of academic careers among men and women (see, for example, Cech & Blair-Loy, 2010; Morley & Walch, 2002; Settler et al., 2006). Albeit women are concentrated in Humanities and Social Sciences, this inequality is also evident in Business Administration (Vincenza, 2007).

Although there are several Qualis A2 Business Administration journals, for an initial conversation, we organized preliminary data from some journals and observed a significant difference in the publication of articles between men and women. Thus, we can affirm that women are still a minority in the authorship of scientific articles in the area, as evident from Table 1:

Table 1. **Distribution of authorship in Business Administration journals - 2017**

	<i>RAE</i>	<i>RAP</i>	<i>RAC</i>	<i>RAUSP</i>	<i>RBGN</i>
Men *	80	89	70	71	52
Women *	39	45	48	44	35

Note: Data collected by Andréa Cerqueira and Ana Paula C. Soares, members of the RAE team, from the online editions published by these journals. It should be noted that the number of editions and articles published in the period analyzed is different for each journal.

*Gender diversity was not considered in this collection, maintaining the traditional binary classification between men and women.

RAP-Revista de Administração Pública (Brazilian Journal of Public Administration) had the highest number of authors (134) in 2017, of which 89 (66%) were males and 45 (34%) were females. *RAE-Revista de Administração de Empresas* (Journal of Business Management) had a total of 119 authors, of which 80 (67%) were male and 39 (33%) were female. *RAC-Revista de Administração Contemporânea* had a total of 118 authors, of which 70 (59%) were males and 48 (41%) were females, the smallest gap between genders in 2017. *RAUSP-Management Journal* had 115 authors, of which 71 (62%) were males and 44 (38%) were females. *RBGN-Review of Business Management* had fewer editions throughout the

year compared to the other journals: four editions and a total of 87 authors, 52 (60%) males and 35 (40%) females.

Although the perspective presented here only considers data of 2017 and a restricted group of publications in the Business Administration field, the results point to a predominance of male authors and agree with the trends presented by Valentova et al. (2017). Therefore, it is necessary to obtain in-depth the knowledge on the participation of women in the Brazilian academic context of Business Administration.

In conclusion, many people question why so much emphasis is being placed on the discussion of women's presence in science or business. Therefore, it is important to reiterate that women's rights and their participation in all areas of knowledge are a matter of human rights and democracy.

Within the pluralistic approach of *RAE*, this edition presents articles from different areas of knowledge (Marketing, Finance, People Management, Organizational Studies, Entrepreneurship, Operations, and Logistics), as well as the Perspective section, in which Eduardo H. Diniz and Fábio Frezatti discuss the theme plagiarism in the Business Administration academic context. This issue is complemented by the review of the books *Avaliação econômica de projetos sociais*, by Naercio Menezes Filho, and *Cultura do consumo: Fundamentos e formas contemporâneas* by Isleide Arruda Fontenelle, and the book recommendation *Governance & charity: The benefits of corporate governance and charity association* by Grazielle Rigotti da Silva.

Maria José Tonelli | ORCID: 0000-0002-6585-1493

Felipe Zambaldi | ORCID: 0000-0002-5378-6444

Fundação Getúlio Vargas, Escola de Administração de Empresas de São Paulo – São Paulo – SP, Brasil

REFERENCES

- Cech, E. A., & Blair-Loy, M. (2010). Perceiving glass ceilings? Meritocratic versus structural explanations of gender inequality among women in science and technology. *Social Problems*, 57(3), 371-397. doi:10.1525/sp.2010.57.3.371
- Morley, L., & Walch, V. (Eds.) (2002). *Feminist academics: creative agents for change*, London, UK: Taylor and Francis.
- Moschkovich, M., & Almeida, A. M. F. (2015). Desigualdades de gênero na carreira acadêmica no Brasil. *Dados*, 58(3), 749-789. doi:10.1590/00115258201558
- Settler, I. H., Cortina, L. M., Malley, J., Stewart, A. J. (2006). The climate for women in academic science: The good, the bad, and the changeable. *Psychology of Women Quarterly*, 30(1), 47-58. doi:10.1111/j.1471-6402.2006.00261.x
- Valentova, J. V., Otta, E., Silva, M. L., & McElligott, A. G. (2017). Underrepresentation of women in the senior levels of Brazilian science. *PeerJ*, (5), e4000. doi:10.7717/peerj.4000
- Vincenza, P. (2007). Being female doing gender: Narratives of women in education management. *Gender and Education*, 19(1), 21-40. doi:10.1080/09540250601087728

ARTICLES

Submitted 01.20.2017. Approved 09.22.2017

Evaluated through a double-blind review process. Guest Scientific Editor: Reinaldo Fagundes dos Santos

Original version

DOI: <http://dx.doi.org/10.1590/S0034-759020180202>

DISMISSAL: IMPORTANT CRITERIA IN MANAGERIAL DECISION-MAKING

Demissão: Critérios importantes na tomada de decisão dos gestores

Dimisión: Criterios importantes en la toma de decisiones de los gestores

ABSTRACT

Knowledge about dismissal decision-making, particularly concerning the criteria used by managers in choosing who will be dismissed and why, is scarce. Considering the implications of such decisions for organizations and society, in this paper, we identify the seven most frequently used criteria in dismissal decisions and examine their importance for managers. We collected data through a survey among 385 managers and used the rational ranking and the multicriteria Analytic Hierarchy Process (AHP) to analyze them. The results show that commitment, performance records, and trust have the greatest impact on the dismissal decision, whereas interpersonal relationship, growth potential, and professional experience are considered secondary criteria. These results contribute to extending our knowledge about dismissal decisions and showing the most relevant criteria in these choices and the relevance assigned to each of the criteria so that greater transparency can be achieved.

KEYWORDS | Decision-making, dismissal, dismissal criteria, human resources, analytic hierarchy process.

RESUMO

O conhecimento sobre a tomada de decisões de demissão é escasso, em particular sobre os critérios que os gestores utilizam para a escolha de quem será demitido e por quê. Considerando as implicações desse tipo de decisão para as organizações e a sociedade, neste artigo, identificamos os sete critérios mais utilizados nas decisões de demissão e sua importância para os gestores. Os dados foram coletados por meio de um survey com 385 gestores e analisados com base no ranking racional e no método multicritérios Análise Hierárquica do Processo (Analytic Hierarchy Process [AHP]). Os resultados mostraram que o compromisso, o histórico de desempenho e a confiança têm maior impacto na decisão de demissão, enquanto a relação interpessoal, o potencial de crescimento e a experiência profissional são considerados critérios secundários. Esses resultados contribuem para ampliar o conhecimento sobre decisões de demissão e para dar mais transparência a essas decisões, mostrando os critérios que mais influenciam essa escolha, bem como a relevância atribuída a cada um deles.

PALAVRAS-CHAVE | Processo decisório, demissão, critérios de demissão, recursos humanos, análise hierárquica do processo.

RESUMEN

El conocimiento sobre la toma de decisiones de despido es escaso, en particular en lo que se refiere a los criterios utilizados por los gestores para elegir a quién despedir y por qué. Considerando las implicaciones de este tipo de decisión para las organizaciones y para la sociedad, en este artículo identificamos los siete criterios más utilizados en las decisiones de despido y su importancia para los gestores que toman estas decisiones. Recopilamos datos en una encuesta a 385 gestores y usamos el ranking racional y el método multicriterio Proceso Analítico Jerárquico (Analytic Hierarchy Process [AHP]) para analizarlos. Los resultados mostraron que el compromiso, los registros de desempeño y la confianza tienen mayor impacto en la decisión de despido, mientras que la relación interpersonal, el potencial de crecimiento y la experiencia profesional se consideran criterios secundarios. Estos resultados contribuyen a ampliar el conocimiento sobre las decisiones de despido y a dar mayor transparencia a dichas decisiones, al mostrar los criterios que más influyen la elección, así como la relevancia asignada a cada uno de dichos criterios.

PALABRAS CLAVE | Toma de decisiones, despido, criterios de despido, recursos humanos, proceso analítico jerárquico.

FABRICIO STOCKER¹

fabriciostocker@hotmail.com

ORCID: 0000-0001-6340-9127

EDUARDO GUEDES VILLAR²

eduardogvillar@gmail.com

ORCID: 0000-0001-5005-4099

KARINA DE DÉA ROGLIO²

karinaroglio@gmail.com

ORCID: 0000-0002-5256-8330

GUSTAVO ABIB²

gustavo.abib@gmail.com

ORCID: 0000-0002-8768-9669

¹Universidade de São Paulo, Faculdade de Economia, Administração e Contabilidade, São Paulo, SP, Brazil

²Universidade Federal do Paraná, Programa de Pós-Graduação em Administração, Curitiba, PR, Brazil

INTRODUCTION

Managers and human resource professionals are regularly involved in employee appointment, appraisal, training, compensation, promotion, and dismissal as part of their normal functions (Armstrong & Taylor, 2014).

Most literature on human resource management focuses on the criteria, techniques, and methods about the processes of recruitment and selection, development programming, promotion, payment, and performance appraisal (Ulrich, Younger, & Brockbank, 2008). However, the literature on contract termination issues, succession, and dismissal is scarce, and knowledge concerning the reasons why managers make dismissal decisions is limited. Thus, a gap exists in the research about issues of how individuals are replaced and what leads to their being dismissed (Hilger, Mankel, & Richter, 2013), in addition to the circumstances prior to dismissals (McDonald, Waterhouse, & Kellner, 2008).

In a decision-making process, managers must evaluate the alternatives available and choose one option over others based on specific criteria (Mintzberg, Raisinghani, & Theoret, 1976; Nutt, 2011; Simon, 1997). This study identifies the hierarchy of criteria in dismissal decision-making from a managerial perspective. Based on the criteria presented in the literature, we identify those deemed the most relevant by managers during dismissal decision-making.

This study contributes to encourage research in the field of dismissal, and is justified by the necessity to understand the managers' cognitive processes during this kind of decision-making so that the dismissal process can be more transparent.

The rest of the paper is organized as follows. The second section covers the literature on dismissal and criteria used in the process. The third section explains the research method and the results. The last section summarizes the conclusions and limitations, as well as identifies future research agenda.

DISMISSAL

Constant changes in markets, globalization, introduction of advanced technologies, increased competitiveness, mergers and acquisitions, and new working systems have made the management of surplus employees an important activity of the human resource management department (Bratton & Gold, 2012).

The process of dismissal, compared to other decision processes, involves substantial efforts, and despite being a mandatory role assigned to managers, is a distressing activity. However, as organizations are forced to reduce the size of their labor force or restructure their staff teams, dismissal has become

a frequent activity in strategic human resource management, and although the dismissal decision-making process is specific to each organization, it is inherent to all types of companies.

Dismissal consists of discharging an employee from the organization, that is, terminating the individual from work and from the performance of duties. Ending the labor contract extends beyond the individual interests of the parties involved and reflects the social dimension, especially in organizational restructuring due to downsizing (Tylcsak, 1991).

Williams and Livingstone (1994) state that it is necessary to analyze the reasons and the criteria for dismissal considering the relevant costs as dismissing an employee also involves expenses, particularly to promote new recruitment, selection, and training.

Dismissal decision-making research includes studies on the practices and strategies in restructuring processes and downsizing (Caldas, 2000; Campion, Guerrero, & Posthuma, 2011; Freitas, 2006; Giniger, Dispenzieri, & Eisenberg, 1983; Harcourt, Hannay, & Lam, 2013; Iverson & Zatzick, 2011; Juhdi, Pa'wan, Hansaram, Kaur, & Othman, 2011; McDonald et al., 2008; Østhus & Mastekaasa, 2010; Shah, 2000; Tonelli, 2000; Tsai & Yen, 2008; Tylcsak, 1991; Tzafrir & Eitam-Meilik, 2005). Works on the succession or removal of top executives and chief executive officers (CEOs) include those by Crossland and Chen (2013), Ertugrul and Krishnan (2011), Goldman (2011), Hilger et al. (2013), Ohana and Meyer (2010), and Wiersema (2002). In these studies, the dismissal process has been analyzed predominantly from the employee's perspective. We did not find studies on the managers' viewpoint.

For dismissal, some criteria are applied to decide who will be dismissed or whether option will be pursued (Hilger et al., 2013). In the next section, these criteria and how they are hierarchized in the dismissal process are discussed.

Dismissal criteria

Dismissal decision-making involves planning and selecting from among choices—which are often sensitive—, besides time. The choices are always based on criteria, that is, who will be dismissed and who is vested with the authority to dismiss (Tylcsak, 1991). Moreover, choices are made from a limited range of possibilities (Simon, 1997). Sometimes, they are based on politics and power relations (Child, Elbanna, & Rodrigues, 2010).

According to Shah (2000), companies opt for the dismissal process mainly to maintain or increase their levels of competitive advantage and to respond to technological changes; that is, companies do not adopt this practice only when they

face declining performance. Other reasons for dismissals are harassment (pregnancy, incapacity, gender, age, appearance, health, race, personal issues), bullying (sexual, verbal, physical contact, or persecution without specific reasons), discrimination, unethical behavior, misappropriation, misconduct, fraud, personal situation, operational reasons, violation of the psychological contract, alteration to job contracts, complaints over salary, low performance, lack of commitment, problems in interpersonal relationships (misunderstandings between managers and employees or CEOs and investors), limited professional experience and growth potential (Campion et al., 2011; Giniger et al., 1983;

McDonald et al., 2008; Quiñones, Ford, & Teachout, 1995; Uppal, Mishra, & Vohra, 2014).

The criteria are inter-related, and often the managers' motivations for dismissing workers are considered subjective. For a better understanding of the process, existing literature is reviewed to identify and categorize the main reasons/criteria used by managers in dismissal decisions. Thus, Exhibit 1 shows the most recurrent dismissal criteria in the management literature, which are personal situation, trust, commitment, professional experience, interpersonal relationships, growth potential, and performance records. These criteria are discussed in detail below.

Exhibit 1. Main criteria for dismissal and their respective definitions

Criteria	Definitions
Personal situation	Circumstances such as diseases, damage, personal reasons, absenteeism without explanation, inability to work during the required hours, relationships inside or outside wrk, friends or family issues, requests of leave of absence from the employee for several reasons (McDonald et al., 2008).
Trust	The company's expectation that the employee will not abuse of the vulnerabilities of the company if he/she has the opportunity to do so (Krishnan et al., 2006).
Commitment	The effort of the employees so that the organization can obtain success and the degree of adjustment between the values of the employees and the values of the organization (Juhdi et al., 2011).
Professional experience	The amount of experience achieved in a specific occupation (McDaniel et al., 1988). Accumulation of experience originating from previous work in other organizations (Uppal et al., 2014).
Interpersonal relationship	Capacity of an individual to work in teams, or the efficient relationship between superiors and subordinates where there is mutual trust (Morgeson et al., 2005; Tzafrir & Eitam-Meilik, 2005)
Growth potential	The previews about the future performance of the employee, i. e., about his/her development and contribution in the organization (Moser & Kraft, 2008).
Performance records	General issues of performance, mistakes/imprecision, inadequate attitudes, communication problems (McDonald et al., 2008).

Although many personal situations mentioned in Exhibit 1 are employee rights, companies do covertly appropriate them during the dismissal process. This criterion also includes gender, age, educational level, and individual attributes (Stumpf & Dawley, 1981).

Issues concerning the termination of contracts, payments, complaints over wages, salaries, and repayments of loans from employers are other reasons that have led managers to opt for dismissals (McDonald et al., 2008). Dismissals for theft, bad faith, and fraud have also been alleged. In the present study, such issues are contained in the category of trust.

Trust involves the confidence individuals have in each other. It relates to availability, competence, consistency, discretion, honesty, integrity, loyalty, transparency, promise, achievement, and receptiveness (Butler, 1991). Regardless of the organizational context, a behavior that inspires trust is the result of a series of actions taken by those involved (Tzafrir & Dolan, 2004).

Trust is also related to ethical issues. Although Ertugrul and Krishnan (2011) do not directly mention the term trust, they attribute the involvement of CEOs in illegal or unethical activities (even when their actions do not have any negative impact on the results of the company) as being the cause for their dismissal.

Another criterion for dismissals found in the literature is commitment. For Meyer, Bobocel, and Allen (1991), commitment is related to turnover, absenteeism, and performance at work. Strongly committed employees are less likely to leave the organization (Allen & Meyer, 1990). Commitment can be identified by the effort that the employee expends for the organization to succeed, and it is related to the willingness to engage in the company's projects and performance at work. If employees are more committed, it can be inferred that managers would prefer to retain them in the organization; thus, they are less liable to be dismissed (Juhdi et al., 2011).

Professional experience of the employee is another criterion used for dismissal (Giniger et al., 1983; Uppal et al., 2014). Quiñones et al. (1995) consider this criterion to be one of the most important as it is also related to staff selection, training, and career development. On this criterion, Adkins (1995) states that previous professional experience is related to how and to what extent the individual will socialize within the company on the job. Based on the studies by Harcourt et al. (2013) and Kirschenbaum (1992), it is possible to consider professional experience as the amount of working years of the professional and the capacity to integrate relevant information and make competent decisions.

Interpersonal relationships are also listed as one of the relevant criteria in the dismissal process. In work environments where high performance and teamwork are required, the collaboration of an individual with the rest of the group is even more evident. In this sense, the "social skills" of the individual are relevant as they reflect his/her ability to adjust to different situations and demands, in addition to influencing the behavior of others and acting cooperatively (Tzafir & Eitam-Meilik, 2005).

This ability of knowing how to work with the group is closely linked to growth potential. For Campion et al. (2011), predicting growth potential is a commonly used practice in dismissal decision-making. However, the authors observe that the criteria for measuring this potential are subjective and that older people have fewer years of career ahead; therefore, any criteria related to the age of the candidate should be avoided in a dismissal decision. According to the authors, this aspect can be measured by the previous performance of the employee.

Kraft (1991) stresses the relevance of professional performance for the organization: without good performance by individuals, it is impossible for the company to achieve its expected productivity. Thus, in addition to making clear that employees who do not perform as expected can be dismissed, a practice used by some companies to incentivize better results

from employees is to pay them based on merit and efficiency, in addition to profit sharing.

Contrary to the results found by McDonald et al. (2008), the study by Hilger et al. (2013) reveals that performance (individual or organizational) is a criterion that significantly influences the chances of dismissal of top executives. The study by Crossland and Chen (2013, p. 83) demonstrates the same trend: "A second important assumption in the literature about dismissal is that the top management board has the power to dismiss CEOs (Chief Executive Officers) with low performance."

In such cases, the CEOs can be discharged: for disagreeing with the administrative board, board of directors, or shareholders concerning the strategic objectives that the organization must follow (Ertugrul & Krishnan, 2011); due to pressure exerted by investors to increase the company's performance (Ertugrul & Krishnan, 2011; Wiersema, 2002); and due to the intervention of shareholders who analyze, in addition to performance, the competence of the CEO (Ertugrul & Krishnan, 2011). Nevertheless, performance affects the dismissals of both CEOs and employees in general (Stumpf & Dawley, 1981; Williams & Livingstone, 1994).

METHODOLOGY

The methodological procedures adopted in this study, descriptive quantitative approach was adopted as the methodology. Considering that the purpose of the study was to identify the hierarchy of criteria for dismissal during managers' decision-making, we conducted a survey among managers and professionals involved in decision-making and management activities.

For this research, we adopted the analytic hierarchy process (AHP). The use of AHP method is justified in those types of decision-making which involve the selection of multiple alternatives and criteria. As a general rule, decision-makers have mutually exclusive objectives and can process information in different ways because of their previous experience and value judgments. Therefore, methods based on multiple criteria decision-making (MCDM) have emerged to facilitate situations in which more than one criterion are assessed and considered in the decision-making process (Chen, 2006).

Among MCDM methods, the AHP assesses the possible criteria involved in the decision in a faster and easier manner based on decision matrixes. Huang, Keisler, and Linkov (2011, p. 735) indicate that the AHP consists of a "systematic and scientific method capable of solving complicated and subjective problems of decision making." Thus, as a result of the application

of mathematical methods to the variables of the research, a hierarchy is obtained. This hierarchy is considered an abstraction of the structure of the system being studied (Saaty, 2008).

A set of criteria grouped together can then be classified as the combination of pairwise comparisons among them (taken in groups of two), with eventual inconsistencies found (due to the multiplicity of pairwise comparisons among all of the criteria of the group, performed separately) being interpreted as errors of the cognitive process. Errors are typically eliminated, taking some convenient average of the results of the pairwise comparisons.

About the index of consistency of the method, Saaty (2006) states that the pairwise comparisons are obtained by directly questioning people who can or cannot be specialists but are familiar with the problem. A central point in this approach is that

people are frequently inconsistent, even though the priorities must be defined, and actions must be taken concerning the inconsistency (Saaty, 2008).

Over a two-month period, the link of the 20-item questionnaire was sent by e-mail to 2,150 managers and professionals in Brazil who work in several sectors of the economy. We used two databases of professionals: one from the Brazilian Association of Human Resources (Associação Brasileira de Recursos Humanos [ABRH]) and another from the Fundação Getulio Vargas. Our target was executives/managers who had subordinates. The respondents were invited to resend the invitation to their colleagues, in the manner of a snowball sampling (Goodman, 1961). After 60 days, 385 valid answers were collected, and the respondents' profile is presented in Table 1.

Table 1. Profile of research respondents

Gender				
Male		Female		
51.17%		48.83%		
Age Range (Years Old)				
Up to 24	From 25 to 34	From 35 to 44	From 45 to 54	Over 55
11.69%	48.31%	25.71%	11.17%	3.12%
Education (Degree)				
Graduate	MBA/Postgraduate	Master	Doctorate	
54.03%	38.44%	3.90%	3.64%	
Time of Professional Experience (Years)				
Up to 5	From 6 to 10	From 11 to 15	From 16 to 20	Over 20
27.27%	28.57%	19.22%	12.21%	12.73%

Source: Research data (385 respondents).

There is a predominant profile of male decision-makers (51.17%), aged from 25 to 44 years old (74.03%), with a higher education or graduate/MBA level of education (92.47%), and with up to 10 years of professional experience (55.84%).

The research instrument was subjected to a pre-test to exclude possible questions with double interpretations and improve their formulation. It was applied to a group of 26 managers, which allowed spelling out and general scale adjustments in the data-gathering instrument.

At the beginning of the questionnaire, the respondents read directions regarding the context of the research so that all of them had similar acquaintance with the dismissal situation they were evaluating. The guiding question of the research is described as follows:

You have just been hired to conduct the process of a merger of two companies that conduct business in the food industry. These companies have redundant departments—with the merger, it came to be that, for example, 2 departments were managing the same operations. In this moment, the duplicated operations will be eliminated. Facing this situation, you will have to dismiss a group of professionals. In this research, we want to know which criteria you would use to choose the people who will be dismissed.

From this moment, the respondents were instructed to rank the seven criteria for dismissal (selected from the theory), randomly presented, according to the degree of importance that they attributed to each: (1) personal situation, (2) performance records, (3) commitment, (4) trust, (5) professional experience, (6) growth potential, and (7) interpersonal relationships. After this

process of ranking, the next step was a pairwise comparison of the first four dismissal criteria ranked based on the AHP method.

In the first part of the instrument, the respondents listed among the seven possible criteria their order of importance in his/her evaluation during the process of dismissal. Then, the top four criteria were compared in pairs, evaluating the high or low preference by one or another. Thus, each respondent made the pairwise crossing of up to four criteria, that is, six pairwise interactions for each respondent. In this manner, we evaluated the consistency between the rational ranking and the pairwise hierarchy among the criteria. The survey form used can be accessed at <https://dismissaldecisionmaking.qualtrics>.

For assigning the degree of importance, a scale ranging from 1 to 9, presented in Exhibit 2, was adopted; here, 1 means that compared to each other, the criteria are given the same importance whereas 9 means that one of them is strongly preferable at the expense of the others.

Exhibit 2. The fundamental scale of absolute numbers

Intensity of importance	Definition
1	Equal Importance
3	Moderate Importance
5	Strong Importance
7	Very strong Importance
9	Extreme Importance

Source: Adapted from Saaty (2008). Intensities of 2,4,6 and 8 can be used to express intermediate values.

Table 2 represents four criteria chosen by each respondent. Following the methodological steps, it is possible to find the eigenvector of each criterion and, subsequently, the main eigenvector (λ_{MAX}). Based on the main eigenvalue and the number of alternatives, we obtain the consistency ratio ($CR = (\lambda_{MAX} - n) / (n - 1)$), calculated according to the following formula:

Table 2. Example with four main criteria from one respondent

Goal	Trust	Interpersonal relationship	Commitment	Performance records	Relative weights
Trust	1	5	5	5	0.6181
Interpersonal Relationship	0.2	1	1	0.5	0.1069
Commitment	0.2	1	1	1	0.1236
Performance records	0.2	2	1	1	0.1514
	1.6	9	8	7.5	

$\lambda_{MAX} = [(0.6181 \times 1.6) + (0.1069 \times 9) + (0.1236 \times 8) + (0.1514 \times 7.5)] = 4.0757$	(1)
--	-----

$CR = ((4.0757 - 4) \div (4 - 1)) = 0.02523$	(2)
--	-----

According to this method, the consistency ratio must be below 0.1. Using the main eigenvector and the number of criteria, we determined the consistency ratio. In the example of the respondent above, the ratio was 0.02523 (2). In all cases (385), the consistency value was reached.

After generating a set of weights for each alternative (w_i), we combined the single priorities across all criteria to determine the global priority (w_g), presented by formula (3). *Transparent Choice* software was used to calculate all answers and combine the total weight of the criteria.

$w_i = \sum w_j \times v_j$ (v_j - number of observations of the criterion)	(3)
--	-----

Normality of distribution of each criterion was verified using a one-sample Kolmogorov-Smirnov test. The results are presented in Table 3.

Table 3. Kolmogorov-Smirnov test for one-sample

Criteria	N	Average	Standard deviation	Kolmogorov-Smirnov Z	Asymp. Sig. (2Tailed)
Trust	301	0.2623	0.165	1.429	0.034
Interpersonal relationship	219	0.2206	0.156	1.569	0.015
Commitment	354	0.3050	0.154	1.379	0.045
Professional experience	176	0.1592	0.125	2.065	0.000
Personal situation	30	0.2387	0.210	0.954	0.323
Performance records	301	0.2685	0.168	1.325	0.050
Growth potential	159	0.2123	0.152	0.558	0.016

Note: n=385 respondents

The results (Table 3) show that six criteria (trust, interpersonal relationships, commitment, professional experience, performance records, and growth potential) have a normal distribution (95% Confidence Interval, $\sigma < 0.05$). For the personal situation criterion, a normal distribution was not seen ($\sigma > 0.05$); thus, the results of this criterion are not statistically reliable and were not considered in the analysis.

RESULTS

Based on the criteria presented in Exhibit 1, the respondents made a rational classification of the criteria between the first and the seventh, in which the first consists of the criteria considered to have the highest weight in their decisions of dismissal whereas the seventh is the last criterion to be considered. From this classification, the criteria were ranked according to the results in Table 4.

Table 4. Hierarchy of dismissal criteria by rational sequencing

	Trust	Professional experience	Commitment	Interpersonal relationship	Personal situation	Performance records	Growth potential
1 ^o	24.94%	9.61%	29.35%	5.19%	1.30%	25.97%	3.64%
2 ^o	23.12%	10.13%	31.95%	11.17%	1.56%	17.14%	4.94%
3 ^o	13.77%	11.95%	20.78%	19.22%	2.08%	18.44%	13.77%
4 ^o	16.36%	14.03%	9.87%	21.30%	2.86%	16.62%	18.96%
5 ^o	11.95%	22.34%	3.12%	15.58%	9.35%	10.65%	27.01%
6 ^o	7.53%	23.38%	3.38%	19.22%	16.36%	8.83%	21.30%
7 ^o	2.34%	8.57%	1.56%	8.31%	66.49%	2.34%	10.39%

Note: n=385 respondents

We found that trust (61.82%), commitment (82.08%), and performance records (61.56%) form a group of criteria predominantly used by the respondents in their dismissal decisions, given that they are concentrated in the first, second, and third hierarchical positions.

Professional experience (59.74%), interpersonal relationship (56.10%), and growth potential (67.27%) form an intermediate group as they are more frequently considered between the fourth and the sixth hierarchical criteria positions. The personal situation criterion was ranked last by 66.49% of

the respondents; it represents the last criterion used by the respondents in their dismissal decision.

In addition to the rational ranking of the dismissal criteria, a cognitive hierarchy was constructed, conducting pairwise analysis based on the AHP method. Because the respondent assigns more relevance only to the first criterion, the four first criteria listed by each respondent in the rational ranking process were compared pairwise. The subsequent criteria, having a smaller impact on the perception of the respondent, would not have an impact on his/her real cognition (see Table 5).

Table 5. Hierarchy of dismissal criteria by cognitive sequencing (AHP)

Criteria	Average	LI	LS	ME	Min	Max	StDev	Count
Commitment	0.3050	0.2915	0.3185	0.0135	0.0344	0.75	0.154	354
Performance records	0.2685	0.2526	0.2844	0.0159	0.0188	0.6654	0.168	301
Trust	0.2623	0.2467	0.2780	0.0156	0.033	0.7018	0.165	301
Personal situation	0.2387	0.1757	0.3017	0.063	0.0279	0.6729	0.210	30
Interpersonal relationship	0.2206	0.2033	0.2380	0.0173	0.0188	0.69	0.156	219
Growth potential	0.2123	0.1925	0.2321	0.0198	0.0254	0.6683	0.152	159
Professional experience	0.1592	0.1437	0.1746	0.0155	0.0301	0.6057	0.125	176

Note: n=385 respondents

From Table 5, it is clear that the criteria of commitment (average 0.3050), performance records (average 0.2685), and trust (average 0.2623) hold the highest averages among the criteria assessed. From the confidence interval of 31.85% and 29.15%, we find that commitment is the most relevant criterion and holds the top hierarchical position. For the criteria of trust (given a confidence interval of 24.67% to 27.80%) and performance records (with a confidence interval of 25.26% to 28.44%), no significant difference in importance between the two is observed, and they rank second in the hierarchy of the dismissal decision.

Using a dummy variable, we verified that 205 respondents ($N = 385$), that is, 53.25%, indicate these three criteria (commitment, trust, and performance records) among the four most relevant.

Interpersonal relationships and growth potential, with averages of 22.06% and 21.23%, respectively, represent the third group of criteria. Considering the reliability in a normal distribution of 95%, both criteria are not significantly different in the hierarchy constructed by the respondents of the research.

For the personal situation criterion, only 30 cases (7.79%) classified it as among the four main criteria. Thus, it is clear that only few professionals recognize this criterion when deciding on dismissal. This result is also reflected in the confidence interval of this criterion, which is between 17% and 30%; that is, it holds little reliability.

In a comparison of the rational and the AHP methods we verified whether the four main criteria maintained their positions even when the classification method was changed. Only 65 respondents (16.88%) maintained the same order in the classification by both methods; 224 respondents (58.18%) maintained two criteria with the same classification, with two

criteria changing positions; and 96 respondents (24.93%) changed the positions of all of the criteria.

AHP analysis of the criteria for dismissal was also compared according to gender, respondents' prior experience with dismissal, and professional experience. Table 6 presents the separation of the sample by gender, with 197 respondents being male (51.17%) and 188 respondents female (48.83%).

We believe that the personal situation criterion holds low representativeness (30 respondents) and a margin of error (ME) greater than 0.05% for both male (0.1107) and female respondents (0.0704). Therefore, despite the difference in the positioning of this criterion in the hierarchy, this result is not statistically reliable and was not considered in the analysis of this comparison.

For the male respondents, performance (29.82%), commitment (27.79%), and reliability (26.43%) are considered the most relevant. For the female respondents also, these three criteria (commitment—33.25%, reliability—26.03%, and performance records—23.75%) appear to have the greatest impact on their decision. Given the confidence interval of these criteria, only commitment shows a significant difference for female respondents, statistically ranking (reliability of 95%) first.

Among the second group of criteria, interpersonal relationships, growth potential, and professional experience were identified for both males (22.16%, 21.89%, and 5.10%) and females (21.95%, 20.47%, and 16.79%). Although these criteria present the same hierarchical order in the comparison between genders, only professional experience shows a confidence interval of 95% for male respondents, taking the last position.

Besides gender comparison, AHP analysis of the criteria for dismissal was compared for the experience with dismissal. The respondents who had ever actively participated in at least one dismissal decision were considered. This comparative analysis is presented in Table 7.

Table 6. Hierarchy of dismissal criteria by cognitive sequencing (AHP) with gender comparison

Male (N = 197)								
	Average	ME	StDev	LI	LS	Min	Max	Count
Performance records	0.2982	0.0240	0.1785	0.2742	0.3221	0.0339	0.6654	150
Personal situation	0.2951	0.1107	0.2427	0.1844	0.4059	0.0309	0.6108	13
Commitment	0.2779	0.0186	0.1512	0.2593	0.2965	0.0344	0.6654	178
Trust	0.2643	0.0237	0.1787	0.2406	0.2880	0.0336	0.7018	154
Interpersonal relationship	0.2216	0.0246	0.1617	0.1970	0.2462	0.0188	0.6900	117
Growth potential	0.2189	0.0280	0.1568	0.1909	0.2469	0.0337	0.6683	85
Professional experience	0.1510	0.0240	0.1394	0.1270	0.1750	0.0339	0.6057	91
Female (N = 188)								
	Average	ME	StDev	LI	LS	Min	Max	Count
Commitment	0.3325	0.0189	0.1527	0.3135	0.3514	0.0391	0.7500	176
Trust	0.2603	0.0204	0.1501	0.2399	0.2806	0.0330	0.6523	147
Performance records	0.2375	0.0202	0.1516	0.2172	0.2577	0.0000	0.6326	152
Interpersonal relationship	0.2195	0.0244	0.1501	0.1951	0.2439	0.0280	0.6644	102
Growth potential	0.2047	0.0281	0.1469	0.1766	0.2327	0.0254	0.6181	74
Personal situation	0.1955	0.0704	0.1764	0.1252	0.2659	0.0279	0.6729	17
Professional experience	0.1679	0.0191	0.1072	0.1488	0.1870	0.0301	0.4757	85

Note: n=385 respondents

Table 7. Hierarchy of dismissal criteria by cognitive sequencing (AHP) with comparison of experience in dismissal

Dismissal experience (N = 230)								
	Average	ME	StDev	LI	LS	Min	Max	Count
Commitment	0.2955	0.0174	0.1536	0.2780	0.3129	0.0344	0.6729	210
Performance records	0.2834	0.0217	0.1747	0.2617	0.3050	0.0188	0.6644	176
Trust	0.2759	0.0200	0.1669	0.2558	0.2959	0.0336	0.7018	188
Interpersonal relationship	0.2251	0.0227	0.1611	0.2024	0.2478	0.0280	0.6900	136
Personal situation	0.1888	0.0623	0.1693	0.1265	0.2510	0.0279	0.6108	20
Growth potential	0.1820	0.0229	0.1351	0.1590	0.2049	0.0254	0.6057	94
Professional experience	0.1534	0.0199	0.1183	0.1335	0.1732	0.0301	0.5853	96
Without dismissal experience (N = 155)								
	Average	ME	StDev	LI	LS	Min	Max	Count
Personal situation	0.3385	0.1325	0.2547	0.2061	0.4710	0.0339	0.6729	10
Commitment	0.3190	0.0212	0.1544	0.2978	0.3401	0.0396	0.7500	144
Growth potential	0.2561	0.0336	0.1648	0.2225	0.2897	0.0339	0.6683	65
Performance records	0.2476	0.0228	0.1552	0.2248	0.2704	0.0266	0.6654	125
Trust	0.2398	0.0248	0.1601	0.2150	0.2646	0.0330	0.6644	113
Interpersonal relationship	0.2133	0.0267	0.1479	0.1866	0.2400	0.0188	0.6644	83
Professional experience	0.1661	0.0244	0.1327	0.1417	0.1905	0.0339	0.6057	80

Note: n=385 respondents

The personal situation criterion was ignored, due to its low representativeness (7.79%) and an ME greater than 0.05 (0.06 and 0.13).

For the 230 respondents with experience with dismissal, commitment (29.55%), performance records (28.34%), and reliability (27.59%) are the most important. Considering the reliability of 95% on a normal distribution curve, there is no significant difference among them.

For this same group of respondents, it was observed that interpersonal relationships, growth potential, and professional experience showed averages of 22.51%, 18.20%, and 15.34%, respectively; therefore, they form a second group of criteria. Although interpersonal relationships (limit inferior—LI—20.24%) and growth potential (LI—20.49%) criteria present a merely tangential approximation, they cannot be considered significantly different, given the sample size.

For the 155 respondents without experience with dismissal, commitment carried the highest weight in their cognitive

simulation, and it presented an average of 31.90%. Given a confidence interval of 29.78% to 34.01%, it is significantly different from the other criteria.

Continuing with the analysis of the respondents without experience with dismissal, we found that growth potential (25.61%), performance records (24.76%), reliability (23.98%), interpersonal relationships (21.33%), and professional experience (16.615) form a second group in the hierarchy of criteria. In contrast to the previous analyses, the growth potential criterion holds a higher average value than that of reliability and performance records; considering their confidence intervals, they are not significantly different and, therefore, are part of the same group of criteria.

We also compare the results by dividing the sample group into respondents with more than ten years of professional experience ($N = 170$) and those with less than ten years of professional experience ($N = 215$); the results are presented in Table 8.

Table 8. Hierarchy of dismissal criteria by cognitive sequencing (AHP) with comparison of professional experience

Group up to ten years of professional experience (N = 215)								
	Average	ME	StDev	LI	LS	Min	Max	Count
Commitment	0.3225	0.0183	0.1555	0.3041	0.3408	0.0366	0.7500	195
Personal situation	0.2614	0.0835	0.2269	0.1780	0.3449	0.0279	0.6729	20
Trust	0.2511	0.0199	0.1537	0.2312	0.2709	0.0330	0.6523	162
Performance records	0.2443	0.0192	0.1528	0.2251	0.2634	0.0266	0.6644	172
Interpersonal relationship	0.2246	0.0226	0.1529	0.2020	0.2472	0.0188	0.6900	124
Growth potential	0.2183	0.0214	0.1273	0.1970	0.2397	0.0254	0.5599	96
Professional experience	0.1692	0.0234	0.1357	0.1458	0.1926	0.0301	0.6057	91
Group with over ten years of professional experience (N = 170)								
	Average	ME	StDev	LI	LS	Min	Max	Count
Performance records	0.3008	0.0262	0.1810	0.2746	0.3270	0.0188	0.6654	129
Commitment	0.2837	0.0196	0.1504	0.2640	0.3033	0.0344	0.7165	159
Trust	0.2755	0.0247	0.1771	0.2507	0.3002	0.0336	0.7018	139
Interpersonal relationship	0.2155	0.0271	0.1607	0.1883	0.2426	0.0303	0.6183	95
Growth potential	0.2030	0.0381	0.1840	0.1649	0.2412	0.0337	0.6683	63
Personal situation	0.1932	0.0898	0.1726	0.1035	0.2830	0.0309	0.5284	10
Professional experience	0.1433	0.0199	0.1132	0.1235	0.1632	0.0000	0.5849	88

Note: n=385 respondents

Just as in the previous analyses, the personal situation criterion is ignored due to its low representativeness (30 respondents) and an ME greater than 0.05 (0.08 and 0.09 approximately) as seen in Table 7.

For the 215 respondents with up to ten years of experience, who are considered less experienced in this study, commitment holds the highest average (32.25%), and considering the confidence interval of 30.41% to 34.08%, it is significantly different from the others and ranks first in the hierarchy of criteria.

The next criteria that the less experienced respondents consider are reliability, performance records, interpersonal relationships, and growth potential with the following average probabilities of 25.11%, 24.43%, 22.46% and 21.83%, respectively. Given the confidence interval of each of these criteria, as shown in Table 7, they cannot be considered to occupy significantly different positions, and hierarchically, they would be in a second group of criteria. The professional experience criterion held an average of 16.92 among the less experienced respondents, and considering its confidence interval, it ranks last in this sample group.

In the analysis of the respondents with more than ten years of experience, it was observed that performance records (30.08%), commitment (28.37%), and reliability (27.55%) are the criteria most important in the dismissal decision. Although these criteria do not show significant differences among themselves, considering the confidence intervals of each, they appear to be significantly different from the others and, therefore form the group of criteria that the more experienced managers consider.

Interpersonal relationships and growth potential form a second group of criteria with averages of 21.55% and 20.30%, respectively. Observing the confidence intervals, they appear to be situated between the group containing the most important criteria and the professional experience criterion, which ranks lowest in the hierarchy with an average of 14.33%.

DISCUSSION

Considering the results presented in this paper, commitment, performance records, and trust appear to be the criteria with the greatest impact on the dismissal decision by the sample group of the survey ($N = 385$). In some sampling separations, commitment appeared to be the most important criterion for male respondents and those with less than ten years of professional experience. This result agrees with the findings of Allen and Meyer (1990), who argued that when there is commitment, the employee has greater chances of staying in the organization; that is, it is an important criterion to be assessed in the process of dismissal.

For the criterion of performance records, also called accomplishment, studies by Hilger et al. (2013) and Crossland and Chen (2013) have established that it significantly influences the dismissal of top executives; it also demonstrated that

this criterion was included in the group of criteria which had the greatest impact on the decision. Furthermore, as noted by Stumpf and Dawley (1981) and Williams and Livingstone (1994), accomplishment is not only evaluated for top management jobs but also for all hierarchical levels, which this study has also confirmed, through a hierarchy of criteria applicable to dismissal in a group of managerial and operational activities.

Interpersonal relationships, growth potential, and professional experience form a group of secondary criteria; that is, they are statistically considered by the respondents to be of lower relevance than the criteria of the first group. In some comparisons among sample groups, the professional experience criterion can significantly differ from the others and rank last, as shown by the male respondents and those with more than ten years of experience.

Professional experience, as noted by Quiñones et al. (1995) and Adkins (1995), is a relevant criterion in the process of recruitment as it is related to possible career development, socialization of the individual, and his/her performance based on the experience. Nevertheless, it is not so important during the dismissal process. According to Watrous, Huffman, and Pritchard (2006), professional experience is related to the performance of the professional in the process of dismissal; comparing and hierarchizing the criteria of performance and experience, what prevails is the current performance.

For the criteria of growth potential and interpersonal relationships, which are connected to each other according to Moser and Kraft (2008), they are also close in the hierarchy of criteria for dismissal. For Morgeson, Reider, and Campion (2005), interpersonal relationships, that is, the social abilities of the employee, are important to ensure the development and growth of the working group, and therefore, in the dismissal decision, performance will be more important than interpersonal relationships. Similarly, growth potential, according to Campion et al. (2011), is considered in the dismissal decision-making; however, it does not have a great impact on the decision, appearing in the intermediate group of criteria for dismissal.

The personal situation criterion, due to its low representativeness in the sample studied (7.79% of the respondents), did not present reliable intervals and was not considered in the comparative analyses. However, in the study by McDonald et al. (2008), even though personal situation, which is linked to personal circumstances, is noted as being one of the most evaluated criteria during the process of dismissal, several other reasons were also indicated such as inability to work (which in this study matches the criteria of accomplishment), relationships inside or outside of work situation (addressed

here as interpersonal relationships), and trust. Therefore, considering the clear and specific definition of the criteria for this study, personal situation, which concerns the situation of the employee outside of the workplace (health, family, etc.), is scarcely evaluated in the dismissal decision.

The dismissal criteria were also analyzed through sample comparison (gender, experience with dismissal, and professional experience), and no significant differences in the between-groups analysis were found. Thus, further research can deepen the analysis of the impact of the decision-maker's background on the dismissal decision and its criteria.

CONCLUSION

In this study, we sought to identify the hierarchy of criteria in dismissal decision-making from the perspective of managers. Based on criteria identified in the literature review, those considered to be the most relevant to managers when making dismissal decisions were identified through field research. The data analysis of 385 questionnaires supported the hierarchy of criteria and comparison of the cognitive styles by using the MCDM AHP.

In summary, the data indicated that the criteria of commitment, performance records, and trust have the greatest impact on the dismissal decision whereas the criteria of interpersonal relationships, growth potential, and professional experience form a group of secondary criteria. The personal situation was considered to be a criterion with little relevance in dismissal decisions in the opinion of the managers surveyed.

One contribution of these results is the expansion of knowledge about dismissal decisions, which, as noted above, is a scarce subject in the strategic human resource management literature, despite its growing relevance as an organizational practice. Another contribution is the possibility of making the dismissal decisions more transparent as the criteria used for the choice are learned, in addition to the relevance assigned to each. The data of the sample studied also allow reflections on the processes of performance appraisal in organizations as commitment was considered the most important criterion for dismissal by the managers surveyed.

About the method used for data analysis, this study makes contributions to comparing and understanding the cognitive styles and profile of the respondents based on the AHP method, which allows managers to build scenarios to help in decision-making and, therefore, make better decisions. While choosing this method, we wanted to overcome the limitation that people

do not always answer exactly how they would act when they had to decide and are not able to evaluate all of the criteria in a hierarchical form. For this reason, we chose the AHP and pairwise comparison, which enabled a more transparent analysis regarding the hierarchy of the dismissal criteria identified.

Another contribution is the application of the AHP method to large samples as studies that have used this method so far had few respondents: two, three, or up to ten people at most. In our study, the method was used to delineate the profile and to compare answers in a population of 385 respondents, showing the viability of its application in large samples.

One limitation of the study was the definition of the criteria for dismissal, given that they were specified through the literature review, and there are few papers published on this subject. We acknowledge other criteria for dismissal can also be categorized and hierarchized, and further qualitative research to understand dismissal decision-making or more experiments for identification or validation of these criteria are recommended.

As an agenda for future research, by recognizing that the backgrounds of managers—such as their age, experience, background, values and other personal characteristics—can influence the rationalization and the process of ranking the criteria for dismissal, assessing these characteristics when delineating the profile of the managers and performing a comparison of the hierarchy of criteria based on these characteristics are recommended. Another possibility for future research is comparison among countries as the order of the criteria can also be linked to the cultural aspects of each region, and a cross-country study can reveal differences in the hierarchy of criteria.

REFERENCES

- Adkins, C. L. (1995). *Previous work experience and organizational socialization: A longitudinal examination*. *Academy of Management Journal*, 38(3), 839-862.
- Allen, N. J., & Meyer, J. P. (1990). *The measurement and antecedents of affective, continuance and normative commitment to the organization*. *Journal of Occupational and Organizational Psychology*, 63(1), 1-18. doi:10.1111/j.2044-8325.1990.tb00506.x
- Armstrong, M., & Taylor, S. (2014). *Armstrong's handbook of human resource management practice*. London, UK: Kogan Page Publishers.
- Bratton, J., & Gold, J. (2012). *Human resource management: Theory and practice*. Basingstoke, UK: Palgrave Macmillan.
- Butler, J. K. (1991). *Toward understanding and measuring conditions of trust: Evolution of a conditions of trust inventory*. *Journal of Management*, 17(3), 643-663. doi:10.1177/014920639101700307

- Caldas, M. P. (2000). Enxugamento de pessoal no Brasil: Podem-se atenuar seus efeitos em empresa e indivíduo? *RAE-Revista de Administração de Empresas*, 40(1), 29-41. doi:10.1590/S0034-7590200000100004
- Campion, M. A., Guerrero, L., & Posthuma, R. (2011). Reasonable human resource practices for making employee downsizing decisions. *Organizational Dynamics*, 40(3), 174-180. doi:10.1016/j.orgdyn.2011.04.004
- Chen, C. F. (2006). Applying the analytical hierarchy process (AHP) approach to convention site selection. *Journal of Travel Research*, 45(2), 167-174. doi:10.1177/0047287506291593
- Child, J., Elbanna, S., & Rodrigues, S. (2010). The political aspects of strategic decision making. In P. C. Nutt and D. Wilson (Eds.), *The Handbook of Decision Making* (pp. 105-137). Chichester, UK: Wiley.
- Crossland, C., & Chen, G. (2013). Executive accountability around the world: Sources of cross-national variation in firm performance—CEO dismissal sensitivity. *Strategic Organization*, 11(1), 78-109. doi:10.1177/1476127012460946
- Ertugrul, M., & Krishnan, K. (2011). Can CEO dismissals be proactive? *Journal of Corporate Finance*, 17(1), 134-151. doi:10.1016/j.jcorpfin.2010.09.008
- Freitas, M. E. D. (2006). Por uma ética na demissão? *RAE-Revista de Administração de Empresas*, 46(1), 102-106. doi:10.1590/S0034-75902006000100007
- Giniger, S., Dispenzieri, A., & Eisenberg, J. (1983). Age, experience, and performance on speed and skill jobs in an applied setting. *Journal of Applied Psychology*, 68(3), 469-475. doi:10.1037/0021-9010.68.3.469
- Goldman, A. (2011). Demagogue to dialogue: An alternative to toxic leadership in corporate downsizings. *Organizational Dynamics*, 40(3), 235-241. doi:10.1016/j.orgdyn.2011.04.011
- Goodman, L. A. (1961). Snowball sampling. *The Annals of Mathematical Statistics*, 32(1), 148-170.
- Harcourt, M., Hannay, M., & Lam, H. (2013). Distributive justice, employment-at-will and just-cause dismissal. *Journal of Business Ethics*, 115(2), 311-325. doi:10.1007/s10551-012-1400-9
- Hilger, S., Mankel, S., & Richter, A. (2013). The use and effectiveness of top executive dismissal. *The Leadership Quarterly*, 24(1), 9-28. doi:10.1016/j.leaqua.2012.07.001
- Huang, I. B., Keisler, J., & Linkov, I. (2011). Multi-criteria decision analysis in environmental sciences: Ten years of applications and trends. *Science of the Total Environment*, 409(19), 3578-3594. doi:10.1016/j.scitotenv.2011.06.022
- Iverson, R. D., & Zatzick, C. D. (2011). The effects of downsizing on labor productivity: The value of showing consideration for employees' morale and welfare in high-performance work systems. *Human Resource Management*, 50(1), 29-44. doi:10.1002/hrm.20407
- Juhdi, N., Pa'wan, F., Hansaram, R. M., Kaur, S., & Othman, N. A. (2011). HR practices, organizational commitment and turnover intention: A study on employees in Klang Valley, Malaysia. In *III World Multiconference on Applied Economics, Business and Development (AEBD '11)* (pp. 30-36). Recent Researches in Applied Economics: Iasi, Romania.
- Kirschenbaum, S. S. (1992). Influence of experience on information-gathering strategies. *Journal of Applied Psychology*, 77(3), 343. doi:10.1037/0021-9010.77.3.343
- Kraft, K. (1991). The incentive effects of dismissals, efficiency wages, piece-rates and profit-sharing. *The Review of Economics and Statistics*, 73(3), 451-459. doi:10.2307/2109569
- Krishnan, R., Martin, X., & Noorderhaven, N. G. (2006). When does trust matter to alliance performance? *Academy of Management Journal*, 49(5), 894-917. doi:10.5465/AMJ.2006.22798171
- McDaniel, M. A., Schmidt, F. L., & Hunter, J. E. (1988). Job experience correlates of job performance. *Journal of Applied Psychology*, 73(2), 327-330. doi:10.1037/0021-9010.73.2.327
- McDonald, P. K., Waterhouse, J. M., & Kellner, A. (2008). Sacked! Young worker's dismissal and the psychological contract. *Proceedings 22nd Conference of the Association of Industrial Relations Academics of Australia and New Zealand* (pp. 305-315). Melbourne, Australia.
- Meyer, J. P., Bobocel, D. R., & Allen, N. J. (1991). Development of organizational commitment during the first year of employment: A longitudinal study of pre-and post-entry influences. *Journal of Management*, 17(4), 717-733. doi:10.1177/014920639101700406
- Mintzberg, H., Raisinghani, D., & Théorêt, A. (1976). The structure of "unstructured" decision processes. *Administrative Science Quarterly*, 21(2), 246-275. doi:10.2307/2392045
- Morgeson, F. P., Reider, M. H., & Campion, M. A. (2005). Selecting individuals in team settings: The importance of social skills, personality characteristics, and teamwork knowledge. *Personnel Psychology*, 58(3), 583-611. doi:10.1111/j.1744-6570.2005.655.x
- Moser, K., & Kraft, A. (2008). Eskalierendes Commitment gegenüber Mitarbeitern: Ein Rahmenmodell. *Gruppendynamik und Organisationsberatung*, 39(1), 106-125.
- Nutt, P. C. (2011). Making decision-making research matter: Some issues and remedies. *Management Research Review*, 34(1), 5-16. doi:10.1108/01409171111096441
- Ohana, M., & Meyer, M. (2010). Should I stay or should I go now? Investigating the intention to quit of the permanent staff in social enterprises. *European Management Journal*, 28(6), 441-454. doi:10.1016/j.emj.2010.06.007
- Østhus, S., & Mastekaasa, A. (2010). The impact of downsizing on remaining workers' sickness absence. *Social Science & Medicine*, 71(8), 1455-1462. doi:10.1016/j.socscimed.2010.06.045
- Quiñones, M. A., Ford, J. K., & Teachout, M. S. (1995). The relationship between work experience and job performance: A conceptual and meta-analytic review. *Personnel Psychology*, 48(4), 887-910. doi:10.1111/j.1744-6570.1995.tb01785.x
- Saaty, T. L. (2006). Rank from comparisons and from ratings in the analytic hierarchy/network processes. *European Journal of Operational Research*, 168(2), 557-570. doi:10.1016/j.ejor.2004.04.032
- Saaty, T. L. (2008). Decision-making with the analytic hierarchy process. *International Journal of Services Sciences*, 1(1), 83-98. doi:10.1504/IJSSci.2008.01759
- Shah, P. P. (2000). Network destruction: The structural implications of downsizing. *Academy of Management Journal*, 43(1), 101-112.
- Simon, H. (1997). *Administrative behavior: A study of decision making processes in administrative organizations*. New York, NY: The Free Press.
- Stumpf, S. A., & Dawley, P. K. (1981). Predicting voluntary and involuntary turnover using absenteeism and performance indices. *Academy of Management Journal*, 24(1), 148-163. doi:10.2307/255830

- Tonelli, M. J. (2000). *Demissão: Causas, efeitos e alternativas para empresa e indivíduo*. [Review of the book *Demissão: Causas, efeitos e alternativas para empresa e indivíduo*, of M. P. Caldas]. *RAE-Revista de Administração de Empresas*, 40(4), 103-108.
- Tsai, C. F., & Yen, Y. F. (2008). A model to explore the mystery between organizations' downsizing strategies and firm performance: Integrating the perspectives of organizational change, strategy and strategic human resource management. *Journal of Organizational Change Management*, 21(3), 367-384. doi:10.1108/09534810810874831
- Tylcsak, L. (1991). *Downsizing without disaster: A thoughtful approach to planned workforce reduction*. Los Altos, CA: Crisp Publications.
- Tzafir, S. S., & Dolan, L. S. (2004). Trust ME: A scale for measuring employee manager trust. *Journal of Management Research*, 2(2), 117-134.
- Tzafir, S. S., & Eitam-Meilik, M. (2005). The impact of downsizing on trust and employee practices in high tech firms: A longitudinal analysis. *The Journal of High Technology Management Research*, 16(2), 193-207. doi:10.1016/j.hitech.2005.10.008
- Ulrich, D., Younger, J., & Brockbank, W. (2008). The twenty-first-century HR organization. *Human Resource Management*, 47(4), 829-850. doi:10.1002/hrm.20247
- Uppal, N., Mishra, S. K., & Vohra, N. (2014). Prior related work experience and job performance: Role of personality. *International Journal of Selection and Assessment*, 22(1), 39-51. doi:10.1111/ijsa.12055
- Watrous, K. M., Huffman, A. H., & Pritchard, R. D. (2006). When coworkers and managers quit: The effects of turnover and shared values on performance. *Journal of Business and Psychology*, 21(1), 103-126. doi:10.1007/s10869-005-9021-2
- Wiersema, M. (2002). Holes at the top. Why CEO firings backfire. *Harvard Business Review*, 80(12). Retrieved from <https://hbr.org>
- Williams, C. R., & Livingstone, L. P. (1994). Another look at the relationship between performance and voluntary turnover. *Academy of Management Journal*, 37(2), 269-298. doi:10.2307/256830

ARTICLES

Submitted 09.19.2016. Approved 08.14.2017

Evaluated through a double-blind review process. Guest scientific editor: Wesley Mendes-da-Silva

Translated version

DOI: <http://dx.doi.org/10.1590/S0034-759020180203>

PESSIMISM AND UNCERTAINTY OF THE NEWS AND INVESTOR BEHAVIOR IN BRAZIL

Pessimismo e incerteza das notícias e o comportamento dos investidores no Brasil

Pesimismo e incertidumbre de las noticias y comportamiento de los inversores en Brasil

ABSTRACT

How investors impound qualitative information released by the media into prices, especially in a less efficient market such as Brazil, helps understand the types of news most sensitive to investors. This study investigates the relationship between the content of the daily editions of specialized financial media in Brazil, captured by a metric of textual tone, and returns and volatility of market indexes. Our database contains 1,237 daily editions of the newspaper “Valor Econômico,” between 01/02/2012 and 12/30/2016. The results indicate that the market put more weight on the words “uncertainty” and “negative” in the news. “Uncertainty” has negative relation to current market-returns and weak evidence that news with “negative” terms have positive associations with current market-volatility. The evidences obtained point to the existence of informative content in the news published by specialized media in Brazil, especially with the words “negative” and “uncertainty.”

KEYWORDS | Sentiment analysis, textual analysis, financial media, Brazil, efficient markets.

RESUMO

Investidores formam suas expectativas sobre os fluxos de caixa futuros das empresas considerando as informações quantitativas e qualitativas a que têm acesso. O entendimento de como os preços de mercado incorporam as informações qualitativas divulgadas pela mídia, especialmente em um mercado com menor nível de eficiência como o Brasil, ajuda na compreensão de quais tipos de notícia mais sensibilizam os investidores. Nesse contexto, este trabalho estuda a relação entre o teor das edições diárias da mídia financeira especializada no Brasil, capturado por uma métrica de tom textual, e a rentabilidade e volatilidade dos índices de mercado. A base de dados estudada contém 1.237 edições diárias do jornal Valor Econômico, compreendendo o período entre 2/1/2012 e 30/12/2016. Os resultados indicam que o mercado avalia com maior peso palavras de incerteza e negativas divulgadas nas notícias. A aparição de termos do tipo “incerteza” tem relação negativa com a rentabilidade, e há indícios mais fracos de que termos relacionados a palavras “negativas” têm associação positiva com a sua volatilidade. Tomadas em conjunto, as evidências obtidas neste estudo apontam para a existência de conteúdo informativo nas notícias veiculadas pela mídia especializada no Brasil, especialmente notícias com palavras “negativas” e de “incerteza”.

PALAVRAS-CHAVE | Análise de sentimento, análise textual, mídia financeira, Brasil, mercado eficiente.

RESUMEN

Los inversores forman sus expectativas sobre los flujos de caja futuros de las empresas, considerando la información cuantitativa y cualitativa a la que tienen acceso. La comprensión de cómo los precios de mercado incorporan las informaciones cualitativas divulgadas por los medios, especialmente en un mercado con menor nivel de eficiencia como Brasil, ayuda a la comprensión de qué tipos de noticias más sensibilizan a los inversores. En este contexto, este trabajo estudia la relación entre el tenor de las ediciones diarias de los medios de comunicación financieros especializados en Brasil, capturado por una métrica de tono textual, y la rentabilidad y volatilidad de los índices de mercado. La base de datos estudiada contiene 1.237 ediciones diarias del periódico “Valor Económico”, que comprenden el período del 02/01/2012 al 30/12/2016. Los resultados indican que el mercado evalúa con mayor peso palabras de incertidumbre y negatividad divulgadas en las noticias. La aparición de términos como “incertidumbre” tiene una relación negativa con la rentabilidad, y hay indicios más débiles de que las palabras “negativas” tienen una asociación positiva con la volatilidad. Las evidencias obtenidas en este estudio muestran la existencia de contenido informativo en las noticias difundidas por los medios especializados en Brasil, especialmente noticias con palabras “negativas” y de “incertidumbre”.

PALABRAS CLAVE | Análisis de sentimiento, análisis textual, medios de comunicación financieros, Brasil, mercado eficiente.

FERNANDO CAIO GALDI

fernando.galdi@fucape.br

ORCID: 0000-0001-6231-0010

ARTHUR MARTINS GONÇALVES

arthgonc@gmail.com

ORCID: 0000-0003-2380-9809

Fundação Instituto Capixaba de Pesquisa em Contabilidade, Economia e Finanças, Vitória, ES, Brazil

INTRODUCTION

Specialized media is an important data source for companies, especially those involved in the capital market, where regulations require that information be disclosed to investors equitably. The association between published reports (journalistic texts, financial blog reviews, posts in social media, rumors, etc.) and market behavior became the subject of study for several researchers, including, Antweiler and Frank (2004), who related financial blog reviews to the return of certain stocks; Tetlock (2007), Tetlock, Saar-Tsechansky, and Macksassy (2008), Fang and Peress (2009) and Chen et al. (2011), who studied the relationship between journalism and the profitability of certain companies; Porshnev, Redkin, and Shevchenko (2013) and Bogle and Potter (2015), who discussed the possibility of predicting the market based on the tone of Twitter posts; Rogers, Skinner, and Zechman (2015), who evaluated if the way in which news stories are spread by the media affects the response of asset prices; and Bushman, Williams, and Wittenberg-Moerman (2016), who investigated whether media coverage of a borrower influences syndicated loans.

In this context, this study investigates if it is possible to identify any relationship (positive or negative) between profitability and market volatility indices (São Paulo State Stock Exchange - Ibovespa - and Brazil Broad-Based Index - IBRA) and positive or negative content (referred to as “tone”) extracted from reports published by primary news sources that specialize in economic issues in Brazil.

The database used to formulate the main variables of this research was the daily edition available on the *Valor Econômico* website, which is the largest specialized newspaper in Brazil. This was the only vehicle of communication used for this research because after *Brasil Econômico* stopped circulating their print versions in 2015, *Valor Econômico* remains the only player in the market and the only source that generates information on the economy, finance, and markets in Brazil on a daily basis. According to data from the Brazilian Association of Newspapers (ANJ, 2017), in 2015, the average daily circulation of *Valor Econômico* was 41,431 copies. A sample containing all the editorial sections was included, as well as a sub-sample, called a filtered sample, considering only the following sections: Brazil, Politics, International, and Finance. Both samples were extracted over a full five-year period, from 2012 to 2016. A computational method called sentiment analysis (or opinion mining), which extracts the opinion of a text (Liu & Zhang, 2012), was used to process the database.

The sentiment analysis was performed using an algorithm that, along with word dictionaries, processed the daily editions,

transforming textual information into quantitative data. This made it possible to quantitatively evaluate the tone of news stories and perform statistical analysis. The algorithm and dictionaries were based on the equivalents developed by Pagliarussi, Aguiar, and Galdi (2016).

The results indicated a negative association between returns on the day that an edition of *Valor Econômico* is put into circulation (print or online) and a higher number of terms denoting uncertainty in the said edition. In addition, weaker evidence showed a positive relation between news with a negative tone and the increase of volatility of Ibovespa.

It is necessary to understand that this study contributed to the literature of the country in both Finance and Accounting, as this is a widely researched subject internationally and is gaining popularity in Brazil. Moreover, combining sentiment analysis with machine learning algorithms can help the investor and/or regulators predict market behavior (Cambria, 2016; Tripathy, Agrawal, & Rath, 2016).

THEORETICAL FRAMEWORK

News and their influence in the market

The theory says that the value of a company should be equal to the present value of their expected cash flow, considering the appropriate cost of capital (Cochrane & Culp, 2003). The projection of this cash flow is conditional on other sets of information, such as a qualitative description of the business environment of companies, their operations, and the prospects presented by the financial press (Tetlock et al., 2008). The literature shows ample evidence that specialized financial media discloses information relevant to capital and credit market participants. This is in addition to the information provided by market analysts and annual reports (Bushman et al., 2016; Tetlock et al., 2008).

Generally, new relevant information about a specific company, industry or economy, may change the market’s view of implied risk and expected financial profitability. Consequently, the market may rebalance the value of these companies owing to their new expectation of financial returns (Tetlock et al., 2008).

As most market investors and participants have access to the media, they could predict changes in the projected cash flow based on the tone of collected information (for instance, positive or negative news about a company, industry, or economy, in particular). This would result in the valuation or devaluation of a

company (stock), and therefore, the exchange of equity holding of companies compromised by others with better performance (Mitra & Mitra, 2011). In this way, considering the market as an aggregate, it is expected that the tone of the news on a given day be associated with the performance and volatility of market indices.

Sentiment analysis

Evaluating the influence of investor sentiment in making decisions goes back to early studies in the 1980s, when economists began using psychological tools to explain investor behavior (Boussaidi, 2013). Barberis, Shleifer, and Vishny (1998) were the first to model investor sentiment to show the formation of beliefs based on psychological evidence and extreme reactions (overreactions or underreactions). Such research was characterized within the field of Behavioral Finance.

As such, the sentiment analysis used in this study is different, as it can be defined as a computational study of opinions, evaluations, attitudes and emotions directed toward entities, individuals, editions, events, as well as topics and their attributes (Liu & Zhang, 2012).

For an average human being, it is a difficult task to follow and read the available news in the vehicles of information (i.e. specialized media, blogs, forums, social networks, etc.). In addition, given the amount of published information, news will not always be easily decoded (understood) by the reader, which further complicates the decision-making process (Liu & Zhang, 2012).

Furthermore, usually, people tend to pay more attention to information and opinions that go against their own preferences (Liu & Zhang, 2012).

Therefore, a big advantage of using computational methods is the ability to process large volumes of text very fast, yielding consistent results, and mitigating the effect of bias by individual opinions and predilections (Liu & Zhang, 2012).

Previous studies

Antweiler and Frank (2004) affirmed that messages about the financial market in forums influence its behavior. While studying the effect of more than 1.5 million messages posted on Yahoo! Finance and the Raging Bull about 45 companies belonging to the Dow Jones Industrial Average and Dow Jones Internet Index, they verified that the tone of the comments helps predict market

volatility. Their results showed that the impact of the messages over the stock returns was statistically relevant, despite being economically small.

Tetlock (2007) evaluated the interaction between the media and the stock market by measuring the tone of The Wall Street Journal column “Abreast of the market” from 1984 to 1999. This column discusses the reasons for the market’s behavior on the previous day, and includes predictions by analysts. The author found evidence indicating that high levels of pessimism predicted a negative effect on stock prices, while average, high, and low levels of pessimism predict a high volume of negotiations. He also suggested that low profitability in the financial market leads to increasing pessimistic news.

Tetlock et al. (2008) expanded the analysis by Tetlock (2007), measuring not only the tone of a column, but also the entirety of The Wall Street Journal and the Dow Jones News Service from 1980 to 2004. They followed stock returns and investigated whether a higher number of negative words could be used to increase the expectancy of future cash flows. The results found that a higher number of negative words in specific news relating to the firm predicted low financial results, especially if the news were related to the company’s financial structure (Tetlock et al., 2008).

Fang and Peress (2009) begin with the hypothesis that media influences stock profitability, even when it conveys incoherent or exaggerated information. They measured the relationship between media coverage and stock returns, and found that stock in companies that are not frequently mentioned by vehicles of information tend to have higher returns than their counterparts.

Chen et al. (2011), in a similar study as Fang and Peress (2009), used the hypothesis that the media can bring new information to the market. They observed The Wall Street Journal’s coverage of companies listed on the S&P 500 Index before the disclosure of financial reports, and the behavior of stocks in terms of their profitability. They argued that the greater the media coverage on a company, the lower the chance of their stocks obtaining abnormal gains, which leads to a smaller earning response coefficient (ERC).

Loughran and McDonald (2011) presented a new methodology to analyze text. They argued that the use of dictionaries produced in other fields, such as psychology, incorrectly classified the tone of financial texts. The authors developed a new word list (Fin-Neg), using texts from the field of Finance, and concluded that about three quarters of words classified as negative by the Harvard Psychosocial Dictionary did not receive the same classification in the new word list.

They also proposed using a mathematical equation that not only takes into account the frequency of words in texts, but also measures their weight (term weighting: $w_{i,j}$, in line with equation 1 (Loughran & McDonald, 2011; Pagliarussi et al., 2016).

$$w_{i,j} = \begin{cases} \frac{(1+\log(tf_{i,j}))}{(1+\log(a_j))} \log \frac{N}{df_i} & \text{if } tf_{i,j} \geq 1 \\ 0 & \text{Otherwise} \end{cases} \quad (1)$$

Where,

$tf_{i,j}$ = Total occurrences of the word i in a document j ;

a_j = Proportion of words counted in a document j ;

N = Total number of documents in the sample;

df_i = Total number of documents with at least once occurrence of the word i .

The argument is that words that appear very frequently in the text do not necessarily provide more information than others that appear less frequently. One of the functions of the algorithm in Equation 1 is to decrease the importance of these terms (Loughran & McDonald, 2011).

Pagliarussi et al. (2016) used sentiment analysis to extract opinions from management reports of certain Brazilian companies from 1997 to 2009, and relate them to their abnormal returns, abnormal volume of business, and their stock price volatility. The authors did not find evidence indicating that the management reports influenced business in the stock market. The authors also developed an algorithm to analyze texts using the formula by Loughran and McDonald (2011) and created Portuguese word dictionaries that they think could be used for any text in the field of Finance.

The dictionaries built by Pagliarussi et al. (2016) are broad and consider some relevant points in adapting to the Portuguese language. Specifically, Pagliarussi et al. (2016) commented:

With the final list containing 22,879 distinct words, we proceeded with their classification as positive, negative, contentious, uncertainty related and modal. Some words can be classified in two or more categories (Loughran and McDonald, 2011). So, the uncertainty-related words list might contain words also occurring in the list of negative words. Another point mentioned by the authors

is that when including a word in the list of negative words, for example, consideration should also be given to the inclusion of its variants. We considered these issues in examining the words contained in the dictionary before closing the lists. The list of negative words contained 1,080 words, such as “crise,” “endividar,” “impacto,” “risco,” “limitado,” “perder,” “reduzir” and “prejuízo” (in English, “crisis,” “debt,” “impact,” “risk,” “limited,” “lose,” “reduce” and “loss”). In addition to the negative word list, we also classified words into four other categories: positive, litigious, uncertainty and modal. The list of positive words included 701 words. Positive words are usually expected to have little impact to evaluate a text’s tone (Loughran and McDonald, 2011). Many of the apparently positive words have their classification jeopardized by ambiguity, since they frequently occur in a context of negation (“did not improve”), although it is more difficult to convey positive news using negation of negative words (“did not worsen”). The list of uncertainty-related words included 170 words, such as “assumir,” “variações,” “especulação,” “eventualidade,” “imaginava,” “instabilidade” and “volatilidade” (in English, “to assume,” “variations,” “speculation,” “eventuality,” “imagined,” “instability” and “volatility”). Words sought in this case are those usually employed in scenarios of uncertainty and risk. As in Loughran and McDonald’s study (2011), some words from the uncertainty-related words list, such as “volatilidade,” “instabilidade” and “risco” (in English, “volatility,” “instability” and “risk”), are also present in the list of negative words. The litigious words list contained 492 words, such as “anulação,” “contestação,” “investigação,” “legalidade,” “legítimar,” “processual,” “recorrer” and “suborno” (in English, “annulment,” “defense,” “investigation,” “legality,” “to legitimize,” “procedural,” “appeal” and “bribery”). Finally, building of the modal word list took into consideration words that express degrees of certainty or obligation. Examples of modal words are “possível,” “provável,” “improvável,” “necessário,” “talvez,” “deve,” “claramente,” and “compulsório,” (“possible,” “likely,” “unlikely,” “necessary,” “maybe,” “ought,” “clearly” and

“compulsory”). The modal list contained 81 words. We prepared the lists out of a corpus that includes an excess of 8 million words occurring in texts directed primarily to the stakeholders of the Brazilian capital market. (p.57)

Even in Brazil, Nascimento, Osiek, and Xexéo (2015) used sentiment analysis to investigate the reaction of the population to news published by the media, and capture the reactions to comments posted on the social network Twitter.

METHODOLOGY

Data collection and treatment

Three computational programs were used to collect and treat the data. The first two, developed in Java, download the daily editions of the *Valor Econômico* newspaper (just the free part) from their website. The third was developed in Python by Pagliarussi et al. (2016), and was used to perform the sentiment analysis of the files produced by the first two.

The sample period extended from January 2, 2012 to December 30, 2016, due to the availability of the *Valor Econômico* newspaper on the website. Days on which the newspaper did not circulate or on which BM&FBovespa was not open were excluded from the database. Consequently, the sample consisted of 1,237 daily editions of the newspaper disseminated in both print and electronic media, from which the tones of the news stories were extracted.

The editorial sections of the newspaper, which were considered in the full sample of the news database, are Brazil, Politics, Finance, Companies, Agribusinesses, International, Opinion, Legislation, Careers, Culture, and Style. In addition, a sub-sample was considered, called a filtered edition, from which the sections that are not primarily related to the development of Brazilian capital markets were removed. The subsample with the filtered edition was composed considering the following sections: Brazil, Politics, International, and Finance.

Every edition is saved in a .txt format file named by the year, month, and day of release (for example, “20120307.txt” for complete editions and “20120307-BPIF.txt” for filtered editions.) This approach was chosen because it would optimize data organization.

With respect to the first two algorithms, Exhibits 1 and 2 provide an example of their functionality. The following news report was taken from the May 15, 2013 edition of the *Valor Econômico* newspaper.

Exhibit 1. First news report from the 5/15/2013 edition (complete edition)

Auctions attract investments of R\$ 7 billion in petroleum
The planned investments of the companies that yesterday purchased exploratory areas for petroleum and gas are estimated at R\$ 7 billion. The 11th ANP bidding round, scheduled to end today, concluded in a single day and warranted strong government commemoration.

Source: *Valor Econômico* (2013).

Note: Text originally written in Portuguese.

In the generated file (“20130515.txt”), presented in the following image, the text in Figure 1 is transformed into:

Exhibit 2. Part of the text in the file “20130515.txt”

Auctions attract investments of R\$ 7 billion in petroleum.
The planned investments of the companies that yesterday purchased exploratory areas for petroleum and gas are estimated at R\$ 7 billion. The 11 ANP bidding round, scheduled to end today, concluded in a single day and warranted strong government commemoration.

Source: *Valor Econômico* (2013).

Note: Text originally written in Portuguese.

Comparing both images it can be observed in Exhibit 2 that all special characters or those with accents were removed or replaced with their non-accented counterparts. For example: “ã” was replaced with “a”, “ê” with “e”, and “ç” with “c”. Meanwhile, “ã” was eliminated, and so on.

These replacements became necessary owing to compatibility issues with the compiler (Python) used. When these characters were present, the algorithm did not identify the words that they contained, indicating that they were missing from the sentiment analysis process. This would generate incorrect values for the primary variables. The same error was also reported by Pagliarussi et al. (2016).

The control variables used are the three factors provided by Fama and French (1993): Small Minus Big (SMB) and High Minus Low (HML), with Market Factor (market risk subtracted from a risk-free interest rate) excluded, given that the dependent variable is directly related to market risk. Factors provided by Carhart (1997) and Amihud (2002) were also included: Winners Minus Losers (WML) and Illiquid Minus Liquid (IML), respectively.

The Bovespa and IBrA indices were chosen for the dependent variables. This choice is because the first is the most used in Brazil and that the second has the largest number of companies.

To illustrate, Table 1 presents a brief comparison of the two indexes.

Table 1. Comparison of Ibovespa and IBRA

	Ibovespa		IBRA	
Number of companies	59		115	
Total of top 10 companies	55.14%		49.37%	
Total of top 20 companies	75.04%		67.83%	
Greatest participation	ITUB4	11.29%	ITUB4	10.02%
Second greatest participation	BBDC4	7.99%	BBDC4	7.09%
Third greatest participation	ABEV3	7.31%	ABEV3	6.49%

Source: Adapted from BM&FBovespa Ibovespa (2015a); BM&FBovespa IBRA (2015b, 2015c).

Operationalization of the Loughran and McDonald (2011) equation

To simplify the construction of the tone variables, we present an operationalization of the calculations in this section.

In the following example, a dictionary of negative words was used that contains just the terms “mensalao” (a neologism roughly meaning “large monthly payments,” which is linked to a vote-buying scandal in Brazil) and “loss” (as neither of these words have accents and when used, the Python version 2.7 does not identify them, excluding them from the analysis. This process was used in all analyses).

Exhibits 3, 4, and 5 show portions of the June 11, 12, and 13 editions, respectively, from 2012. Only a small portion of these newspapers was used, as the figures would otherwise be very long without affecting the mathematical analysis.

Exhibit 3. Part of file 20120611.txt

Brazil Congress Candidates use CPI against opponents in municipal elections. A coincidence in timing has encouraged politicians to use research to try to weaken opposing political groups. Revenue for a bad mayor. We can rule out bad mayoral candidates by seeing if they discuss topics fundamental to the city or if they avoid them. A 2014 dispute is motivating Alckmin and Kassab to search for allies for Serra. Current alliance is circumstantial and does not rule out confrontation between the two in the next elections. PT chooses name for vice of Lacerda. Tucano launches candidacy to the City of Rio. International Energy USA buys less petroleum abroad. Country reduces dependency on imported petroleum, thanks to an increase in domestic production, more efficient engines, and the use of ethanol. Shorts Data dispels pessimism over China. Numbers released over the weekend indicate a much stronger economy than what many in the market feared one week ago. Parallel dollar out of control in Venezuela. Bolivar suffers record losses in the parallel market in Venezuela while individuals race due to the shortage of American currency. March of anti-Chavez. Special Juncture Industrial production suffers but confidence improves in benefited sectors. Clothing and footwear manufacturing still skates, but entrepreneurs report improved confidence after payroll tax relief. Country needs to stimulate growth in the private sector, says Araujo valor.com.br. Arrogance reigns there as much as here. With a little tolerance, it is possible to look upon our southern neighbors without preconceived notions or conservative biases. Flu vaccination slows and specialists are already discussing the anticipation of campaigns. Flu vaccine delivery delayed and governments and experts anticipate upcoming vaccination campaigns. Infrastructure Public investment in transportation in 2012 is not jumping off the page.

Source: *Valor Econômico* (2012).

Note: Text originally written in Portuguese.

Exhibit 4. Part of file 20120612.txt

Some exchange any gift for a ride on wheels alongside the half-face. On Valentine's Day, we tell stories with a happy ending and hide those that are not publishable. Brazil Congress Ruralistas defend Mendes Ribeiro. Minister has been stripped of authorization by the president in negotiations relating to the Forest Code. Curtas Dirceu waiting for Armageddon 4. On the eve of the trial of the mensalao defendants, former minister calls on students for the “final battle.” Federal pact commission maintains unanimity requirement in Confaz. Group of 14 experts called on by the president of the Senate, Jose Sarney, also favors the adoption of the IPCA for the indexation of state debts valor.com.br Commission will investigate Pimentel's use of plane. Committee decided to deepen investigations of consulting services provided by the ministry. Elections Freixo launches with appeal for a “Rio de Janeiro” spring. 1 PSOL candidate has the support of artists and composers, like Caetano Veloso and Chico Buarque. Truth Commission endorses calling agents of the dictatorship. Regional Truth Commissions will be allowed to call alleged torturers by the national body. At stake is information that can be used to sell advertising on mobile devices. Aviation TAM stock fell by 2.09% on the eve of the creation of Latam. Brazilian airline closes capital today and the Chilean Lan will negotiate BDRs on the BM&FBovespa. Europeans must have losses of 1.1 billion US dollars. Airlines offer iPads to passengers to reduce costs. Arezzo shoes starts expanding a more expensive brand. Schutz franchise project allows a looser gross margin to higher-end stores. Health Sabara must replicate AACD model. Eduardo Carneiro, from the Sabara hospital, calculates that in 2014, it will reach a balance. Vapza Foods reduces package and attracts women.

Source: *Valor Econômico* (2012).

Note: Text originally written in Portuguese.

Figure 5. Part of file 20120613.txt

Sentencing for the mensalao is still delayed. None of the 38 accused in the mensalao will be arrested in the Federal Supreme Court decision, scheduled to begin on August 1, and unlikely to end before September. Brazil Government CGU prohibits Delta from closing new contracts. Company inequity, decided by CGU, extends to states and municipalities. The historical crossroads of the mensalao 6. The trial decided not only the future of the 38 accused, but also the route or path that Brazil will take. Perillo's testimony should lead CPI to back off from its breach of secrecy. PT and PSDB deny non-aggression agreement in relation to their governors. Cachoeira got a vote for habeas corpus. Chamber approves MP that simplifies PAC biddings. A new kind of European union. If it seems unlikely that current policies work, I suggest a combination of two ideas: insurance-based bonds and adjustment-based bonds. Judiciary Resources may take mensalao to 2013. In a process marked by uncertainty, the only certainty is that no one will go to jail due to the Supreme Court case. Ayres Britto denies pressure on STF. Companies Oil Comgas will be BG's client in the presal. Comgas will be able to buy the British part of the gas produced in the Lula field. Featured Bankruptcy motion Accounting Brazil sends more resources to the IFRS. Endowment increases 16%, but the contribution of the country to the foundation that governs international accounting is still small. Stock offer Facebook investor sues stock market.

Source: *Valor Econômico* (2012).
 Note: Text originally written in Portuguese.

Using the formula proposed by Loughran and McDonald (2011) presented in Equation 1 to complete the sentiment analysis of the texts contained in the boxes above yields:

In Exhibit 1, neither of the two words was found; therefore, the result is obtained according to the equations below:

$w_{loss, 20120611} = 0$ (A)	(A)
------------------------------	-----

$w_{mensalao, 20120611} = 0$ (B)	(B)
----------------------------------	-----

Meanwhile, in Figure 2, both words appear once in the text; solving the equation for this case yields:

For the calculation of the word “loss,” the values are as follows:

$tf_{loss, 20120612} = 1$ (There is just one occurrence in document 20120612);

$N=3$ (Document total, three newspapers);

$df_{loss} = 1$ (Only occurs in one document).

Calculating $a_{20120612}$:

$a_{20120612} = \frac{nc}{nt}$	(C)
--------------------------------	-----

Where:

nc = Sum of occurrences of words “loss” and “mensalão”

nt = Sum of a single presence of each dictionary word in the document analyzed.

$a_{20120612} = \frac{2}{2} = 1$	(D)
----------------------------------	-----

Improving on the explanation of the calculation of a_j , in Exhibit 2, both the words “mensalão” and “loss” appear once, making equation D the result of this analysis. If, for example, “mensalão” were to have occurred twice, and “loss” just once, then the new value of $a_{20120612}$ is $a_{20120612} = 1.5$ because $nc = 3$ while $nt = 2$. For Exhibit 5, it is possible to find the word “mensalão” four times, while “loss” does not appear. In this way, the result of $a_{20120612}$ is

$a_{20120613} = \frac{4}{1} = 4$	(E)
----------------------------------	-----

Replacing the values in equation (1)

$w_{loss, 20120612} = \frac{(1+\ln(1))}{(1+\ln(1))} \ln \frac{3}{1}$	(F)
--	-----

$w_{loss, 20120612} = \ln 3$	(G)
------------------------------	-----

$w_{loss, 20120612} = 1.098612289$	(H)
------------------------------------	-----

For the calculation of the word “mensalão,” the values are as follows:

$tf_{mensalao, 20120612} = 1$ (There is just one occurrence in document 20120612);

$N = 3$ (Document total, three newspapers);

$df_{mensalao, 20120612} = 2$ (Occurs in two documents, 20120612 and 20120613).

$a_{mensalao, 20120612} = 1$ (Result of equation D)

Again, substituting the values in equation (1)

$w_{mensalao, 20120612} = \frac{(1+\ln(1))}{(1+\ln(1))} \ln \frac{3}{2}$	(I)
--	-----

$w_{mensalao, 20120612} = \ln 1.5$	(J)
------------------------------------	-----

$w_{mensalao, 20120612} = \ln 0.405465$	(K)
---	-----

Summing the two values yields

$w_{loss, 20120612} + w_{mensalao, 20120612} = \ln 1.504077$	(L)
--	-----

The value found in equation K is the weight of the words (for the dictionary of negative words used in this example) for the day of June 12, 2012.

Finally, in Exhibit 3, the word “loss” does not occur, making the result $w_{loss, 20120612} = 0$. In this case, “mensalão” appears four times. The calculation in this case is as follows:

$tf_{mensalao, 20120612} = 4, a_{20120613} = 4, N=3, df_{mensalao} = 2$

Replacing these values in equation (1)

$w_{mensalao, 20120612} = \frac{(1+\ln(4))}{(1+\ln(4))} \ln \frac{3}{2}$	(M)
--	-----

$w_{mensalao, 20120612} = \ln 1.5$	(N)
------------------------------------	-----

$w_{mensalao, 20120612} = 0.405465$	(O)
-------------------------------------	-----

The value determined in equation M is the value of the weight of negative words on the day of June 13, 2013.

To calculate the weight of each word in the sample presented in Exhibits 1, 2, and 3, all of the w_{ij} must be summed for “loss” and “mensalão.” The equations for P and Q simplify as

$w_{loss, 20120611} + w_{loss, 20120612} + w_{loss, 20120613} = 1.504077$	(P)
---	-----

$w_{mensalao, 20120611} + w_{mensalao, 20120612} + w_{mensalao, 20120613} = 1.81093$	(Q)
--	-----

Econometric models

The dependent variables are ibov, ibra, ibov_vol, and ibra_vol. These represent the daily profitability (equations 4 and 12) and volatilities (equations 6 and 13) of Ibovespa and IBrA, respectively.

The independent variables are the weight of the negative, positive, litigious, uncertain, and modal (primary variables) words (term weighting) and SMB, HML, WML, IML, and riskfree (control variables). In addition, SMB_vol, HML_vol, WML_vol, IML_vol, and riskfree_vol, which are the respective volatilities of the control variables, were added when the dependent variables were the volatility of both the indices.

Equations 2 and 3 represent the econometric models in which the dependent variables are related to the Bovespa Index.

$ibov = \beta_0 + \beta_1 negatives + \beta_2 positives + \beta_3 litigious + \beta_4 uncertainty + \beta_5 modals + \beta_6 SMB + \beta_7 HML + \beta_8 WML + \beta_9 IML + \beta_{10} riskfree + u$	(2)
---	-----

$ibov_vol = \beta_0 + \beta_1 negatives + \beta_2 positives + \beta_3 litigious + \beta_4 uncertainty + \beta_5 modals + \beta_6 SMB + \beta_7 HML + \beta_8 WML + \beta_9 IML + \beta_{10} riskfree + \beta_{11} SMB_vol + \beta_{12} HML_vol + \beta_{13} WML_vol + \beta_{14} IML_vol + \beta_{15} riskfree_vol + u$	(3)
---	-----

In which:

$ibov_t = \ln \frac{B_t}{B_{t-1}} \quad (4)$
--

In which

t = A date (business day), ranges from January 2, 2012 to December 30, 2014.

B_t = Closing value of the Bovespa Index for a given day (ex.: $B_{01/08/13} = 49.140$).

B_{t-1} = Closing value of the Bovespa Index on the preceding day t (ex.: $B_{31/07/13} = 48.234$). With respect to the volatility ($ibov_vol_t$), the formula is as follows:

$ibov_vol_t = \sqrt{\frac{1}{n-1} \sum_{i=t}^n (x_i - \bar{x})^2} \quad (5)$

Similarly to Equations 2 and 3, Equations 6 and 7 now have a dependent variable related to the IBRA.

$ibra = \beta_0 + \beta_1 \text{negatives} + \beta_2 \text{positives} + \beta_3 \text{litigious} + \beta_4 \text{uncertainty} + \beta_5 \text{modals} + \beta_6 \text{SMB} + \beta_7 \text{HML} + \beta_8 \text{WML} + \beta_9 \text{IML} + \beta_{10} \text{riskfree} + u \quad (6)$

$ibra_vol = \beta_0 + \beta_1 \text{negatives} + \beta_2 \text{positives} + \beta_3 \text{litigious} + \beta_4 \text{uncertainty} + \beta_5 \text{modals} + \beta_6 \text{SMB} + \beta_7 \text{HML} + \beta_8 \text{WML} + \beta_9 \text{IML} + \beta_{10} \text{riskfree} + \beta_{11} \text{SMB_vol} + \beta_{12} \text{HML_vol} + \beta_{13} \text{WML_vol} + \beta_{14} \text{IML_vol} + \beta_{15} \text{riskfree_vol} + u \quad (7)$
--

Where

$ibra_t = \ln \frac{A_t}{A_{t-1}} \quad (8)$
--

In which:

t = A date (business day), ranges from January 2, 2012 to December 30, 2014.

A_t = Closing value of the IBRA for a given day t .

A_{t-1} = Closing value of the IBRA before day $(t - 1)$

With respect to the volatility ($ibra_vol_t$), the formula is as follows:

In which:

n = Number of days (ex: $n = 60$, value used in this work).

i = A given day, begins on t and goes until $t - 59$ (ex: $t =$ August 1, 2013, $t - 1 =$ July 31, 2013, $t - 2 =$ July 30, 2013, ..., $t - 59 =$ May 8, 2013).

x_i = Value of $ibov_t$ on a given date (ex.: $ibov_{01/08/2013} = 1.86\%$).

\bar{x} = Mean value of $ibov_t$ within a certain period t until $t - 59$ (60 business days).

The methodology used to calculate the variables SMB_vol, HML_vol, WML_vol, IML_vol, and riskfree_vol was the same as applied to obtain the result for $ibov_vol$, changing, evidently, the values for $ibov$ in x_i and \bar{x} for the respective values of SMB, HML, WML, IML, and riskfree.

$ibra_vol_t = \sqrt{\frac{1}{n-1} \sum_{i=t}^n (x_i - \bar{x})^2} \quad (9)$

In which:

n = Number of days (ex: $n = 60$, value used in this work).

i = A given day, begins on t and goes until $t - 59$ (ex: $t =$ August 1, 2013, $t - 1 =$ July 31, 2013, $t - 2 =$ 7/30/2013, ..., $t - 59 =$ May 8, 2013).

x_i = Value of $ibra_t$ on a given date (ex: $ibra_{01/08/2013} = 1,84\%$).

\bar{x} = Mean value of $ibra_t$ within a certain period t until $t - 59$ (60 business days).

The daily Ibovespa closing values (used in B_t and B_{t-1}) were extracted from the database of the Institute for Applied Economic Research (IpeaData, 2015), while those for IBrA (referred in A_t and A_{t-1}) were retrieved from the BM&FBovespa database.

The variables SMB, HML, WML, IML, and riskfree were obtained from the website of the Center for Financial Economic Research (Nefin), connected to the Economics Department of the School of Economics, Business Administration, and Accounting of the University of São Paulo.

In all the econometric models, the applied method to estimate the parameters was that of ordinary least squares (OLS), using fixed effects for year and cluster-robust standard errors.

Hypothesis and expected behavior

From the econometric equations presented in the previous section (profitability: Equations 2 and 6; and volatility: Equations 3 and 7), the tested variables are the weight of the negative; positive; litigious; uncertainty; and modal words (primary variables). Thus, using “negative” as an example, the hypothesis is that if β_i is equal to zero, it means that the “negative” variable does not affect what returns, this possibly being, *ibov*, *ibov_vol*, *ibra*, and *ibra_vol*. Otherwise, it would not be possible to discard “negatives” from the previously mentioned equations. The same example works with the variables “positives”, “uncertainty”, “litigious”, and “modals”; however, changing the value of Beta (β) for its respective value.

Staying with the primary variables, “negatives” have negative signs in Equations 2 and 6 (related to daily profitability of the indices), and positive signs in Equations 3 and 7 (related to volatility). The opposite effect is expected for the “positives” or rather, positive signs in Equations 2 and 6 and negatives in Equations 3 and 7 (Tetlock, 2007; Tetlock et al., 2008).

Like the “negative” variable, the “uncertain” and “litigious” ones yield a lower profitability (negative sign) in Equations 2 and 6, and positive in Equations 3 and 7. It is believed that a greater weight of these words in newspapers increases uncertainty about the direction the market will take.

Finally, there are no expectations on “modals” with respect to signs of profitability and volatility.

RESULTS

Word analysis (term weighting)

Table 2 shows the most heavily weighted words within the sample of collected newspapers. When comparing the results in

the two tables, there is significant difference between the most heavily weighted words in both cases. For instance, the word “development,” which belongs to the positive category, was the most weighted (significant) in Table 2 for both every individual year and all the years pooled together. Nonetheless, in Table 3, this word was not among the top five of the most significant words, in any case.

Another interesting example is the word “mensalão,” which belongs to the negative category. Returning to the tables, “mensalão” was the most heavily weighted word in 2012, with a weight equal to 99.78, according to Table 2. However, in Table 3, for the same year, “mensalão” appeared in the second position, with a higher weight equal to 103.85. Respectively, “mensalão” appeared 313 times in the sample that contained all the editions and 255 times in the sample with filtered editions.

The difference between the results above can be explained by how Equation (1), used in the algorithm by Pagliarussi et al. (2016), treats the data.

Descriptive statistics

Table 3 displays descriptive statistics of the main variables for the complete and filtered editions, respectively. For the complete editions, the negative words (in average) were weighted more, followed by the positive and litigious words. Words in the modal and uncertainty category exhibited the lowest values, respectively.

A similar situation occurs in the case of the filtered editions. However, these showed lower average, median, maximum, and minimum values. Besides, the standard deviation also presented lower values. The lower number of words within that sample explains this outcome.

Similarly to the study by Davolos, Rogers, Silva, and Oliveira (2013), to contribute to the understanding of the obtained results, Table 4 shows the main news published in *Valor Econômico* over 24 days with the highest returns and 24 days with the lowest returns in Ibovespa, in the analyzed period. In Panel A, on the days with the highest returns, reports with a positive tone, of a political nature, and relating to great impacts on the economy dominate the news. Similarly, Panel B is dominated by economic and political news with a negative tone.

Regression analysis

Table 5 displays the results of the estimations from Equation 2 and 6. The dependent variables are: “*ibov*” and “*ibra*,” which are

the daily profitability of the Bovespa Index and IBRA, and “ibov_vol” and “ibra_vol,” which represent the volatility of both indices calculated over a period of 60 days.

To organize the table better, it was decided to differentiate between the dependent variables of the sample composed of all the editions and the sub-sample, in which only the following sections were analyzed, Brazil, Politics, International, and Finance.

The results show that the weight of words with “uncertainty” tone is statistically relevant in explaining Ibovespa returns when all editions are considered, as well as Ibovespa and IBRA returns when only the filtered editions are considered. Words with a “Negative,” “Positive,” and “Modal” tone were not significant in any of the equations.

Table 2. Term weighting

	All editions		Filtered editions	
Negatives	loss	468.17	crisis	468.21
	discount	454.96	inflation	467.42
	deficit	444.88	deficit	460.46
	low	432.67	risk	447.71
	cut	431.63	reduction	445.41
Positives	development	434.53	growth	484.31
	grew	422.64	investments	480.18
	invests	421.81	investment	472.50
	trust	417.36	grow	454.24
	gain	417.03	trust	393.26
Litigious	judicial	434.78	resources	471.03
	law	431.58	disputes	446.57
	contract	429.32	fiscal	444.62
	contracts	424.17	rules	427.87
	creditors	420.01	law	406.82
Uncertainty	risks	447.18	wait	459.93
	expectation	438.80	risk	449.52
	possible	430.78	expectation	397.10
	expectations	423.16	risks	377.11
	tendency	417.41	expectations	350.87
Modals	high	336.89	less	415.24
	little	328.24	smaller	413.83
	large	322.16	strong	407.08
	majority	321.18	large (pl.)	370.45
	greater	314.71	little	354.36

Table 3. Descriptive statistics

		Negatives	Positives	Uncertainty	Litigious	Modals
Complete editions	Mean	59.381	33.807	14.576	24.317	6.853
	Median	39.015	23.753	15.683	20.963	5.093
	Maximum	107.302	69.974	34.512	58.325	22.062
	Minimum	15.418	8.815	1.909	3.145	0.486
	Standard deviation	13.988	10.603	5.711	9.001	3.157
Filtered editions	Mean	37.334	18.835	9.199	14.017	6.066
	Median	24.620	15.317	5.048	11.821	3.282
	Maximum	81.015	55.908	30.563	49.683	25.578
	Minimum	10.229	0.000	0.000	0.000	0.000
	Standard deviation	11.288	8.147	5.118	7.736	3.613

Table 4. Main news stories published on the days that Ibovespa fluctuated the most between January 2012 and December 2016

Panel A. Most positive returns over the period and the news of the day			
Date	Ibovespa	% day	News
Oct. 22, 2014	56,432.03	+7.75%	Abstentions should reach record level in the 2nd round
			“Kit elections” still have speculative gains
Mar. 17, 2016	50,886.40	+6.66%	Clip of Lula and Dilma plunges country into political chaos
			Federal Reserve cuts interest rate hike
Mar. 3, 2016	47,288.28	+5.65%	Cunha must become defendant, but says that he will not resign
			Distant from PT, Dilma seeks to save mandate
Nov. 21, 2014	56,055.06	+4.96%	Weak economy and strong dollar decrease profits
			Marina supports Aécio and cites “Letter to the Brazilians”
Jul. 27, 2012	56,515.35	+4.70%	Government only agrees to linear increase to servant
			Credit grows and default retreats discretely
Nov. 3, 2015	48,023.72	+4.65%	Accounting of interest and dollar already impacts balance sheets
			MP and PF open six fronts of investigation against Lula
Aug. 24, 2015	44,312.77	+4.63%	Government plans to raise taxes next year
			Midsized bank profit down 43%

Continue

Table 4. Main news stories published on the days that Ibovespa fluctuated the most between January 2012 and December 2016

Panel A. Most positive returns over the period and the news of the day			
Date	Ibovespa	% day	News
Oct. 6, 2014	57,013.57	+4.57%	Votes maintain PT-PSDB polarization
			Performance of Aécio Neves should boost the market
Jan. 29, 2016	40,263.28	+4.53%	Oil field concessions will be extended
			Petrobras wants to pull out of various areas
Oct. 28, 2014	52,294.96	+4.42%	Lula makes three nominations for Fazenda
			Companies request definitions from Dilma
Feb. 22, 2016	43,304.60	+4.18%	Renegotiation of state debts raises deficit
			Commodity manufacturers drop GDP
Nov. 7, 2016	64,092.86	+4.16%	Government wants to change law to intervene in Oi
			FBI files new case against Hillary
Oct. 31, 2014	54,666.09	+4.14%	Interest should continue rising
			Vale loss of R\$ 3 bn surprises
May 10, 2016	53,051.05	+4.08%	Renan ignores Maranhão and continues with the impeachment
			BC president loses minister status
Mar. 4, 2016	49,168.99	+3.98%	Recession spreads and threatens country
			Accusation of Delcídio encourages supporters of impeachment
Apr. 12, 2016	52,068.20	+3.94%	Chamber Commission approves opening impeachment
			Market already indicates change of government
May 21, 2012	56,583.31	+3.83%	CGU sees irregularities in FGTS applications
			Dividend already yields more than real interest
Jan. 3, 2012	59,224.75	+3.82%	2012 concessions will demand investments of R\$ 90 bn
			Exports feel the weight of the crisis
Dec. 9, 2015	46,082.81	+3.82%	Impeachment in the hands of the opposition
			Commodity decline deepens
Oct. 2, 2015	47,012.50	+3.80%	Measure broad power of BC and CVM to investigate and punish
			Petrobras investment halves

Continue

Table 4. Main news stories published on the days that Ibovespa fluctuated the most between January 2012 and December 2016

Panel A. Most positive returns over the period and the news of the day			
Date	Ibovespa	% day	News
Dec. 17, 2014	48,722.59	+3.67%	Russia crisis presses emerging markets
			For Levy, fiscal adjustment even more urgent
Aug. 27, 2015	47,689.07	+3.60%	Government will propose the return of the CPMF to cover gap
			Entrepreneur listens to Dilma and presses Levy
Jan. 2, 2013	62,761.20	+3.55%	Industry should have a “slack” in costs of 20% in 2013
			Economists predict GDP above 3%
Sep. 13, 2012	61,979.58	+3.45%	Deceleration is good for China and the world
			Companies default at record pace
Panel B. Most negative returns over the period and the news of the day			
Date	Ibovespa	%	News
Oct. 15, 2014	56,134.11	-3.18%	Decay of petroleum puts an end to gasoline lag
			Dilma could veto new exonerations
May 17, 2012	54,022.06	-3.28%	Crisis tends to slow recovery for 2013
			Greek banks lose credit and deposits
Jul. 10, 2012	53,581.92	-3.31%	Electricity companies push to define contracts
			Ibama speeds up licenses for petroleum and gas
Oct. 16, 2014	54,270.88	-3.32%	Decay of petroleum threatens Petrobras investments
			Deceleration crashes markets around the world
Dec. 8, 2014	50,246.99	-3.35%	Lack of water becomes a risk factor for credit
			Government predicts burden increase in LDO
Oct. 10, 2014	55,317.26	-3.41%	Whistleblowers revealed tipping scheme at Petrobras
			Equating debt is the main objective of Oi
Jun. 10, 2016	49,337.70	-3.42%	Fraga suggests a longer deadline to the goal of 4.5%
			Accusations to mark US election
Jun. 19, 2013	47,742.76	-3.44%	Bad mood hits market and mega-deal is canceled
			Fed victims spend a day hoping
May 14, 2012	57,411.51	-3.50%	Banks intensify the increase in tariffs
			Unpredictable performance of fixed income

Continue

Table 4. Main news stories published on the days that Ibovespa fluctuated the most between January 2012 and December 2016

Conclusion

Panel B. Most negative returns over the period and the news of the day			
Date	Ibovespa	%	News
Oct. 21, 2014	52,373.42	-3.50%	Business profit expected to fall 10% in the 3rd quarter
			Fundos try to attract resources abroad
Dec. 12, 2014	48,012.83	-3.55%	CEO of Petrobras says he warned Graça about abuse
			Electricity bill increases the January IPCA
Mar. 15, 2016	47,098.11	-3.59%	Judge passes Moro's arrest warrant and Lula will be minister
			Congress discusses how to remove Dilma
Apr. 4, 2016	48,746.98	-3.61%	Business debts grow 24%
			The results of the developers are falling
Oct. 27, 2014	50,083.17	-3.63%	Dilma, re-elected, promises dialogue
			Tight win keeps Lula under the spotlight
Sep. 9, 2016	57,952.98	-3.70%	Government employee earns up to 200% more than a private one
			Grows reaction to the increase in servers
Jul. 2, 2013	45,244.99	-4.13%	By decree, BNDES helps in surplus
			Dilma denies ministerial reform
Oct. 13, 2015	47,346.20	-4.19%	Agreements to reduce wages and work hours progress
			Cornered, Cunha dispatches impeachment today
Nov. 11, 2016	58,827.82	-4.21%	"Trump Effect" increases the value of the dollar and generates turbulence
			China resumes offensive for TPP without United States
Dec. 1, 2016	59,466.33	-4.23%	Economy melts and pressure grows due to interest cuts
			States may win 'recovery law'
Feb. 2, 2016	38,770.10	-4.27%	Brazilian bonds pay high interest and see attraction
			Steel crisis
Dec. 1, 2014	52,218.40	-4.43%	Levy wants new business financing model
			Remains to pay already exceed investment forecast
Sep. 29, 2014	54,599.67	-4.57%	Government starts siege on employment fraud
			BC resists transaction between BTG and Nacional
Oct. 24, 2014	51,968.04	-7.91%	Market reflects progress of Dilma
			Whistleblower also cites corruption at Eletrobras
Aug. 21, 2015	42,352.03	-9.09%	Janot asks 184 years in prison for Cunha
			Fear will break out of government articulation

Table 5. Relationship between news tone and return

	Complete editions		Filtered editions	
	Ibov	Ibra	Ibov	Ibra
Negative	0.0000274	0.0000334	0.0000325	0.0000471
	(-0.99)	(-1.11)	(-1.29)	(-1.78)
Positive	0.00000981	0.000011	0.0000337	0.0000391
	(-0.55)	(-0.62)	(-1.91)	(-1.75)
Uncertainty	-0.0000951**	-0.0000545	-0.0000801*	-0.0000774*
	(-3.51)	(-1.83)	(-2.52)	(-2.43)
Litigious	0.0000435	0.0000482	-0.0000142	-0.00000187
	(-1.34)	(-1.34)	(-0.37)	(-0.04)
Modal	0.000119	0.000132	-0.0000605	-0.0000659
	(-1.3)	(-1.76)	(-0.63)	(-0.73)
SMB	0.324*	0.195	0.321*	0.192
	(-2.54)	(-1.23)	(-2.51)	(-1.21)
HML	0.590**	0.505**	0.584**	0.499**
	(-3.90)	(-3.04)	(-3.85)	(-3.00)
WML	-0.357**	-0.258*	-0.357**	-0.256*
	(-3.74)	(-2.43)	(-3.76)	(-2.43)
IML	-1.205***	-0.963**	-1.203***	-0.961**
	(-6.48)	(-4.26)	(-6.35)	(-4.18)
Riskfree	1.691	-1.628	0.438	-2.618
	(-0.21)	(-0.17)	(-0.05)	(-0.26)
Constant	-0.00313	-0.00239	-0.000468	0.000542
	(-0.69)	(-0.48)	(-0.09)	(-0.10)
Fixed year effect	yes	yes	yes	yes
N	1237	1237	1237	1237
R ²	0.496	0.436	0.494	0.434

Note: Coefficients in the first row and p-value statistics in parentheses in the second row of each variable ($\alpha < 10\%$ *, $\alpha < 5\%$ ***, $\alpha < 1\%$ ***).

Generally, the control variables, SMB, HML, and WML and riskfree are statistically significant, demonstrating the estimation adequacy of the four-factor model by Fama and French (1993).

Table 6 shows the results for the estimates of Equations 3 and 7. These data display less robust evidence and demonstrate that only words with a negative tone in the sub-sample show a positive association with the volatility of Ibovespa. This result, not entirely as expected based on international literature (Tetlock, 2007; Tetlock et al., 2008), can be explained by the high volatility of the Brazilian market when compared to the volatility of the North American market.

Table 6. Relationship between news tone and volatility

	Complete editions		Filtered editions	
	Vol Ibov	Vol Ibra	Vol Ibov	Vol Ibra
Negative	0.00000926	0.00000441	0.0000160**	0.00000815
	(-1.59)	(-0.92)	(-2.99)	(-1.10)
Positive	0.0000016	0.00000124	-0.00000547	-0.00000639
	(-0.26)	(-0.24)	(-0.72)	(-0.90)
Uncertainty	0.00000504	0.00000892	-0.0000104	-0.00000177
	(-0.99)	(-1.63)	(-1.82)	(-0.25)
Litigious	0.00000551	0.00000737	0.00000116	0.00000374
	(-0.62)	(-0.83)	(-0.09)	(-0.28)
Modal	-0.0000169	-0.00000986	0.00000021	-0.00000071
	(-1.28)	(-1.38)	(-0.02)	(-0.08)
SMB_vol	-0.958	-0.948	-0.958	-0.945
	(-1.20)	(-1.30)	(-1.21)	(-1.31)
HML_vol	0.418	0.766**	0.422	0.774**
	(-1.26)	(-3.77)	(-1.28)	(-3.86)
WML_vol	0.384	0.182	0.381	0.177
	(-2.05)	(-1.34)	(-2.05)	(-1.31)
IML_vol	1.783*	1.416	1.783*	1.414
	(-2.14)	(-1.70)	(-2.16)	(-1.72)
Riskfree_vol	284.0**	164.5**	284.2**	163.2**
	(-3.18)	(-2.82)	(-3.18)	(-2.83)
Constant	0.000519	0.000306	0.000824	0.000623
	(-0.20)	(-0.13)	(-0.32)	(-0.27)
Fixed year effect	yes	yes	yes	yes
N	1237	1237	1237	1237
R ²	0.496	0.436	0.494	0.434

Note: Coefficients in the first row and p-value statistics in parentheses in the second row of each variable ($\alpha < 10\%$, $\alpha < 5\%$, $\alpha < 1\%$ ***).

FINAL CONSIDERATIONS

The objective of this work was to apply the sentiment analysis technique to daily editions of the *Valor Econômico* newspaper, to investigate the existence of a relationship between profitability and the volatility of Ibovespa and IBrA and the tone of news published by daily, printed media, specializing in Economy and Finance in the Brazilian market.

There is some discrepancy in “negative” terms, between the values found on this study and those in the literature. It was expected that, in line with Tetlock (2007) and Tetlock et al. (2008), a higher number of negative terms would lead to unfavorable effects on profitability (decreasing) and volatility (increasing). This was the case in the Brazilian market, but only for volatility and with weaker evidence. On the other hand, as expected from the evidence in the North American market, the terms classified under “uncertainty” showed a negative association with daily profitability in both Ibovespa and IBrA

From the dictionaries used in this study, words classified under “negative” and “uncertainty” were relevant, in contrast with words with a “positive,” “litigious,” and “modal” tone. In this sense, a greater number of these terms in the daily edition of *Valor Econômico* could have consequences associated with market profitability and/or volatility. In other words, the evidence indicates that the market accords greater weight to words published by the specialized media that are negative or convey uncertainty.

This study aims to contribute to the research on the impacts of qualitative information from textual analysis within Brazil.

The evidence obtained from this study points to the relevance of the specialized media in Brazil, and to the existence of informative content in published news. The results can motivate capital market participants to use this method, along with others such as machine learning, to predict the behavior of variables in the market (Cambria, 2016; Tripathy et al., 2016). Additionally, investors can benefit from the results of this study, as a relationship is evident between the tones extracted from published news in the specialized media in Brazil and stock profitability and/or volatility during the day of the analysis.

This study has some limitations. Note that it investigates a relationship between weight/tone of words and the market as a whole (using the Bovespa Indices and Brazil Broad-Based Index). Therefore, a single negative news story, for instance, about a company with a great deal of weight on the aforementioned indices could elicit strong movements in profitability and/or volatility. However, if there were a potential market prediction based on these models, the effect would not be felt.

Future studies can attempt to directly establish the relationship between the tone of specific news stories about a company and stock returns and volatility. Moreover, they can adopt other vehicles of financial communication (for instance, Bloomberg, Google Finance, etc.), as well as information from social networks, such as Twitter or Facebook. They may also consider option developing word dictionaries to perform the textual analysis. Finally, the use of machine learning methods to create prediction techniques for market or company indicators is suggested. Therefore, a broad spectrum of research on the topic of this study is evident.

ACKNOWLEDGEMENTS

Fernando Caio Galdi thanks the Fundação de Amparo à Pesquisa e Inovação do Espírito Santo (FAPES) for their financial support in performing the research.

REFERENCES

- Amihud, Y. (2002). Illiquidity and stock returns: Cross-section and time-series effects. *Journal of Financial Markets*, 5(1), 31-56. doi:10.1016/S1386-4181(01)00024-6
- Antweiler, W., & Frank, M. Z. (2004). Is all that talk just noise? The information content of internet stock message boards. *The Journal of Finance*, 59(3), 1259-1294.
- Associação Nacional de Jornais. (2017, Junho 10). *Os maiores jornais do Brasil de circulação paga, por ano*. Retrieved from <http://www.anj.org.br/maiores-jornais-do-brasil/>
- Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of Financial Economics*, 49(3), 307-343. doi:10.1016/S0304-405X(98)00027-0
- BM&FBovespa. (2015a). Índice Bovespa (Ibovespa). *Composição/Carteira do índice*. Retrieved from <http://www.bmfbovespa.com.br/indices/ResumoIndice.aspx?Indice=Ibovespa&Idioma=pt-br>
- BM&FBovespa. (2015b). Índice Brasil Amplo (IBrA). *Composição/Carteira do índice*. Retrieved from <http://www.bmfbovespa.com.br/indices/ResumoCarteiraTeorica.aspx?Indice=IBrA&idioma=pt-brr>
- BM&FBovespa. (2015c). Índice Brasil Amplo (IBrA). *Estatísticas históricas*. Retrieved from <http://www.bmfbovespa.com.br/indices/ResumoEvolucaoDiaria.aspx?Indice=IBrA&idioma=pt-br>
- Bogle, S. A., & Potter, W. D. (2015). SentAMaL: A sentiment analysis machine learning stock predictive model. Proceedings on the International Conference on Artificial Intelligence (ICAL). The Steering Committee of the World Congress in Computer Science, Computer Engineering and Applied Computing, Las Vegas, USA, WorldComp.
- Boussaidi, R. (2013). Representativeness heuristic, investor sentiment and overreaction to accounting earnings: The case of the Tunisian stock market. *Procedia-Social and Behavioral Sciences*, 81, 9-21. doi:10.1016/j.sbspro.2013.06.380

- Bushman, R. M., Williams, C. D., & Wittenberg-Moerman, R. (2016). The informational role of the media in private lending. *Journal of Accounting Research*, 55(1), 115-152. doi:10.1111/1475-679X.12131
- Cambria, E. (2016). *Affective computing and sentiment analysis*. *IEEE Intelligent Systems*, 31(2), 102-107. doi:10.1109/MIS.2016.31
- Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of Finance*, 52(1), 57-82. doi:10.1111/j.1540-6261.1997.tb03808.x
- Chen, K. T., Lu, H.-M., Chen, T.-J., Li, S.-H., Lian, J.-S., & Chen, H. (2011). Giving context to accounting numbers: The role of news coverage. *Decision Support Systems*, 50(4), 673-679. doi:10.1016/j.dss.2010.08.025
- Cochrane, J. H., & Culp, C. L. (2003). Equilibrium asset pricing and discount factors: Overview and implications for derivatives valuation and risk management. In P. Field (Ed.), *The Growth of Risk Management: A History* (pp. 57-92). London, UK: Risk Books.
- Davolos, L. C., Rogers, P., Silva, W. M., & Oliveira, M. A. (2013). O que determina o preço das ações? Exame empírico do mercado brasileiro pré-subprime (1994-2007). *REA-Revista Eletrônica de Administração*, 12(1), 48-67.
- Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3-56. doi:10.1016/0304-405X(93)90023-5
- Fang, L., & Peress, J. (2009). *Media coverage and the cross-section of stock returns*. *The Journal of Finance*, 64(5), 2023-2052. doi:10.1111/j.1540-6261.2009.01493.x
- Instituto de Pesquisa Econômica Aplicada. (2015). *Índice de ações Ibovespa – Fechamento*. Retrieved from <http://www.ipeadata.gov.br/>
- Liu, B., & Zhang, L. (2012). A survey of opinion mining and sentiment analysis. In C. Aggarwal & C. Zhai (Eds.), *Mining text data* (pp. 415-463). Boston, USA: Springer.
- Loughran, T., & McDonald, B. (2011). *When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks*. *The Journal of Finance*, 66(1), 35-65. doi:10.1111/j.1540-6261.2010.01625.x
- Mitra, G., & Mitra, L. (Eds.). (2011). *The handbook of news analytics in finance*. Hoboken, USA: John Wiley & Sons.
- Nascimento, P., Osiek, BA, & Xexêo, G. (2015). *Análise de sentimento de Tweets com foco em notícias*. *Revista Eletrônica de Sistemas de Informação*, 14(2), 1-14. doi:10.21529/RESI.2015.1402002
- Pagliariussi, M. S., Aguiar, M. O., & Galdi, F. C. (2016). Sentiment analysis in annual reports from Brazilian companies listed at the BM&FBovespa. *BASE-Revista de Administração e Contabilidade da Unisinos*, 13(1), 53-64.
- Porshnev, A., Redkin, I., & Shevchenko, A. (2013). *Machine learning in prediction of stock market indicators based on historical data and data from twitter sentiment analysis*. 13th IEEE International Conference on Data Mining Workshops. Washington, USA: IEEE.
- Rogers, J. L., Skinner, D. J., & Zechman, S. L. (2015). The role of the media in disseminating insider-trading activity (Working Paper, No. 13-34). University of Colorado, Boulder, USA.
- Tetlock, P. C. (2007). Giving content to investor sentiment: The role of media in the stock market. *The Journal of Finance*, 62(3), 1139-1168. doi:10.1111/j.1540-6261.2007.01232.x
- Tetlock, P. C., Saar-Tsechansky, M., & Macksakassy, S. (2008). More than words: Quantifying language to measure firms' fundamentals. *The Journal of Finance*, 63(3), 1437-1467. doi:10.1111/j.1540-6261.2008.01362.x
- Tripathy, A., Agrawal, A., & Rath, SK (2016). *Classification of sentiment reviews using n-gram machine learning approach*. *Expert Systems with Applications*, 57, 117-126. doi:10.1016/j.eswa.2016.03.028
- Valor Econômico. (2012, Maio 15). *Edição impressa*. Retrieved from <http://www.valor.com.br/impresso/>
- Valor Econômico. (2013, Maio 15). *Edição impressa*. Retrieved from <http://www.valor.com.br/impresso/>

ARTICLES

Submitted 03.15.2017. Approved 07.03.2017

Evaluated through a double-blind review process. Scientific Editor: Antonio Padula

Translated version

DOI: <http://dx.doi.org/10.1590/S0034-759020180204>

BARRIERS TO GREEN SUPPLY CHAIN MANAGEMENT IN THE AUTOMOTIVE INDUSTRY

Barreiras à gestão da cadeia de suprimentos verde na indústria automotiva

Barreras a la gestión de la cadena de suministro verde en la industria automotriz

ABSTRACT

This study identified the barriers to Green Supply Chain Management (GSCM) and analyzed their degree of influence from the perspective of a first-tier supplier in the Brazilian automotive industry. The literature indicates a total of 43 barriers, of which 13 were validated in the following areas: support and involvement (five), operational performance (three), economic performance (two), environmental performance (two), and knowledge and information (one). The validation was based on the perception of technical and academic specialists familiar with environmental and supply chain management in various sectors. The hierarchy of the barriers by priority was obtained using the Analytic Hierarchy Process (AHP) method, with decision makers representing an industry in the automotive sector. The study showed that cost implications are the most influential barrier to GSCM from the perspective of a first-tier supplier in the sector.

KEYWORDS | Green supply chain management, barriers, automotive industry, content validation, analytic hierarchy process.

RESUMO

Este estudo identificou as barreiras e analisou seu grau de influência na Gestão da Cadeia de Suprimentos Verde (GCSV), de acordo com a perspectiva de um fornecedor de primeira camada da indústria automotiva brasileira. Foram encontradas 43 barreiras na literatura especializada, e 13 validadas: apoio e envolvimento (cinco), desempenho operacional (três), desempenho econômico (duas), desempenho ambiental (duas), conhecimento e informação (uma). A validação ocorreu por meio da percepção de especialistas técnicos e acadêmicos com familiaridade nos temas gestão ambiental e cadeia de suprimentos de diversos setores. A hierarquia das prioridades das barreiras foi obtida por meio da aplicação do método Analytic Hierarchy Process (Análise Hierárquica do Processo [AHP]), tendo como decisores representantes de uma indústria do setor automotivo. A pesquisa mostrou que as implicações de custo representam a barreira mais influente à GCSV, do ponto de vista de um fornecedor de primeira camada do setor estudado.

PALAVRAS-CHAVE | Gestão da cadeia de suprimentos verde, barreiras, indústria automotiva, validação de conteúdo, análise hierárquica do processo.

RESUMEN

Este estudio identificó las barreras a la Gestión de la Cadena de Suministro Verde (GCSV) y analizó su grado de influencia, de acuerdo con la perspectiva de un proveedor de primer nivel (tier 1) de la industria automotriz brasileña. De las 43 barreras encontradas en la literatura, se han validado trece: apoyo e implicación (cinco), desempeño operacional (tres), desempeño económico (dos), desempeño ambiental (dos), y conocimiento e información (una). La validación ocurrió por medio de la percepción de especialistas técnicos y académicos familiarizados con los temas gestión ambiental y cadenas de suministro de diversos sectores. La jerarquía de las prioridades de las barreras se realizó a través de la aplicación del Proceso lítico Jerárquico (Analytic Hierarchy Process [AHP]), y los decisores fueron representantes de una industria del sector automotriz. La investigación mostró que las implicaciones de costo representan la barrera más influente en la GCSV, desde el punto de vista de un proveedor de primer nivel del sector estudiado.

PALABRAS CLAVE | Gestión de la cadena de suministro verde, barreras, industria automotriz, validación de contenido, proceso analítico jerárquico.

FLÁVIA CRISTINA DA SILVA¹
flacrisil@uninove.edu.br
ORCID: 0000-0001-6999-948X

FABIO YTOSHI SHIBAO¹
fabio.shibao@gmail.com
ORCID: 0000-0002-6666-0330

JOSÉ CARLOS BARBIERI²
jose.barbieri@fgv.br
ORCID: 0000-0002-4019-8950

ANDRE FELIPE HENRIQUES LIBRANTZ³
librantz@uninove.br
ORCID: 0000-0001-8599-9009

MARIO ROBERTO DOS SANTOS⁴
mario.rsantos@terra.com.br
ORCID: 0000-0001-6222-9255

¹Universidade Nove de Julho, Programa de Mestrado Profissional em Administração, São Paulo, SP, Brazil

²Fundação Getúlio Vargas, Escola de Administração de Empresas de São Paulo, São Paulo, SP, Brazil

³Universidade Nove de Julho, Programa de Mestrado e Doutorado em Informática e Gestão do Conhecimento, São Paulo, SP, Brazil

⁴Universidade Nove de Julho, Programa de Pós-Graduação em Administração, São Paulo, SP, Brazil

INTRODUCTION

The automotive sector supply chain involves several supply levels and feature disparities among companies according to their position. This imbalance in the supply chain introduces critical aspects in terms of the economic, environmental, and operational performance of the upstream players in which most of the companies are constituted by small and medium enterprises, and small family business. Nonetheless, these are not isolated phenomena because such aspects affect every relationship along the chain (Zhu, Sarkis, & Geng, 2005).

The effects of such disparities tend to form a barrier to the implementation of supply chain management, which involves the introduction of instruments to adapt the processes and products to the environmental protection guidelines called Green Supply Chain Management (GSCM) practices, which include eco-design, recycling, remanufacturing, green purchasing, life-cycle evaluation, and reverse logistics (Leigh & Li, 2014; Srivastava, 2007).

Because different organizations interact in a supply chain, and it is impossible to eliminate all the barriers to GSCM simultaneously, the players in the chain tend to hierarchize the barriers and overcome them in according to their priorities (Govindan, Mathiyazhagan, Kannan, & Haq, 2014). Therefore, the objective of this study is to identify the barriers to GSCM and analyze their degree of influence from the perspective of a first-tier supplier in the Brazilian automotive industry. The remainder of this paper is structured into five sections. The next section discusses our theoretical framework, and the succeeding one presents the methodology used. A characterization of the researched economic sector is next discussed, with the second-to-last section presents our results. The final section presents the considerations and implications of the study.

THEORETICAL FRAMEWORK

Green Supply Chain Management (GSCM)

A supply chain involves several activities. It can be understood as a set of at least three entities directly involved in the upward and downward flow of products, services, financial resources and/or information, that is, from the raw material provider all the way to the customer. These include planning and control of all operations involving the supply, purchases, distribution logistics, and production of goods, from the extraction of raw material to the post-use disposal of the product (Seuring & Müller, 2008; Shibao, 2011).

GSCM integrates all the environmental considerations into supply chain management, including product design, outsourcing services, manufacturing processes, and delivery of the final product to consumers as well as product management at the life-cycle end (Srivastava, 2007). In terms of limitations, besides the integration of manufacturing processes and distribution, the control of GSCM ranges from the design to the product disposal stage (Sarkis, Zhu, & Lai, 2011).

GSCM activities are known by different names, including green operations; environmental practices, initiatives, or capabilities; and GSCM competencies, strategies, approaches, or tools (Jabbour, Arantes, & Jabbour, 2013; Srivastava, 2007). This study uses the term “GSCM practices” as defined by Vachon and Klassen (2006). Note that the literature presents studies related to different kinds of GSCM practices, and there is not a general agreement among authors on a unique model. However, the research converges when dealing with management activities relating to suppliers, product design, manufacturing, and reverse logistics (Jabbour et al., 2013).

Several aspects of GSCM require further clarification, including the imbalance between internal and external practices, the conflicting results of GSCM practices, and differing economic performance (Zhu et al., 2005). In fact, the lack of strong evidence to link GSCM implementation with an increase in any type of environmental, economic, or operational development represents a barrier to GSCM, as pointed out by Zhu et al. (2005).

Barriers to GSCM implementation

While there are several driving forces that lead organizations toward the implementation of GSCM and contribute to corporate sustainability, some factors challenge the efforts of companies to adopt environmentally sustainable practices, implying that the implementation of GSCM is a complex and wide-ranging task (Giunipero, Hooker, & Denslow, 2012; Haq & Mathiyazhagan, 2013).

The factors that oppose or create barriers to the implementation of GSCM are classified in different ways in the literature, as will be shown later.

METHODOLOGY

This study is categorized as applied and exploratory, and investigates the issue in the Brazilian context, implying that the study’s findings can be applied to resolve specific problems (Prodanov & Freitas, 2013). This study was carried out in three

phases using a mixed method to extract and combine the strengths of qualitative and quantitative strategies to better understand the research problems (Creswell, 2010). The first phase of the study reviews the related literature, while the next two phases focus on exploring the environmental factors in order to define and identify the barriers to GSCM (Martins & Theóphilo, 2009).

Phase 1: This phase first reviews the SciELO and Spell databases from 1999 to 2015 and the Scopus database from 1999

to 2014 extensively and systematically. The search terms used for the field titles, abstracts, and keywords consisted of two sets of words: (a) “barriers” “obstacles” “difficulties” “impediment” and “impracticable” and (b) “green supply chain management” and “environmental management in the supply chain”.

The barriers to GSCM implementation extracted from the research papers that meet the selection criteria were classified under categories based on other studies, as detailed in Exhibit 1 below.

Exhibit 1. Criteria for classifying the barriers to GSCM

Classification type	Class	Justification for adoption	Studies that used the same classification
Extent of interaction with GSCM	Economic performance	Priority for organizations and one of the main reasons for implementing GSCM practices (Zhu, Sarkis, & Lai, 2012)	Govindan et al. (2014); Mathiyazhagan, Govindan, Nooru Haq and Geng, (2013); Muduli, Govindan, Barve, and Geng, (2013); Balasubramanian (2012)
	Environmental performance	Management of environmental aspects of an organization affects and is affected by various stakeholders (ABNT, 2004, 2005)	Balasubramanian (2012), Mathiyazhagan et al. (2013)
	Operational performance	GSCM practices influence the technical and technological processes of organizations (Zhu, Sarkis, & Lai, 2007).	Govindan et al. (2014); Mathiyazhagan et al. (2013); Muduli et al. (2013); Balasubramanian (2012)
	Knowledge and information	Skills and competences promote transformations in the organizational environment, and these are transmitted to the environment through multiple channels of interaction (World Economic Forum, 2013; Lee, 2015)	Govindan et al. (2014); Muduli, et al., (2013); Balasubramanian (2012)
	Support and involvement	The competitiveness of companies depends on the relationships maintained with their suppliers, and aspects such as interaction, commitment, trust, and reciprocity are fundamental requirements for GSCM (Chan, He, Chan, & Wang, 2012; Lee, 2015)	Govindan et al. (2014); Balasubramanian (2012)
Nature	Attitudinal	It refers to the posture of resistance, passivity, reactivity, or inactivity in relation to the environment, skepticism in relation to the benefits derived from GSCM practices (Kasim & Ismail, 2012; Mathiyazhagan, Govindan, & Nooru Haq, 2014)	Perron (2005)
	Resources	Related to the unavailability of human capital, as well as tangible and intangible means to operationalize GSCM practices (Giunipero et al., 2012)	
	Information	It refers to the restricted access to information or difficulty in interpreting and understanding the data (Daily & Huang, 2001)	
	Technique	Corresponds to the commitment of the processes due to lack of method or procedure (Barve & Muduli, 2013)	
Scope	Internal	Involves internal stakeholders, resources, and actions under the control of a single organization (Perron, 2005; Zhu, Sarkis, & Lai, 2012)	Balasubramanian, (2012); Walker & Jones (2012); Zhu et al. (2012).
	External	It covers the decisions of several players in the chain (Perron, 2005; Zhu et al., 2012)	

Given the complex and subjective character of the barriers to GSCM implementation, their categorization was based on the similarity among their definitions, as in Balasubramanian (2012) and Haq and Mathiyazhagan (2013). In addition, from the plurality of the concepts and purposes of this study, the barriers to GSCM it was assumed simultaneously to have an internal and external scope and hold up to two different natures, as displayed in Exhibit 2.

Exhibit 2. List of barriers to GSCM

Barriers					
Type	Description	Nature	Scope	References	
Economic performance	B1	Cost implications	Resources	External	Al Zaabi, Al Dhaheri, and Diabat (2013); Drohomerski, Costa, and Lima (2014); Giunipero et al. (2012); Govindan et al. (2014); Luthra, Kumar, Kumar, and Haleem (2011); Mehrabi, Gharakhani, Jalalifar, and Rahmati (2012); Mollenkopf, Stolze, Tate, and Ueltschy (2010); Muduli and Barve (2013); Muduli et al. (2013); Solér, Bergstrom, and Shanahan, (2010); Walker and Jones (2012); Wycherley (1999).
	B2	Unavailability of cash flow	Resources attitudinal	Internal	Mathiyazhagan, Govindan, Nooru Haq, and Geng (2013); Mehrabi et al. (2012); Mudgal, Shankar, Talib, and Raj (2010); Muduli and Barve (2013); Walker, Di Sisto, and Mcbain (2008); Walker and Jones (2012)
	B3	High investment and low financial return	Resources	Internal	Barve and Muduli (2013); Govindan et al. (2014); Mathiyazhagan et al. (2013); Mollenkopf et al. (2010); Walker and Jones (2012); Wycherley (1999).
	B4	Unavailability of credit to finance green initiatives	Resources attitudinal	External	Govindan et al. (2014); Mathiyazhagan et al. (2013).
	B5	High cost of ecological packaging	Resources	External	Al Zaabi et al. (2013); Walker et al. (2008).
	B6	High cost of waste disposal	Resources technique	External	Al Zaabi et al. (2013); Govindan et al. (2014); Mathiyazhagan et al. (2013); Muduli et al. (2013).
	B7	Lack of competitiveness of organic products	Resources	External	Bala, Muñoz, Rieradevall, and Ysern (2008); Bovell-Benjamin, Hathorn, Ibrahim, Gichuhi, and Bromfield (2009); Kasim and Ismail (2012); Mosgaard, Riisgaard, and Huulgaard (2013).
Environmental performance	B8	Environmentally inappropriate strategic planning	Attitudinal	Internal	Al Zaabi et al. (2013); Barve and Muduli (2013); Giunipero et al. (2012); Govindan et al. (2014); Mehrabi et al. (2012); Mudgal et al. (2010); Walker et al. (2008).
	B9	Lack of metrics for internal performance evaluation	Information	Internal	Mathiyazhagan et al. (2013); Witczak et al. (2014).
	B10	Lack of metrics for performance evaluation common to chain members	Information	Internal External	Al Zaabi et al. (2013); Bala et al. (2008); Govindan et al. (2014); Mathiyazhagan et al. (2013); Mollenkopf et al. (2010); Mudgal et al. (2010).
	B11	Corporate restrictions regarding the product	Attitudinal	Internal	Govindan et al. (2014); Mathiyazhagan et al. (2013); Mudgal et al. (2010).
	B12	Competition and uncertainty in the market	Attitudinal information	External	Luthra et al. (2011); Mehrabi et al. (2012); Miao, Cai, and Xu (2012).
	B13	Decrease in the efficiency of GSCM	Attitudinal	Internal External	Govindan et al. (2014); Kasim and Ismail (2012); Mathiyazhagan et al. (2013); Mollenkopf et al. (2010); Muduli and Barve (2013); Walker and Jones (2012); Witczak et al. (2014); Wycherley (1999).
	B14	Inadequate business self-regulation	Attitudinal	Internal	Mehrabi et al. (2012); Walker et al. (2008).
	B15	Belief in the loss of competitive advantage	Attitudinal information	Internal	Mehrabi et al. (2012); Walker et al. (2008).
	B16	Fear of failure	Attitudinal information	Internal	Govindan et al. (2014); Mathiyazhagan et al. (2013)

Continue

Exhibit 2. List of barriers to GSCM

Barriers					
Type	Description		Nature	Scope	References
Operational performance	B17	Resistance to innovations in technology, materials and processes	Attitudinal technique	Internal	Barve and Muduli (2013); Govindan et al. (2014); Luthra et al. (2011); Mathiyazhagan et al. (2013); Mehrabi et al. (2012); Muduli et al. (2013).
	B18	Lack of implementation of green practices	Attitudinal information	Internal External	Luthra et al. (2011); Mudgal et al. (2010); Mehrabi et al. (2012); Muduli and Barve (2013)
	B19	Disbelief in the performance and quality of green products	Attitudinal information	Internal	Bala et al. (2008); Mosgaard et al. (2013).
	B20	Lack of human resources	Resources	Internal	Govindan et al. (2014); Mathiyazhagan et al. (2013); Muduli et al. (2013); Witczak et al. (2014).
	B21	Lack of proper reverse logistics practices	Attitudinal technique	Internal External	Al Zaabi et al. (2013); Chen, Chen, Shen, Lo, and Chu (2014); Mathiyazhagan et al. (2013); Mudgal et al. (2010); Muduli et al. (2013); Sadrnia et al. (2013).
	B22	Low eco-efficiency due to complexities in product design	Information technique	Internal External	Al Zaabi et al. (2013); Govindan et al. (2014); Mathiyazhagan et al. (2013).
Knowledge and information	B23	Internal communication failures	Attitudinal information	Internal	Govindan et al. (2014); Mathiyazhagan et al. (2013); Muduli and Barve (2013).
	B24	Lack of implementation of information technologies (IT)	Information resources	Internal	Al Zaabi et al. (2013); Luthra et al. (2011); Mudgal et al. (2010).
	B25	Poor quality of human resources	Information resources	Internal	Barve and Muduli (2013); Luthra et al. (2011); Mathiyazhagan et al. (2013); Muduli and Barve (2013).
	B26	Lack of knowledge or technique	Information	Internal	Govindan et al. (2014); Mathiyazhagan et al. (2013); Mehrabi et al. (2012); Mosgaard et al. (2013); Muduli and Barve (2013); Muduli et al. (2013); Witczak et al. (2014); Thun and Muller (2010); Walker and Jones (2012)
	B27	Lack of staff training	Attitudinal information	Internal	Al Zaabi et al. (2013); Govindan et al. (2014); Mathiyazhagan et al. (2013); Mudgal et al. (2010).
	B28	Difficulties in interpreting environmental and sustainable concepts	Attitudinal information	Internal	Al Zaabi et al. (2013); Giunipero et al. (2012); Solér et al. (2010); Walker et al. (2008); Walker and Jones (2012).
	B29	Environmental Labeling	Attitudinal information	Internal	Chen et al. (2014); Wycherley (1999).
	B30	Lack of information dissemination among chain members	Attitudinal information	External	Govindan et al. (2014); Mollenkopf et al. (2010); Muduli and Barve (2013); Muduli et al. (2013); Solér et al. (2010); Wycherley (1999).
	B31	Linguistic and cultural diversity	Attitudinal information	External	Setthasakko (2009); Walker and Jones (2012).

Continue

Exhibit 2. List of barriers to GSCM

Conclusion

		Barriers			
Type	Description	Nature	Scope	References	
Support and involvement	B32	Lack of public policies and favorable government regulations	Attitudinal	External	Al Zaabi et al. (2013); Barve and Muduli (2013); Chen et al. (2014); Govindan et al. (2014); Kasim and Ismail (2012); Luthra et al. (2011); Mathiyazhagan et al. (2013); Mehrabi et al. (2012); Miao et al. (2012); Mosgaard et al. (2013); Mudgal et al. (2010); Muduli and Barve (2013); Muduli et al. (2013); Wycherley (1999).
	B33	Lack of corporate socio-environmental responsibility	Attitudinal	Internal	Govindan et al. (2014); Mathiyazhagan et al. (2013); Mudgal et al. (2010); Setthasakko (2009).
	B34	Lack of integration between members of the chain	Attitudinal	External	Mathiyazhagan et al. (2013); Miao et al. (2012); Mudgal et al. (2010).
	B35	Lack of commitment by the senior management	Attitudinal	Internal	Al Zaabi et al. (2013); Barve and Muduli (2013); Giunipero et al. (2012); Govindan et al. (2014); Luthra et al. (2011); Mathiyazhagan et al. (2013); Mehrabi et al. (2012); Mudgal et al. (2010); Muduli and Barve (2013); Muduli et al. (2013); Setthasakko (2009); Walker et al. (2008); Walker and Jones (2012); Witczak et al. (2014).
	B36	Lack of commitment of employees	Attitudinal	Internal	Barve and Muduli (2013); Muduli and Barve (2013); Muduli et al. (2013); Thun and Muller (2010); Walker et al. (2008); Walker and Jones (2012); Wycherley (1999).
	B37	Lack of involvement in environmental networks	Attitudinal	External	Govindan et al. (2014); Mathiyazhagan et al. (2013).
	B38	Lack of supplier commitment	Attitudinal	External	Drohmeretski et al. (2014); Govindan et al. (2014); Luthra et al. (2011); Mathiyazhagan et al. (2013); Miao et al. (2012); Mollenkopf et al. (2010); Mudgal et al. (2010); Walker et al. (2008); Walker and Jones (2012); Wycherley (1999).
	B39	Lack of client commitment	Attitudinal	External	Bala et al. (2008); Govindan et al. (2014); Kasim and Ismail (2012); Luthra et al. (2011); Mathiyazhagan et al. (2013); Mehrabi et al. (2012); Miao et al. (2012); Mosgaard et al. (2013); Mudgal et al. (2010); Muduli et al. (2013); Solér et al. (2010); Wycherley (1999).
	B40	Resistance to change	Attitudinal	Internal	Barve and Muduli (2013); Mudgal et al. (2010); Mathiyazhagan et al. (2013); Muduli et al. (2013).
	B41	Incompatibility of legal requirements among countries	Attitudinal	Internal	Giunipero et al. (2012); Thun and Muller (2010); Walker and Jones (2012).
	B42	Dependency among members of the chain	Attitudinal	External	Bala et al. (2008); Thun and Muller (2010).
	B43	Lack of integration with stakeholders	Attitudinal	External	Barve and Muduli (2013); Mehrabi et al. (2012); Muduli et al. (2013).

Phase 2: The barriers to GSCM compiled from the literature were presented as a questionnaire for validation by technical experts and academics according to the following standards: “essential” “useful, but not essential” and “not essential”.

The study used the LinkedIn network to look for professionals having at least five years of experience in the area of consulting and certification of environmental management systems in small, medium, and large companies from at least two different economic sectors.

The academics were selected from postgraduate programs professors in Administration in the metropolitan area of the São Paulo city and certified by the National Association of Post graduation and Research in Administration (ANPAD) for student admission. The minimum criteria required for the selection are a doctorate degree and specialization in research fields related to environmental management and supply chain. The other requirements are the same as for the technical experts.

The content validity method followed the criteria proposed by Lawshe (1975), and reformulated by Ayre and Scally (2014); it recommends calculating the content validity ratio (CVR) from the number of experts evaluating the item as essential (ne) and the total number of respondents (N), excluding those who abstained from answering. Table 1 shows the CVR for some expert panels.

Table 1. Criteria for validating content

Total number of experts in the panel	Proportion of agreement (Essential item)	CVR (Exact values)	$N_{critico}$ (Minimum number of experts in agreement)
17	0.765	0.529	13
18	0.722	0.444	13
19	0.737	0.474	14
20	0.750	0.500	15
21	0.714	0.429	15

Source: Ayre and Scally (2014, p. 85).

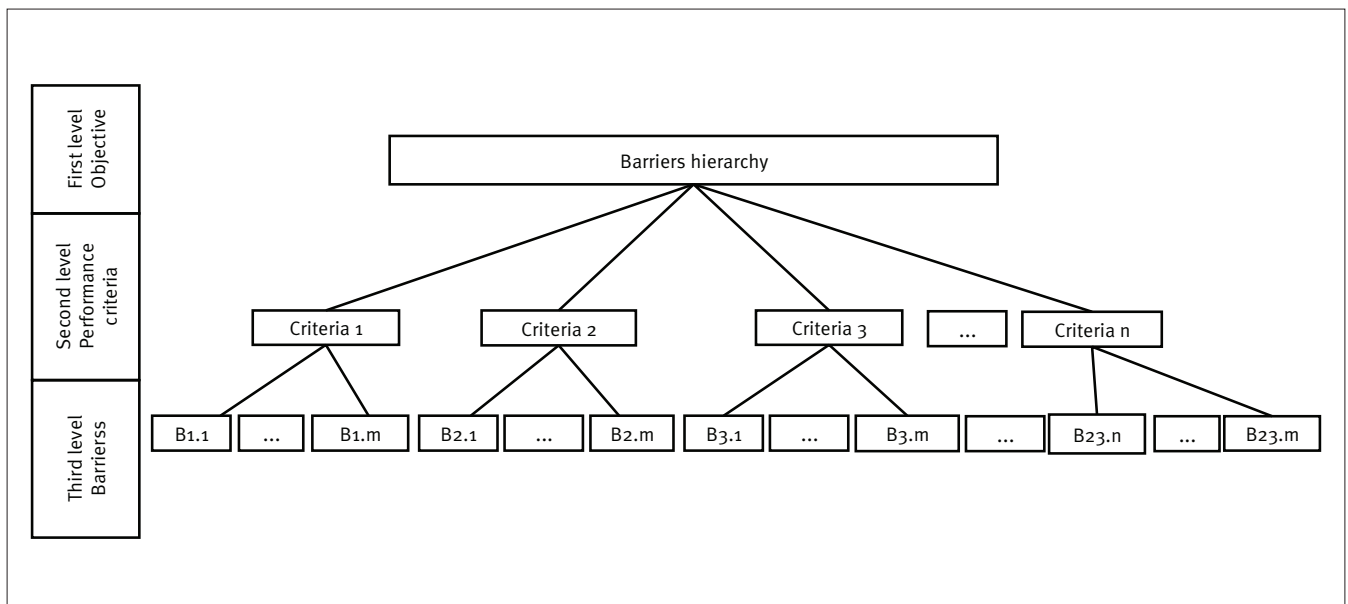
Fifty-three technical experts and 21 academics were contacted via email between August 24 and December 11, 2015. From this group, 14 technical experts and 6 academics were validated to participate, with response rates of 26.4% and 28.6%, respectively. A panel of 20 members required the consensus of at least 15 experts in order to validate each barrier to GSCM, as illustrated in Table 1.

Phase 3: The third and last phase of this research involved comparing the results obtained in the previous phases with the current position in the different departments of an organization. The scope of this research was limited to the automotive sector and defined, and, as a sample, to a first-tier supplier. This was represented by up to three collaborators located in strategic positions in different areas having direct contact with the players of the supply chain, such as purchasing department managers, logistics, quality, production, and development.

The study used the Analytic Hierarchy Process (AHP) method to analyze the degree of influence of each barrier to GSCM, following examples in the literature (Govindan et al., 2014; Salem, Salman, Najafi, & Moawad, 2010); moreover, this is a general theory of evaluation widely accepted by academics (Saaty & Vargas, 2012). The AHP method is generally divided into three stages: decomposition of the problem into a hierarchical structure (with objective, criteria and sub-criteria, and alternatives), construction of a comparison matrix between the criteria using the Saaty importance scale, and calculation of the priority vector (classification) for the alternatives (Saaty, 2008).

For the purpose of this study, this is the most suitable method, because it can be implemented partially. This is consistent with the model proposed in this work, which goes to the third level, as shown in Figure 1. Furthermore, this method can be easily developed in a spreadsheet, which would facilitate interaction with the decision makers. Another advantage is that the method allows a one-to-one comparison of the criteria, for a more focused analysis.

Figure 1. AHP decision model adopted in this work



Since the AHP is an information and communication tool, each index of the comparative scale is given a numerical value: 1 for equal importance among the elements, 3 for a moderate difference, 5 for a significant difference, 7 when one element is much more important than the other, and 9 to show the extreme importance of one element over another. The values 2, 4, 6, and 8 are intermediaries between two decisions (Saaty, 2008).

Collective decisions arise from the combination of individual preferences for a concise and explicit purpose (Gomes, Gomes, & Almeida, 2009). From the different strategies documented in the literature for group decision making, and following the example in Aguarón, Escobar, and Moreno-Jiménez (2014), this study applied the AHP method integrally to each decision maker, after which the individual decisions were aggregated into a single decision using the geometric mean, a technique known as aggregation of individual priorities (AIP) (Costa & Belderrain, 2009; Cruz, 2011; Lai, Wong, & Cheung, 2002; Saaty & Peniwati, 2013).

The decision makers analyzed the problem and expressed their point of view and specific interests separately, and their decisions were verified in terms of the acceptable inconsistency patterns of the individual matrices, to obtain a consistency ratio (CR) lower than 0.1 (Saaty & Peniwati, 2013). In order to obtain a global picture of the difficulties faced by a given company, no weight was attributed to the decision of each company representative.

CONTEXTUALIZATION OF THE SUBJECT OF STUDY

The Brazilian automotive industrial complex consisted of 624 auto part manufacturing companies, including representative offices, and 31 vehicle, agricultural machinery, and road machinery manufacturers (National Association of Motor Vehicle Manufacturers [Anfavea], 2016). As in other sectors, the automotive industry's supply chain is organized in levels or tiers; that is, from the focal company—the assembler—toward the upstream suppliers and downstream customers (Castro, 2005).

The component, module, or pre-assembled subsystem suppliers are placed in the first upstream tier. Since these products are directly incorporated into the assembler production line, closer ties allow the focal company to have control over the consolidation of volumes and activities performed by the supplier. This occurs whether it is allocated within its own infrastructure, regardless of the assembler, the so-called single sourcing, or

inserted in a delivery zone on the assembly plant itself or attached to it (Castro, 2005; Humphrey, Lecler, & Salerno, 2000; Martins, Souza, & Serio, 2011; Pires, 1998; Pires & Sacomano Neto, 2010; Salerno, Zilbovicius, Arbix, & Dias, 1998).

A certified environmental management system, waste management, and the adoption of green buildings (Lopes, Sacomano Neto, Silva, & Lopes, 2013; Pombo & Magrini, 2008) are some of the most commonly observed GSCM practices in the Brazilian automotive companies. However, the pressure to become energy efficient, minimize the environmental impact, and reduce oil dependence has driven the automotive industry to look for sustainable solutions (Vaz, Barros, & Castro, 2014).

This study chose the Alpha Company for analysis, given the ease of access and availability of information to carry out this research. Dedicated to the transformation of plastic material, with a production capacity of 65 tons per day, the company is considered as a large industry in accordance with The Brazilian Development Bank (BNDES, 2017) classification. Established as a first-tier supplier in the automotive supply chain, it relates with 12 light vehicle and truck assemblers downstream, and 90 suppliers upstream. Thus, they supply the domestic market with various products, such as tanks, cold start systems, and safety triangles.

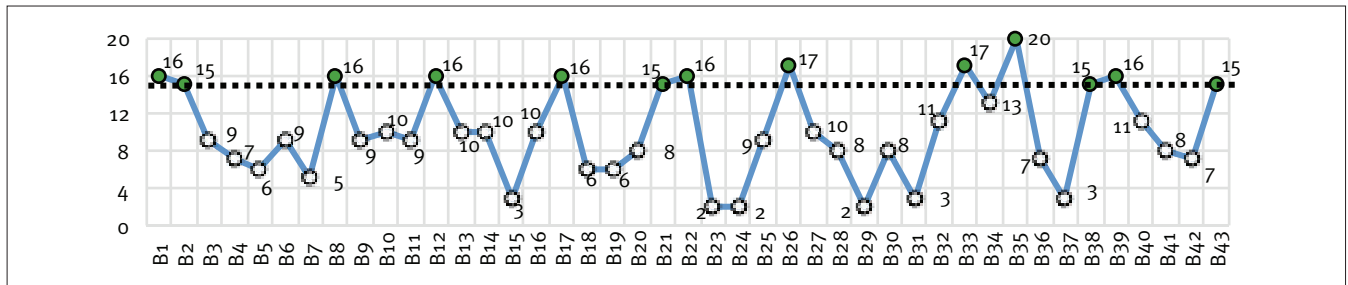
Over the process of hierarchizing the barriers to GSCM, the Alpha Company is represented by its Quality Engineering (decision maker 1), Production (decision maker 2), and Purchasing (decision maker 3) department managers. Decision makers 1 and 2 are qualified in Production Engineering, and decision maker 3 is qualified in Business Administration and Economics, and together they have an average experience of about 15 years.

RESULTS

As in other works dealing with the influence of the barriers to GSCM at the national level (Jabbour & Souza, 2015; Nascimento, Silva, Nunes, & Sellito, 2014), the conceptual framework of this study is based on studies carried out in the developed and developing countries.

As Figure 2 shows, a cut-off line of 15 evaluations from a panel of 20 specialists is required for a barrier to GSCM to be defined valid (Ayre & Scally, 2014). Only barrier B35, lack of commitment from top management, showed total consensus. From the barriers to GSCM implementation considered least impactful or irrelevant, B23, B24, and B29 were considered essential by 10% of the panel.

Figure 2. Validation of the barriers to GSCM



The total number of the valid barriers to GSCM in this study is 13; this is consistent with Zaabi, Dhaheri, and Diabat (2013), and places this study in an intermediate position among works analyzing the influence of four barriers to GSCM (Giunipero et al., 2012; Thun & Müller, 2010) and those investigating up to 26 barriers (Govindan et al., 2014; Mathiyazhagan, Govindan, Haq, & Geng, 2013). Table 2 compares the barriers to GSCM validated with regard to the aspect that they interact with.

Table 3. Comparison of the validated barriers to GSCM

Influence over:	Total number of barriers		Validated barriers	% of validation
	Qty	Description		
1 - Economic performance	7	B1, B2, B3, B4, B5, B6, B7	B1, B2	28.6
2 - Environmental performance	9	B8, B9, B10, B11, B12, B13, B14, B15, B16	B8, B12	22.2
3 - Operational performance	6	B17, B18, B19, B20, B21, B22	B17, B21, B22	50.0
4 - Knowledge and information	9	B23, B24, B25, B26, B27, B28, B29, B30, B31	B26	11.1
5 - Support and involvement	12	B32, B33, B34, B35, B36, B37, B38, B39, B40, B41, B42, B43	B33, B35, B38, B39, B43	41.7

Decision makers 2 and 3 exhibited a consistency ratio (CR) of less than 0.1 in their decisions (Saaty, 1991). Meanwhile, decision maker 1 showed a CR of 0.139, implying a need for reconsideration. After the decisions were made again, the CR value was confirmed to be equal to 0.091.

Table 3 shows the individual decisions on the extent to which the barriers influence GSCM.

Table 4. Criteria priority

Criteria		Decision maker 1		Decision maker 2		Decision maker 3	
EP	Economic performance	0.214	3 rd	0.537	1 st	0.232	2 nd
EnP	Environmental performance	0.076	5 th	0.079	4 th	0.035	5 th
OP	Operational performance	0.134	4 th	0.169	2 nd	0.107	3 rd
KI	Knowledge and information	0.230	2 nd	0.041	5 th	0.095	4 th
SI	Support and involvement	0.345	1 st	0.174	3 rd	0.531	1 st

Both Purchase and Quality managers agree that the barriers to GSCM are concentrated around the relationship among the players, mainly because the first-tier supplier is responsible for the automaker for the management of the suppliers at later tiers (Humphrey et al., 2000).

According to Vanalle and Salles (2011), the relationship among players, which is mediated through cooperation agreements, generally extends over the supply period of the product and impacts the final price of the car as well as other aspects such as quality, warranty, and image.

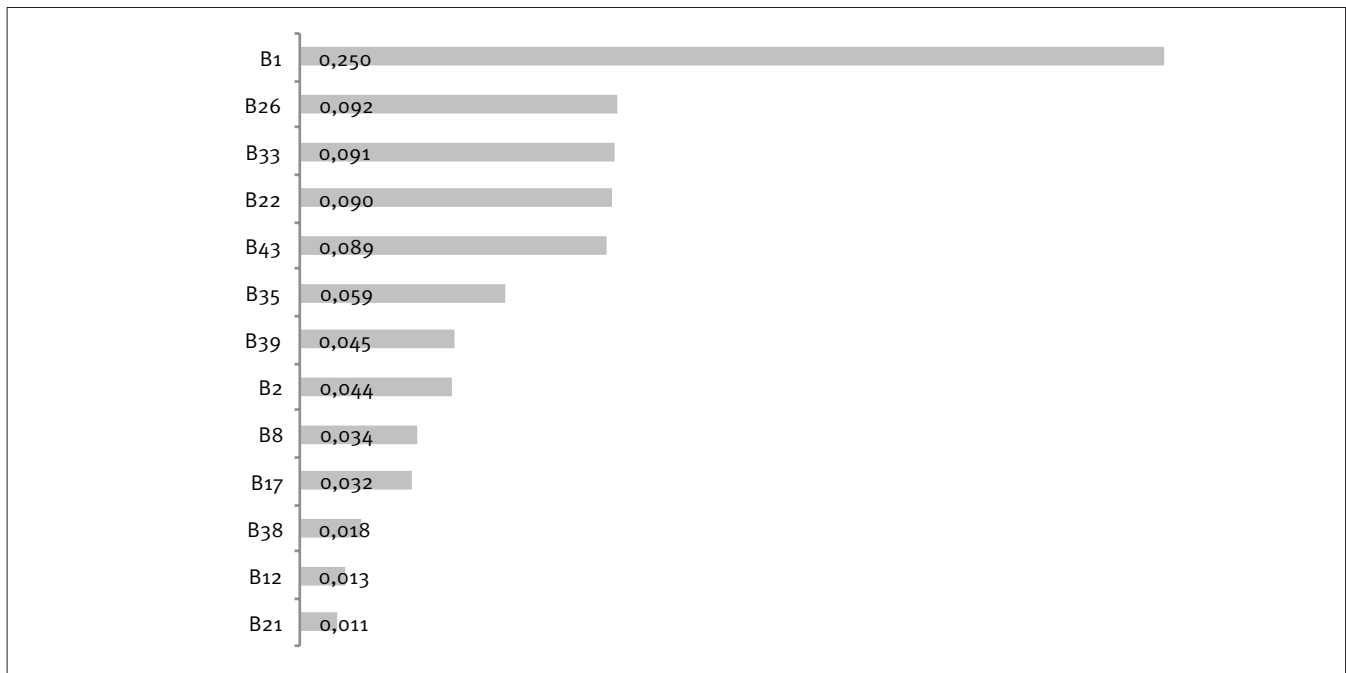
Decision maker 2, the production manager, finds the difficulties related to economic factors more critical for GSCM, despite the need to offer products at lower prices than their competitors and, at the same time, reduce production costs (Jabbour & Filhos, 2010).

In general, the production strategies in the Brazilian automotive sector focus on the fulfillment of competitive goals relating to cost, quality, and flexibility (Vanalle, Salles, & Vieira, 2009).

For all the decision makers, the environmental performance barrier category was less significant, showing little doubt on the need to align their corporate goals with processes and products that are less aggressive to the environment. As Pombo and Magrini (2008) indicated, for more than a decade, the automotive sector had the largest number of companies with certified environmental management systems following NBR ISO 14001 (ABNT, 2004).

After aggregating the decision makers' individual priorities, the overall influence of the barriers to GSCM on a primary supplier of the automotive supply chain was obtained by determining the geometric mean, as shown in Figure 3.

Figura 3. Influence of the barriers to GSCM



The Cost Implications (B1) barrier was recognized as the primary challenge to implementing GSCM. This supports Nascimento et al. (2014), who identified four primary barriers to GSCM in the oil lubricant supply chain, of which three related to economic performance.

The priority index of B1 is 22 times more impactful than that of the lowest rated barrier, B21, lack of proper reverse logistics practices. This can be better understood by considering the vast body of the legislation and environmental policies, mainly at the state and federal levels, such as those for the collection and

final disposal of solid waste like fluorescent lamps, batteries, lubricating oil, and tires.

Lack of technical knowledge, B26, was second in degree of priority. This highlights the need for organizations to sustain a position or department specialized in environmental issues dedicated to the diffusion of knowledge (Corazza, 2003). Jabbour, Teixeira, and Jabbour (2013) identified cases of co-evolution between the level of planned environmental training following the implementation of best practices and the environmental management level of Brazilian companies in various economic sectors.

Socio-environmental responsibility lies not only with the top management, but also with the whole organization (Tachizawa & Andrade, 2008). According to the decision makers in Alpha Company, the lack of socio-environmental responsibility impedes GSCM, which is why B33 was treated as the third most important factor. In a study of the Indian automotive industry, Mudgal, Shankar, Talib, and Raj (2010) found an interdependence between the barriers to GSCM and the lack of socio-environmental responsibility and technical knowledge.

Barrier B22, low process eco-efficiency due to product design complications, shows a weight of 0.090, rendering it the fourth most pertinent barrier to GSCM. Although more modern vehicles consume less resources and are less polluting, it is difficult to translate legal requirements into technical criteria (Naveiro, Pacheco, & Medina, 2005).

Barrier B43, lack of integration with stakeholders, is in the fifth place, with a weight of 0.089. This can be explained by the difficulty of integrating various interests, such as the interests of regulatory bodies, the surrounding community, employees, and class associations (Seles & Jabbour, 2014; Wu, Ding, & Chen, 2012). For more reflections on barrier B43 in the automotive sector, see Gavirneni (2003).

Some results of this study could not find any comparison parameters with other works on this theme at the national level (Drohomeretski, Costa, & Lima, 2014; Jabbour & Souza, 2015; Nascimento et al., 2014) because they did not address several of the barriers to GSCM, such as B8, B33, and B35.

Lack of commitment of senior management (B35) was found to have high relevance during the second phase of the research, given that it was unanimously validated by technical and academic specialists. However, this barrier did not attain the same distinction for Alpha's decision makers. Note that Mudgal et al. (2010) found organizational management barriers to be the root cause of the problems in implementing GSCM in Indian manufacturing industries.

Supply chain management finds it increasingly important to know the barriers to GSCM implementation, primarily from the pressures and demands for better environmental practices by governments, significant segments of society in general, and internal and external stakeholders.

FINAL CONSIDERATIONS

The objective of this study is to identify the barriers to GSCM implementation and analyze their degree of influence, specifically from the perspective of a first-tier supplier in the

Brazilian automotive industry. To accomplish this, through a specialized literature search, this study identified 43 barriers to GSCM and classified them according to their nature, scope, and extent of effect. From this total, 13 barriers were validated using the perception of technical and academic specialists familiar with environmental management and supply chains in various sectors of the national economy. Of these 13 barriers, 5 were related to supportive relationships and commitment among players in the chain. The remaining barriers were related to economic performance (two), environmental performance (two), operational performance (three), and knowledge and information (one).

The degree of influence of these barriers to GSCM in the Brazilian automotive industry was obtained by applying the AHP to three representatives of a first-tier supplier. The priorities were organized separately for each decision maker, with the goal to understand the extent to which the barriers impact each area of the company, such as purchasing, quality, and production. At the end of the process, the barriers to GSCM were ranked by taking the geometric mean of the provided ratings.

The cost implications barrier (B1) led the ranking of GSCM impediments, with a weight 22 times more than the 13th barrier, B21. The decline in sales experienced by the Brazilian automotive industry since 2009 and the political and economic instability which the country currently faces may have had a notable influence on the situation of the company surveyed, which in turn might have been reflected in priority allocation.

This research used a consistent method, assuming that it can be replicated in supply chains in other sectors. This could follow when managers are aware of the potential barriers, especially when faced with the pressures and demands exerted by internal and external stakeholders and the society in general in favor of better environmental practices.

The scope of this academic study was relatively limited due to the research method adopted and its execution. As far as sampling is concerned, the barriers were validated by considering a 95% confidence level and a five-point interval, according to the CVR indices calculated as recommended by Ayre and Scally (2014). However, if more experts had been consulted, the range of validated barriers could have been larger.

This study addressed a frontier topic, and its results and conclusions are exploratory in nature and restricted to the company studied. However, it has contributed to the literature by identifying the main barriers to the integration of environmental management in the automotive supply chain. The results presented can be a starting point for action plans to overcome the barriers to GSCM implementation.

This study opens up diverse research possibilities. Other companies can replicate the pattern of this research to delineate the barriers to their GSCM implementation in various supply chains. Furthermore, this research model can be extended to other supply levels by expanding the extent of research and diversifying the statistical analytic techniques so as to obtain more conclusive results regarding the Brazilian automotive sector.

REFERENCES

- Aguarón, J., Escobar, M. T., & Moreno-Jiménez, J. M. (2014). The precise consistency consensus matrix in a local AHP-group decision making context. *Annals of Operations Research*, 245(1-2), 245-259. doi:10.1007/s10479-014-1576-8.
- Al Zaabi, S., Al Dhaheri, N. & Diabat, A. (2013). Analysis of interaction between the barriers for the implementation of sustainable supply chain management. *International Journal of Advanced Manufacturing Technology*, 68(1-4), 895-905.
- Associação Brasileira de Normas Técnicas. (2004). *NBR ISO 14001: Sistemas da gestão ambiental: Requisitos com orientações para uso*. Rio de Janeiro, RJ: ABNT.
- Associação Nacional dos Fabricantes de Veículos Automotores. (2016). *Anuário da indústria automobilística brasileira*. Retrieved from <http://www.anfavea.com.br/anuario.html>
- Ayre, C., & Scally, A. J. (2014). Critical values for Lawshe's content validity ratio: Revisiting the original methods of calculation. *Measurement and Evaluation in Counseling and Development*, 47(1), 79-86. doi:10.1177/0748175613513808
- Bala, A., Muñoz, P., Rieradevall, J., & Ysern, P. (2008). Experiences with greening suppliers. The Universitat Autònoma de Barcelona. *Journal of Cleaner Production*, 16(15), 1610-1619. doi:10.1016/j.jclepro.2008.04.015
- Balasubramanian, S. (2012). A hierarchical framework of barriers to green supply chain management in the construction sector. *Journal of Sustainable Development*, 5(10), 15-27. doi:10.5539/jstd.v5n10p15
- Banco Nacional de Desenvolvimento Econômico e Social. (2017). *Classificação de porte dos clientes*. Retrieved from <http://www.bndes.gov.br/wps/portal/site/home/financiamento/guia/quem-pode-ser-cliente/>
- Barve, A., & Muduli, K. (2013). Modelling the challenges of green supply chain management practices in Indian mining industries. *Journal of Manufacturing Technology Management*, 24(8), 1102-1122. doi:10.1108/JMTM-09-2011-0087
- Bovell-Benjamin, A. C., Hathorn, C. S., Ibrahim, S., Gichuhi, P. N., & Bromfield, E. M. (2009). Healthy food choices and physical activity opportunities in two contrasting Alabama cities. *Health & Place*, 15(2), 429-438. doi:10.1016/j.healthplace.2008.08.001
- Castro, R. L. (2005). *Planejamento e controle da produção e estoques: Um survey com fornecedores da cadeia automobilística brasileira* (Masters dissertation). Universidade de São Paulo, São Paulo, SP.
- Chan, R. Y. K., He, H., Chan, H. K., & Wang, W. Y. C. (2012). Environmental orientation and corporate performance: The mediation mechanism of green supply chain management and moderating effect of competitive intensity. *Industrial Marketing Management*, 41(4), 621-630. doi:10.1016/j.indmarman.2012.04.009
- Chen, S. M. S. M., Chen, Y-T., Shen, Y-H., Lo, S-T., & Chu, S-S. (2014). Green supply chain management as a conceptual framework for Taiwan textile industry. *Research Journal of Applied Sciences, Engineering and Technology*, 7(12), 2432-2436. doi:10.19026/rjaset.7.548
- Corazza, R. I. (2003). *Gestão ambiental e mudanças da estrutura organizacional*. *RAE-eletrônica*, 2(2), 1676-5648. doi:10.1590/S1676-56482003000200006
- Costa, T. C., & Belderrain, M. C. N. (2009). Decisão em grupo em métodos multicritério de apoio à decisão. *XV Encontro de Iniciação Científica e Pós-Graduação do ITA*. São José dos Campos, SP.
- Creswell, J. W. (2010). *Projeto de pesquisa: Métodos qualitativo, quantitativo e misto* (3ª ed.). Porto Alegre, RS: Artmed.
- Cruz, M. H. (2011). *Utilização de uma metodologia de apoio à decisão na análise de outsourcing em uma empresa metalúrgica* (Masters dissertation). Universidade Estadual de Campinas, Campinas, SP.
- Daily, B. F., & Huang, S. (2001). Achieving sustainability through attention to human resource factors in environmental management. *International Journal of Operations & Production Management*, 21(12), 1539-1552. doi:10.1108/01443570110410892
- Drohomeretski, E., Costa, S. G., & Lima, E. P. (2014). Green supply chain management: Drivers, barriers and practices within the Brazilian automotive industry. *Journal of Manufacturing Technology Management*, 25(8), 1105-1134. doi:10.1108/JMTM-06-2014-0084
- Gavirneni, S. (2003). Supply chain management at a chip tester manufacturer. In T. P. Harrison, H. L. Lee, & J. J. Neale (Eds.), *The practice of supply chain management: Where theory and application converge* (pp. 277-293). Norwell, USA: Kluwer Academic Publishing.
- Giunipero, L. C., Hooker, R. E., & Denslow, D. (2012). Purchasing and supply management sustainability: Drivers and barriers. *Journal of Purchasing and Supply Management*, 18(4), 258-269. doi:10.1016/j.pursup.2012.06.003
- Gomes, L. F. A. M., Gomes, C. F. S., & Almeida, A. T. (2009). *Tomada de decisão gerencial: Enfoque multicritério* (3ª ed.). São Paulo, SP: Atlas.
- Govindan, K., Mathiyazhagan, K., Kannan, D., & Haq, A. N. (2014). Barriers analysis for green supply chain management implementation in Indian industries using analytic hierarchy process. *International Journal of Production Economics*, 147(Part B), 555-568. doi:10.1016/j.ijpe.2013.08.018
- Haq, A. N., & Mathiyazhagan, K. (2013). Comparative study of green supply chain: Barrier analysis. *IV International Conference on Mechanical, Production and Automobile Engineering*. Dubai, United Arab Emirates.
- Humphrey, J., Lecler, Y., & Salerno, M. S. (2000). *Global strategies and local realities: The auto industry in emerging markets*. London, UK: Macmillan.
- Jabbour, A. B. L. S., & Filhos, A. G. A. (2010). Tendências da área de pesquisa em estratégia de produção. *Revista Eletrônica Sistemas & Gestão*, 4(3), 238-262. doi:10.7177/sg.2009.V4N3A4

- Jabbour, A. B. L. S., Arantes, A. F., & Jabbour, C. J. C. (2013). Gestão ambiental em cadeias de suprimentos: Perspectivas atuais e futuras de pesquisa. *Interciencia*, 38(2), 104-111.
- Jabbour, A. B. L. S., & Souza, C. L. (2015). Oportunidades e desafios para lidar com as barreiras à adoção de práticas de green supply chain management: Guidelines à luz de um estudo de múltiplos casos no Brasil. *Gestão & Produção*, 22(2), 295-310. doi:10.1590/0104-530X871-13
- Jabbour, C. J. C., Teixeira, A. A., & Jabbour, A. B. L. S. (2013). Treinamento ambiental em organizações com certificação ISO 14001: Estudo de múltiplos casos e identificação de coevolução com a gestão ambiental. *Produção*, 23(1), 80-94. doi:10.1590/S0103-65132012005000047
- Kasim, A., & Ismail, A. (2012). Environmentally friendly practices among restaurants: Drivers and barriers to change. *Journal of Sustainable Tourism*, 20(4), 551-570. doi:10.1080/09669582.2011.621540
- Lai, V. S., Wong, B. K., & Cheung, W. (2002). Group decision making in a multiple criteria environment: A case using the AHP in software selection. *European Journal of Operational Research*, 137(1), 134-144. doi:10.1016/S0377-2217(01)00084-4
- Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology*, 28(4), 563-575. doi:10.1111/j.1744-6570.1975.tb01393.x
- Lee, S. Y. (2015). The effects of green supply chain management on the supplier's performance through social capital accumulation. *Supply Chain Management: An International Journal*, 20(1), 42-55. doi:10.1108/SCM-01-2014-0009
- Leigh, M., & Li, X. (2014). Industrial ecology, industrial symbiosis and supply chain environmental sustainability: A case study of a large UK distributor. *Journal of Cleaner Production*, 106, 623-643. doi:10.1016/j.jclepro.2014.09.022
- Lopes, L. J., Sacomano Neto, M., Silva, E. M., & Lopes, F. C. C. (2013). Influência das práticas do green supply chain management no desempenho ambiental das empresas do setor automotivo brasileiro. *XXXVII Encontro da Associação Nacional de Pós-Graduação e Pesquisa em Administração*. Rio de Janeiro, RJ.
- Luthra, S., Kumar, V., Kumar, S., & Haleem, A. (2011). Barriers to implement green supply chain management in automobile industry using interpretive structural modeling technique: An Indian perspective. *Journal of Industrial Engineering and Management*, 4(2), 231-257. doi:10.3926/jiem.v4n2.p231-257
- Martins, G. A., & Theóphilo, C. R. (2009). *Metodologia da investigação científica para ciências sociais aplicadas* (2ª ed.). São Paulo, SP: Atlas.
- Martins, R. S., Souza, O. V., Filho, & Serio, L. C. (2011). Práticas colaborativas entre camadas na cadeia automobilística brasileira. *XIV Simpósio de Administração da Produção; Logística e Operações Internacionais*. São Paulo, SP.
- Mathiyazhagan, K., Govindan, K., & Haq, A. N. (2014). Pressure analysis for green supply chain management implementation in Indian industries using analytic hierarchy process. *International Journal of Production Research*, 52(1), 188-202. doi:10.1080/00207543.2013.831190
- Mathiyazhagan, K., Govindan, K., Haq, A. N., & Geng, Y. (2013). An ISM approach for the barrier analysis in implementing green supply chain management. *Journal of Cleaner Production*, 47, 283-297. doi:10.1016/j.jclepro.2012.10.042
- Mehrabi, J., Gharakhani, D., Jalalifar, S., & Rahmati, H. (2012). Barriers to green supply chain management in the petrochemical sector. *Life Science Journal*, 9(4), 3438-3442.
- Miao, Z., Cai, S., & Xu, D. (2012). Exploring the antecedents of logistics social responsibility: A focus on Chinese firms. *International Journal of Production Economics*, 140(1), 18-27. doi:10.1016/j.ijpe.2011.05.030
- Mollenkopf, D., Stolze, H., Tate, W. L., & Ueltschy, M. (2010). Green, lean, and global supply chains. *International Journal of Physical Distribution & Logistics Management*, 40(1/2), 14-41. doi:10.1108/09600031011018028
- Mosgaard, M., Riisgaard, H., & Huulgaard, R. D. (2013). Greening non-product-related procurement: When policy meets reality. *Journal of Cleaner Production*, 39, 137-145. doi:10.1016/j.jclepro.2012.08.018
- Mudgal, R. K., Shankar, R., Talib, P., & Raj, T. (2010). Modelling the barriers of green supply chain practices: An Indian perspective. *International Journal of Logistics Systems and Management*, 7(1), 81-107. doi:10.1504/IJLSM.2010.033891
- Muduli, K., & Barve, A. (2013). Establishment of a sustainable development framework in small scale mining supply chains in India. *International Journal of Intelligent Enterprise*, 2(1), 84-100. doi:10.1504/IJIE.2013.057340
- Muduli, K., Govindan, K., Barve, A., & Geng, Y. (2013). Barriers to green supply chain management in Indian mining industries: A graph theoretic approach. *Journal of Cleaner Production*, 47, 335-344. doi:10.1016/j.jclepro.2012.10.030
- Nascimento, A. P., Silva, F. P., Nunes, A. A. B., & Sellito, M. A. (2014). Barreiras para implementação da gestão verde da cadeia de suprimento em uma distribuidora de óleo lubrificante. *Revista Eletrônica em Gestão, Educação e Tecnologia Ambiental*, 18(2), 718-728. doi:10.5902/2236117013125
- Naveiro, R. M., Pacheco, E. B. A. V., & Medina, H. D. V. (2005). Ecodesign: O desenvolvimento de projeto de produto orientado para reciclagem. *V Congresso Brasileiro de Gestão de Desenvolvimento de Produto*. Belo Horizonte, MG.
- Perron, G. M. (2005). *Barriers to environmental performance improvements in Canadian SMEs*. Dalhousie University, Halifax, Canada.
- Pires, S. R. I. (1998). Gestão da cadeia de suprimentos e o modelo de consórcio modular. *Revista de Administração da Universidade de São Paulo*, 33(3), 5-15.
- Pires, S. R. I., & Sacomano Neto, M. (2010). Características estruturais, relacionais e gerenciais na cadeia de suprimentos de um condomínio industrial na indústria automobilística. *Produção*, 20(2), 172-185. doi:10.1590/S0103-65132010005000032
- Pombo, F. R., & Magrini, A. (2008). Panorama de aplicação da norma ISO 14001 no Brasil. *Gestão & Produção*, 15(1), 1-10. doi:10.1590/S0104-530X2008000100002
- Prodanov, C. C., & Freitas, E. C. (2013). *Metodologia do trabalho científico: Métodos e técnicas da pesquisa e do trabalho acadêmico* (2ª ed.). Novo Hamburgo, RS: Universidade FEEVALE.
- Saaty, T. L. (1991). Some mathematical concepts of the analytic hierarchy process. *Behaviormetrika*, 18(29), 1-9. doi:10.2333/bhmk.18.29_1
- Saaty, T. L. (2008). Decision making with the analytic hierarchy process. *International Journal of Services Sciences*, 1(1), 83-98. doi:10.1504/IJSSci.2008.01759

- Saaty, T. L., & Peniwati, K. (2013). *Group decision making: Drawing out and reconciling differences*. Pittsburgh, EUA: RWS Publications.
- Saaty, T. L., & Vargas, L. G. (2012). *Models, methods, concepts e applications of the hierarchy analysis process* (2nd ed.). New York, USA: Springer Science & Business Media.
- Sadriani, A., Ismail, N., Zulkifli, N., Ariffin, M. K. A., Nezamabadi-Pour, H., & Mirabi, H. (2013). A multi objective optimization model in automotive supply chain networks. *Mathematical Problems in Engineering*, 2013, 1-10. doi:10.1155/2013/823876doi.org/10.1155/2013.
- Salem, O., Salman, B., Najafi, M., & Moawad, A. (2010). Use of trenchless technologies for a comprehensive asset management of culverts and drainage structures. *Pipelines 2010: Climbing New Peaks to Infrastructure Reliability – Renew, Rehab, and Reinvest*. Retrieved from [https://ascelibrary.org/doi/abs/10.1061/41138\(386\)102](https://ascelibrary.org/doi/abs/10.1061/41138(386)102).
- Salerno, M. S., Zilbovicius, M., Arbix, G., & Dias, A. V. C. (1998). Mudanças e persistências no padrão de relações entre montadoras e autopeças no Brasil. *Revista de Administração*, 33(3), 16-28.
- Sarkis, J., Zhu, Q., & Lai, K. H. (2011). An organizational theoretic review of green supply chain management literature. *International Journal of Production Economics*, 130(1), 1-15. doi:10.1016/j.ijpe.2010.11.010
- Seles, B. M. R. P., & Jabbour, A. B. L. S. (2014). O papel dos stakeholders no contexto da green supply chain management: Uma revisão sistemática. *XXXIV Encontro Nacional de Engenharia de Produção*. Curitiba, PR.
- Setthasakko, W. (2009). Barriers to implementing corporate environmental responsibility in Thailand: A qualitative approach. *International Journal of Organizational Analysis*, 17(3), 169-183. doi:10.1108/19348830910974905
- Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, 16(15), 1699-1710. doi:10.1016/j.jclepro.2008.04.020
- Shibao, F. Y. (2011). *Cadeia de suprimentos verde: Um estudo nas indústrias químicas do Brasil* (Doctoral thesis). Universidade Presbiteriana Mackenzie, São Paulo, SP).
- Solér, C., Bergström, K., & Shanahan, H. (2010). Green supply chains and the missing link between environmental information and practice. *Business Strategy and the Environment*, 19(1), 14-25. doi:10.1002/bse.655
- Srivastava, S. K. (2007). Green supply chain management: A state-of-the-art literature review. *International Journal of Management Reviews*, 9(1), 53-80. doi:10.1111/j.1468-2370.2007.00202.x
- Tachizawa, T., & Andrade, R. O. B. (2008). *Gestão socioambiental: Estratégias na nova era da sustentabilidade*. Rio de Janeiro, RJ: Elsevier.
- Thun, J. H., & Müller, A. (2010). An empirical analysis of green supply chain management in the German automotive industry. *Business Strategy and the Environment*, 19(1), 119-132. doi:10.1002/bse.642
- Vachon, S., & Klassen, R. D. (2006). Extending green practices across the supply chain integration: The impact of upstream and downstream integration. *International Journal of Operations & Production Management*, 26(7), 795-821. doi:10.1108/01443570610672248
- Vanalle, R. M., & Salles, J. A. A. (2011). Relação entre montadoras e fornecedores: Modelos teóricos e estudos de caso na indústria automobilística brasileira. *Gestão e Produção*, 18(2), 237-250.
- Vanalle, R. M., Salles, J. A. A., & Vieira, M., Junior. (2009). Strategies of production in the automobile industry: A multi-case study in Spain and Brazil. *Brazilian Journal of Operations and Production Management*, 6(2), 101-124.
- Vaz, L. F. H., Barros, D. C., & Castro, B. H. R. (2014). *Veículos híbridos e elétricos: Sugestões de políticas públicas para o segmento*. Rio de Janeiro, RJ: BNDES Setorial.
- Walker, H., & Jones, N. (2012). Sustainable supply chain management across the UK private sector. *Supply Chain Management: An International Journal*, 17(1), 15-28. doi:10.1108/13598541211212177
- Walker, H., Sisto, L. Di, & McBain, D. (2008). Drivers and barriers to environmental supply chain management practices: Lessons from the public and private sectors. *Journal of Purchasing & Supply Management*, 14(1), 69-85. doi:10.1016/j.pursup.2008.01.007
- Witczak, J., Kasprzak, J., Klos, Z., Kurczewski, P., Lewandowska, A., & Lewicki, R. (2014). Life cycle thinking in small and medium enterprises: The results of research on the implementation of life cycle tools in Polish SMEs-part 2: LCA related aspects. *International Journal of Life Cycle Assessment*, 19(4), 891-900. doi:10.1007/s11367-013-0687-9
- World Economic Forum. (2013). *The human capital report 2013*. Genève, Suisse. Retrieved from <http://reports.weforum.org/human-capital-index-2013/>
- Wu, G. C., Ding, J. H., & Chen, P. S. (2012). The effects of GSCM drivers and institutional pressures on GSCM practices in Taiwan's textile and apparel industry. *International Journal of Production Economics*, 135(2), 618-636. doi:10.1016/j.ijpe.2011.05.023
- Wycherley, I. (1999). Greening supply chains: The case of The Body Shop International. *Business Strategy and the Environment*, 8(2), 120-127. doi:10.1002/(SICI)1099-0836(199903/04)8:2<120::AID-BSE188>3.0.CO;2-X
- Zaabi, S. Al, Dhaheri, N. Al, & Diabat, A. (2013). Analysis of interaction between the barriers for the implementation of sustainable supply chain management. *International Journal of Advanced Manufacturing Technology*, 68(1-4), 895-905. doi:10.1007/s00170-013-4951-8
- Zhu, Q., Sarkis, J., & Geng, Y. (2005). Green supply chain management in China: Pressures, practices and performance. *International Journal of Operations & Production Management*, 25(5), 449-468. doi:10.1108/01443570510593148
- Zhu, Q., Sarkis, J., & Lai, K. H. (2007). Initiatives and outcomes of green supply chain management implementation by Chinese manufacturers. *Journal of Environmental Management*, 85(1), 179-189. doi:10.1016/j.jenvman.2006.09.003
- Zhu, Q., Sarkis, J., & Lai, K. H. (2012). Examining the effects of green supply chain management practices and their mediations on performance improvements. *International Journal of Production Research*, 50(5), 1377-1394. doi:10.1080/00207543.2011.571937

ARTICLES

Submitted 02.13.2017. Approved 08.03.2017

Evaluated through a double-blind review process. Guest editor: Arnaldo Luiz Ryngelblum

Translated version

DOI: <http://dx.doi.org/10.1590/S0034-759020180205>

IDORT AND MANAGEMENT DIFFUSION IN 1930s BRAZIL

Idort e difusão do management no Brasil na década de 1930

Idort y propagación del Management en Brasil en la década de 1930

ABSTRACT

Management in Brazil has been considered from different theoretical and analytical perspectives. Some seek to reveal its relationship with Anglo-Saxon thought, which is the original constitution of this body of knowledge and organizational practice, and highlights the importance of historical Management research. Therefore, this study examines how the importation of Management doctrines and its diffusion through the creation of Idort was marked by a turbulent scenario of political and ideological disputes, which became the substrate for the consolidation of practices that determined the institutional locus of Management in Brazil in the following decades.

KEYWORDS | Management in Brazil, Management history research, Idort, Management Institutes, Management diffusion.

RESUMO

O Management no Brasil tem sido considerado a partir de diferentes perspectivas teóricas e analíticas. Algumas delas buscam revelar sua especificidade em relação ao pensamento anglo-saxão, a perspectiva original de constituição desse corpo de conhecimento e prática organizacional. Nesse sentido, uma importante forma de abordagem do Management é pela perspectiva histórica, na qual este estudo foi realizado. Assim, buscamos revelar como a importação e difusão de doutrinas do Management a partir da criação do Idort são marcadas por um conturbado cenário de disputas políticas e ideológicas, que se revelou como o substrato para a consolidação de práticas que determinaram o próprio locus institucional do Management no País nas décadas seguintes.

PALAVRAS-CHAVE | Management no Brasil, pesquisa histórica em Administração, Idort, Instituto de Management, difusão do Management.

RESUMEN

La gestión en Brasil ha sido considerada desde diferentes perspectivas teóricas y analíticas. Algunas de estas tratan de revelar su especificidad en relación con el pensamiento anglosajón, que es la perspectiva original de la constitución de este conjunto de conocimientos y prácticas organizacionales. En este sentido, una forma importante de enfoque de la gestión es la investigación histórica. Así, en este estudio, hemos tratado de revelar cómo la importación y la difusión del Management, con la creación del Idort, están marcadas por un escenario problemático, de disputas políticas e ideológicas, que resultó en sustrato para la consolidación de prácticas que determinan la dirección del propio locus institucional en el país, en las décadas siguientes.

PALABRAS CLAVE | Gestión en Brasil, investigación histórica de la gestión, Idort, Institutos de gestión, difusión de la gestión.

FÁBIO VIZEU

fabio.vizeu@gmail.com

ORCID: 0000-0003-2261-3142

Universidade Positivo, Programa de Mestrado e Doutorado em Administração, Curitiba, PR, Brazil

INTRODUCTION

Brazilian researchers face the challenge of understanding the uniqueness of the country's organizational practices, exercised in a significantly different context from the great majority of the management models adopted here. Therefore, one way to verify the peculiar aspects of Brazilian management and organizational forms is by scrutinizing the historical trajectory of Management in the country, and by analyzing the social, economic, and political references that conditioned this process.

There was a significant difference in the establishment of modernization processes in Brazil from that of Management in the United States during the turn of the 20th century. In the United States, the emergence and dissemination of Management occurred from an economic and social conjuncture favored by rapid capitalist and technological development characteristic of the second half of the 19th century, which conditioned the most advanced stage of industrialization (Chandler, 1977; Vizeu, 2011). In Brazil, the introduction of industrial capitalism and the first efforts to systematize professional management occurred at a time of political turmoil, when specific elements of the traditional institutions of a pre-industrial past persisted (Pinheiro, 1977).

Thus, the introduction of Management in our country was marked by anachronism, creating specific conditions for its consolidation in reality (Vizeu, 2011). In Brazil, industrialization began much later than other great nations, generating a peripheral and dependent system, in addition to having conditioned the pace of technological development and the competitive capacity of the country (Cardoso, 1972).

That said, the understanding of modern Business Administration in Brazil necessarily entails the understanding of the historical context surrounding its introduction and the first attempts to diffuse Management in the country. Thus, this study attempts to deal with this process by recovering one of the first efforts in the institutionalization of Management in Brazil: the establishment of an institute for the diffusion of Taylorist principles and techniques of work rationalization and systematic management. This effort was the foundation of the Rational Work Organization Institute (Instituto de Organização Racional do Trabalho [Idort]), which occurred in São Paulo in the early 1930s, a city and period of great relevance in the consolidation of the industrial economy in the country.

This institute was the manifestation of an effort to promote Management similar to that in Europe and the United States in the period between the great wars, through the creation of the International Management Institute and the Taylor Society, respectively. It is important to consider that the statute of the

Taylor Society served as the basis for the elaboration of the Idort statute, as verified in the historical documents investigated.

From the methodological perspective, this study is a historiographical study. Our historical analysis is based on that of Burke (1992), who understands history as a narrative, a personal and peculiar version of the past, constituted originally by the researcher. Thus, the analysis of the historical documents was oriented to indicate a trajectory of construction and development of the project of diffusion of Management in the country from the foundation of Idort, in which we tried to identify factors that portrayed the results, problems, and even the transformations of Idort.

Operationally, the procedure used in this study was the documentary analysis of material made available in the historical archives. The collection of Idort's historical documents can be found in the Edgard Leuenroth Archive (AEL) of the Institute of Philosophy and Social Sciences of the State University of Campinas. The description of the documents is available electronically on the website of the archive, in the collections "Idort" and "Roberto Mange." These include all copies of *Revista Idort* (Idort Journal) (from 1932 to 1961), the annual board meeting minutes (from 1931 to 1961), and other documents of Idort and their divisions (leaflets, reports, and opinions) totaling more than 250 documents. We had the technical assistance of AEL's staff for the proper handling of the documents. In addition to the AEL, we used some documents from the "Getúlio Vargas" and "Lourenço Filho" collections, electronically available from the Contemporary Brazilian History Research and Documentation Center (CPDOC) of the Getúlio Vargas Foundation (FGV) to gather information on the time contextualization and participation of Idort's members in the Department of Public Service Administration (DASP) and FGV. These documents were consulted from their titles and descriptions. Finally, considering that the collections surveyed were composed of a limited number of documents and information, our narrative was constructed by examining the Brazilian historiographical literature, to contextualize the events and other aspects identified, as relevant to the historical trajectory of Idort. Among the most consulted historiographical texts are Dean (2001), Faoro (2001), Leopoldi (2000), Luz (1975), Martins (1974), Pinheiro (1977), Skidmore (1998), Marcovitch (2005), Cardoso (1972), Wahrlich (1983) and Codato (1997).

The period of coverage chosen for the documentary analysis was the year corresponding to the year of foundation of Idort, following up to 20 years later (1931-1951). This historical cut covers the period in which the first significant industrial momentum occurs in Brazil (Leopoldi, 2000; Luz, 1975; Pinheiro,

1977). Therefore, we understand that this is a decisive moment for the emergence of large manufacturing organizations, and consequently, when the need arises for a new model focusing on the rationalization of managerial practices.

HISTORICAL CONTEXT OF IDORT EMERGENCY

The attempt to introduce Management in Brazil by the Idortian project in the 1930s was conditioned by a particular institutional context, marked by elements of traditional patrimonial orientation (Cardoso, 1972; Faoro, 2001; Vizeu, 2011). Therefore, the agrarian institutions that consolidated in nineteenth-century Brazil played a decisive role in the pace of this modernization process, which, despite the fact that interest in political and economic modernization was already present at the beginning of that century, only substantiated at the turn of the twentieth century (Luz, 1975; Skidmore, 1998). In other words, the original institutions in the colonial period conditioned Brazilian business activity, and the role they played in the modernization process of the late 19th century resulted in the country's anachronistic configuration. Especially concerning the Republican state and the industrial economy, a largely ambiguous caricature was established, characterized by the paradoxical coexistence between elements of an archaic Brazil with the promise of modernity.

Therefore, patrimonialism conditioned the industrialization at the beginning of the 20th century and its consequent mechanisms of business management. Thus, the cultural elements prevailing in the political order of colonial-imperial Brazil, such as the clientelism of relations between private actors and public agents (the basis of maintaining the bureaucratic state), marked the entrepreneurial practice at the beginning of industrialization. Leopoldi (2000) observes this aspect when examining the formation of associations of the industrial class in the early 20th century, characterized by the protectionism of the elites and the articulation of private interests. This is the background to the creation of the first Management institute in Brazil.

IDORT CREATION PROJECT

According to the documentary sources consulted, Idort was founded on June 23, 1931, by a group of 92 associates, most of them from social classes and professional categories, which at

the time expressed an explicit interest in the great modernization projects of the country. The projects that focused on the demand for industrialization—questions about training factory labor, rationalization of production, technological improvement of the national industry, and even the modernization of the state machinery in support of industrial activity—stood out.

In the heterogeneous set of sympathizers of Brazilian modernization, a group of intellectuals and professionals stood out in São Paulo during the 1920s (Leopoldi, 2000). This group began formulating a project to establish an institute focusing on the doctrines of Management that were proliferating in the United States and Europe at that time. Since this doctrinal movement was named *Organização Racional do Trabalho* (Rational Work Organization) in Brazil, this group began isolated projects of rationalization and systematization of business administration and industrial work, efforts which gradually gathered in a unified movement, which founded the Idort 10 years later (Amaral, 1961).

However, according to the documents, from the 1920s, under the coordination of Robert Mange—professor of the future School of Sociology and Politics of São Paulo and one of the founders of Idort—studies began on the rationalization of professional selection and physiological problems of work hygiene, under the supervision of the medical hygienist Paula Souza (Amaral, 1961). The results of studies by Mange and Paula Souza resulted in the proposal of an institute to promote these efforts to rationalize work, first as a society of psychotechnics, which would deal with issues such as physiology and industrial psychology.

With the failure of this first initiative, the idea was revived by Aldo Mario Azevedo, an engineer and businessman. The proposal was rethought as an institute for the propagation of the rational work organization, idealized like the American movement of Scientific Administration and denominated Instituto Paulista de Eficiência (São Paulo Institute of Efficiency). For this second initiative, besides the group linked to the project of the Institute of psychotechnics, managers, and entrepreneurs from several organizations from São Paulo were recruited. Only a few months earlier, the denomination was decided as the Rational Work Organization Institute, abbreviated to Idort. Moreover, Aldo Azevedo and his collaborators decided to invite engineer Armando de Salles to preside over it, in order to give weight to the institute (Amaral, 1961).

Armando de Salles was an important figure in São Paulo society, son-in-law of Júlio Mesquita, a remarkable businessman and founder of the newspaper *O Estado de S. Paulo* (Marcovitch, 2005). When he was invited, Armando de Salles had just become

the president of the company that owned the newspaper, which was fundamental to the strategy of promoting the institute in São Paulo, to increase its membership.

This is how Idort was organically formed, similar to the Taylor Society and other European organizations of dissemination of the rational work organization practice, especially the International Management Institute, based in Geneva, an organization of which the Brazilian institute was a member and representative in Latin America (*Revista Idort*, 1, 1932).

However, we must also consider that Idort emerged from a daring project of association of the political forces that made up São Paulo's elite in a troubled period of major transformation in the country. At this point, the foundation of Idort served the interests of intellectual and entrepreneur groups through the articulation of national institutions (Leopoldi, 2000). Idort needed the State's and that of other institutions in the non-economic sphere, acting in areas such as education, public health, and so on, its central element of rationalizing economic agents for national development. Therefore, in addition to engineers and industrialists, we find sanitarians, politicians, educators and even businessmen, and bankers as idealizers of Idort.

The founders of Idort came from a conciliatory ideological element, aiming to free themselves from the ideological dispute between workers and industry and between agriculture and industry (Leopoldi, 2000, Luz, 1975, Pinheiro, 1977), not only in the idea of conciliation between different economic niches (industry, agriculture and commerce), but mainly through the Taylorist assumption of harmony between employer and employee, generated by the rational work organization.

During the tense period between the great wars and owing to national and international conjunctures, those in São Paulo society that supported the Idort project saw, in the creation of this institute, a neutral ground, capable of joining forces, despite differences of interest and political differences. That was how, in the eyes of the founders of the institute, the period of global crisis only made the need for this "national integration" over efficiency and rationalization more acute (Amaral, 1961).

Thus, by bringing together the efforts of rationalization by some medical hygienists, by pedagogues concerned with the educational system and the professional training of the mass of workers, and especially by engineers and industrialists interested in systematizing the work process and management activity, Idort emerged in the 1930s with the great promise of introducing and disseminating the principles of Management in the industrial center of the country.

OBJECTIVES OF THE IDORT AND INITIAL EXPECTATIONS OF ITS FOUNDERS

As mentioned, the question of cooperation among the different classes of production in the country remained a central issue for this organization when it was founded, and this principle was reflected in its statutory guidelines. The group of scholars and sympathizers who created Idort justified this project as a way out of the crisis that plagued the world in the late 1920s and believed that efficiency was imperative, given increased competitiveness. The founding partner Moacyr Alvaro argued for the creation of Idort as follows:

Here, as elsewhere, the general malaise, arising from an economic-financial debacle, was the element that gave rise to a new and receptive mentality for the ideas long ago defended by some experts in the issues of scientific organization of work. Just as Taylor and his American disciples only saw their ideas of rationalization of work technique diffused when the crisis resulting from the immoderate expenditures arising from the World War forced the industry into intense competition, also among us the acceptance of Taylor's methods, according to the ideas of Fayol and Emerson, the application of the teachings of physiology and work hygiene and of psychotechnics were only possible when, having been hit hard by the restriction of easy markets for our products, we were forced to work harder to be able to compete with our competitors. (Alvaro as quoted in Amaral, 1961, p. 8)

As indicated by the Idort statute, the institute was created with the mission of studying, disseminating, and applying the methods of scientific organization of work for the economic and social promotion of São Paulo and Brazilian society. Although these broad guidelines imply a broad spectrum of the types of organizations and industries that the institute should embrace, the initial intention of the directors was for Idort to turn to the private sector. This is evident in the type of public initially approached to participate in the society, which, overwhelmingly, was that of entrepreneurs, managers, and private sector technicians. Furthermore, the documents relating to the first years demonstrate a preference for industries, as this was the original sector for the majority of the founding members, especially the engineers.

The founding statute of Idort defines the performance of its activities from the creation of a journal and two technical divisions, referred to in the documents as First and Second Technical Divisions of Idort, but with statutory names of Division of Administrative Organization and Division of Technical Organization of Work, respectively. The main objective of the technical divisions was to carry out, together with the companies of São Paulo and other Brazilian states, studies to reorganize the administrative structure of companies and public agencies. Thus, Idort wanted its technical divisions to be the direct channel for the empirical development of the techniques and principles of Taylor and the other authors in Management, through new arrangements and systems focused on work optimization and management as a technically oriented function in Brazilian companies.

A different focus of action characterized the attributions of the technical divisions. The working regime stipulated for the First Technical Division was *ad hoc*, where special commissions would be formed for each contracted project. According to the founding statute of Idort, besides the parameters of a modern general administration, this division would take care of the simplification, standardization, and efficiency of the methods and processes in Administration, Production, Statistics, Accounting, and Legislation of the applicant companies.

As for the Second Technical Division, the focus was the operational and execution level of the work, following the doctrinal line of Taylorism. This division brought together technicians interested in this doctrine and industrial psychology. Therefore, the Second Technical Division was headed, for a long time, by the professor of the Polytechnic School of São Paulo, the Swiss engineer Robert Mange, the main disseminator of psychotechnics in Brazil in that period.

In addition to the two technical divisions, Idort's other work center was the institute's journal. Created to be an important channel for disseminating ideas about the rationalization of business administration and industrial work, this journal was also designed to serve as an important vehicle for the promotion of Idort and its work in São Paulo society, becoming a channel of communication and integration of a true technicist community of rationalization.

Its editorial consisted of articles by members and experts on the ideas of important foreign thinkers in this area, summaries of the reports on the works of the institute's technical divisions, reports on management experiences and scientific organization of national and foreign companies. Idort had exchanges with similar organizations in Europe and the United States for the publication of foreign studies and articles on issues of interest to the institute, in its journal. That was how, according to this

editorial line, several translations of articles from American and European publications acquired by the institute were published in *Revista Idort*.

Another indication is that the creation of *Revista Idort* was mainly for disseminating the Management movement in the country. Although it was expected that the journal would become one of the main sources of finance for the institute, the free distribution of copies was adopted as policy since the first edition. When analyzing this decision of the Institute, we perceived it as an oriented mechanism for the diffusion of the ideology of rationalization. The initial strategy was the distribution of copies in important class associations and other organizations considered social centers conducive to the rationalization of management and work. This measure was direct action to attract new adherents to the cause of the institute, but also to attract new partners. In the reports and documents of the institute, the directors refer to the free distribution of copies of the journal as a conscious effort to sediment the so-called "rational mentality" in Brazilian society.

Finally, an important target set by the Idort's directors at the time of the founding of the institute was to reach 500 associates quickly. This number would convince the founding partners that it would be easy to establish a rationalization institute in São Paulo, considering that it was the great industrial center of the country. The following statement of the first-year management report suggests this: "An institute with the purposes of Idort must have at least 500 partners in an advanced environment such as São Paulo. It is not possible that it cannot achieve this." (Idort's Annual Report 1932, page 8). In addition, reaching 500 members indicated was deemed by the founders, as necessary for the financial balance of the institute, as it was expected that the journal and the technical divisions would finance themselves, and the revenue from members' contributions should maintain ordinary expenses with facilities, tax obligations, and the office. We will see below that, in fact, the number of partners was one of the main problems faced by Idort in its early years, significantly compromising the institute's survival. We will also see that this issue was fundamental in the redirection of Idort's focus of activity.

FIRST YEARS OF THE INSTITUTE: DIFFICULT TIMES

From the initial effort of the institute's idealizers, everything indicated that the creation of Idort would be relatively easy. In part, this was due to the optimistic spirit of this group, given the

intense mobilization of the commission to spread the project and increase members in São Paulo. From this initial effort, the Idort creation commission succeeded in bringing together 92 partners for the foundation of the institute in June 1931.

However, the documents reveal that the institute's actions in its early years were just the opposite. Financial difficulties, technical divisions that were not functioning due to lack of projects, and difficulties in terms of growth in the number of partners were the main problems that challenged the directors of Idort in disseminating Management to companies in São Paulo. (*Revista Idort*, n.1, 1932).

Furthermore, in the first Annual Report of the Board of Directors, we identified the disappointment of the directors over the frustrating indifference of society in São Paulo to Idort. In fact, the numbers in the early years are below the 500-partner target (423 partners in the fifth year), a regretful reminder in the Annual Reports of the Board of Directors of the first four years after foundation. The low membership of the institute was probably not due to the omission of the directors, as they were engaged in the arduous task of recruiting Idort adherents well before its foundation.

On the other hand, the involvement of the common partner in this effort to recruit new members is not similar, considering the weak response to the appeals of the directors, as can be seen in the following section, referring to the first Annual Report of the Board of Directors:

On February 15, 1932, we sent the founding members a circular letter inviting them, as a matter of urgency for the survival of the Institute, to advertise it and obtain new partners among their friends. The result of this circular, however, was so small that it almost went unnoticed. (Idort's Annual Report of the Board of Directors, 1932, p. 3)

If the low adherence to the appeals of the directors is explained by the difficulties of the ordinary partner in raising new members or if this problem was caused by the indifference of the members to the concerns of the board, is something that the documents available are unable to clarify. However, in either case, recognizing the importance of the institute and its cause was difficult. The late association of some important industries in São Paulo also shows a certain indifference with which the big industrialists received the Idort proposal. Companies such as Companhia Antártica Paulista, Fábrica Votorantim S / A, Indústrias Reunidas Francisco Matarazzo and Pirelli S/A only associated

themselves with Idort in 1935 (Idort's Annual Report of the Board of Directors, 1935, p.1), shortly after the president of the institute became the intervenor of the State of São Paulo of Vargas's Government. This may indicate that the affiliation was more for political interest than for the doctrines of Management. We will return to this issue in the next section.

TURNAROUND OF THE INSTITUTE

Considering that one of the expectations of the founding partners was that Idort's priority was in the private sector, the frustrated initiatives to expand the membership and in executing the consulting services of the technical divisions in the early years were decisive in questioning this perspective. Thus, from 1935, the institute began to take a new course due to the financial problems that jeopardized its survival (Idort's Annual Reports of the Board of Directors, 1933, 1934, 1935), but mainly due to the opportunities that arose with the appointment of Idort's president as federal intervenor in the government of the State of São Paulo. This political appointment was instrumental in the turnaround of Idort.

Two main indicators demonstrate that this was a period of significant turnaround in Idort's trajectory. They are, i) overcoming the financial crisis; and ii) significant increase in the number of partners, events which occurred specifically after 1935.

Concerning membership growth, the 1936 Annual Report of the Board of Directors indicates that from 1935 to 1936, there was a significant increase in the number of partners (from 423 to 791). The Idort board considered the following causes for this:

The remarkable surge in progress made last year may be largely attributed to the work of the administrative reorganization of the State of São Paulo carried out by IDORT, which had great repercussion not only among the statesmen and officials who were able to appreciate the excellent results achieved, but also by the public in general that had knowledge of them through the press. (Annual Report of the IDORT Board, 1936, p.3)

According to Idort's own directors, the increase in the number of associates, plus the resources from a job performed by Idort's technical divisions, was sufficient for the institute's financial recovery. This consulting work performed by Idort corresponded to a broad process of reorganization of the

administrative framework of the state executive power, centered on the rationalization principles of Management, and was named the Administrative Reorganization of the State Government. Not coincidentally, it was hired in the management of the newly appointed Governor of the State of São Paulo, Armando de Salles de Oliveira, Idort's first president.

Support from the Governor of the State of São Paulo

With the appointment of Idort's president as federal intervenor in the State of São Paulo in August 1933 (the equivalent of the governor of the state in the provisional government of Vargas), a unique opportunity arose for the institute to overcome the bad phase of its first years. Thus, with Armando de Salles Oliveira in the highest position of the state executive showed Idortians that their struggle to disseminate the ideology of rational organization in São Paulo had gained a strong ally—the State—an actor which, in that troubled political and economic context, might be able to sensitize large industrialists better, and implement more effective actions among the masses, something that even Idort's sponsor newspaper was unable to achieve.

Thus, in the same decree that recognized Idort as a public utility institution, Armando de Salles Oliveira authorized RAGE to be held on January 25, 1934, only five months after taking office in São Paulo's government (Idort's Annual Report of the Board of Directors, 1934, p.2). The agreement for this administrative reorganization program determined the payment of 75 “contos” to Idort, corresponding to the execution of work estimated to be carried out in five or six months. This money was sufficient to end the financial crisis definitively, considering the financial statements of the institute, and would allow the expansion of Idort's activities.

The RAGE was initially undertaken by the First Division, which analyzed and proposed changes in the first step of the administration of São Paulo, covering the office of the auditor and the State Departments. Subsequently, the government of the State of São Paulo requested the services of the Second Division to analyze the execution of operational processes, such as paperwork procedures, archiving, and attendance to the internal and external public. Moreover, the Second Division was responsible for carrying out studies and proposing new procedures for the selection and training of public servants.

After a long period of analysis of the administrative and operational structure of the State administration, the RAGE program proposed a new structure for São Paulo's

government, centered on the division between administrative services and technical services. In addition to the creation of a department of control and flow of managerial information, the RAGE promoted the rationalization of state government portfolios, reducing the number of departments and standardizing the purely administrative functions of these departments, such as accounting, protocol, and control of personnel. As mentioned, RAGE also had the participation of Second Division's services, which corresponded to the study of times and movements of protocol services and of furniture and materials used in this function. Furthermore, the Second Division held the first rational personnel selection process for a public agency in the country through RAGE.

New support from other political patrons

After the RAGE was contracted in 1934, other Idort members made similar commitments as the federal intervenor and former president of that institute. The route chosen by these new “political patrons” was the same as the RAGE: by decree or decision of the person in charge of a specific public body and who had some formal relationship with the institute. Thus, Idort was contracted to carry out large services, which always represented the input of financial resources in times of crisis, whether for the maintenance of the activities of the technical divisions or of the journal itself.

In this sense, some examples should be highlighted. Regarding the contracting of the RAGE in the state of Goiás (the second largest administrative reorganization program conducted at that time, by the First Division), this occurs exactly after the intervenor of that state takes office, another politician who had been a founding partner of Idort. The contracting of Idort services also took place within the ministries and state departments. Three important examples were the appointment of Aldo Azevedo to the Public Service Department (created by the RAGE in the government of Armando de Salles)—one of the public bodies that demanded services from Idort's technical divisions, the appointment of Abelardo Vergueiro Cesar to the Department of Justice of São Paulo and of Clóvis Ribeiro to the Treasury Department of that state, all of them founding partners of Idort.

Another interesting case was the increase in revenues from *Revista Idort* subscriptions. Before 1936, the journal's revenue was never enough to cover its own expenses, and finance from other sources was necessary. However, in 1935, there was an almost 250% increase in the number of subscriptions, which ensured the journal's self-sufficiency. This was due to 250

subscriptions held by the Municipal Administration Department of the State of São Paulo, under the command of Secretary of State Domício Pacheco e Silva, Idort's First Category partner. According to the 1935 Idort's Annual Report of the Board of Directors, these subscriptions were used to supply each city in the state with a copy of the journal. Although held at a reduced price, in the following year—when Pacheco e Silva left the government—the subscriptions were not renewed by the Department of Municipalities. Each city was granted individual renewal of its respective subscription, but this appeal had slight effect.

Furthermore, the Ministry of Foreign Affairs had contributed with the purchase of 99 copies of *Revista Idort* to be distributed at Brazilian embassies and consulates in foreign countries. However, this favorable attitude to Idort was because J. C. de Macedo Soares, a founding partner of Idort, held the top position in this important ministry of Vargas's government. Along with the other cases, this event demonstrates that even considering themselves a vanguard group, Idort's directors were not embarrassed to adopt the patronage politics characteristic of archaic Brazil.

Finally, the political tone in contracting the services offered by Idort to public administration bodies can be attested by the interruption of these services after the “political patrons” left their positions. This orientation was clear in the aforementioned case of subscription interruption by the cities of the State of São Paulo, when the superintendent of the Department of Municipalities, Domicio Pacheco e Silva, left his position and the municipalities were not obliged to renew the subscriptions. However, the most significant example was the interruption of the RAGE with the departure of Armando de Salles from the government.

DISCUSSION: IDORT'S FAILURE AMONG ENTREPRENEURS AND ITS PIONEERING SPIRIT IN THE RATIONALIZATION OF THE PUBLIC SECTOR

The creation of Idort represents a movement very similar to the spread of Management in the United States and Europe at that time. Conceived as an institute of work psychotechnics for medical hygienists and professors of technical schools in São Paulo, Idort was only feasible as a project with the engagement of certain members of the emerging industrial management class. This class comprised mostly engineers working as directors and

technical leaders in the country's industries who, at the time, felt the weight of inefficiency in their organizations and wanted to share practical solutions to their managerial problems.

We see that the Idort project began as a vehicle for interlocution and gathering of practical ideas of the technical class in the industries of São Paulo, similar to the class associations and specialized newspapers of the United States, which at the turn of the 19th century, were the birthplace of Taylor's *Scientific Management* (Jenks, 1960).

However, its history is marked by aspects very different from similar institutes in the United States and Europe. In a way, this peculiar trajectory of the institute can be understood from the historical identity of Brazil itself, marked by privatization between the economic elites and public power, commonly noted in the literature on the history of national institutions (e.g., Codato [1997]; Faoro [2001]; Leopoldi [2000]; Skidmore [1998]; Vizeu [2011]). We present some possible explanations about Idort's history to recognize how its foundation and initial trajectory can help us understand the formation of Brazilian management thinking. Because it is a historiographic study with limited sources and many gaps—such as any historiographic study in the Brazilian organizational context (Vizeu, 2010)—we cannot consider the following points as conclusive evidence and definitive explanations about the history of Management in Brazil. Indeed, as noted by Burke (1992), the role of writing history is to constitute an interpretation of the past, a possible explanation, running away from the presumption of an absolute truth common to the hegemonic positivist thinking in the academic field of social sciences. Thus, we consider the role of Idort as a movement capable of explaining the history of Management in Brazil.

Despite Idort's initial expectation of wide acceptance of its program in the business environment (especially in industrial enterprises, as indicated by the documents), the difficulties in attracting new partners, conducting consulting projects of technical divisions of the institute and the financial problems in its early existence, indicated that their idealizers were wrong. The 500-partner target was reached only after a turnaround in the initial direction. The original concern for the broad participation of the private sector—as did most European and US equivalent associations—give way to greater emphasis on actions in the public sector, owing to the appointment of the institute's president to the highest position in the government of São Paulo.

One possible explanation for the disenchantment of Brazilian industrialists of the time with Idort is the social matrix of most of these entrepreneurs. As Pereira (1974) and Cardoso (1972) observed in their studies on the ethnic and social origins

of São Paulo entrepreneurship, and in Dean's (2001) study of the industrial references at the beginning of the last century, the relationship between entrepreneur and the professional manager in Brazil did not happen like in the United States and most industrialized countries of Europe. While in developed industrial countries, the logic of efficiency prevailed as a determinant of competitiveness, in Brazil, business growth was through relationships between industrialist and the political class, not by improvement in management practices. We have put forth this thesis already (Vizeu, 2011), noting that this orientation is the sedimentation of patrimonial mentality among the first Brazilian industrialists.

Another important point about the history of Management in Brazil from the initial Idort perspective concerns the beginning of administrative rationalization in the public sector. In the literature on the history of public administration in Brazil, DASP is commonly referred to as the first rationalization effort in state administration in the country (Wahrlich, 1983). However, in this study, we have seen that Idort's RAGE program was an earlier initiative and that, unlike usual literature, this program should be considered the first effort to restructure public administration, centering on the principles of Management. As this idea was overlooked in important studies on the history of the country's public administration, we can infer some possible reasons for this omission.

One possible explanation is that Idort and its achievements appear to have been intentionally excluded from the news and official documents of other organizations of that time. In the editorials of *Revista Idort*, we noted some regrets of the directors regarding the omission of Idort in the headlines, specifically on the initiatives in which this institute had direct participation, such as the creation of CFESP, DASP, and FGV. This posture of the press towards Idort could be explained by the sharp political differences in the troubled scenario of that time, highlighted by sharp polarization within the State of São Paulo (Codato, 1997). Furthermore, we must consider the tensions between the citizens of São Paulo and the federal government, which may have encouraged the disregarding of Idort's participation in the rationalization initiatives of Getúlio Vargas's government.

However, our study reveals strong evidence on the participation of Idort and its members in such management rationalization initiatives in Vargas's Government. For example, Idort documents (especially *Revista Idort* editorials in the issues published between 1937 and 1941, as well as the director's reports of the same period) reveal that the institute probably played an

important role in the creation of DASP and FGV, although Idort was not mentioned in the literature as a participant. Similarly, other institutes and parastatal organizations were associated with Idort, considering the participation of their directors and founders, such as the Brazilian Association of Technical Norms, the Railway Center for Teaching and Selection of Personnel, the Institute of Psychology, the Brazilian Association for the Prevention of Accidents, the Free School of Sociology and Politics, and the University of São Paulo itself.

CONCLUSIONS

We consider that studying the founding of Idort in the 1930s is important, as it reveals a decisive moment in the configuration of Management in Brazil and indicates a new understanding of Brazilian managerial identity, currently investigated by studies on current organizational and managerial culture.

How Idort dealt with difficulties in achieving its goal of disseminating Management doctrines—problems caused by the low adherence of businessmen and industrialists to the institute—also reveals a pattern of behavior of the Brazilian business class. In fact, what the directors of Idort did to solve their problems was a common practice between the nineteenth-century agrarian elite and the estate. That is, the pursuit of privileges obtained through good relations between the economy class and authorities in public power and the advantages from the patronage of strong men in the state, as was the case in colonial and monarchic Brazil (Faoro, 2001). Ironically, Idort only adopted this practice due to the difficulties it faced, suggesting an indifference to the importance of the management rationalization program by the business class. In a way, the practice of obtaining economic benefits through political influence reflects a characteristic of patrimonial relations, something already noted by Vizeu (2011). That was how an organization founded under the aegis of the vanguard, because it defended one of the most important values of modernity—rationality—was stuck in the same institutional order that it tried to renew.

Another important point to consider is the pioneering spirit of Idort. Founded in 1931, it was a vanguard project, being contemporary to the introduction of Management in industrialized countries of that time. Despite this, this effort is commonly overlooked in most literature that directly or indirectly addresses the history of Management in Brazil. During our study, we inquired about this gap and its reasons. Through this study, we intend to remind the country that Idort should be recognized as a pioneer organization in the promotion of Management in Brazil.

Thus, just as the pioneering role of ESAN in business administration education in Brazil is obscured by the great impact of FGV-SP and USP Administration schools on the institutionalization of Management teaching (Bertero, 2006), or even the role of the Administration courses of FACE/UFMG (Barros, 2014), the first efforts of Idort were also relegated to oblivion. Thus, despite this first attempt by Idort to introduce and establish Management practices in the country, it was only in the 1950s that that this institution was incorporated into Brazilian business reality, especially considering presence in the administrative frameworks of the companies of professionals trained by the great management schools (Bertero, 2006), but also due to the greater presence of foreign industries in the country, which, forced to operate directly in the production of industrialized goods owing to strict application of law on similar products, contributed to a widespread professional management mentality in Brazil (Pereira, 1974; Pinheiro, 1977).

Idort's history urges future studies on comparative history. As we focused on investigating events and data in Brazil, we do not know the extent of exclusivity or similarity with other countries having similar trajectories in introducing Management. It would be interesting to examine the constitution of Management in countries outside the mainstream. It may help understand the influence of the United States and the industrialized countries of Europe in the import and diffusion of managerial doctrine.

As the aspects revealed in our study about the role of Idort have gone almost unnoticed by the specialized literature shows that in a country as complex as Brazil—and with such poorly investigated business realities—the history of Brazilian Administration is not as obvious as it seems. Therefore, it is important to highlight recent studies that elucidate this complex reality, such as the historical studies by Amon and his collaborators on teaching administration in Brazil (Barros, 2014, 2017; Barros & Carrieri, 2013), or studies by Alcadipani and Bertero (2012, 2014) and Wanderley (2016). Our study aims to contribute to these efforts, revealing important nuances in the history of Management in Brazil. Understanding Brazilian management is the understanding of Brazil in its social, cultural, economic, and political totality, a task only possible through broad historical perspectives.

REFERENCES

- Alcadipani, R., & Bertero, CO (2012). *Guerra fria e ensino do management no Brasil: O caso da FGV-EAESP*. *RAE-Revista de Administração de Empresas*, 52(3), 284-299. doi:10.1590/S0034-75902012000300002
- Alcadipani, R., & Bertero, CO (2014). *Uma escola norte-americana no Ultramar? Uma historiografia da EAESP*. *RAE-Revista de Administração de Empresas*, 54(2), 154-169. doi:10.1590/S0034-759020140204
- Amaral, PF (1961). Trinta anos de atividades no campo da organização científica. *Revista de Organização Científica do IDORT*, 30(353/354), 5-26.
- Barros, A. (2014). *Uma narrativa sobre os cursos superiores em administração da Face/UFMG: Dos primeiros anos à sua unificação em 1968*. *Cadernos EBAPE.BR*, 12(1), 7-25.
- Barros, A. (2017). *Antecedentes dos cursos superiores em administração brasileiros: As escolas de comércio e o curso superior em administração e finanças*. *Cadernos EBAPE.BR*, 15(1), 88-100.
- Barros, AN, & Carrieri, AP (2013). *Ensino superior em administração entre os anos 1940 e 1950: Uma discussão a partir dos acordos de cooperação Brasil-Estados Unidos*. *Cadernos EBAPE.BR*, 11(2), 256-273.
- Bertero, CO (2006). *Ensino e pesquisa de administração*. São Paulo, SP: Thomson Learning.
- Burke, P. (1992). *A escrita da história*. São Paulo, SP: Editora Unesp.
- Cardoso, FH (1972). *Empresário industrial e desenvolvimento econômico no Brasil* (2ª ed.). São Paulo, SP: Difusão Europeia do Livro.
- Chandler, AD (1977). *The visible hand: The managerial revolution in American business*. Cambridge, USA: Harvard University Press.
- Codato, A. (1997). *O departamento administrativo do estado de São Paulo na engenharia do Estado Novo*. *Revista de Sociologia e Política*, 9, 115-127.
- Dean, W. (2001). *A industrialização de São Paulo: 1880-1945* (4ª ed.). São Paulo, SP: Bertrand Brasil.
- Faoro, R. (2001). *Os donos do poder* (3ª ed.). São Paulo, SP: Globo.
- Jenks, L. (1960). *Early phases of the management movement*. *Administrative Science Quarterly*, 5(3), 421-447. doi:10.2307/2390664
- Leopoldi, MA (2000). *Política e interesses na industrialização brasileira*. São Paulo, SP: Paz e Terra.
- Luz, N. V. (1975). *A luta pela industrialização no Brasil*. Rio de Janeiro, RJ: Alfa-Ômega.
- Marcovitch, J. (2005). *Pioneiros e empreendedores: A saga do desenvolvimento no Brasil* (2 vols.). São Paulo, SP: Edusp/Saraiva.
- Martins, CE (1974). *Tecnocracia e capitalismo: A política dos técnicos no Brasil*. São Paulo, SP: Brasiliense.
- Pereira, LCB (1974). *Empresários e administradores no Brasil*. São Paulo, SP: Brasiliense.
- Pinheiro, P. (1977). *Política e trabalho no Brasil*. Rio de Janeiro, RJ: Paz e Terra.
- Skidmore, T. (1998). *Uma história do Brasil*. São Paulo, SP: Paz e Terra.

Fábio Vizeu

Vizeu, F. (2010). Potencialidades da análise histórica nos estudos organizacionais brasileiros. *RAE-Revista de Administração de Empresas*, 50(1), 37-47. doi:10.1590/S0034-75902010000100004

Vizeu, F. (2011). Rural heritage of early Brazilian industrialists: Its impact on managerial orientation. *Brazilian Administration Review*, 8(1), 68-85. doi:10.1590/S1807-76922011000100006

Wahrlich, BM (1983). *A reforma administrativa da era de Vargas*. Rio de Janeiro, RJ: Fundação Getúlio Vargas.

Wanderley, S. (2016). Iseb, uma escola de governo: Desenvolvimentismo e a formação de técnicos e dirigentes. *Revista de Administração Pública*, 50(6), 913-936. doi:10.1590/0034-7612150061

ARTICLES

Submitted 09.14.2016. Approved 10.16.2017

Evaluated through a double-blind review process. Scientific Editor: Mateus Canniatti Ponchio

Original version

DOI: <http://dx.doi.org/10.1590/S0034-759020180206>

DIMENSIONALITY AND EFFECTS OF INFORMATION MOTIVATION ON USERS' ONLINE SOCIAL NETWORK ADVERTISING ACCEPTANCE

Dimensão e efeitos da motivação da informação sobre a aceitação dos usuários da publicidade nas redes sociais

Dimensionalidad y efectos de la motivación de la información en la aceptación de la publicidad de las redes sociales online de los usuarios

ABSTRACT

Social media has produced substantial changes in the communication landscape. Online social network sites (SNS) grew as a common platform for online social interaction. SNS firms generate revenue from the advertising appearing on SNS. Their survival depends on users' approval of such social network advertising (SNA). Marketing literature indicates that users accept advertising if it is consistent with their motivations for using social media. Information seeking is the most recognized SNS motivation. Yet, research on evaluating the influence of SNS information motivation on users' approval of SNA is scarce. Based on SNS uses and gratifications theory, this study proposes a multidimensional model that shows the influence of SNS information motivation on users' approval of SNA.

KEYWORDS | Social network sites, information motivation, social network advertising, attitude, behavior

RESUMO

As redes sociais produziram modificações significativas no panorama da comunicação. Os sites de rede sociais (SRS) cresceram como uma plataforma comum para a interação social. As empresas de SRS geram receitas de publicidade que aparecem nos SRS. A sobrevivência dessas empresas depende da aprovação dos usuários de publicidade nas redes sociais (PRS). A literatura sobre o Marketing indica que os usuários aceitam a publicidade se esta for compatível com as suas motivações para o uso de meios de comunicação sociais. A busca de informações, assim como as pesquisas que avaliam a influência da motivação da informação do SRS sobre a aprovação dos usuários de PRS, é a motivação mais reconhecida dos SRS. Baseado na teoria de usos e gratificações do SRS, este estudo propõe um modelo multidimensional que mostra a influência da motivação da informação do SRS na aprovação de usuários de PRS.

PALAVRAS-CHAVE | Sites de redes sociais, motivação da informação, publicidade nas redes sociais, atitude, comportamento.

RESUMEN

Las redes sociales han producido cambios sustanciales en el panorama de la comunicación. Los sitios de redes sociales online (SNS) crecieron como plataforma común para la interacción social online. Las empresas de SNS generan ingresos de la aparición de publicidad en SNS. Su supervivencia depende de la aprobación de los usuarios de dicha publicidad en redes sociales (SNA). La literatura de marketing indica que los usuarios aceptan publicidad si es consistente con sus motivaciones para usar las redes sociales. La búsqueda de información es la motivación de SNS más reconocida. También lo es la investigación sobre evaluar la influencia de la motivación de información de SNS en la aprobación de los usuarios de SNA. Con base en la teoría de usos y gratificaciones de SNS, este estudio propone un modelo multidimensional que muestra la influencia de motivación de información de SNS en la aprobación de los usuarios de SNA.

PALABRAS CLAVE | Sitios de redes sociales, motivación de información, publicidad en redes sociales, actitud, comportamiento.

IMRAN ANWAR MIR

mr.imran.mir@gmail.com

ORCID: 0000-0002-4373-6419

Federal Urdu University of
Arts, Science and Technology,
Islamabad, Pakistan

INTRODUCTION

The evolution of social media has modernized the ways of social and commercial communication (Mir & Rehman, 2013). Social network sites (SNS) in particular have shown rapid user adoption globally (Taylor, Lewin, & Strutton, 2011) and have become a common place for social interaction (Mir, 2014). SNSs are Web 2.0 based applications that enable online user interactivity (Boyd & Ellison, 2007). Advertising appearing on an SNS is the principal revenue source for SNS firms, such as Facebook (Trusov, Bodapati, & Bucklin, 2010). The survival of such firms depends on the users' acceptance of social network advertising (SNA) (Taylor et al., 2011). Mir (2014) suggests that users accept SNA that relates to their respective SNS motivations. Several studies, such as Chen (2012) found information motivation as the most common stimulus that drives people to SNSs. Users join and use SNSs to gather information that is useful for simplifying recognized purchase decisions, improving knowledge, getting inspiration, and verifying existing information (Chu & Kim, 2011; Kuss & Griffiths 2011; Muntinga, Moorman, & Smit, 2011; Park, Kee, & Valenzuela, 2009). Despite the relevance of information motivation in SNSs, few researchers, such as Chi (2011), Mir (2014), and Taylor et al. (2011) assessed its influence on users' approval of the SNA. However, these researchers theorized SNS information motivation as a single dimensional construct. Literature indicates that it is a multidimensional construct. Identifying the dimensions of information motivation is indispensable because they influence attitude and behavior differently (Bloch, Sherrell, & Ridgway, 1986; Touré-Tillery & Fishbach, 2014).

In addition, past research (Taylor et al., 2011) measured the impact of SNS information motivation only on user attitudes toward SNA. A favorable user attitude does not guarantee the success of advertising unless it stimulates click-through behavior. Ad click behavior provides the numerical summation of users who see these ads. Yet, it does not reveal how it impacts users' online buying behavior (Briggs & Hollis, 1997). For the successful execution of SNA, these points need to be addressed and therefore, this study identifies the various dimensions of SNS information motivation. Furthermore, it examines the mediated and direct effects of these dimensions on users' SNS ad clicking behavior. To obtain the complete picture of SNS ad click exposure, the influence of SNS ad clicking behavior on users' online buying behavior is also measured. The relationship of SNS information motivation with user acceptance of SNA is modeled using the uses and gratifications theory (UGT).

INFORMATION MOTIVATION

Information motivation is defined as the goal-directed activities performed by users to fulfill certain information needs and motives (Rubin, 1984). It is one of the most common SNS motivations (Kim, Shim, & Ahn, 2011). Past studies (Chew, 1994; Weigts, Widdershoven, Kok, & Tomlow, 1993; Wilson, 1999) identified information motivation as a multidimensional construct. For instance, Muntinga et al. (2011) discovered surveillance, knowledge, pre-purchase information search, and inspiration as dimensions of information motivation that drive users to consume social media brand content. Gratifications studies (Chu & Kim, 2011; Kuss & Griffiths, 2011) identified that users participate in SNS to gather information to support their purchase decisions, improve their knowledge, get inspiration, and verify existing product information. Consistent with a few past studies (Muntinga et al., 2011; Wilson, 1999), this study proposes pre-purchase search, inspiration, ongoing search, and verification as dimensions of SNS information motivation. These dimensions are derived from different information needs of users. For example, pre-purchase search is derived from the need to support purchase decisions (Ha, 2002). Ongoing search relates to the need of building knowledge banks (Bloch et al., 1986). Inspiration is based on the need to locate novel consumption ideas (Muntinga et al., 2011). Similarly, verification is derived from the need to ensure that a person possesses the right information (Chew, 1994). According to Petter, Straub, and Rai (2007), multidimensional constructs are formative in nature. Formative constructs present the complete portrayal of the issue being studied. Since the dimensions of a formative construct capture different aspects of a phenomenon, they may have different consequences (Jarvis, MacKenzie, & Podsakoff, 2003). Consistent with this argument, previous researches, such as those by Bloch et al. (1986) and Touré-Tillery and Fishbach (2014), claim that the dimensions of information motivation influence user attitudes and behavior differently. Details on the dimensions of SNSs information motivation are provided in the following sections.

Pre-purchase search

According to Mir (2014), pre-purchase search refers to information exploration and management behavior that users exhibit to streamline recognized buying decisions. Past studies, such as those by Park et al. (2009), discovered that users use an SNS to gather valuable facts that helps them in selecting the right products. Particularly, users collect product-related information

on SNSs (e.g., on Facebook) to minimize the risk of making flawed buying decisions. Users usually seek other users' product views on the web to minimize the perceived purchase risk. SNSs enable users to obtain the informational tip-offs and suggestions that are helpful in addressing the product purchase related issues (Goldsmith & Horowitz, 2006). Some researchers (e.g., Punj & Staelin, 1983) declared pre-purchase information search as the principal motivation that drives consumers to use media. The information provided by the media increases brand comprehension and helps consumers in making quality purchase decisions and consumption choices (Ha, 2002).

Inspiration

Inspiration is a significant motivating factor that drives users to social media. Consuming brand content available on social media inspires users. Social media brand content helps generate new consumption ideas (Muntinga et al., 2011). Particularly, users participate in SNSs to observe consumption patterns of other users, such as what they purchase, how they purchase, and how they use products across consumption situations. Today, users rely on social media to discover inspiring brand content prior to acquiring a product (Cisco, 2012). For instance, users visit online showrooms for inspiration before buying a car. According to Densten (2002), inspirational motivation is categorized into two types. One is image-based and the other is concept-based. On SNSs, such as Facebook, users frequently upload pictures and video clips of their consumption activities. In addition, they write about their consumption patterns in the form of opinions, comments, and views. The user-generated imagery and concept-based brand content inspire other SNS users to buy specific products.

Ongoing search

According to Bloch et al. (1986), ongoing search is a notable motivation that leads users to social media. The motives behind ongoing search are diverse. For instance, users conduct ongoing search to develop their knowledge banks (Bloch et al., 1986) and update their knowledge (Grant, 2005). Users' ongoing search behavior is not related to some precise need or buying decision (Bloch et al., 1986). Ongoing search enhances purchasing efficiencies, leads to impulse buying, and influences opinion leadership. It acquaints users with product functionalities. It is an important predictor of media consumption (Diddi & LaRose, 2006). Ongoing search has been found to be an important users' SNS motivation. Users participate in SNSs to enrich their product

and brand knowledge. SNSs expose them to a copious amount of information (Kuss & Griffiths, 2011).

Verification

Users receive enormous product information from multiple sources (e.g., friends, print media, electronic media, and the Internet) daily. Yet, information obtained from different sources may not be equally reliable for them. They may perceive some information to be credible and accurate, while the rest to be erroneous. In such a situation, users face the challenge of verifying the precision of the information (Hilligoss & Rieh, 2008). According to Rieh and Hilligoss (2008), when users suspect inconsistencies in information obtained from various sources, they attempt to verify it. Gathering information to verify the reliability of the existing product information is an important user need (Weigts et al., 1993). Users use media to find the information useful to verify the accuracy of the existing product information (Wilson, 1999). Many users perceive the information presented on social media, such as on SNSs accurate and credible (Al Jenaibi, 2011). Since users regard the information that their friends recommend on SNSs credible and reliable, they may depend on a particular SNS as a place to verify the credibility and accuracy of the information that they receive from multiple sources socially (Chu & Kim, 2011).

THEORETICAL FOUNDATIONS AND CONCEPTUAL MODEL

Motivations are the key stimuli that drive users to join and use SNSs (Chi, 2011). Understanding the users' SNS motivations is therefore critical for the success of SNS firms and SNS advertisers (Taylor et al., 2011). Papacharissi and Rubin (2000) defined motivations as inclinations that drive a person to satisfy his or her needs and wants. Gratifications researches by Kim et al. (2011) and Chen (2012) found information seeking as the most common SNS motivation. Information motivation is derived from the users' need for information acquisition (Katz, Gurevitch, & Hass, 1973). The present research employs UGT to rationalize the SNS information motivation dimensions, as well as their effects (mediated and direct) on SNS users' banner ad clicking behavior. UGT is also employed to explain the impact of SNS banner ad clicking behavior on users' online buying behavior.

The review by Ruggiero (2000) shows that UGT lacks theoretical and operational grounds. Yet, it is considered to be a valuable theory to grasp users' media usage motivations (Ruggiero, 2000). Rosengren, Wenner, and Palmgreen (1985) state that lack of theoretical explanatory power and operational

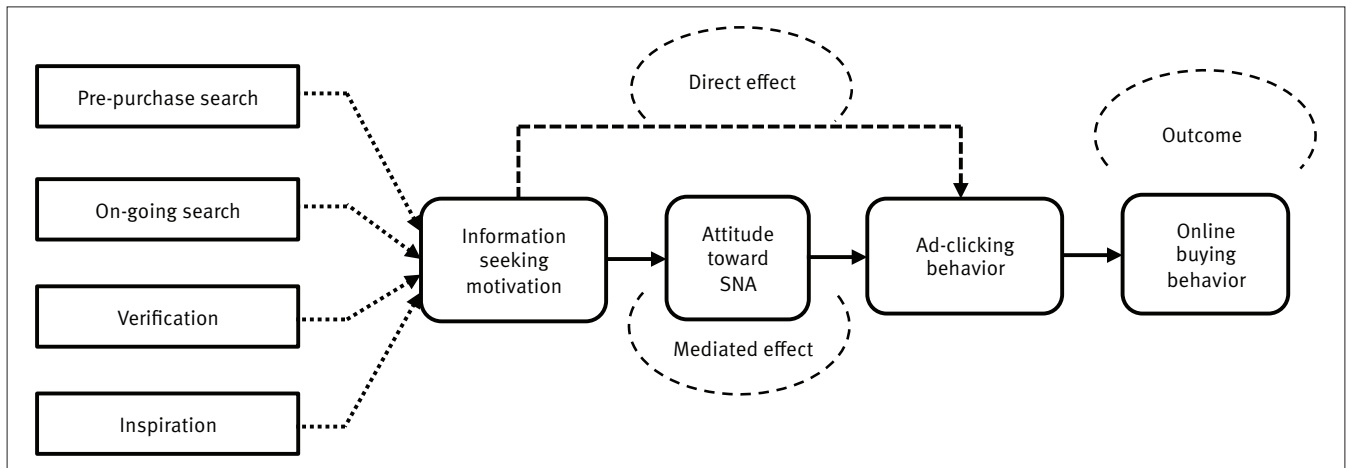
elusiveness in UGT allows researchers to amend this theory according to the research situation. Previous research by Orchard, Fullwood, Galbraith, and Morris (2014) and Al-Menayes (2015) identified UGT as appropriate to measure users' SNS motivations. Similarly, Taylor et al. (2011) and Mir (2014) discovered UGT to be an appropriate theoretical framework to assess the influence of SNS motivations on users' acceptance of SNS advertising.

Severin and Tankard (1997) stated that the focus of UGT is on the user. It explains the reasons that stimulate users to use different media. By applying UGT, several studies, such as those by Korgaonkar and Wolin (1999) and Taylor et al. (2011), identified that users use conventional media (e.g., television) and online media (e.g., social media) for the fulfillment of different information-related needs and motives. Similarly, SNS gratifications literature unveils that people use SNSs to fulfil various information needs. For instance, users participate in an SNS to collect the information that they can use to simplify their

buying decisions (Park et al., 2009), improve their knowledge (Kuss & Griffiths, 2011), get inspiration (Muntinga et al., 2011), and verify the accuracy of existing information (Chu & Kim, 2011). These findings indicate that SNS information motivation is a multidimensional construct. Based on UGT and gratifications literature, this study proposes that SNS information motivation is a multifaceted construct comprising pre-purchase search, inspiration, ongoing search, and verification motivations (see Figure 1). According to Johnson, Rosen, Chang, Djurdjevic, and Taing (2012), a relevant theory should explain the multidimensionality of a construct. Both theory and relevant literature should specify the underlying dimensions of the construct. Based on the conceptualization mentioned above, the following hypothesis is set forth:

H1: SNS information motivation is a multidimensional construct consisting of "pre-purchase search, inspiration, on-going search, and verification factors."

Figure 1. SNS information motivation based user acceptance model of SNA



According to Petrovici and Marinov (2007), information seeking is the key motivation that positively impacts the users' attitude towards advertising. SNS information motivation exposes users to the SNS banner ads (Trusov et al., 2010). Chou, Rashad, and Grossman (2008) found that exposure to the ads impacts the users' attitude towards advertising. According to Fishbein and Ajzen (1975), attitude is a person's favorable or unfavorable emotional state and psychological judgment to execute a certain behavior. Taylor et al. (2011) found a positive causal association between SNS information motivation and user attitudes toward SNA. In marketing literature, the mediating role of attitude is well established (MacKenzie, Lutz, & Belch, 1986). Mir (2014) found that users' attitude towards SNA plays a mediating role between

SNS motivations and users' ad clicking behavior. An ad click indicates an action initiated by users that redirects them from the SNS web page to an advertiser's homepage. On the advertiser's homepage, users receive more information and may buy the product there (Mir, 2012). Consistent with past gratifications research, this study postulates that attitude towards SNA mediates the causal association between SNS information motivation and users' SNS display ad clicking behavior. This causal association is proposed to be positive (see Figure 1). Yet, this attitudinal mediation may be partial because each dimension of information motivation differently affects the user attitudes and behaviors (Bloch et al., 1986; Touré-Tillery & Fishbach, 2014). Based on the aforementioned theorization, the following hypothesis is set forth:

H2: Attitudes toward SNA mediate the causal association between SNS information motivation and users' SNS banner ad clicking behavior.

Besides the mediated effect, motivations have been found to directly impact users' ad clicking behavior (Burgess, 2015). Motives to use the Internet expose users to Internet advertising, which in turn stimulate users' Internet ad clicking behavior (Chatterjee, 2008; Yoo, 2008). This study postulates that SNS information motivation influences users' SNS banner ad clicking behavior directly and positively (see Figure 1). However, all dimensions of SNS information motivation may not equally influence the users' SNS banner ad clicking behavior. According to Bloch et al. (1986), each dimension of information motivation has a varying effect on the users' search behavior. Furthermore, Briggs and Hollis (1997) state that ad clicking behavior provides the numerical summation of users who see these ads. Yet, it does not reveal how it impacts the users' online buying behavior. Therefore, this study proposes that users' SNS banner ad clicking behavior positively influences their online buying behavior (see Figure 1). This supposition is supported by Mir (2012) who found that users' social media banner ad clicking behavior positively influences their online buying behavior. The following hypotheses are stated based on the conceptualization mentioned above.

H3: SNS information motivation has a direct and positive impact on users' SNS banner ad clicking behavior.

H4: Users' SNS banner ad clicking behavior has a positive influence on their online buying behavior.

METHOD

Sample

Data were collected from 450 undergraduate and graduate (274 male and 176 female) students via two offline surveys. Past researchers (e.g., Chu, 2011) collected cross sectional data via surveys to test the causal models on SNA. Students were sampled from two capital and four provincial universities in Pakistan using a simple random sampling (SRS) procedure. The aggregate students of these universities were 47,490. Yamane's (1967) formula provided a sample size of 397. Nonetheless, a sample size of 450 was used. Lists of students were obtained from each university and each student was given a number. Samples were drawn from each list using a lottery method of sampling. First, the data from 200 students were collected to conduct the pilot study. In the second phase of the research, data of the pilot study were

incorporated into the data collected from 250 students to test the theoretical model of SNA acceptance. According to Lancaster, Dodd, and Williamson (2004), in case of the SRS pilot study is part of the main study. It is conducted using data from some percentage of the total sample size. The data of both the pilot and main studies were combined to test the theoretical model. In both phases of this research, the sample size was divided among the chosen universities based on their student ratios in the aggregate population. The targeted students were Facebook, Google+, and MySpace users. The ages of the majority of sampled students were between 20 and 25 years. Students were targeted because they actively use SNSs, spend sufficient time on SNSs daily (Mir, 2012), and are the main targets of SNA campaigns (Chu, 2011). The questionnaire focused on personal wear (i.e., t-shirts and wrist watches) and personal use devices (i.e., laptops and mobile handsets) product categories.

Measurement, content validity, and pretest

To measure the SNS information motivation, a pool of 28 items was developed from past studies (Ancu & Cozma, 2009; Cisco, 2012; Chu & Kim, 2011; Goldsmith & Horowitz, 2006; Grant, 2005; Korgaonkar & Wolin, 1999; Muntinga et al., 2011; Rodgers, Wang, Rettie, & Alpert, 2007; Weights et al., 1993). The deductive method of scale development (Clark & Watson, 1995) was employed to choose the items. Comprehensive literature review and theorization of SNS information motivation was performed to guide the item generation as recommended by Hinkin (1995). User responses were recorded on a 5-point Likert scale, varying from 1 (strongly disagree) to 5 (strongly agree). To evaluate the content validity of SNS information motivation measures, relevant literature review and two subject experts were used (Straub, 1989). Before the main surveys, 25 students assessed the comprehensibility of the questions.

Pilot study

To reduce the pool of items measuring SNS information motivation and to detect its dimensions, principal component analysis (PCA) was performed on the data collected from a sample of 200 students. PCA was employed with orthogonal rotation using the varimax method. In case of data reduction, PCA is performed. Orthogonal rotation with the varimax method is used because it yields simple and true underlying factors of a construct (Floyd & Widaman, 1995) with high and low loadings (Fabrigar, Wegener, MacCallum, & Strahan, 1999). The criteria of item communalities $>0,40$ and factor loadings $>0,60$ were used to retain the items.

To retain the components (factors) of SNS information motivation, the criterion of eigenvalue > 1.00 was applied. PCA yielded four factors of SNS information motivation: “Pre-purchase Search” (F1) ($\alpha = 0.81$), “Inspiration” (F2) ($\alpha = 0.83$), “On-going Search” (F3) ($\alpha = 0.72$), and “Verification” (F4) ($\alpha = 0.75$) after four iterations. Kaiser-Meyer-Olkin (KMO) measure of sample adequacy = 0.81 and Bartlett’s test of sphericity = 000 ensured the successful application of PCA on the data. The PCA confirmed the formative nature of the SNS information motivation as it produced its four factors (dimensions) capturing different themes (Jarvis et al., 2003). Table 1 shows the detailed PCA results.

Table 1. PCA rotated factor solution for SNS information motivation

	F 1	F 2	F 3	F 4
Measures	Pre-purchase search	Inspiration	On-going search	Verification
I use SNS:				
To find the recommendations and advice to support my purchase decisions	0.714	-	-	-
To get in-depth information about products	0.757	-	-	-
To get the information to make informed buying decisions	0.781	-	-	-
To learn how to solve problems involved in a purchase decision	0.713	-	-	-
To find information to reduce the risk of making a bad product choice	0.679	-	-	-
To find what people buy	-	0.840	-	-
To find what people use	-	0.859	-	-
To find how people buy & use products	-	0.819	-	-
To update my product information	-	-	0.720	-
To enhance my knowledge about different products	-	-	0.717	-
Because they give quick & easy access to large volumes of information	-	-	0.771	-
To explore new products	-	-	0.609	-
When I hear about a new thing I check it out on SNSs	-	-	-	0.824
When I hear about a product I check it out on SNSs	-	-	-	0.828
To check the authenticity of information which I receive from my friends & relatives offline	-	-	-	0.653
Eigenvalues	4.453	1.996	1.760	1.262
Percentage of item variance explained	29.689%	13.304%	11.735%	8.412%
Percentage of total variance explained	63.141%			

To examine the goodness of fit and validity of the dimensional structures of the SNS information motivation measurement model, “confirmatory factor analysis” (CFA) was conducted on the data as suggested by Floyd and Widaman (1995). The model with a $\chi^2 = 123.132$, $df = 84$, and $P = 0.004$ ($p < 0.05$) failed to yield the goodness of fit. Yet, the model showed a good fit to data on the alternate model testing technique (i.e., χ^2/df ratio, with a value $1.466 < 3$) (Kline, 1998). The measurement model also presented a good fit to the data on assessment indices (i.e., GFI = 0.93, IFI = 0.96, CFI = 0.96, NFI = 0.90, TLI = 0.95, and RMSEA = 0.04; GFI, IFI, CFI, NFI, and TLI > 0.90) (Bentler & Bonnet, 1980; McDonald & Ho, 2002). RMSEA < 0.08 (MacCallum, Browne, & Sugawara, 1996) indicated goodness fit of the measurement model. Table 2 shows the detailed CFA results.

Table 2. SNS information motivation CFA estimates

	Measures	Formative Direction	Factors	Estimate	Standardized estimate	SE	CR	P
	I use SNS:							
1	To find the recommendations and advice to support my purchase decisions	→	F1	1.000	0.619	-	-	-
2	To get in-depth information about products	→	F1	1.159	0.734	0.149	7.807	***
3	To get the information to make informed buying decisions	→	F1	1.081	0.679	0.145	7.471	***
4	To learn how to solve problems involved in a purchase decision	→	F1	1.054	0.672	0.149	7.080	***
5	To find information to reduce the risk of making a bad product choice	→	F1	1.036	0.660	0.148	6.995	***
6	To find what people buy	→	F2	1.000	0.774	-	-	-
7	To find what people use	→	F2	1.026	0.798	0.099	10.349	***
8	To find how people buy & use products	→	F2	1.097	0.792	0.109	10.047	***
9	To update my product information	→	F3	1.000	0.611	-	-	-
10	To enhance my knowledge about different products	→	F3	0.963	0.600	0.164	5.887	***
11	Because they give quick & easy access to large volumes of information	→	F3	1.116	0.687	0.167	6.685	***
12	To explore new products	→	F3	1.002	0.606	0.167	5.987	***
13	When I hear about a new thing I check it out on SNSs	→	F4	1.000	0.758	-	-	-
14	When I hear about a product I check it out on SNSs	→	F4	1.008	0.767	0.114	8.832	***
15	To check the authenticity of information which I receive from my friends & relatives offline	→	F4	0.737	0.622	0.102	7.249	***

Note: ***p < 0.001

Convergent and discriminant validity

Convergent validity exhibits how closely associated the measurement items representing a construct are (Gefen & Straub, 2005). Convergent validity of measures representing factors of SNS information motivation was assessed by evaluating their loadings and t-indices. Statistically significant item loading and $t < -1.96$ and $> +1.96$ (Byrne, 2001) demonstrate convergent validity (Anderson & Gerbing, 1988; Dunn, Seaker, & Waller, 1994). The t-index is represented by the critical ratio (CR) in the Amos Software output file. The item loading of measures representing factors of SNS information motivation varied between 60 and 79 and their accompanying t-indices varied between 5.8 and 10.3

at the significance level of .001 that ensured convergent validity (see Table 2).

Discriminant validity of SNS information motivation was assessed by evaluating the inter-factor-correlations (r) among the measures of its factors (Shore, Shore, & Thornton, 1992). The r varied between 0.221 and 0.425 that ensured discriminant validity (see Table 3). Low r (i.e., < 0.70) (Yang, Watkins, & Marsick, 2004) among the construct measures indicates discriminant validity (Heeler & Ray, 1972). Furthermore, the square root of the average variance extracted (AVE) was greater than the inter-factor correlations of SNS information motivation (See Table 3) that confirmed discriminant validity (Fornell & Larcker, 1981; Gefen & Straub, 2005).

Table 3. Discriminant validity matrix of SNS information motivation

SNS information motivation	Square root of AVE and inter-factor correlation matrix (from Amos output)				Inter-factor correlation matrix less than 0.70 (from SPSS output)			
	1	2	3	4	1	2	3	4
Dimensions								
Pre-purchase Search	0.674				0.70			
Inspiration	0.387	0.788			0.317**	0.70		
On-going Search	0.388	0.265	0.625		0.292**	0.221**	0.70	
Verification	0.368	0.339	0.534	0.719	0.277**	0.285**	0.425**	0.70

Note: N = 200, **P < 0.01

Endogenous variables

Six items were adapted from previous research (Mir, 2012; Taylor et al., 2011) to measure users' attitude toward SNA. Three items from Mir (2012) were adapted to measure users' behavior to click on SNS banner ads. One measure from Mir (2012) was adapted to assess users' online buying behavior. User responses were recorded on a 5-point Likert scale. Internal consistency of endogenous variables that demonstrate to what extent all items in a measurement scale measure the targeted construct (Tavakol & Dennick, 2011), was assessed via corrected item-total correlation (CITC) and reliability tests. According to Dunn et al. (1994), CITC is conducted to refine the measurement scale prior to assessing its reliability. The criterion of CITC value > 0.50 (Zaichowsky, 1985) was used to retain the items in the scale. The CITC of all items measuring endogenous variables was > 0.05 (see Table 4). Therefore, they met the precondition of the reliability assessment test. Through Cronbach's alpha coefficient (α), reliability of the

endogenous variables was assessed. Attitude towards SNA ($\alpha = 0.810$) and ad clicking behavior ($\alpha = 0.833$) exceeded the acceptable reliability coefficient (i.e., 0.70) that ensured internal consistency (Nunnally, 1978). The online buying behavior scale was not statistically refined as it contained only one item.

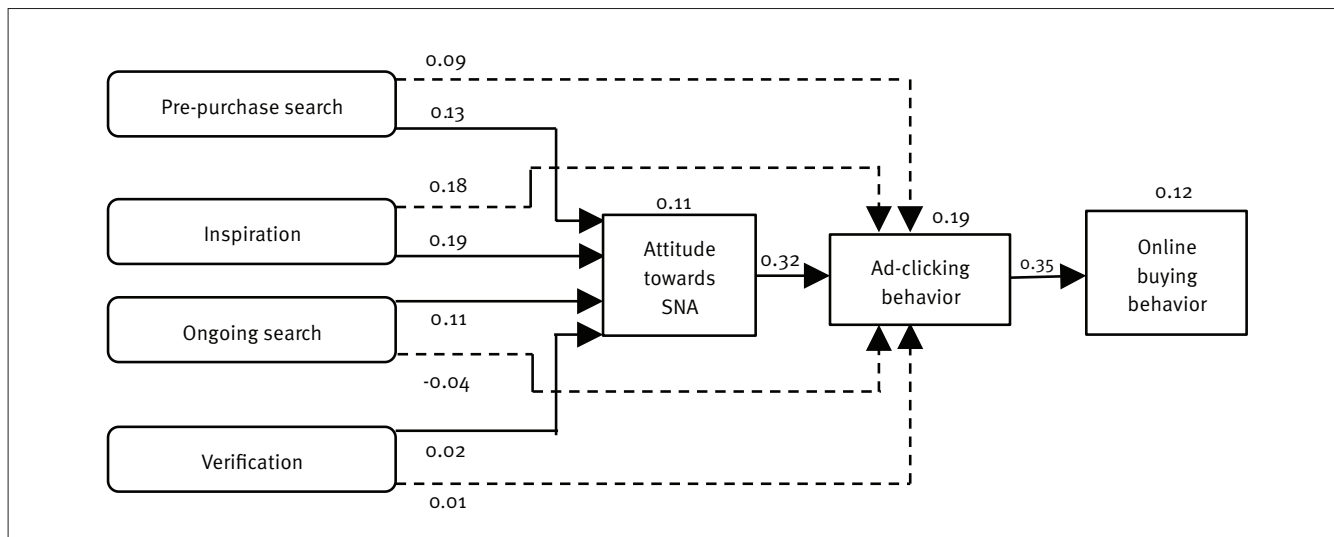
MODEL TESTING

The user acceptance model of SNA based on SNS information motivation was tested on the sample size of 450. The structural model failed to yield a goodness of fit with $\chi^2 = 12.175$, $df = 5$, and $P = 0.032$ ($P < 0.05$). Yet, it showed a good fit to the data on the alternate model testing technique χ^2/df ratio with a value $2.435 < 3$. GFI = 0.992, NFI = 0.975, IFI = 0.985, TLI = 0.935, CFI = 0.985, and RMSEA = 0.057 also showed goodness of fit between the model and the data. Figure 2 presents the structural model of SNA acceptance.

Table 4. Correlated item-total correlation (CITC)

Variable	Measures	CITC
Attitude toward SNA	1. Overall, I consider SNA a good thing	0.51
	2. Overall, I like SNA	0.57
	3. I consider SNA very essential	0.64
	4. I would describe my overall attitude toward SNS banner advertising very favorably	0.62
	5. My general opinion about SNA is favorable	0.55
	6. I like banner ads of products shown on social network sites	0.52
Ad-clicking behavior	1. I often click on ads shown on SNS	0.79
	2. I often click on SNS banner ads	0.70
	3. I often click on ads shown on my SNS profile	0.67
Online buying behavior	1. I often buy products mentioned in SNS banner ads from website of the company	

Figure 2. Structural model of SNA acceptance



Structural model and hypotheses testing

The present research discovered “pre-purchase search, inspiration, ongoing search, and verification” as the dimensions of SNS information motivation (see Figure 2) that supported hypothesis H1. To evaluate the hypotheses, the path values (i.e., β , P, and t statistics) between the dimensions of SNS information

(exogenous variables) and attitudes toward SNA, ad clicking behavior, and online buying behavior (endogenous variables) were examined. The P and t statistics show the significance of the relationships between variables (Byrne, 2001). The path statistics among “pre-purchase search, inspiration, and ongoing search” and users’ attitude toward SNA were $\beta = 0.13$, $P < 0.05$, $t = 2.489$; $\beta = 0.19$, $P < 0.001$, $t = 3.724$; and $\beta = 0.11$, $P < 0.05$, $t =$

2.255, respectively. These values showed significant and positive causal associations between the aforementioned exogenous and endogenous variables. Conversely, the statistics, $\beta = 0.02$, $P > 0.05$, and $t = 0.391$, indicated an insignificant causal association between verification and users' attitude toward SNA. The statistics, $\beta = 0.32$, $P < 0.001$, and $t = 7.073$ between attitudes toward SNA and users' behavior to click on SNS banner ads, indicated a significantly positive causal relationship. Therefore, the overall results partly supported hypothesis H2.

The path statistics, $\beta = 0.09$, $P > 0.05$, $t = 1.794$; $\beta = -0.04$, $P > 0.05$, $t = -0.775$; and $\beta = 0.01$, $P > 0.05$, $t = 0.262$, between "pre-purchase search, on-going search, verification, and users' behavior to click on SNS banner ads indicated a non-significant causal association. On the contrary, the statistics, $\beta = 0.18$, $P < 0.001$, and $t = 3.681$, between inspiration and users' behavior to click on SNS banner ads, respectively, indicated a significantly positive causal relationship. Therefore, the overall results partly supported hypothesis H3. Furthermore, the path statistics, that is, $\beta = 0.35$, $P < 0.001$, and $t = 7.982$, between users' SNS banner ad clicking behavior and their online buying behavior indicated a significantly positive causal relationship, thereby supporting hypothesis H4.

DISCUSSION

Since the business model of several SNS firms is based on SNA, identifying the ways of making it effective is indispensable for their survival. Mir (2014) indicates that users will approve SNS advertising if it is compatible with their SNS motives. Past research, such as Chen (2012), found information seeking as the most common SNS motivation. This study identified SNS information motivation as a multifaceted construct containing "pre-purchase search, inspiration, on-going search, and verification" aspects. Some researchers, such as Punj and Staelin (1983) declared pre-purchase information search as the principal motivation that drove consumers to use media. The pre-purchase search leads to product comprehension that is essential for making the right purchase decisions (Ha, 2002). Several online and SNS gratifications studies (e.g., Goldsmith & Horowitz, 2006; Park et al., 2009) endorsed the claim by Punj and Staelin. Consistent with the past gratifications research, this study identified "pre-purchase search" as an important dimension of users' SNS information motivation. Users gather information on SNS that is helpful in risk aversion and streamlining purchasing decisions. They do so by reading other SNS users' comments, product views, and reviews (Mir

& Zaheer, 2012). This study found "inspiration" as the second important dimension of SNS information motivation. Users use SNS to gather inspiring consumption ideas by observing what products and brands other users buy and use. For instance, users get inspiration online by observing what dresses, shoes, etc. other users buy and how they use them (Muntinga et al., 2011). SNS users often share their product experiences in the form of views, photos, and videos. This user-generated content may work as an inspiration for other SNS users and stimulate them to buy some specific brands. This study recognized "ongoing search" as the third significant dimension of SNS information motivation. Users participate in SNSs to explore new products, update product information, and enrich product knowledge. This finding supports the proposition made by Bloch et al. (1986) that along with "pre-purchase search," users are involved in "ongoing search" that is independent of any recognized purchase need or decision. Finally, this study discovered "verification" as the fourth important dimension of SNS information motivation. Users perceive user-generated content on SNSs as accurate, credible, and unbiased (Al Jenaibi, 2011). Therefore, they may rely on an SNS as a place to verify the credibility and accuracy of the information that they receive from multiple sources socially (Chu & Kim, 2011).

In marketing literature, the mediating role of attitude is well established (Mackenzie et al., 1986). Mir (2014) found that users' attitude toward SNA plays a mediating role between SNS motivations and users' SNS ad clicking behavior. Consistent with past investigations, this research identified that association between SNS information motivation and SNS ad clicking behavior is mediated by the users' attitude toward SNA. However, only pre-purchase search, inspiration, and on-going search positively influence users' attitude towards SNA. Verification insignificantly affected user attitudes toward SNA. This indicates that only former dimensions of SNS information motivation have a mediated effect on users' SNS banner ad clicking behavior. Rodgers (2002) proposed that motivations could directly influence users' online ad clicking behavior. Burgess's (2015) found this supposition true. Consistent with aforementioned researchers, this study discovered that SNS information motivation has a direct and positive impact on users' SNS banner ad clicking behavior. Yet, this effect is true only in case of inspiration. The "pre-purchase search, on-going search, and verification" do not directly influence users' behavior to click on SNS banner ads. These results imply that identifying the dimensions of SNS information motivation is necessary because they influence users' attitude and behavior differently (Bloch et al., 1986; Touré-Tillery & Fishbach, 2014).

Marketing literature suggests several reasons for the dimensions of SNS information motivation to behave differently. For instance, pre-purchase search has a positive mediated impact on users' behavior to click on SNS banner ads because they consider advertising information useful for making sensible purchase decisions (O'Donohoe, 1994). Verification has neither a mediated nor direct impact on users' behavior to click on SNS banner ads because advertising is not deemed as a reliable information source for examining the accuracy of other information (Greer, 2003). Inspiration has a positive influence on users' approval of SNA since they consider both commercial and user-generated online brand content as a source of inspiration (Cisco, 2012). Furthermore, ongoing search has a positive mediated influence on users' behavior to click on SNS banner ads because advertising is believed to be useful for improving product knowledge and keeping it current (Jansen, Sobel, & Cook, 2011).

Consistent with earlier research by Mir (2012), the current study found that SNS banner ad clicking behavior has a positive influence on users' online buying behavior. Briggs and Hollis (1997) stated that clicking on ads does not depict the overall value of online banner advertising. Therefore, knowing the aftereffects of ad clicks is crucial for advertisers. Pavlou and Stewart (2000) stated that clicking on ads generates users' interest in the advertised product that ultimately influences their online buying behavior (Mir, 2014).

CONCLUSION AND LIMITATIONS

This research identified SNS information motivation as a multifaceted construct containing pre-purchase search, inspiration, ongoing search, and verification dimensions. Each of these dimensions has a differential effect on users' SNA acceptance. Therefore, SNS firms and advertisers should focus on the multi-dimensionality of SNS information motivation to make SNA effective. This study concentrated on traditional display advertising. Researchers should work on unconventional SNA, such as fan pages and brand communities in future studies. Furthermore, the impact of other important user motives, such as identity formation and social impressions on SNA acceptance should also be assessed.

CONTRIBUTION AND IMPLICATIONS

Unlike earlier investigations, this study identified the dimensions of SNS information motivation. Furthermore, it applied UGT to

theorize and operationalize both the mediated and direct impacts of SNS information motivation on SNS users' banner ad clicking behavior. Previous research (e.g., Chi, 2011; Taylor et al. 2011) focused only on SNS users' attitude toward SNS advertising. Moreover, this research examined the influence of users' behavior to click on SNS display ads on their online buying behavior. The results of this investigation imply that SNS firms and advertisers should focus on the dimensions of SNS information motivation when designing SNS banner ads because they influence SNS users' attitude toward SNA and their SNS banner ad clicking behavior differently.

REFERENCES

- Al Jenaibi, B. N. A. (2011). Use of social media in the United Arab Emirates: An initial study. *Global Media Journal (Arabian Edition)*, 1(2), 3-27.
- Al-Menayes, J. J. (2015). Motivations for using social media: An exploratory factor analysis. *Journal of Psychological Studies*, 7(1), 43-50. doi:10.5539/ijps.v7n1p43
- Ancu, M., & Cozma, R. (2009). MySpace politics: Uses and gratifications of befriending candidates. *Journal of Broadcasting & Electronic Media*, 53(4), 567-583. doi:10.1080/08838150903333064
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411-423. doi:10.1037/0033-2909.103.3.411
- Bentler, P. M., & Bonnet, D. C. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88(3), 588-606. doi:10.1037/0033-2909.88.3.588
- Bloch, P. H., Sherrell, D. L., & Ridgway, N. M. (1986). Consumer search: An extended framework. *Journal of Consumer Research*, 13(1), 119-126. doi:10.1086/209052
- Boyd, D. M., & Ellison, N. B. (2007). Social networks sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1), 210-230. doi:10.1111/j.1083-6101.2007.00393.x
- Briggs, R., & N. Hollis, N. (1997). Advertising on the web: Is there response before click-through?. *Journal of Advertising Research*, 37(2), 33-45.
- Burgess, D. (2015). Online banner adverts: More than the final click. *Journal of Student Research*, 4(2), 94-104.
- Byrne, B. M. (2001). *Structural equation modeling with Amos: Basic concepts, applications and programming*. New Jersey, USA: Lawrence Erlbaum Associates.
- Chatterjee, P. (2008). Are unclicked ads wasted? Enduring effects of banner and pop-up ad exposures on brand memory and attitudes. *Journal of Electronic Commerce Research*, 9(1), 51-61.
- Chen, H. (2012). Relationship between motivation and behavior of SNS user. *Journal of Software*, 7(6), 1265-1272. doi:10.4304/jsw.7.6.1265-1272

- Chew, E. (1994). The relationship of information needs to issue relevance and media use. *Journalism Quarterly*, 71(3), 676-688. doi:10.1177/107769909407100318
- Chi, H-H. (2011). Interactive digital advertising vs. virtual brand community: Exploratory study of user motivation and social media marketing responses in Taiwan. *Journal of Interactive Advertising*, 12(1), 44-61. doi:10.1080/15252019.2011.10722190
- Chou, S-Y., Rashad, I., & Grossman, M. (2008). Fast-food restaurant advertising on television and its influence on childhood obesity. *Journal of Law and Economics*, 51(4), 599-618. doi:10.1086/590132
- Chu, S-C. (2011). Viral advertising in social media: Participation in Facebook groups and responses among college-aged users. *Journal of Interactive Advertising*, 12(1), 30-43. doi:10.1080/15252019.2011.10722189
- Chu, S-C., & Kim, Y. J. (2011). Determinants of consumer engagement in electronic word-of-mouth (eWOM) in social networking sites. *International Journal of Advertising*, 30(1), 47-75. doi:10.2501/IJA-30-1-047-075
- Cisco. (2012). Digital signage for retail: Attract and keep your customers. Retrieved from www.cisco.com/go/retailsolutions
- Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, 7(3), 309-319. doi:10.1037/1040-3590.7.3.309
- Densten, I. L. (2002). Clarifying inspirational motivation and its relationship to extra effort. *Leadership & Organization Development Journal*, 23(1), 40-44. doi:10.1108/01437730210414553
- Diddi, A., & LaRose, R. (2006). Getting hooked on the news: Uses and gratifications and the formation of news habits among college students in an internet environment. *Journal of Broadcasting & Electronic Media*, 50(2), 193-210. doi:10.1207/s15506878jobem5002_2
- Dunn, S. C., Seaker, R. F., & Waller, M. A. (1994). Latent variables in business logistics research: Scale development and validation. *Journal of Business Logistics*, 15(2), 145-172.
- Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4(3), 272-299. doi:10.1037/1082-989X.4.3.272
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behaviour: An introduction to theory and research*. Reading, UK: Addison-Wesley.
- Floyd, F. J., & Widaman, K.F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, 7(3), 286-299. doi:10.1037/1040-3590.7.3.286
- Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50. doi:10.2307/3151312
- Gefen, D., & Straub, D. (2005). A practical guide to factorial validity using PLS-graph: Tutorial and annotated example. *Communications of the Association for Information Systems*, 16(5), 91-109.
- Goldsmith, R. E., & Horowitz, D. (2006). Measuring motivations for online opinion seeking. *Journal of Interactive Advertising*, 6(2), 214. doi:10.1080/15252019.2006.10722114
- Grant, I. C. (2005). Young peoples' relationships with online marketing practices: An intrusion too far. *Journal of Marketing Management*, 21(5-6), 607-623. doi:10.1362/0267257054307417
- Greer, J. D. (2003). Evaluating the credibility of online information: A test of source and advertising influence. *Mass Communication & Society*, 6(1), 11-28. doi:10.1207/S15327825MCS0601_3
- Ha, H-Y. (2002). The effects of consumer risk perception on pre-purchase information in online auctions: Brand, word-of-mouth, and customized information. *Journal of Computer Mediated Communication*, 8(1). doi:10.1111/j.1083-6101.2002.tb00160.x
- Heeler, R. M., & Ray, M. L. (1972). Measure validation in marketing. *Journal of Marketing Research*, 9(4), 361-370. doi:10.2307/3149297
- Hilligoss, B., & Rieh, S. Y. (2008). Developing a unifying framework of credibility assessment: Construct, heuristics, and interaction in context. *Information Processing & Management*, 44(4), 1467-1484. doi:10.1016/j.ipm.2007.10.001
- Hinkin, T. R. (1995). A review of scale development practices in the study of organizations. *Journal of Management*, 21(5), 967-988. doi:10.1016/0149-2063(95)90050-0
- Jansen, B. J., Sobel, K., & Cook, G. (2011). Classifying ecommerce information sharing behavior by youths on social network sites. *Journal of Information Science*, 37(2), 120-136. doi:10.1177/0165551510396975
- Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research*, 30(2), 199-218. doi:10.1086/376806
- Johnson, R. E., Rosen, C. C., Chang, C-H. S., Djurdjevic, E., & Taing, M. U. (2012). Recommendations for improving the construct clarity of higher-order multidimensional constructs. *Human Resource Management Review*, 22(2), 62-72. doi:10.1016/j.hrmr.2011.11.006
- Katz, E., Gurevitch, M., & Hass, H. (1973). On the use of mass media for important things. *American Sociological Review*, 38(2), 164-181. doi:10.2307/2094393
- Kim, J. Y., Shim, J. P., & Ahn, K. M. (2011). Social Networking service: Motivation, pleasure, and behavioral intention to use. *Journal of Computer Information Systems*, 51(4), 92-101. doi:10.1080/08874417.2011.11645505
- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. New York, USA: Guilford Press.
- Korgaonkar, P. K., & Wolin, L. D. (1999). A multivariate analysis of web usage. *Journal of Advertising Research*, 39(2), 53-68.

- Kuss, D. J., & Griffiths, M. D. (2011). Online social networking and addiction: A review of the psychological literature. *International Journal of Environmental Research and Public Health*, 8(9), 3528-3552. doi:10.3390/ijerph8093528
- Lancaster, G. A., Dodd, S., & Williamson, P. R. (2004). Design and analysis of pilot studies: Recommendations for good practice. *Journal of Evaluation in Clinical Practice*, 10(2), 307-312. doi:10.1111/j.2002.384.doc.x
- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130-149. doi:10.1037/1082-989X.1.2.130
- MacKenzie, S. B., Lutz, R. J., & Belch, G. E. (1986). The role of attitude toward the ad as a mediator of advertising effectiveness: A test of competing explanations. *Journal of Marketing Research*, 23(2), 130-143. doi:10.2307/3151660
- McDonald, R. P., & Ho, M. H. R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods*, 7(1), 64-82. doi:10.1037/1082-989X.7.1.64
- Mir, I. A. (2012). Consumer attitudinal insights about social media advertising: A South Asian perspective. *The Romanian Economic Journal*, 15(45), 265-288.
- Mir, I. A. (2014). Effects of pre-purchase search motivation on user attitudes toward online social network advertising: A case of university students. *Journal of Competitiveness*, 6(2), 42-55. doi:10.7441/joc.2014.02.04
- Mir, I. A., & Rehman, K. U. (2013). Factors affecting consumer attitudes and intentions toward user-generated product content on YouTube. *Management & Marketing*, 8(4), 637-654.
- Mir, I., & Zaheer, A. (2012). Verification of social impact theory claims in social media context. *Journal of Internet Banking and Commerce*, 17(1). Retrieved from <http://www.arraydev.com/commerce/jibc/>.
- Muntinga, D. G., Moorman, M., & Smit, E. G. (2011). Introducing COBRAs: Exploring motivations for brand-related social media use. *International Journal of Advertising*, 30(1), 13-46. doi:10.2501/IJA-30-1-013-046
- Nunnally, J. (1978). *Psychometric theory*. New York, USA: McGraw-Hill.
- O'Donohoe, S. (1994). Advertising uses and gratifications. *European Journal of Marketing*, 28(8/9), 52-75. doi:10.1108/03090569410145706
- Orchard, L.J., Fullwood, C., Galbraith, N., & Morris, N. (2014). Individual differences as predictors of social networking. *Journal of Computer-Mediated Communication*, 19(3), 388-402. doi:10.1111/jcc4.12068
- Papacharissi, Z., & Rubin, A. M. (2000). Predictors of internet use. *Journal of Broadcasting & Electronic Media*, 44(2), 175-196. doi:10.1207/s15506878jebem4402_2
- Park, N., Kee, K. F., & Valenzuela, S. (2009). Being immersed in social networking environment: Facebook groups, uses and gratifications, and social outcomes. *Cyberpsychology & Behavior*, 12(6), 729-733. doi:10.1089/cpb.2009.0003
- Pavlou, P. A., & Stewart, D. W. (2000). Measuring the effects and effectiveness of interactive advertising: A research agenda. *Journal of Interactive Advertising*, 1(1), 61-77. doi:10.1080/15252019.2000.10722044
- Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *MIS Quarterly*, 31(4), 623-656. doi:10.2307/25148814
- Petrovici, D., & Marinov, M. (2007). Determinants and antecedents of general attitudes towards advertising: A study of two EU accession countries. *European Journal of Marketing*, 41(3/4), 307-326. doi:10.1108/03090560710728354
- Punj, G. N., & Staelin, R. (1983). A model of consumer information search behavior for new automobiles. *Journal of Consumer Research*, 9(4), 366-380. doi:10.1086/208931
- Rieh, S. Y., & Hilligoss, B. (2008). College students' credibility judgments in the information-seeking process. Digital media, youth, and credibility. In M. J. Metzger & A. J. Flanagin (Eds.), *The John D. & Catherine T. MacArthur foundation series on digital media & learning* (pp. 49-72). Cambridge, MA: The MIT Press.
- Rodgers, S. (2002). The interactive advertising model tested: The role of motives in ad processing. *Journal of Interactive Advertising*, 2(2), 22-33. doi:10.1080/15252019.2002.10722059
- Rodgers, S., Wang, Y., Rettie, R., & Alpert, F. (2007). The web motivation inventory: Replication, extension and application to internet advertising. *International Journal of Advertising*, 26(4), 447-476. doi:10.1080/02650487.2007.11073028
- Rosengren, K. E., Wenner, L. A., & Palmgreen, P. (Eds.) (1985). *Media gratifications research: Current perspectives*. Beverly Hills, CA: Sage Publications.
- Rubin, A. M. (1984). Ritualized and instrumental television viewing. *Journal of Communication*, 34(3), 67-77. doi:10.1111/j.1460-2466.1984.tb02174.x
- Ruggiero, T. E. (2000). Uses and gratifications theory in the 21st century. *Mass Communication & Society*, 3(1), 3-37. doi:10.1207/S15327825MCS0301_02
- Severin, W. J., & Tankard, J. W. (1997). *Communication theories: Origins, methods and uses in the mass media* (4th ed.). New York, NY: Longman.
- Shore, T. H., Shore, L. M., & Thornton, G. C. III. (1992). Construct validity of self and peer evaluations of performance dimensions in an assessment center. *Journal of Applied Psychology*, 77(1), 42-54. doi:10.1037/0021-9010.77.1.42

- Straub, D. W. (1989). Validating instruments in MIS research. *MIS Quarterly*, 13(2), 147-169. doi:10.2307/248922
- Tavakol, M., & R. Dennick, (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53-55. doi:10.5116/ijme.4dfb.8dfd
- Taylor, D. G., Lewin, J. E., & Strutton, D. (2011). Friends, fans, and followers: Do ads work on social networks? How gender and age shape receptivity. *Journal of Advertising Research*, 51(1), 258-275. doi:10.2501/JAR-51-1-258-275
- Touré-Tillery, M., & Fishbach, A. (2014). How to measure motivation: A guide for the experimental social psychologist. *Social and Personality Psychology Compass*, 8(7), 328-341. doi: 10.1111/spc3.12110
- Trusov, M., Bodapati, A. V., & Bucklin, R. E. (2010). Determining influential users in internet social networks. *Journal of Marketing Research*, 47(4), 643-658. doi:10.1509/jmkr.47.4.643
- Weigts, W., Widdershoven, G., Kok, G., & Tomlow, P. (1993). Patients' information seeking actions and physicians' responses in gynecological consultations. *Qualitative Health Research*, 3(4), 398-429. doi:10.1177/104973239300300402
- Wilson, T. D. (1999). Models in information behavior research. *Journal of Documentation*, 55(3), 249-270. doi:10.1108/EUM000000007145
- Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). New York, NY: Harper & Row.
- Yang, B., Watkins, K. E., & Marsick, V. J. (2004). The construct of the learning organization: Dimensions, measurement, and validation. *Human Resource Development Quarterly*, 15(1), 31-55. doi:10.1002/hrdq.1086
- Yoo, C. Y. (2008). Unconscious processing of web advertising: Effects on implicit memory, attitude toward the brand, and consideration Set. *Journal of Interactive Marketing*, 22(2), 2-18.
- Zaichowsky, J. L. (1985). Measuring the involvement construct. *Journal of Consumer Research*, 12(3), 341-352. doi:10.1086/208520

ARTICLES

Submitted 03.13.2017. Approved 09.28.2017

Evaluated through a double-blind review process. Guest Scientific Editor: Maurício Serva

Translated version

DOI: <http://dx.doi.org/10.1590/S0034-759020180207>

SOCIAL COUPLING AND DECOUPLING: PASTORS AS ENTREPRENEURS

Acoplamento e desacoplamento sociais: Pastores como empreendedores

Acoplamiento y desacoplamiento social: Pastores como empresarios

ABSTRACT

Neo-Pentecostal ministers, whose churches follow productive enterprise patterns, seem to be endowed with the ability to build new social relations—linked to the religious context—while concurrently moving away from previous links, especially those with family and friends. This coupling (the creation of and linkage to new bonds) and decoupling capacity (distancing oneself from past relationships) was first observed by Granovetter (2009) while investigating immigrant entrepreneurs. This article goes beyond the scope of his studies, where the displacement factor was ethnic-geographical, to analyze a new phenomenon of an ethical-religious nature. In order to do so, it introduces the cases of 16 pastors in the metropolitan region of Belo Horizonte, Brazil. Evidence is found of the importance of the coupling/decoupling phenomenon in the creation of new religious communities, which are widespread throughout the country. At the same time, this study makes new contributions to the field and opens up different lines of research.

KEYWORDS | Coupling, decoupling, religious entrepreneurship, neo-Pentecostal pastors, social networks.

RESUMO

Pastores neopentecostais responsáveis por igrejas cujo funcionamento aparenta seguir moldes de empreendimentos produtivos parecem ser dotados da capacidade de construir novas relações sociais – associadas ao contexto religioso –, ao mesmo tempo que se afastam parcialmente de laços anteriores, sobretudo familiares e de amizade. Essa capacidade de acoplamento – criação e vinculação a novos laços – e de desacoplamento – distanciamento de relações passadas – foi observada por Granovetter (2009) na investigação de empreendedores imigrantes. O presente artigo extrapola o âmbito de estudos desse autor, em que o fator de deslocamento é étnico-geográfico, para analisar novo fenômeno, de natureza ético-religiosa. Para isso, analisa o caso de 16 pastores da região metropolitana de Belo Horizonte. As evidências demonstram a importância do fenômeno de acoplamento/desacoplamento para a construção de novas comunidades religiosas, suscitando reflexões sobre esse tipo de empreendimento, em franca proliferação no Brasil. Ao mesmo tempo, possibilita contribuições à literatura da área, abrindo diferentes vertentes de investigações.

PALAVRAS-CHAVE | Acoplamento, desacoplamento, empreendedorismo religioso, pastores neopentecostais, redes sociais.

RESUMEN

Los pastores neopentecostales, responsables de iglesias cuyo funcionamiento aparenta seguir los moldes de los emprendimientos productivos, parecen estar dotados de la capacidad de construir nuevas relaciones sociales -asociadas al contexto religioso-, al mismo tiempo que se alejan parcialmente de lazos anteriores, sobre todo familiares y de amistad. Esta capacidad de acoplamiento – creación de y vinculación a nuevos lazos- y de desacoplamiento – distanciamiento de relaciones pasadas- fue observada por Granovetter (2009) en la investigación sobre emprendedores inmigrantes. El presente artículo extrapola el ámbito de estudios de ese autor, donde el factor de desplazamiento es étnico-geográfico, para analizar un nuevo fenómeno de naturaleza ético-religiosa. Para ello, analiza el caso de 16 pastores de la región metropolitana de Belo Horizonte. Las evidencias demuestran la importancia del fenómeno de acoplamiento/desacoplamiento en la construcción de nuevas comunidades religiosas, lo que suscita reflexiones sobre este tipo de emprendimiento, en franca proliferación en Brasil. Al mismo tiempo, posibilita contribuciones a la literatura del área, al abrir diferentes vertientes de investigación.

PALABRAS CLAVE | Acoplamiento, desacoplamiento, iniciativa empresarial religiosa, pastores neopentecostales, redes sociales.

VICTOR SILVA CORRÊA¹
victorsilvacorrea@yahoo.com.br
ORCID: 0000-0001-7412-2375

**GLÁUCIA MARIA
VASCONCELLOS VALE²**
galvale@terra.com.br
ORCID: 0000-0001-9460-9455

MARCELO DE REZENDE PINTO²
marcrez@hotmail.com
ORCID: 0000-0002-3251-2460

¹Universidade Paulista, Programa de Mestrado em Administração, São Paulo, SP, Brazil

²Pontifícia Universidade Católica de Minas Gerais, Programa de Pós-Graduação em Administração, Belo Horizonte, MG, Brazil

INTRODUCTION

Social networks have been widely researched in the literature, especially after Granovetter's work (1973, 2005). Among the possible research approaches, there is one that investigates the impact of networks on the paths of entrepreneurs. According to Slotte-Kock and Coviello (2009, p. 31), "In recent years, an interest in networks has permeated the research on entrepreneurship." According to Hoang and Antoncic (2003, p. 165), "Approximately 15 years ago, research on networks emerged as an important new area of inquiry within the field of entrepreneurship." The essence of this association is the notion that individuals are embedded in social and economic frameworks that are capable of influencing them (Correa & Vale, 2014; Sexton & Smilor, 1997; Slotte-Kock & Coviello, 2009; Starr & MacMillan, 1990). This article deals with the essence of these concepts. It analyzes the evolution and influence of the social ties of individuals from Catholic communities who became neo-Pentecostal pastors responsible for creating and guiding small independent churches.

This theme is particularly interesting in the Brazilian context, primarily for three interrelated reasons. First, due to a change in the religious profile of the country with the recent exponential growth of the Evangelical population (on this subject, see Neri, Carvalhaes, & Monte, 2011; Pacheco, Silva, & Ribeiro, 2007; Passos, Zorzin, & Rocha, 2011; Rabuske, Santos, Gonçalves, & Traub, 2012). In fact, between 1991 and 2010, nearly 30 million people became Protestants. That is 9.4 million people more than, for example, the population of the state of Minas Gerais (IBGE, 2010.). Currently, about 40 million people, more than 20% of the Brazilian population, consider themselves Evangelical.

Second, many neo-Pentecostal pastors originated from other religious communities: 70% of the population is made up of Evangelical converts, individuals from other religions (mainly Catholic) (Rabuske et al., 2012). This religious conversion led to related changes in the social networks of individuals. Third, the active and combative attitude of these churches and pastors identify them as specific types of enterprise and entrepreneur, respectively.

The entrepreneurship of the pastors derives from religious pluralism, seen in the possibility of new designations entering and gaining institutional strength in the country (on this subject, see Frigerio & Pinheiro Filho, 2008; Mariano, 2003; Passos et al., 2011; Teixeira, 2008). This emerged in part as a response to the increased competition among the growing number of churches in the country. The necessity of adopting a more active, professional, and effective attitude to survive in the market (Mariano, 2008, 2013; Pierucci, 1999, 2006, 2008) derived therefrom. According to the latest data

from the Brazilian Institute of Tax Planning (*Instituto Brasileiro de Planejamento Tributário*, 2017), in 2013, nearly 12 new churches were opened every day in Brazil—an average of one every 2 hours. "In an extremely heated 'religious market'," evident today in the country, "those churches, religions [or entrepreneurs] that do not enter the competitive process of 'soul dispute', more incisively, are 'left behind'" (Passos et al., 2011, p. 704).

However, despite the obvious relevance of this theme, it has not received the attention it deserves in the literature. This can be observed in both the international (Dougherty, Griebel, & Neubert, 2013; Frigerio & Pinheiro Filho, 2008; Iannaccone, 1995) and national contexts (Borges, Enoch, Borges, & Almeida, 2015; Seraphim & Alperstedt, 2012). In a search of some of the major databases (Web of Science, Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior [Capes], Scientific Periodicals Electronic Library [Spell]), journals (RAC-Revista de Administração Contemporânea, RAE-Revista de Administração de Empresas, RAUSP-Revista de Administração, O&S-Organizações & Sociedade, BAR-Brazilian Administration Review e Cadernos EBAPE.BR), and conferences in Brazil on administration (Encontro da Associação Nacional dos Programas de Pós-Graduação em Administração [EnAnpad], Encontro de Estudos Organizacionais da ANPAD [Eneo], Seminários em Administração [SemeAd] e Encontro de Estudos sobre Empreendedorismo e Gestão de Pequenas Empresas [Egepe]), no studies that discuss religious entrepreneurship were found. The search focused on keywords in the titles and abstracts of papers published in the last 20 years. There is even a lack of studies on the topic in the international context. In a search of Web of Science, only one article—by Pearce, Fritz, and Davis (2010)—was located. It focuses on a particular context: the specific investigation of a traditional denomination. The authors were not thorough regarding the micro-level entrepreneurial behavior of pastors, which is important to this study. As observed by Pearce et al. (2010, p. 228), the "role of entrepreneurial behavior in the religious context remains unexplored." This article—an innovative one in the area of administration that can be inserted precisely into this context—seeks to partially fill this gap.

We will use theoretical contributions on social networks, specifically on coupling and decoupling, to investigate the phenomenon of interest. The former signals the importance of networks with strong interactions among actors, and of trust relationships expressed through bonds capable of generating reciprocity. The latter points to the relevance of simultaneously sustaining relative distancing and detachment, which are important in certain situations. Often, such distancing is how entrepreneurs avoid excessive requests that could subvert the productive logic of their ventures.

This theoretical and empirical article occupies that space. The article is based on secondary data on ethnic entrepreneurship (Granovetter, 2009), complemented by and associated with quantitative and qualitative evidence derived from research on pastors from neo-Pentecostal churches. It presents a comparative analysis of the two types of entrepreneurship: ethnic-religious and immigrant. It aims to investigate, in an innovative way for studies of administration, the relevance of coupling/decoupling in an analysis of the dimensions of the phenomenon of religious entrepreneurship. In doing so, it sheds new light on the study of this particular type of entrepreneurship, which is growing at a significant rate in Brazil. At the same time, it makes contributions to the literature on coupling/decoupling by providing totally unprecedented theoretical interpretations.

The study focuses on the existence of gaps. The first gap is related to the association between entrepreneurship and social networks. When the literature discusses entrepreneurship associated with religion, the focus shifts to the investigation of how secularization has intensified the fierce competition among ecclesiastical agents (see, for example, Frigerio & Pinheiro Filho, 2008; Gracino Junior, 2008; Mariano, 2003, 2008; Rabuske et al., 2012; Stark, 1999; Stark, Iannaccone, & Finke, 1996). When networks are included in studies of religious ventures, they are disassociated from reflections (discussed here) on social coupling/decoupling. The second gap is associated with the lack of research on coupling/decoupling. Such themes have not received much attention from researchers in the field of administration. This is true in the international and national contexts.

THEORETICAL BASIS

Neo-Pentecostal churches seem to enjoy benefits derived from strong interactions among their members, associated with a distinctive ability to avoid interference by exploiters. In these churches, the combination of these benefits originates, on the one hand, from attributes derived from the entrepreneurial capacity of the pastors, and, on the other, from interactions among members. This phenomenon is composed of two distinct and, at the same time, complementary parts. The first relates to the fact that, after converting, individuals begin to integrate into groups with strong religious ties (Ciscon-Evangelist & Menandro, 2011). In fact, it is their “confessional affiliation [that determines] their sociability networks” (Hervieu-Léger, 2008, p. 52). Prandi (2008, p. 159) point out that the “aesthetic and behavioral limits imposed [by] religion” discourage us from participating in a group bigger than the one constrained by the church itself. (Scott & Cantarelli, 2004).

The second phenomenon derives from the first and its implications for strong ties. Due to the primacy of congregational relations, it is possible to observe how “not rarely, the new [Evangelical] ‘family’ surpasses as [in] an investment of time and affection in relation to the natural one” (Pacheco et al., 2007, p. 58). Evidence of how “religion brings similar people together and separates them from others” (Prandi, 2008, p. 159), how it performs a dual function of “social identification: internal, because it incorporates believers into a given community; external, because it separates those who do not belong there” (Hervieu-Léger, 2008, p. 27).

Such a reflection is consistent with propositions, derived from the field of social networks, on the benefits derived from a proper balance between close and distant relations. The works of Granovetter (1973, 2009), a key author, stand out. He built two pairs of concepts—strong and weak ties and coupling and decoupling—that are of interest to this study. Strong ties consist of frequent and long-lasting contacts between two or more individuals. Weak ties are characterized by infrequent relationships, created on occasions for which contacts are fortuitous or of short duration. Originating from different types of network, weak ties generate and distribute unprecedented resources, which extrapolate those available in the set of relationships in which the entrepreneur is embedded (Granovetter, 1973).

Later, Granovetter advanced his work on social ties by developing a typology of structures based on two main concepts: coupling and decoupling. While coupling indicates the presence of networks with strong interactions among actors, decoupling suggests less dense and more fragmented networks. An excessive, and insufficient, level of coupling could be detrimental to certain activities. Observing the creation of small enterprises by immigrant Chinese populations, Granovetter (2009) emphasized the importance of the balance between coupling and decoupling, and the concomitant presence of a balance between them.

While coupling generates “solidarity” and trust relationships, expressed through bonds capable of generating reciprocity, decoupling signals the possibility of distancing and disconnection, which are important in certain situations. Often, this relative distancing is how entrepreneurs can avoid “uncontrolled solidarity” and abuse derived from strong ties (personal friends, family), which could interfere in their venture in a harmful way. Free of barriers generated by excessive coupling, the individual can possess greater autonomy. According to Granovetter (2005), a strategy based on trust and limitations on obligations seems to be convenient in the creation of small prosperous enterprises.

Granovetter states that a lack and excess of solidarity both have negative impacts on the development of productive

enterprises. The author points out that successful ventures should have an adequate balance between coupling and decoupling. In fact, “as important as the intensity of the interaction is the clearly defined boundary beyond which such intensity and trust fall off sharply” (Granovetter, 2009, p. 255). Granovetter (2009) highlights that groups of entrepreneur emigrants, particularly Chinese, seem to be more likely to have such attributes than the native populations.

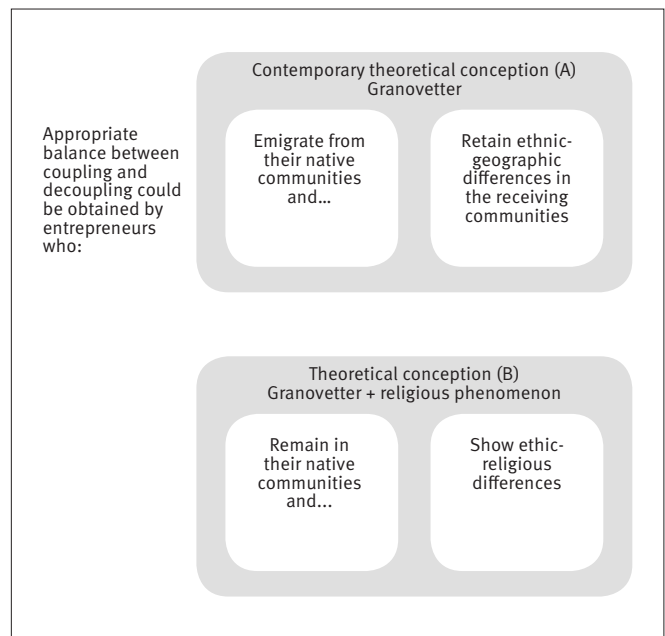
Essential to Granovetter’s (2009) conception is the notion that individuals need to decouple from their native communities and move to a new country to prevent uncontrolled solidarity. Only in this way can they get rid of excess requests coming from strong ties. In fact, “immigrants have an advantage over natives in achieving the right balance between what might be called ‘coupling’ and ‘decoupling’” (Granovetter, 2009, p. 258). Based on that, it is clear that the related analyses usually take for granted the most interesting part of the problem: the factors that make it profitable to think of the maintenance and manipulation of ethnic identity as a matter of rational choice.

Although geared to different contexts, it is possible to observe the existence of certain similarities between the works of Granovetter (2009) and those related to religious endeavors (Almeida, 2006; Ciscon-Evangelist & Menander, 2011; Hervieu-Léger, 2008, among others). As entrepreneurs, they initially, for ethical-religious reasons, joined cohesive networks that could eventually provide them with fundamental resources. At the same time, notice how both types of entrepreneur seemed partially decoupled from other actors not embedded in the same religious or geographical community. These two associations suggest that religious entrepreneurs, at least theoretically, have the ability, under certain circumstances, to benefit from the resources coming from the adequate adjustment of their coupling/decoupling, like the ethnic communities highlighted by Granovetter (2009).

However, there is something more there—something that calls our attention to a distinct finding of significant theoretical relevance. Unlike Granovetter (2009), who claims that the displacement of individuals from their native communities to another country is necessary to enjoy the benefits of the balance between coupling/decoupling, the religious entrepreneurs emphasized here theoretically do not need to move away from their countries of origin. Two distinct concepts emerge from this reflection. The first is based on Granovetter’s (2009) perspective on ethnic entrepreneurship. The second is unprecedented. It develops from the junction of Granovetter and authors focusing on the sociology of religion (for example, Almeida, 2006; Ciscon-Evangelist & Menander, 2011; Hervieu-Léger, 2008, among others).

Figure 1 illustrates the nature of this line of reasoning.

Figure 1. Views on the requirements for the development of coupled entrepreneurs



The first design (A) emphasizes the importance of spatial displacement (change of country). The second (B) suggests that religious conversion is enough to ensure an appropriate balance between coupling and decoupling.

METHODOLOGICAL BASIS

Field research was initially conducted with 23 pastors from the metropolitan region of Belo Horizonte. Of these, 16 contributed to the empirical evidence. Two interconnected criteria were employed. The first, methodological in nature, related to the fine-tuning of the data collection tools. This took place during the field research. The second derived from the first. The improved tools allowed the researchers to strengthen the quality and validity of the previous evidence.

The search strategy was qualitative, featuring appropriation and triangulation of the qualitative and quantitative evidence (Creswell, 2007; Meyer, 2001; Neves, 1996). The method used was the multiple case study approach (Yin, 2010). Evidence collection was based on the combination of two sets of criteria. The first related to the theoretical categories of interest, including: i) pastors’ entrepreneurial orientation, i.e., their ability to act as entrepreneurs; and ii) egocentric social structures relating to previous and later religious conversion periods, investigating the factors and repercussions derived

from each. For the first theoretical category, a qualitative technique was used for data collection (semi-structured in-depth interviews). For the second, two techniques were used: one, qualitative in nature (in-depth semi-structured interviews), which was considered the main one; and another, which was quantitative (structured interviews). They were designed to strengthen the previous evidence (Yin, 2010).

The second set of criteria related to the respondents' characteristics, with four theoretical criteria. First, the individuals had to be pastors. Second, they had to have been converted from another religion. Third, they had to have remained in the region where their conversion took place. Finally, they had to have created and been responsible for a small religious business. Indeed, pastors can create major religious denominations. One example is the Universal Church of the Kingdom of God, considered one of the churches responsible for leading the emergence of what might be called "enterprise-churches" (Mariano, 2003, p. 120). However, according to Pacheco et al. (2007, p. 55), "pastors insert themselves into autonomous Pentecostalism, [responsible for] creating small and independent communities scattered around the outskirts of major urban centers and organized [principally] around the attributes [...] of their leaders."

The in-depth interviews were conducted using guided, but not strict, conversations (Yin, 2010). More than 51 hours of interviews were recorded. The names of the interviewees were changed for ethical reasons, with pseudonyms being chosen at random. They are Abelardo, Antônio, Benedito, Cristiano, Damião, Edmundo, Fernando, Humberto, Itamar, Jeferson, Kaio, Napoleão, Raimundo, Sebastião, Teodoro, and Ulisses. The structured interviews (Gil, 1999; Yin, 2010) were based on "social network analysis" (SNA). It was thus possible to map the egocentric structures of the pastors (Hanneman & Riddle, 2005, s/p) and understand, through sociograms and algorithms provided by Ucinet 6.480 (Hanneman & Riddle, 2005), the impact of interactions among actors (Hanneman & Riddle, 2005; Tomaél, 2007).

The structured interviews were carried out using fixed questions, which were asked in the same order for all participants. Since they incorporated a retrospective collection of longitudinal data (Elliott, 2005), they followed a two-step pattern: i) a request to the pastors to write the names of 40 people in their close circle, both before and after their conversion; and ii) the construction of a sociometric matrix. Together with the researchers, they described the interactions of the "alters", and indicated the kind of relationship, in relation to their egos. The structures of seven

respondents were mapped. There were three reasons for this: i) the pastors' lack of availability, ii) their inability to access/remember the names of contacts from before their conversion, and iii) theoretical saturation.

The qualitative data analysis consisted of the "examination [and] the tabulation of evidence" (Yin, 2010, p. 154). The strategy used was "analytic generalization" (Meyer, 2001; Yin, 2010). Sociometric matrices derived from the SNA were used in the quantitative analysis. Three of them are density, centrality, and clicks. Network density can be understood as the "average strength of the connections between us and [...] a form of closure in which the contacts are also connected" (Burt, 2000, pp. 374-375). The degree of centrality indicates the number of connections that the actors have in a given network. It is "a measure of the direct influence that a vertex has in relation to its contacts" (Freitas, 2010, p. 2). Finally, clicks refers to subsets of networks. It comprises "actors connected by cohesive relations" (Burt, 1980, p. 80), tightly intertwined with each other (Burt, 1980; Hanneman & Riddle, 2005).

The quantitative Spearman's rank correlation coefficient was employed, simultaneously, in an innovative approach for studies associated with networks. The transformation coefficient, little used in the investigation of social structures for two periods of time, together with indicators derived from SNA enabled broadening of the understanding of the influence of religious conversion on changes in egocentric networks. Siegel (1975) highlights that the Spearman correlation coefficient is a measure of association whose variables must be shown, at least in an ordinal scale, so that the objects or individuals under study may be ranked in two ordered series. In this study, the ranks were created on the basis of the number of individuals in each relationship group. The association that we investigated referred to the periods before and after conversion. To do this, the following formula was used:

$$r_s = 1 - \frac{6 \sum_{i=1}^N d_i^2}{N^3 - N}$$

where " d_i " refers to the value of the Spearman rank correlation coefficient; " Σ " to the sum; " d_i " the difference between the two ranks (before and after religious conversion); " i " to the value number 1 (one); " N " to all pairs of sample values; and $\sum_{i=1}^n d_i^2$ to the "sum of classified differences squared" (Pocinho, 2010, p. 69). Exhibit 1 details the formula, elements, and interpretation of the Spearman's rank correlation coefficient.

Exhibit 1. Breakdown of the Spearman Coefficient

Concept	Formula	Elements	Interpretation
Coefficient of Spearman's rank correlation	$r_s = 1 - \frac{6 \sum_{i=1}^N d_i^2}{N^3 - N}$ <p>When the ranks are equal:</p> $r_s = \frac{\sum x^2 + \sum y^2 - \sum d_i^2}{2\sqrt{\sum x^2 \sum y^2}}$ $Sx^2 = \frac{N^3 - N}{12} - \sum T$ $Sy^2 = \frac{N^3 - N}{12} - \sum T$ $T = \frac{t^3 - t}{12}$	<p>In which:</p> <p>r_s: correlation coefficient;</p> <p>d_i: difference of ranks.</p> <p>N: Number of sample values</p> <p>i: Indexing ranging from 1 to N</p> <p>$x = X - \bar{X}$: difference of the X scores and their mean.</p> <p>$y = Y - \bar{Y}$: difference of the Y score and their mean.</p> <p>T: Correction factor;</p> <p>t: Number of observations equal to the determined rank</p>	<p>“Measure that requires both variables at least to have an ordinal scale.” (Siegel, p. 228)</p> <p>The higher the d_i:</p> <p>a) the less perfect the association between variables;</p> <p>b) The significance test;</p> <p>The null hypothesis corresponds to the absence of correlation between “before” and “after” conversion</p>

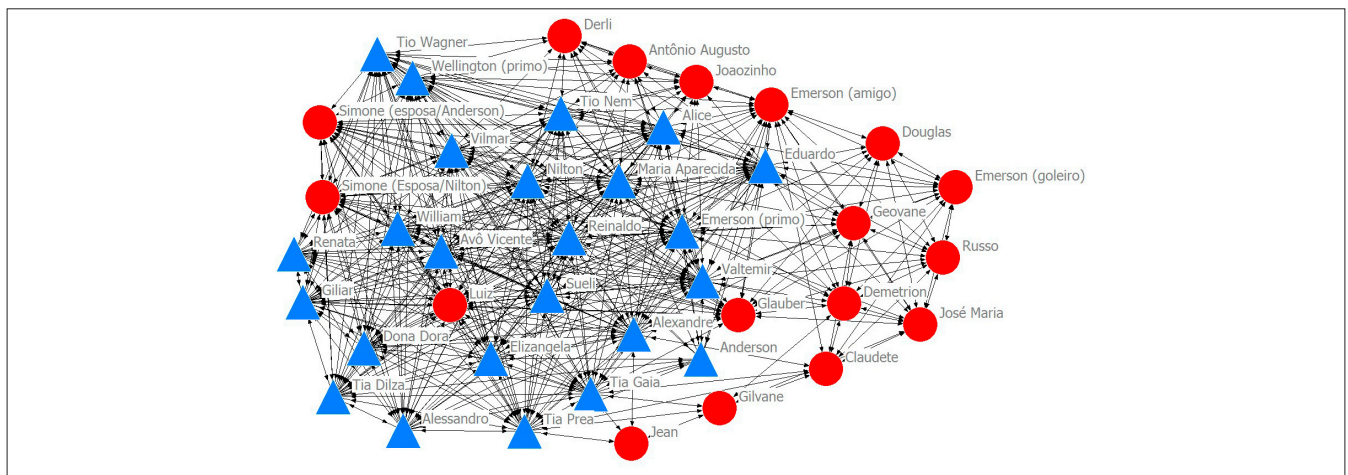
RESULTS OBTAINED

When they convert, evangelicals end up experiencing a transformation in their social structures that is characterized by the onset of two movements. The first is their estrangement from family members and close friends. Napoleão stressed that “people distance themselves from you.” “When we [...] embrace the faith, [...] it is even upsetting to say, but people avoid us” (Ulisses). “I have testimony of people who converted to the church and the family did not want to see them any more” (Edmundo). “Unfortunately, you only meet family at funerals. It’s even scary to think this. Those who preach life only find relatives in death. It’s a strange pun” (Humberto).

The second transformation is associated with the reconstruction of relational structures. After conversion, individuals begin to interact mainly with other evangelicals. In fact, “I began to relate more to evangelicals” (Abelardo). “[I made] great friendships with the brethren of the church” (Jeferson). This implies, practically, “starting from scratch. Let us re-consider another bond of friendship” (Edmundo). “It’s natural. At lunch, for example, you no longer invite the family. You invite the brothers, and other pastors” (Humberto).

Look at the case of Pastor Jeferson, for example. Figure 2 shows his egocentric social structure from the period prior to his religious conversion.

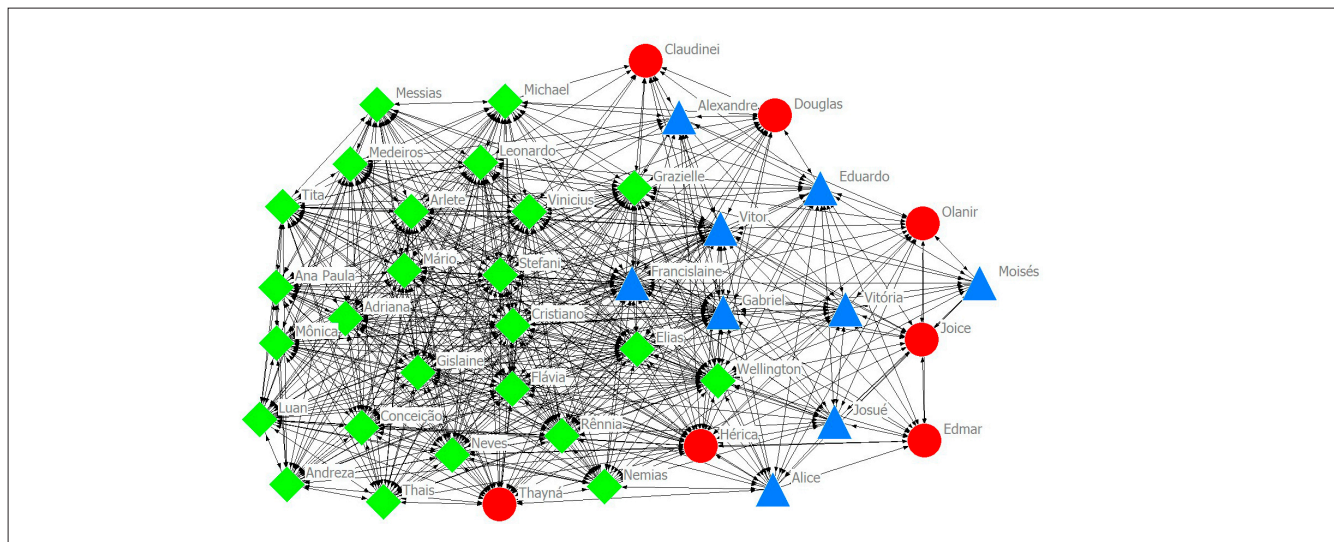
Figure 2. Graph representing Jeferson’s social structure before conversion



Note: For “relationship groups,” i) red circle = acquaintances and ii) blue triangle = family members.

Note how Jeferson was mainly related to “acquaintances” and family members. This structure was almost totally modified after his religious conversion, as can be observed from the sociogram shown in Figure 3.

Figure 3. Graph representing Jeferson’s social structure following conversion



Note: For “relationship groups,” i) Red circle = acquaintances, ii) green diamond = church members, and iii) blue triangle = family members.

Notice how, after his conversion, Jeferson became especially close to members of his church, dissociating himself from previous ties, including family and friends. This transformation was repeated with other pastors whose sociometric data was collected. Table 1 details the number of people for the periods before and after conversion.

Table 1 indicates how, before conversion, the interviewees’ interactions were mainly with family members (37%), friends (45%), and acquaintances (15%). Afterwards, however, members of two new social groupings—church (42%) and pastors (14%)—were jointly responsible for more than 50% of their relationships. Note, therefore, the transformation of the pastors’ post-conversion structures compared to those of the previous period. To show this, the Spearman correlation coefficient was used in addition to those indicators already discussed. The results were not significant, with

a p-value greater than 5% (Siegel, 1975). Regarding the probability of error when rejecting the null hypothesis, the lower the p-value, the greater the probability that the null hypothesis is false (Bisquerra et al., 2004). In this study, the hypothesis was $H_0 = \text{correlation} = \text{zero}$: the relationship structure before the conversion differs from that following conversion. The alternative hypothesis (H_1) was that the relationship structure before conversion does not differ significantly from that following conversion.

This indicator showed that there was no supporting evidence for correlations between the compositions of the structures before and after conversion. This indicates that individuals, after conversion, transformed their relational frameworks almost completely. This effect could be seen for all pastors and, therefore, for each interviewee. The case of Pastor Ulisses (Table 2) details the changes in his social structures.

Table 1. Distribuição percentual dos grupos de relacionamento dos pastores

Groups	A_Abelardo	D_Abelardo	A_Benedito	D_Benedito	A_Jeferson	D_Jeferson	A_Kaio	D_Kaio
Family	0%	18%	38%	40%	60%	23%	48%	55%
Friends	55%	5%	30%	30%	40%	18%	23%	8%
Acquaintances	45%	0%	33%	0%	0%	0%	25%	0%
Church	0%	73%	0%	25%	0%	60%	0%	30%

Continue

Table 1. Percentage distribution of pastors' relationship groups

Conclusion

Groups	A_Abelardo	D_Abelardo	A_Benedito	D_Benedito	A_Jeferson	D_Jeferson	A_Kaio	D_Kaio
Pastors	0%	5%	0%	5%	0%	0%	0%	8%
Workmate	0%	0%	0%	0%	0%	0%	3%	0%
Classmate	0%	0%	0%	0%	0%	0%	3%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Correlation Spearman (p-value)	-0.19	p=0.69	0.27	p=0.48	0.54	p=0.21	0.05	p=0.91
Groups	A_Napoleão	D_Napoleão	A_Teodoro	D_Teodoro	A_Ulisses	D_Ulisses	A_PASTOR	D_PASTOR
Groups	5%	38%	90%	43%	20%	13%	37%	33%
Family	75%	5%	10%	0%	80%	15%	45%	11%
Friends	0%	0%	0%	0%	0%	0%	15%	0%
Acquaintances	0%	33%	0%	45%	0%	28%	0%	42%
Church	0%	25%	0%	10%	0%	45%	0%	14%
Pastors	20%	0%	0%	3%	0%	0%	3%	0%
Workmate	0%	0%	0%	0%	0%	0%	0%	0%
Classmate	100%	100%	100%	100%	100%	100%	100%	100%
Correlação Spearman;(p-valor)	0.02	p=0.96	0.09	p=0.84	0.18	p=0.68	-0.08	p=0.87

Nota: (A= antes; D = Depois da conversão)

Table 2. Spearman's coefficient relative to Pastor Ulisses' social structure

Before	After	Ranks Before	Ranks After	di	(di) ²
0.20	0.13	6	4	2	4
0.80	0.15	7	5	2	4
0.0	0.0	3	2	1	1
0.0	0.28	3	6	-3	9
0.0	0.45	3	7	-4	16
0.0	0.0	3	2	1	1
0.0	0.0	3	2	1	1
Total					36

Notice how the number of draws “before conversion” was five. Ergo, the correction factor (T) = (53 - 5) / 12 = 10. At the same time, only one sequence of draw positions was observed. Thus,

ΣT=10 (for X). The number of draws was three “after conversion.” Correction factor = (33 - 3) / 12 = 2 => ΣT=2 (for Y).

$$S_x^2 = (7^3 - 7) / 12 - 10 = 18$$

$$S_y^2 = (7^3 - 7) / 12 - 2 = 26$$

Therefore, the Spearman's correlation coefficient is:

$$r_s = \frac{\sum x^2 + \sum y^2 - \sum d_i^2}{2\sqrt{\sum x^2 \sum y^2}}$$

$$r_s = (18 + 26 - 36) / (2 * ((18 * 26))^{0.5}) = 0,1849$$

Siegel points out that, for n>10, the r_s test should be the t of student, presented in the following formula:

$$t = r_s \sqrt{\frac{N-2}{1-r_s^2}}$$

When the values are replaced,

$$t = 0.1849 * \sqrt{((7-2)/(1-0.18492))} = 0.4207$$

$$P\text{-valor} = 0.69$$

Indeed, religious ties take precedence over family members after conversion. Four factors explain this. The first is the nature of evangelical interactions. For some, they have a familial character: “A brother [of the faith] is more than a relative. Often, you do more for a brother than for a relative” (Humberto). The second relates to conversion. Afterwards, the individual’s interactions with evangelicals make up for their estrangement from their family: “There was a time when I missed them. Wow! One moment there were loads of people here. Now there’s nobody. [...] I’m going to church” (Edmundo). The third is religious in nature—a manifestation of Divine Will: “For us to do the will of God, [...] we often have to deny ourselves a lot. House, family and employment are denied in order to do God’s will” (Napoleão). Finally, the fourth is associated with cooperative behavior. Converts get support from evangelicals that they do not find in the family: “At the time when I was most in need, it was not my family that helped me. It was the church” (Kaio).

When they create their own churches, pastors seem capable of stimulating a combination of three sets of attributes that are fundamental to their endeavors. The first is behavioral in nature. Pastors seem able, in the creation and development of their institutions, to act as entrepreneurs. “Six out of every ten pastors” (Anthony) are like this. In fact, Humberto stressed the existence of a corporate dimension to the churches: “Do not think that the religious institution is different from any other institution. It is not! [...] I can tell you that a church is like any other private institution.” Herein resides the utilitarian and entrepreneurial behavior of pastors. It can be observed, for example, in competitive disputes. Pastors “understand that church has another name, which is competition. It is my church which is going to take you to heaven” (Benedito). The dispute is “so strong that they tend to keep an eye on their brother’s church” (Cristiano).

In this context, “the vision is of a company” (Benedito). It is common for “big churches to want to swallow up small ones” (Edmundo). There is “competition as if it were supermarket and advertising” (Fernando). This is evident in the search for new

believers. Two main forms are found here: making disciples or proselytism. In the first, “you [convert] a person, for example, a Catholic, whom we evangelicals think will not reach salvation” (Humberto). For evangelicals, if the person “was not born again, if he did not accept Jesus, he goes to hell” (Humberto). In the second, they take members of other evangelical churches and take them “to the other, only because of the advantages [they] can bring with them” (Humberto).

The second set of attributes is relational. They relate to the pastors’ capacity to build a close relationship with the faithful. In fact, pastors and believers of the same church build and sustain, among themselves, cohesive networks based on mutual assistance. “We seek to be a family” (Napoleão). “Everyone fights the other’s fight” (Theodore). This network is based on a voluntary and unconditional dimension. Evangelicals mobilize a wide range of resources to help. “They do what they have to do” (Cristiano). “They come together and help” (Kaio). “Many prefer [to] bless rather than receive” (Edmundo). This unconditional aid manifests in the growth of the churches. In fact, this is largely a result of the resources obtained by pastors from believers. “Today, all we have achieved in the church, acquiring things, [is] through them” (Kaio). In fact, “church is not like this: I have money, I will build. [...] There must be participation of all who are committed in this work” (Teodoro).

The third attribute is the outstanding capacity of pastors to inhibit the actions of profiteers—those people who seek to enjoy the benefits without contributing. “There are opportunists everywhere” (Abelardo). They “keep an eye on out. They think the church is a source of profit.” “It’s everywhere. They see the big church, and think that it has money” (Fernando). “We see the mischievousness of the person” (Abelardo). There are two groups of usurpers. The first is made up of people outside of the ministries. “They do everything. A person arrives in front of you and cries. The person is a performer. Just like this, in front of you. [It is] common” (Itamar). The second group is made up of believers, by members of the churches. “Unfortunately, people are so hungry for money. It’s like this: the church has money, it can help me” (Fernando). “There are cases of outsiders. They say to themselves: the grass is greener here. They convert in order to stay. [...] They only want the benefits of the work” (Sebastião).

Two sets of attributes help pastors avoid profiteers, both external and internal. The first is of an active nature, carried out by the pastors in a planned way. It involves investigating need, helping only those individuals that were recommended, and postponing the delivery of aid. The second is relational, and relates to the sustained relationship structure between pastors and members of their churches. Pastors and believers interact,

almost exclusively, with members of the same congregation. They resemble “urban tribes, [whose members] only relate to each other. [...] But this is [even] clearer in the church, because it lasts a lifetime. [...] It is natural for you to think [of it] like a biological family” (Humberto).

Such a delimitation has different implications. Three of them stand out. The first is the near absence of ties between evangelicals from different ministries. “They do not mix with anyone. They are closed, private groups” (Damião). The second is a reflection of the first. It is the impossibility of other people, whether family or not, taking advantage of the resources built by the ministerial structure. These implications are directed mainly toward the members of the churches. “Many [...] think that the resources are just for them. This behavior has not changed. [...] My group is more important than the others. This causes social stratification” (Humberto). Finally, the third implication is associated with a non-assisting dimension. Pastors and believers are partially estranged from others. This enables them to suppress claims from people not embedded in their congregational structures. “If you want help, you come to the Assembly,” said Humberto. “If you go to the Foursquare Church, the pastor there helps you. I will not help you [...] in this way. [...] there is no interreligious dialogue.”

FINAL CONSIDERATIONS

The results obtained allow us to make some interesting observations. The first relates to entrepreneurial activities. As Granovetter (2009) affirms, empirical evidence suggests that the successful efforts are based on an appropriate equilibrium between coupling/decoupling. Excessive coupling of church members to local communities would stimulate this uncontrolled solidarity. On the other hand, total decoupling would imply a rupture between members of the churches and members of the communities, resulting in essentially occluded networks, hindering their growth. Thus, the field data obtained propose, similar to Granovetter, that the total presence and/or absence of coupling/decoupling would be detrimental to the development of productive enterprises, whether religious or not.

The second finding derives from the previous one. Like Granovetter, who supports the notion that ethnic entrepreneurs are capable of adequately adjusting their coupling/decoupling, the evidence obtained here suggests that religious entrepreneurs are also capable of doing this. Two clusters of evidence demonstrate this. The first relates to coupling. Pastors and believers build and sustain, among themselves, close structures

of mutual aid and horizontal solidarity. Built within the confines of congregational coupling, these networks are able to provide them with resources considered in many ways fundamental. To the pastors, they provide the creation and development of their churches. To the believers, they satisfy their varied needs.

The second is associated with decoupling. It unfolds into two complementary spheres. The first is familial. Pastors and believers are, after their conversion, partially decoupled from their previous ties (see, for example, Almeida, 2006; Ciscon-Evangelista & Menandro, 2011; Hervieu-Léger, 2008; Pacheco et al., 2007; Prandi, 2008; Scott & Cantarelli, 2004). This was found in this research. New converts seek to make up for the absence of family by interacting with other evangelicals. The second sphere is institutional, as is associated with the scope of the church as a whole. The congregational collectivity that couples pastors and believers in cohesive mutual aid networks also limits their borders of sociability. The research data suggest that there are pastors and believers decoupled from people who are not part of their churches. Family members and other evangelicals are included in this. This presents us with three additional findings.

The first is that decoupling is partial, not complete. Pastors and believers maintain interactions, however restrictive, with individuals outside their structures. The second is that the services provided by the churches are circumscribed. They are intended, almost exclusively, for the members of the institution. The third is a consequence of the previous one. People not engaged in congregational collectivity are unable to enjoy the resources and benefits built by ministerial structures.

It is worth noting that, like neo-Pentecostal churches, pastors and believers seem capable of obtaining an adequate balance in their social structures due to the religious-congregational collectivity they share. This finding expands Granovetter's (2009) preliminary proposal on the requirements necessary for entrepreneurs to obtain an appropriate coupling/decoupling equilibrium. The appropriate balance between coupling/decoupling, considered essential for the development of productive enterprises (religious or otherwise), can be obtained, according to Granovetter, by emigrant entrepreneurs, and also by religious entrepreneurs and neo-Pentecostal pastors, as seen in this study,

However, there is something else here that reveals a third point of considerable theoretical relevance. It is an unprecedented reinterpretation of Granovetter's (2009) concept. He maintains the necessity of displacing individuals from their native communities so that they can, in other countries, enjoy the benefits derived from the proper balance between coupling

and decoupling. However, the empirical evidence obtained here suggests that it is not fundamentally necessary for entrepreneurs to move away from their countries of origin for this. That is, it is not necessary to promote spatial changes.

Neo-Pentecostal pastors are evidence of this. They achieve, without making geographical changes, an adequate balance in their social structure. They do this by converting, partially decoupling from their ties, and then engaging in and prioritizing close neo-Pentecostal structures. In them, they become pastor-entrepreneurs and enjoy, like the ethnogeographic entrepreneurs highlighted by Granovetter (2009), a singular position regarding the nature of coupling/decoupling in their social structures. This is an important theoretical finding, incorporating a totally unprecedented interpretation of the literature on coupling/decoupling.

In addition to the above conclusions, this article makes original contributions in the theoretical and methodological dimensions, with practical implications. In the theoretical dimension, i) it extends the current understanding of coupling/decoupling (Granovetter, 2009), revealing unprecedented criteria related to its appropriate adjustment; ii) it expands Granovetter's proposition that emigrant entrepreneurs have advantages over natives in achieving a balance between coupling and decoupling to religious-entrepreneurs; and iii) it shows and expands Granovetter's conjecture that it is not fundamentally necessary for entrepreneurs to leave their countries of origin in order to achieve an adequate balance between coupling and uncoupling.

In the methodological dimension, this research was innovative because of its use of Spearman's coefficient in the analysis of social networks to investigate transformations in the social structures of individuals, based on a sociometric survey of different periods. In doing so, its relevance and use, not yet emphasized for studies of this nature, was highlighted. There are important practical implications. First, the need to incorporate themes related to social structures in entrepreneurship programs is evident. Second, the importance of administrators who understand churches as productive enterprises creating and formatting implementation and development strategies for those churches was revealed. Third, it reemphasized the prominence of the Brazilian religious context as a fertile field for research and new discoveries by researchers of administration.

New theoretical and empirical studies are necessary. They could advance the coupling/decoupling conceptualization that was merely outlined here. In this sense, we suggest i) investigating the existence of other relevant factors, in addition to those of a religious or ethnic-geographic nature, ii) using SNA in the study

of pastors' social structures and their impact on the development of churches, iii) comparing the entrepreneurial trajectories of different pastors, relating them to the evolution of their religious organizations, and iv) defining and delimiting reference criteria for entrepreneurial behavior in the religious context.

ACKNOWLEDGMENTS

The authors would like to thank Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for their support.

REFERENCES

- Almeida, R. (2006). A expansão pentecostal: Circulação e flexibilidade. In F. Teixeira & R. Menezes (Orgs.), *As religiões no Brasil: Continuidades e rupturas* (Cap. 7, pp. 111-122). Petrópolis, RJ: Vozes.
- Bisqueria, R., Sarriera, J. C., & Martínez, F. (2004). *Introdução à estatística: Enfoque informático com o pacote estatístico SPSS*. Porto Alegre, RS: Artmed.
- Borges, A. F., Enoque, A. G., Borges, J. F., & Almeida, L. L. S. (2015). Empreendedorismo religiosos: Um estudo sobre empresas que exploram o nicho da religiosidade. *RAC-Revista de Administração Contemporânea*, 19(5), 565-583. doi:10.1590/1982-7849rac20151626
- Burt, R. S. (1980). Models of network structure. *Annual Review of Sociology*, 6, 79-141. doi:10.1146/annurev.so.06.080180.000455
- Burt, R. S. (2000). The network structure of social capital. *Research in Organizational Behavior*, 22, 345-423. doi:10.1016/S0191-3085(00)22009-1
- Ciscon-Evangelista, M. R., & Menandro, P. R. M. (2011). Transito religiosos e construções identitárias: Mobilidade social e evangélicos neopentecostais. *Psico-USF*, 16(2), 193-202. doi:10.1590/S1413-82712011000200008
- Correa, V. S., & Vale, G. M. V. (2014). Redes sociais, perfil empreendedor e trajetórias. *RAUSP-Revista de Administração*, 49(1), 77-88. doi:10.5700/rausp1132
- Creswell, J. W. (2007). *Projeto de Pesquisa: Métodos qualitativo, quantitativo e misto*. Porto Alegre, RS: Artmed.
- Dougherty, K. D., Griebel, J., Neubert, M. J., & Park, J. Z. (2013). A religious profile of American entrepreneurs. *Journal for the Scientific Study of Religion*, 52(2), 401-409. doi:10.1111/jssr.12026

- Elliott, J. (2005). *Using narrative in social research: Qualitative and quantitative approaches*. London, UK: Sage Publications.
- Freitas, L. Q. de. (2010). Medidas de centralidade em grafos (Masters dissertation). Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil.
- Frigerio, A., & Pinheiro Filho, F. A. (2008). O paradigma da escolha racional: Mercado regulado e pluralismo religioso. *Tempo Social, Revista de Sociologia da USP*, 20(2), 17-39. doi:10.1590/S0103-20702008000200002
- Gil, A. C. (1999). *Métodos e técnicas de pesquisa social*. São Paulo, SP: Atlas
- Gracino Júnior, P. (2008). *Dos interesses weberianos dos sociólogos da religião: Um olhar perspectivo sobre as interpretações do pentecostalismo no Brasil*. *Horizonte*, 6(12), 69-92.
- Granovetter, M. (1973). *The strength of weak ties*. *American Journal of Sociology*, 78(6), 1360-1380. doi:10.1086/225469
- Granovetter, M. (2005). Business groups and social organization. In N. J. Smelser, & R. Swedberg (Eds.), *The handbook of economic sociology* (pp. 429-450). New York, NY: Princeton University Press.
- Granovetter, M. (2009). The economic sociology of firms and entrepreneurs. In R. Swedberg (Ed.), *Entrepreneurship: The social science view* (pp. 244-275). New York, NY: Oxford University Press.
- Hanneman, R. A., & Riddle, M. (2005). *Introduction to social network methods*. Riverside, CA: University of California.
- Hervieu-Léger, D. (2008). *O peregrino e o convertido: A religião em movimento*. Petrópolis, RJ: Vozes.
- Hoang, H., & Antoncic, B. (2003). *Network-based research in entrepreneurship: A critical review*. *Journal of Business Venturing*, 18(2), 165-187. doi:10.1016/S0883-9026(02)00081-2
- Iannaccone, L. (1995). *Voodoo economics? Reviewing the rational choice approach to religion*. *Journal for the Scientific Study of Religion*, 34(1), 76-88.
- Instituto Brasileiro de Geografia e Estatística. (2010). *Censo 2010*. Retrieved from Instituto Brasileiro de Geografia e Estatística: <https://censo2010.ibge.gov.br/>
- Instituto Brasileiro de Planejamento Tributário. (2017). *Empresas Ativas no Brasil*. Retrieved from Instituto Brasileiro de Planejamento Tributário: <https://www.empresometro.com.br/Home/Estatisticas>
- Mariano, R. (2003). *Efeitos da secularização do Estado, do pluralismo e do mercado religiosos sobre as igrejas pentecostais*. *Civitas-Revista de Ciências Sociais*, 3(1), 111-125. doi:10.15448/1984-7289.2003.1.112
- Mariano R. (2008). *Usos e limites da teoria da escolha racional da religião*. *Tempo Social, Revista de sociologia da USP*, 20(2), 41-66. doi:10.1590/S0103-20702008000200003
- Mariano, R. (2013). *Antônio Flávio Pierucci: Sociólogo materialista da religião*. *Revista Brasileira de Ciências Sociais*, 28(81), 7-16. doi:10.1590/S0102-69092013000100001
- Meyer, C. B. (2001). *A case in case study methodology*. *Field Methods*, 13(4), 329-352. doi:10.1177/1525822X0101300402
- Neri, M. C., Carvalhaes, L., & Monte, S. R. S. (2011). *Novo mapa das religiões (Relatório de Pesquisa/2011)*, São Paulo, SP, Centro de Políticas Sociais, Fundação Getulio Vargas. Retrieved from <http://www.cps.fgv.br/cps/religiao/>.
- Neves, J. L. (1996). *Pesquisa qualitativa: Características, usos e possibilidades*. *Caderno de Pesquisa em Administração*, 1(3), 1-5.
- Pacheco, E. T., Silva, S. R. da, & Ribeiro, R. G. (2007). "Eu era do mundo": Transformações do autoconceito na conversão pentecostal. *Psicologia: Teoria e Pesquisa*, 23(1), 53-61. doi:10.1590/S0102-37722007000100007
- Passos, M., Zorzin, P. L. G., & Rocha, D. (2011). *O que (não) dizem os números - Para além das estatísticas sobre o "Novo Mapa das Religiões Brasileiro"*. *Horizonte*, 9(23), 690-714. doi:10.5752/P.2175-5841.2011V9N23P690
- Pearce, J. A., Fritz, D. A., & Davis, P. S. (2010). *Entrepreneurial orientation and the performance of religion congregations as predicted by rational choice theory*. *Entrepreneurship Theory and Practice*, 34(1), 219-248. doi:10.1111/j.1540-6520.2009.00315.x
- Pierucci, A. F. (1999, dezembro 26). *Fim da união Estado-Igreja ampliou oferta de religiões*. *Folha de São Paulo*, Caderno Especial. Retrieved from <http://www1.folha.uol.com.br/fsp/especial/fe/fe16.htm>
- Pierucci, A. F. (2006). *Ciências sociais e religião: A religião como ruptura*. In F. Teixeira & R. Menezes (Orgs.), *As religiões no Brasil: Continuidades e rupturas* (Cap. 1, pp. 17-34). Petrópolis, RJ: Vozes.
- Pierucci, A. F. (2008). *De olho na modernidade religiosa*. *Tempo Social: Revista de Sociologia da USP*, 20(2), 9-16. doi:10.1590/S0103-20702008000200001
- Pocinho, M. (2010). *Estatística II: Teoria e exercícios passo-a-passo*. Retrieved from http://docentes.ismt.pt/~m_pocinho/Sebenta_estatistica_II_com_anexos_2010.pdf.
- Prandi, R. (2008). *Converter indivíduos, mudar culturas*. *Tempo Social: Revista de Sociologia da USP*, 20(2), 155-172. doi:10.1590/S0103-20702008000200008
- Rabuske, I. J., Santos, P. L., dos, Gonçalves, H. A., & Traub, L. (2012). *Evangélicos brasileiros: Quem são, de onde vieram e no que acreditam?* *Revista Brasileira de História das Religiões*, 4(12), 255-267. doi:10.4025/rbhranpuh.v4i12.30275
- Scott, R. P., & Cantarelli, J. (2004). *Jovens, religiosidade e aquisição de conhecimentos e habilidades entre camadas populares*. *Caderno CRH*, 17(42), 375-388.
- Serafim, M. C., & Alperstedt, G. D. (2012). *As organizações religiosas e suas relações: Uma análise a partir da teoria dos stakeholders*. *Revista de Negócios*, 17(2), 21-40. doi:10.7867/1980-4431.2012v17n2p53-71

- Sexton, D. L., & Smilor, R. A. Y. (1997). *Entrepreneurship 2000*. Chicago, IL: Upstart Publishing.
- Siegel, S. (1975). *Estatística não paramétrica para as ciências do comportamento*. São Paulo, SP: McGraw-Hill do Brasil.
- Slotte-kock, S., & Coviello, N. (2010). Entrepreneurship research on network processes: A review and ways forward. *Entrepreneurship Theory and Practice*, 34(1), 31-57. doi:10.1111/j.1540-6520.2009.00311.x
- Stark, R. (1999). Micro foundations of religion: A revised theory. *Sociological Theory*, 17(3), 264-289. doi:10.1111/0735-2751.00080
- Stark, R., Iannaccone, L. R., & Finke, R. (1996). Religion, science, and rationality. *The American Economic Review*, 86(2), 433-437.
- Starr, J. A., & MacMillan, I. C. (1990). Resource cooptation via social contracting: Resource acquisition strategies for new ventures. *Strategic Management Journal*, 11(4), 79-92.
- Teixeira, F. (2008). Apresentação. In D. Hervieu-Léger (Ed.), *O peregrino e o convertido: A religião em movimento* (pp. 7-13). Petrópolis, RJ: Vozes.
- Tomaél, M. I. (2007). Redes sociais, conhecimento e inovação localizada. *Informação & Informação*, 12(1), 1-24. doi:10.5433/1981-8920.2007v12n1esp63
- Yin, R. K. (2010). *Estudo de Caso: Planejamento e métodos*. Porto Alegre, RS: Bookman.

PERSPECTIVES

Invited article

Translated version

DOI: <http://dx.doi.org/10.1590/S0034-759020180208>

COPYCAT: SIMILARITIES AND ACADEMIC PRODUCTION IN THE DIGITAL AGE

INTRODUCTION

My experience as a *RAE* editor allowed me to learn about the difficulties of dealing with the issue of similarity of scientific publishing in the digital age. I had to deliberate on sensitive issues constantly, and in several opportunities I expressed myself, in oral presentations and in *RAE*'s editorials, how I was dealing with this complex subject. In this brief article of the Perspectives section, I discuss some concepts using editorials of that period.

I will avoid, whenever possible, the expression, “plagiarism,” as this discussion aims at informing and educating authors. Plagiarism presupposes deceit, and in most cases I faced, the main problems were errors of interpretation and lack of understanding of the academic publishing process. In cases where an explicit bad intention is identified, the problem has a different nature, and I will not discuss them here because they happen less frequently and must be addressed according to legal precepts, which is not my specialty. The purpose of this article is to help well-meaning authors in situations they may face when preparing papers for publication in high-level journals.

Firstly, to better understand the complexity of the problem of similarity and the diversity of situations in which it occurs, I recommend consulting the infographic *Did I plagiarize?* (*The Visual Communication Guy, 2014*). This infographic introduces a typology that comprises 13 different situations in which some degree of similarity in a paper is possible. The gravity of the problem varies according to the situation faced. Authors can learn about the limits of reusing texts in scientific works by answering the questions in the infographic.

Secondly, we are in the process of cultural adaptation to an increasingly digitized world. Until a few years ago, copying text from one place to another was much more laborious than writing an original text. The copy & paste practice is relatively recent in our lives, and due to technical issues was only introduced by the spread of digital technologies. As it is an easy and convenient practice, it has spread rapidly, and we are not yet fully aware of the risks it involves.

EDUARDO H. DINIZ

eduardo.diniz@fgv.br

ORCID: 0000-0002-7950-9146

Fundação Getúlio Vargas, Escola de Administração de Empresas de São Paulo, São Paulo, SP, Brazil

Thirdly, and herein lies the most complicated problem, we (scholars) are under pressure by the publish or perish logic. The perverse thing is that the evaluation of scientific production is better fit to compute “quantity”, with much less consensus on how to identify the “quality” of this production. This is the origin of so-called “productivism,” a harmful behavior for the evolution of scientific knowledge, which has been discussed constantly in the academy, and generated good papers, some published in *RAE* (Machado & Bianchetti, 2011).

After this introduction, we will advance the discussion on similarities by addressing two topics. The first is about differences and similarities in full papers, i.e., how to consider two papers that are actually one or a paper that has been divided in two. The second is about similarities found in parts of papers, i.e., material that is copied from one paper and used in another.

REPLICATION AND SALAMI

Initially, I will present a discussion from the editorial, “Ethics, and discernment against productivism” (Diniz, 2013), written in response to a question addressed to the editorial team on whether the journal would accept a second version of one previously published, either in another language or with modified text.

Although the obvious answer should be “no,” the question allowed me to reflect more deeply on the situation of a hypothetical author who, having originally published a paper in Chinese, would like to share ideas with other audiences, for example, in Brazil. On the one hand, it cannot be denied that that paper would be original in the Portuguese, what could justify its republication. On the other hand, by accepting this paper, the journal could tarnish its image for publishing a paper already published, even though it was in a language unfamiliar to most of its readers. Although this may seem a somewhat Byzantine question, it gains relevance if we consider the hot debate in the academic environment about which language national journals should adopt.

However, the editorial moves in another direction and poses a different question: Who does a magazine intend to serve by republishing a paper? If the answer concerns needs of the hypothetical author to publish in a more relevant journal because the Chinese version was published in a lower ranked journal, then we are facing the productivist logic. Alternatively, if the paper is explicitly identified as a reproduction, preventing

it from being registered as a new production of the author, and the editorial team evaluates that it is of interest to the journal’s community, it is possible to accept the idea of republication.

What is important in this case is to understand that one journal’s primary commitment must always be to its readers, and not to the logic of productivism. Although scientific journals are committed to their authors, they should be predominantly committed to their readers and the principles of the ethical dissemination of knowledge. Thus, the best response to the question addressed to the editorial is, “It depends.” Publishing simply to meet the hypothetical author’s needs should receive a resounding “No,” while republishing a paper, communicating to readers the existence of the original version, and emphasizing the relevance of the dissemination of that knowledge in an ethical manner is acceptable.

A similar situation occurs when a modified version of another paper is published. Would it be possible to extract more than one paper from a single different empirical investigation analysed on the same theoretical approach? Or, otherwise, to publish different papers from the same empirical basis? Once again, we have to isolate the logic of productivism and evaluate the possible contributions of the paper to the primary target audience of the journal, its readers. If the similar version brings no new contribution, there is no interest in the publication. Alternatively, if using a new conceptual approach over the same data or using the same conceptual approach on different empirical data sets brings a new contribution to a given academic area, the second version could be accepted.

Avoiding what is popularly called “salami research,” a practice in which the author divides content for the sole purpose of producing a greater number of papers, it is perfectly acceptable to imagine one single research work as a source for different papers. Again, the important thing is not the number of papers but the diversity of contributions. Although any publisher might prefer a more complete contribution in a single paper instead of two partial contributions in different papers, what should be avoided is the logic of productivism.

Identifying whether two papers are actually a single paper is not always an easy task. Many authors would like journals to state in their publication guidelines the conditions for acceptance of modified versions. However, as noted above, not everything is crystal clear. Although journals are obliged to define what is acceptable within their editorial line, each case is unique. Moreover, as the editorial concludes, “more than any rule, ethics and discernment are the best medicine against productivism.”

LIMITS OF SIMILARITY IDENTIFICATION TOOLS

Another editorial (Diniz, 2015b) addressed the implementation in *RAE* of a new tool for identifying similarities. As an increasingly common editorial instrument for scientific journals, I nominated similarities detection systems as the “second stage of the digital revolution in scientific journals” (Diniz, 2015a).

Given the higher level of digitization in our society, journals must care about ensuring integrity on what they publish and felt pressure to identify similarities in papers they receive. Although ethics is most obvious issue to influence adoption of similarities detection tools, dealing with intellectual property rights in an academic context cannot be ignored.

When using a similarity detection tool, journals must make decisions on conflicting situations they have not experienced in the past. With the system’s implementation in *RAE*, I realized that classifying and addressing different cases of similarity had become a much more complex activity and therefore caused potentially rising attrition between the editorial team and authors.

These systems aim to prevent journals from publishing excerpts from third-party texts without referring to the original, although these cases are not very problematic, since many authors are trained to avoid such situations. Moreover, if this happens, authors usually acknowledge their error, and generally accept the request for a change, revising the citation to bring it in line with ethically acceptable ways of referring to the work of others.

Concerning the problem of incorrect, incomplete, or misquoted citations, in another editorial (Diniz, 2014), I drew attention to an article in the *Times Higher Education* journal that describes a situation in which the respected Polish intellectual, Zygmunt Bauman, the creator of the concept of “liquid modernity,” reacted to an accusation of plagiarism by a doctoral student. According to the opinion editor of this journal, in his response to the indictment, Bauman claimed that “high-quality scholarship does not depend on obedience to technical rules on referencing”, an opinion not supported by most journals and probably by the scientific community at large. Although Bauman also made clear that he “never once failed to acknowledge the authorship of the ideas or concepts that inspired the ones” he coined, this episode would not have happened without the existence of similarities detection tools.

There are other cases in which attrition between journals and authors may increase because of the use of these tools. It

is very common, for example, to identify similarity in different texts by the same author. Authors usually reuse parts of their previous work, a practice known as “self-plagiarism,” and do not generally consider this a wrong practice, as the text they reuse is their own. However, from the perspective of journals, this situation is not so simple.

Depending on the original source, the innocent and well-intentioned author’s practice of reusing parts of his own text can cause problems for the journal. In less serious cases, when the original does not imply assigning copyright to a publishing entity, as in a conference paper, for example, many journals even take in account the similarity and adopt the understanding that in some cases previously published versions are only natural stages in the development of a paper.

It is different when the original source is associated to a copyright contract, which is common in most journals. In such cases, the contract between author and publisher usually limits its use, in whole or in part, by another publication. Thus, when this type of similarity is found, the journal is obliged to ask the author to rewrite the text to eliminate similar excerpts, under penalty of being sued for misappropriation. Authors who have difficulty understanding the separation between “authorship” and “ownership” of an intellectual work feel offended, as they believe that they have done nothing wrong. However, by signing a contract with the original publisher, the issue ceases to be purely ethical and becomes related to commercial law.

The extension of problems resulting from the identification of similarity goes beyond what has already been exposed. What if similarity is found in different papers published by the same publisher? Take as an example this article you are reading now. I set out to write about a topic I had previously discussed in *RAE* editorials, and I reported this in the first paragraph of this article. After being analyzed by *RAE*’s similarity detection tool, I discovered that this article has a 9% similarity with the editorials I wrote myself and published in the same journal. Even if *RAE* does not wish to sue itself, there will be people claiming that I am “rehashing” old texts, because they would prefer to read new unpublished ones.

This is only a small sample of the enormous variety of situations that occur when a journal begins to check for similarity in its editorial processes. Aside from the origin of the text, many other issues are also considered in similarity assessment. One of these issues is the amount of similar content. How much is “acceptable”: a sentence, a paragraph, a page, or half of the paper? Moreover, in which part of the text is the similarity

found: in the introduction, theoretical review, methodology or conclusions? All of these questions open doors to many situations that do not always have easy solutions.

Other issues emerge with the increasing use of automatic similarity detection tools. By exclusively verifying textual similarity, i.e., identifying similarities between a submitted text and others already published, these tools automatically check word by word, and are unable, for example, to compare published texts in different languages or even identical ideas written differently, something that humans are perfectly capable of doing.

A case that is worth reporting, and which illustrates the limits of these tools, is it was when a reviewer suspected similarities in an paper that had not been detected by the RAE's system. The reviewer requested further checks, and it was discovered that the identification included a large number of double quotations (such as Author 1, 1900; Author 2, 2000), which is quite unusual. The author could not escape the reviewer's watchful eye, despite not having been detected by the tool of translating excerpts verbatim from another paper, and copying even the references. The similarity was high but in another language, and the paper was not published.

As similarity detection tools continue to evolve, artificial intelligence capabilities will soon be incorporated as well. I suspect that the process will become more complex for journals, and they will have to adapt to an even more sophisticated typology of similarities.

RAE explains the whole process of tracking similarities in its guidelines (RAE Guidelines, n.d.), clearly stating that the report generated by the tool is used in addition to decision making on the acceptance of an paper. Following this process, the paper is evaluated by editorial staff before any communication is forwarded to the authors. Regardless of the results reported on similarities, the tone used in communication with the authors should never be one of accusation. It is always better to ask for clarification on the points where similarity exceeds reasonable limits, and give the author the floor.

CONTINUOUS LEARNING ON A COMPLEX AND EVOLVING SUBJECT

As has been affirmed from the beginning of this brief article, dealing with the issue of similarities is not a simple task, because it involves cultural issues in a constantly evolving technological environment. The mechanisms for scientific knowledge dissemination, including academic journals, are changing rapidly for technical and economic reasons.

Furthermore, the traditional perception of the evolution of science is that it rests on the pillars of knowledge that is freely shared, new concepts developed from a preexisting base, and community identification of what is new in a given area. Although these principles may look simple and obvious, their applicability is complicated due to economic, social, and even political factors.

As Professor Maggolini (2014) teaches us, even ethics have been affected by the growing digitalization of society. The Bauman case mentioned previously is especially emblematic, because it is associated with a thinker who greatly contributed to the knowledge of our interconnected society.

Academic authors, pressed by the wave of productivism, use digital resources the best as they can to expand their impact on respective scientific communities. Organizations such as the Committee on Publication Ethics (COPE) help us to better understand the limits of what we can do and what we should not do to reach this goal, and everyone engaged in academic activity should be in touch with its principles of transparency and best practices for scientific publications (COPE, 2015).

To conclude, the key point is to avoid "copycat" behavior (whereby one copies ideas from others and presents them as one's own) on any of its possible levels. Let us use all available digital resources, endeavoring to always act ethically and avoid productivism.

REFERENCES

- Committee on Publication Ethics. (2015). *Principles of transparency and best practice in scholarly publishing*. Retrieved from http://publicationethics.org/files/Principles_of_Transparency_and_Best_Practice_in_Scholarly_Publishingv2.pdf
- Diniz, E. H. (2013). Ética e bom senso contra o produtivismo. *RAE-Revista de Administração de Empresas*, 53(4), 331. doi:10.1590/S0034-75902013000400001
- Diniz, E. H. (2014). Editorial. *RAE-Revista de Administração de Empresas*, 54(4), 351. doi:10.1590/S0034-759020140401
- Diniz, E. H. (2015a). Tradução automática, terceiro estágio da revolução digital dos periódicos. *RAE-Revista de Administração de Empresas*, 55(2), 119. doi:10.1590/S0034-759020150201
- Diniz, E. H. (2015b, Maio/Junho). Similaridade e plágio: Novos desafios para a gestão de periódicos científicos. Editorial. *RAE-Revista de Administração de Empresas*, 55(3), 239. doi:10.1590/S0034-759020150301
- Jump, P. (2014). Zygmunt Bauman rebuffs plagiarism accusation. *Times Higher Education*. Retrieved from <https://www.timeshighereducation.com/>

Eduardo H. Diniz

Machado, A. M. N., & Bianchetti, L. (2011). (Des)feticização do produtivismo acadêmico: Desafios para o trabalhador-pesquisador. *RAE-Revista de Administração de Empresas*, 51(3), 244-254. doi:10.1590/S0034-75902011000300005

Maggiolini, P. (2014). Um aprofundamento para o conceito de ética digital. *RAE-Revista de Administração de Empresas*, 54(5), 585-591. doi:10.1590/S0034-759020140511

RAE Guidelines. (n.d.). Rastreamento de similaridades. Retrieved from <http://rae.fgv.br/en/manual-rae>

The Visual Communication Guy. (2014). *Did I plagiarize?: The types and severity of plagiarism violations*. Retrieved from <https://visually.com/community/infographic/education/did-i-plagiarize-types-and-severity-plagiarism-violations>

PERSPECTIVES

Invited article

Translated version

DOI: <http://dx.doi.org/10.1590/S0034-759020180209>

DÉJÀ-VU IN ACADEMIA: I HAVE SEEN THIS BEFORE!

HAVE YOU SEEN THIS OR NOT?

There are things that enter our lives that make us think: again? The plagiarism issue is one of those things that never seems to be resolved and it will probably not be eliminated.

Academic activity, regardless of its form, is mobilized around the search for solutions to the problems in action areas that result from new knowledge in any dimension. According to the word ontology, merit recognition to a given subject or group of subjects based on discovery, identification, or creation is a great honor for a researcher. In a broader sense, it is the recognition by peers, authorities, organizations, and society that fit in a given area of knowledge.

In Applied Social Sciences, which comprises an extensive range of focused knowledge, there are peculiar aspects, including the relatively lower tangibility. We do not have a vaccine, a *chip*, a sticker, a medicine for fungus, a new comet (I exaggerated the concept of tangibility) to present for display. I would like to acknowledge the merits of the ancestor who mastered fire, because we still benefit from it today. It is an example of a “seminal” contribution that benefits many areas. Anonymity prevents this person from being recognized today, but certainly this brilliant researcher must have received tremendous recognition and considerable power in the community.

In the areas comprised by Applied Social Sciences, contributions affect institutions. When this path is trodden, people welcome new contributions as solutions to problems, thus providing a relatively long way between innovation and use. Ruptures are rare, and the preponderance of innovation is incremental in essence and in the form of communication. In this combination, uniqueness is only identified and valued by a specialist, an aware and informed researcher. *Publishers* of books, articles, and academic journals in educational institutions have much to do with the problems and, especially, the solutions to valued recognition.

PLAGIARISM IN THE GENERATION OF KNOWLEDGE

Some activities do not add value in the academic environment, while others destroy it. This is a set of inadequate practices incorporated into the research process that socially tarnish the entire process of generating and communicating knowledge. Among them, plagiarism is a practice that always destroys value in the short and long term. It damages authors and the publishing macro-environment of authors, reviewers, readers, and other stakeholders. It destroys the logic of meritocracy, and the very motivation of a researcher when he is not identified, reported, and penalized. Someone wins while someone else loses, and a sense of justice is not maintained.

A sensitivity to the problems of plagiarism has developed among researchers, government agency employees, research institutions, and the public. It regards ethical conduct as essential to

FÁBIO FREZATTI

frezatti@usp.br

ORCID: 0000-0002-5927-022X

Universidade de São Paulo,
Faculdade de Economia,
Administração e Contabilidade,
São Paulo, SP, Brazil

scientific research; consequently, collaboration and trust among agents may provide conditions for project development (Shamoo & Resnik, 2009).

The definition of plagiarism from Shamoo & Resnik (2009), would be: “Plagiarism is the appropriation of ideas, processes, results, or words without giving appropriate credit” (p. 148).

It is believed that the environment can be improved if plagiarism is an issue to be solved according to its moral sense than in the legal sense, although this is not our researchers’ way of thinking.

Even though there are qualitative parameters to identify plagiarism, the qualitative logic is very strong. In some cases, the percentage of texts that are equal or even similar to what has been previously published facilitates the decision-making process of whether to treat a given case as plagiarism. I dealt with a case in which a single sentence unrelated to the citations made the article contribution innovative although it was not. Moreover, it had already been reported by another researcher. In other words, the qualitative issue of something relevant that has already been reported by others is crucial to tackling this issue.

Without exhausting the possibilities and even relating them to how they are captured, there are several practices that may be linked to plagiarism, according to the concept placed in this reflection. This includes plagiarism of the following: literature review texts, analysis, conclusions, references when cited by an author, but not read by him or her in the original source, texts in different languages, and tables and figures. This also includes self-plagiarism.

The question of self-plagiarism requires careful analysis because the argument that it does not harm other people is too simplistic (Shamoo & Resnik, 2009, p. 101). It does harm, since it fosters recognition of something that has already been communicated. Moreover, an author who develops such practices is more favorably placed in *rankings* and assessments than others. In the world of *Creative Commons*, this has no limit and it cannot be forgotten.

THE ONLY WAY TO SOLVE THIS PROBLEM IS TO UNDERSTAND THE CAUSES

What would be the causes of plagiarism? There may be several, and some of them are correlated. I am going to take a relatively heuristic approach to focus on reasons found in routine activities, not necessarily stemming from studies developed from rigorous statistical treatments. Considering several possibilities, I would like to highlight the following reasons, regardless of circumstances:

Disinformation

Let’s start with the benefit of the doubt. Among the several preventative, elucidative mechanisms on inadequate research practices, including plagiarism, the following ones may be mentioned: subjects that deal with ethical issues in the research process, ethics committees, *Committee on Publication Ethics* (COPE), extensive literature available in books, articles, and websites. Still, it is possible that a lack of awareness in implementing the citation commitment occurs (TurViñes, Fonseca-Mora, & Gutiérrez-San-Miguel, 2012).

Ways of working in teams

I cannot tolerate the catchphrase “Blame it on the intern” anymore. A research group must have a leader, someone who is committed to tutoring, coordinating, checking, and compiling. Students in scientific initiation projects, as well as master’s, doctorate, or post-doctoral degree students, integrate any group activity, whether it is a study among peers or even tutoring. In summary, someone should ensure that ethical procedures be followed. It is rather disappointing to see the widespread use of the intern’s strategy.

Pressure to look pretty in the picture and rapidly generate production

The career pressure (Goodstein, 2010) and the logic of productivism have been used to justify countless problems (Martins & Lucena, 2014). It is not that the pressure does not affect people, but to consider that this is the main great reason to justify fraud means to ignore people’s character. In the famous Enron case, an article was published defending the cause of fraud as the organization’s existing budget. It might be a good theme to employ the Attribution Theory. I understand that it is a variant of “blame it on the intern.” The difference is that there is no subject to counter.

An environment of impunity that pervades the world, in varied dimensions

I experienced a fraud situation in that the agent used this exact argument: If all do it, but nothing happens, why not do it? Unfortunately, it must be considered that, although there are set, publicized rules, people may perceive them as mere advice, not something to seriously respect. The academic environment is not excluded from this moment experienced by society as a whole.

Dishonesty, nature

I left this for last because I believe that the community is generous, smart, and it has a propensity to be honest. Leadership and clear rules can bring the benefit of guidance and reference to the environment. However, I must admit that there are those who do not stick to this rule and use plagiarism with or without ease (Trzesniak & Plata-Caviedes, 2012, p. 72). In some cases, they may adopt plagiarism as a strategy, with high technical efficiency and “professionalism.”

SO WHAT? WHAT CAN BE DONE TO REDUCE DÉJÀ-VU?

I offer this list of possible *drivers* to act against plagiarism:

1. Understanding that this is something that can only be tackled by a joint effort from several agents. This includes focusing on people in several roles (students, teachers, authors, reviewers, and editors), and on institutions directly related to people (journals, *publishers*, educational bodies, regulatory bodies, and financial institutions). Cavalcante (2006) identifies the university as the main center for the ethical aspect, under the focus of competences. However, each agent has a share in an environment surpassing national borders. In the United States, the Senate became involved in this issue with a very active committee engaged in coordinating efforts.
2. Regarding the institutional environment, there are actions that may be taken in undergraduate and graduate courses, congresses, and journals to repeatedly train through different perspectives and habits (Cavalcante, 2006). Whether we like it or not, repetition is a type of action that fosters the institutionalization of a habit. In view of the changes in technology, including plagiarism, training should be viewed as something recurrent, in the short, medium, and long terms. Divulging information on a website may be a start, but it is too little to bring change in the preventive approach to the subject.
3. Discussion groups/inter-institutional forums for more specific clarifications, about different real cases of plagiarisms. The idea to avoid internal discussions is a try to avoid corporatist, group aspects. The idea is to have an advisory body resembling that of COPE, but focused on local demands and specificities (Cavalcante, 2006).
4. Greater availability of devices that may identify potential plagiarism in academic journals: personnel, *software*, and allowing reviewers more time (Araújo, Azevedo, Vieira, Araújo, & Nascimento, 2017, p. 57). The existing *software* help identify potential plagiarism. Nonetheless, they do not function without human intervention, either judging convergence percentages or evaluating an essay clearly similar to another one that was not cited. Consequently, we will continue greatly depend on people’s involvement and maturity (Shamoo & Resnik, 2009, p. 118) until artificial intelligence reaches this stage.
5. Showing that “crime does not pay,” highlighting existing cases and what plagiarists have lost when they were identified. I understand that this suggestion may be easier said than done as it is complex and quite hard to implement. Thus, it may demand reasonable institutional support to develop. This must happen in one way or another.
6. Increased support for journals in terms of proactive mechanisms to avoid plagiarism. This is not just about IT tools, but more human resources for support structures or reviewers (Pearson & Sharma, 2015), investment in training, and greater dialogue with the community. This is only possible if the journals’ administrative bodies respond to such a challenge. Although I see this as hard to implement, I believe that the functionalist view requires some incentive within a graduate program evaluation, for example.
7. Attention to what happens in other areas of knowledge, whether they are close or distant, that may be perceived as similar and bring relevant learning. Some of them present extensive traditions to tackle the issue. Its importance is not only related to the mimetic opportunity, but the reflection of someone who is also learning to deal with such a complex question.
8. The internationalization movement, in which students and teachers are sent to and received from other research centers, provides an opportunity to emphasize the subject and note idiosyncrasies and solutions. I do not believe that this occurs in relationships with any center, but, in general, some benefit from promoting the theme is expected.

9. This issue cannot be overlooked, even when it seems as if the plagiarism cases have become extinct. It is possible to alter the *doxa* over time; however, the essence of the problem must be revisited and treated.
10. Practice of ethics in the broad sense, in a personal way, by everyone, in the various contexts of participants within the academic community, i.e., at home, in the research environment, and in the classroom. This one was placed in the end, but it should be the first to be challenged and developed. Without it, nothing changes. There is no use in complaining about other agents' actions without doing your/our part. This is the Attribution Theory, inverted.

FINAL REMARKS: WILL THIS HAPPEN AGAIN?

Several movies have somehow dealt with *déjà vu* or something similar. There comes a time when the will to change the end of the movie becomes relentless and infectious, and something changes. This does not happen because we pray to God to do something, but because each one of us, in our various roles, has mobilized to change. We believe that this is possible, and we do our part, as small as it may seem, as a personal yet collective commitment. Even the movies show that the end may be different. Let's go?

REFERENCES

- Araújo, R. M., Azevedo, A. K. de, Vieira, L., Araújo, M. A. D. de, & Nascimento, T. C. (2017). Gestão de periódicos: Um estudo na área de administração, ciências contábeis e turismo. *Revista Eletrônica de Biblioteconomia e Ciência da Informação*, 22(49), 42-58. doi:10.5007/1518-2924.2017v22n49p42
- Cavalcante, L. E. (2006). Políticas de formação para a competência informacional: O papel das universidades. *Revista Brasileira de Biblioteconomia e Documentação*, 2(2), 47-62.
- Goodstein, D. (2010). *On fact and fraud*. Princeton, EUA: Princeton University Press.
- Martins, O. S., & Lucena, W. G. L. (2014). Produtivismo acadêmico: As práticas dos docentes dos programas de pós-graduação em contabilidade. *Advances in Scientific and Applied Accounting*, 7(1), 66-96. doi:10.14392/ASAA.2014070103
- Pearson, A. W., & Sharma, P. (2015). Referencing in scholarly articles: What is just right? *Family Business Review*, 28(3), 188-192. doi:10.1177/0894486515599111
- Shamoo, A. E., & Resnik, D. B. (2009). *Responsible conduct of research: Public health* (2nd ed.). Oxford, UK: Oxford University Press.
- Trzesniak, P., & Plata-Caviedes, T. (2012). Qualidade de conteúdo, o grande desafio para os editores científicos. *Revista Colombiana de Psicología*, 21(1), 57-78.
- Tur-Viñes, V., Fonseca-Mora, M.-C., & Gutiérrez-San-Miguel, B. (2012). Ética de la publicación científica: Iniciativas y recomendaciones. *El Profesional de La Información*, 21(5), 491-497. doi:10.3145/epi.2012.sep.07

BOOK REVIEWS

Translated version

SOCIAL PROJECTS: EVALUATION METHODOLOGIES AND INSTRUMENTS

ECONOMIC EVALUATION OF SOCIAL PROJECTS

Naercio Menezes Filho (Org.). São Paulo, SP, Brazil: Itaú Foundation, 2016, 2nd ed., 293 p.

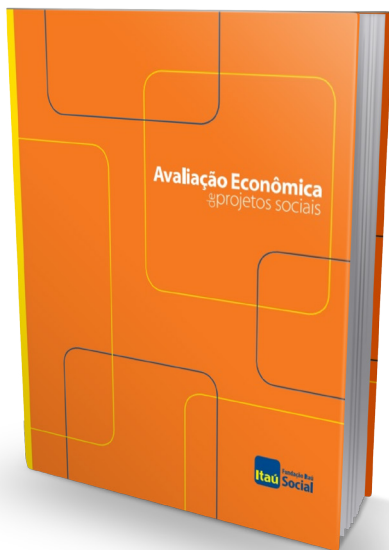
Avaliação Econômica de Projetos Sociais, an initiative of Itaú Social Foundation, is the second edition but the fourth book in the series published by the institution. It has 8 chapters and 293 pages. The database introduced by the first edition of the book, published in 2012, helped in the development of this work. The other two books in the series are *Private Social Investment Evaluation: Organizational Strategy and Evaluation for Private Social Investment: Methodologies*.

Each chapter has a different author. According to these authors, the primary objective was to present theory and practice in economic evaluation of social projects. The main features of the book and some suggestions on form and content that could help achieve the established objectives are presented in this review.

The first chapter in the book generically introduces the theme. It explains, for example, that economic evaluation is divided into impact evaluation and economic return evaluation. The chapter presents the reasons for and importance of evaluations and explains that there are experimental and non-experimental methods for performing these evaluations. It also clarifies concepts such as program impact and helps in understanding effective and potential impacts. The text also addresses cost-effectiveness and cost-benefit, when to evaluate—before or after a program, limitations of evaluation, and methods to find out if a social program has contributed to improving the lives of participants and whether the amounts invested are fair.

The second chapter describes how to constitute control and treatment groups, i.e., to develop a counterfactual and thus measure the impact of certain government actions on society. Furthermore, it explains naive comparisons, i.e., those in which the control group is divided into treated and untreated, or even the state of the group before and after government action. The text presents the methods of comparison that try to reduce self-selection bias.

The third chapter is dedicated to presenting the experimental Randomization Method. In this model, individuals with homogeneous characteristics are selected to the control and treatment groups. Public policy evaluators disseminate this model. The chapter, besides demonstrating the difficulties of randomization, also presents a review of the external validity and internal validity of an evaluation, costs, and statistical analysis of the model.



By

OTÁVIO AUGUSTO DE OLIVEIRA CRUZ FILHO

otaviocruz.filho@gmail.com

ORCID: 0000-0002-4487-870X

VICTOR REZENDE TELES

victor432@gmail.com

ORCID: 0000-0002-5190-884X

WLADIMIR FURUHASHI VIANA

wladimir.viana945@gmail.com

ORCID: 0000-0001-7351-3753

Universidade de Brasília, Faculdade de
Administração, Contabilidade e Economia,
Brasília, DF, Brazil

The fourth chapter of the book introduces non-experimental methods. The first method is Differences in Differences (DD), which consists of, as the name suggests, the difference of two means. In this chapter, the naive methods are criticized and a statistical analysis of the DD model is performed, highlighting its disadvantages.

The fifth chapter is dedicated to explaining the method of pairing. In this model, a control group similar to the treatment group is constructed with observable characteristics. In this chapter, a statistical analysis of the model is performed and the pairing estimators such as Simple Matching, Propensity Score Matching, Linear Regression, Rebalancing, and a combination of these methods are shown.

The sixth chapter of the book is dedicated to Instrumental Variables, a model that aims at analyzing the unobservable variables. This chapter presents multiple instruments and continuous instruments, focusing on mathematical and statistical analyses.

The seventh chapter introduces the method of Regression Discontinuity Design, which allows the use of weaker hypotheses than the other non-experimental models explained in previous chapters. In this chapter, the Sharp and Fuzzy cases and the Estimation are detailed, graphic analysis is performed, and the method is compared with the other methods described earlier.

The last chapter emphasizes the calculation of economic return. While the previous chapters served to measure the impact of a policy on the treatment group compared to the control group, this chapter presents several ways of transforming the benefits of a program into economic benefits using project cost evaluation, sensitivity analysis, and economic return measures.

After discussing the content and structure of the book, we must consider some aspects that could be improved in the work. The first is its form. All chapters have questions at the end. However, there is no section with answers. This may make reading difficult for those who use the book as a tool for evaluating policies. Ideally, there should be an appendix for this purpose. Second, the text could be given in the format of

an instruction manual. The layout is clean and well organized, but without a standard font type. The first, second, and eighth chapters are instructive and explanatory, while the others are mostly technical. Given that each chapter has a different author, there is a clear difference in the style of argumentation and construction of text. Therefore, the organizer could be more attentive, presenting the content in a more didactic format.

Some aspects of the content must be pointed out. The introduction of the book explains that the text is directed at people with a degree in social sciences and knowledge of basic statistics. However, the concepts of statistics are explained in detail and, therefore, those who do not have a deeper knowledge of this subject may not understand the content completely. Moreover, many statistical formulas are not explained, and this compromises the objective of disseminating the evaluations. Although the book has a section listing books that may help answer questions relating to statistical formulas, presenting only the formula and not explaining how to obtain a given result does not help. Providing examples in all chapters will help the reader understand the subject.

Another aspect that could be improved is the concept of counterfactual. In some parts of the book the term “counterfactual” is used, while in others the term “control groups” is used. This usage of terms could be standardized to ensure clarity. Furthermore, the text could be targeted not only at people with a certain degree of public policy knowledge, but also managers with lesser knowledge of public policy, by adopting a less technical writing style.

In any case, the book fulfils its objective of clarifying the importance of evaluating policies and how this should be done in a more appropriate (expert/sophisticated) way. This book could be used more widely if simplifications and adjustments to form and content are carried out, insofar as the decision maker has more grants to direct actions towards the public policies established by him. The promotion of free-of-charge distribution of the book on the Itaú Social Foundation website helps with its dissemination. However, the proposed changes are fundamental to achieve the primary objective of the book.

BOOK REVIEWS

Translated version

WHAT IS THE ROLE OF CONSUMPTION IN THE CONTEMPORARY CAPITALIST SOCIETY?

CULTURA DO CONSUMO. Fundamentos e formas contemporâneas.

Isleide Arruda Fontenelle. Rio de Janeiro, RJ: Editora FGV, 2017. 220 p.

How can one explain the role of consumption in the contemporary capitalist society from a more holistic view compared to the one usually taught in business schools? This is the ambitious goal that Professor Isleide Fontenelle, PhD, aims to reach in the book *Cultura do consumo: Fundamentos e formas contemporâneas*. Building on her career as a researcher and professor of this subject at the Fundação Getúlio Vargas, the author summarized 150 years of history of the relationship between consumption and capitalism, and proposed two main theoretical axes underpinning it.

Fontenelle considers the studies on marketing, advertising, and consumer behavior as part of the object of analysis, and not as a field of research as such. She goes beyond the more traditional approach of the *Consumer Culture Theory (CCT)*, which seeks to understand the consumers' choices and behaviors not only from economic and psychological standpoints, but also from a sociocultural one. The book is ambitious because it links these two perspectives. Moreover, it considers the fields of marketing, advertising, and consumer behavior as object of analysis, using theoretical foundations of economics and psychology/psychoanalysis to explain the framework of the contemporary capitalist society.

Even though the book is composed of five chapters, the author's intention in dividing her work into two major parts is clear. The first one (chapters I to III) covers almost two thirds of the work, conducting a retrospective study of nearly 150 years of changes in capitalism and consumption. Fontenelle adopted a subdivision of its own despite being inspired by reference authors. She divides this story into three stages: foundations of consumer culture (1880–1945); consolidation of consumer culture (1945–1990); and contemporaneity (1990 to present). The first part of the book offers a more descriptive character without deepening the theoretical aspect. The second part of the book (chapters IV and V) provides a deeper theoretical perspective, summarizing the historical development of capitalism and consumption into two theoretical perspectives.

Chapter I (Fundamentals) constitutes what the author calls the first phase of consumer culture, spanning 1880 to 1945. This stage results from two key historical movements, one economic, the Industrial Revolution, and the other political, the



By

VINICIUS ANDRADE BREI

brei@ufrgs.br

ORCID: 0000-0002-0502-4533

Universidade Federal do Rio Grande do Sul,
Escola de Administração,
Porto Alegre, RS, Brazil

French Revolution. Together, these movements paved the way for the so-called “modern age,” and consequently the “modern individual.” The Industrial Revolution was essential for two reasons: it increased the amount of goods produced that needed to be sold and laid the foundations of a type of consumption that works in a different way in capitalism than other modes of production: the consumption of commodities. Commodities, in the capitalist system, may take different forms and suffer resignification in comparison to their original form. That means they can satisfy more extensive needs than those foreseen for when it was produced. The French Revolution was key to supporting this new role of goods in the capitalist system, since it established new possibilities of social mobility, enabling individuals to be freer in their identity choices. Therefore, the consumption of commodities was not associated with a historical sense of destruction. However, it gained new positive meanings, sustaining a world of freedom and individual expression.

Several other social changes occurred due to which such transformation in the meaning of consumption could happen and the capitalist system could expand. For instance, there were improvements in urbanization, transport, communication and distribution systems, creation of department stores and consumer credit, acceleration of commodities life cycle and, most importantly, the creation of public relations (PR), marketing, advertising, and market research. It is possible that some readers disagree of the separation made by the author regarding the roles of marketing, PR, and advertising. Nevertheless, it is undeniable that they generally helped build the foundations of the contemporary capitalism.

Chapter II depicts the consolidation of consumer culture, between 1945 and 1990. One of the most remarkable features of this period is the abundance and the subsequent pursuit of differentiation of commodities by changing their image. For that to happen, market research, commercials (advertising), and branding (brand management) were essential to the consumption management, since production management had already been solved. The chapter presents more examples of how companies have managed investments in their image, besides a theoretical analysis of the subject.

Chapter III (Contemporary Forms of Consumption) examines how the culture of consumption has been reinventing itself from two central events -- the new information technologies and the environmental crisis. The author summarizes recent changes in two large “forms”: “consumption of experiences” (or hedonic consumption) and “responsible consumption.” The first reflects

the companies’ efforts to go beyond the satisfaction of utilitarian needs, that is, providing the consumption of experiences. The consumption of experiences is based on the notion that we are going through the passage of a buy-and-sell economy to an access economy. The responsible consumption is anchored in the environmental, social or individual implications of the act of consuming. That is, it is a reaction to the exacerbated, predatory consumerism that prevailed throughout the greater part of capitalism.

The highlight of the book for readers with a more academic profile will probably be chapter IV, since the fifth and last chapter provides only a summary of work. It is in Chapter IV that Fontenelle gets more theoretical and less descriptive about the culture of consumption. She summarizes this culture in two connected theoretical foundations: the Theory of Capitalism and Theory of Passions. The Theory of Capitalism is based on the notion that there is a central economic axis in the culture of consumption. That is, to understand the operation of the capitalist system is to understand the culture of consumption, especially that the essence of this system is the production of surplus capital and its continuous expansion. According to the Theory of Passions, the selling of commodities and the permanent expansion of capital can only occur through the mobilization of human “passions”. That is, people need to renew their consumer desires constantly. To support her argument, the author investigates main theorists of capitalism and psychology/psychoanalysis, associating the two theoretical aspects.

The book is ambitious because it tries to describe the culture of consumption in about 200 pages. Obviously, such limited space in terms of pages would not allow a thorough analysis, which does not mean that the book does not have virtues. It has several. First, it is a good source for a reader who wants to have a coherent glimpse of a complex historical process. Second, it features a relevant set of works and reference authors for those who want to deepen their understanding of consumption, either in its historical, economical, and psychological/psychoanalytical contexts. Third, it is a well-written, organized, and structured book, providing the reader with a pleasant, didactic experience of traveling in time to understand the world of consumption. The book stands out for its more “horizontal” than “vertical” view on the culture of consumption. That is, a reader who is new to the subject may possibly be satisfied with the approach. However, it is likely that readers who have already been initiated will consider the book shallow in some points.

BOOK RECOMMENDATIONS

Translated version

Governance & charity: The benefits of corporate governance and charity association

Grazielle Rigotti da Silva | irgrazielle@gmail.com | ORCID: 0000-0003-4442-1555

The scope of the concept and applicability of corporate governance encompasses the most diverse sectors and aspects of organizational life and society. Some factors—such as social responsibility and the practice of charity—understood as a characteristic of donor behavior, whether individual or organizational, are of great social relevance and have gained attention in recent studies, mainly to cope with high-impact socio-environmental problems. Thus, the benefits of a governance system that encourages charitable activities, generating positive results, and a charity motivated and legitimized by transparent practices, guaranteed by good governance, are becoming more evident each day. **Grazielle Rigotti da Silva** (FGV EAESP), a master's student and researcher of the theme, suggests five books.



GIVE FOR GOOD: A how-to guide for business giving

Debbie Johnson. Austin, USA: Philanthropy Press, 2017. 206 p.

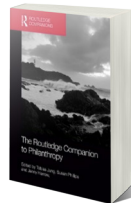
Based on a practical approach, the work defines a "step-by-step" process for organizational reflection that allows a strategic and engaging philanthropic positioning considering its three components: consumers, owners, and employees. The author explains this process in 15 chapters, from reasons to donate to its impact, even confirming greater retention of employees and increase of revenues for more generous companies.



TRANSFORMATIONAL GOVERNANCE: How boards achieve extraordinary change

Beth Gazley and Katha Kissman. Hoboken, USA: Jossey-Bass, 2015. 288 p.

Corporate governance tools have been occupying an increasing place in non-profit organizations in an increasingly competitive market. Composed of eight chapters, this book, using a technical approach, but still with real examples, proposes a course of transformation comprising the professionalization and deepening of these tools. It also presents the steps for building good governance in these organizations.



THE ROUTLEDGE COMPANION TO PHILANTHROPY

Tobias Jung, Susan D. Phillips and Jenny Harrow (Eds.). London, UK: Routledge: Routledge Companions in Business, Management and Accounting, 2016. 532 p.

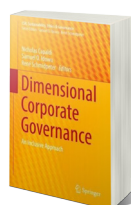
Organized into seven parts, this book offers an international view of contemporary researchers on the role of philanthropy in hybrid structures, such as partnerships established between the public, private, and non-profit sectors despite global challenges such as increased inequality and poverty. Addressing topics such as philanthropy and governance, and philanthropy in the digital era, the authors offer a qualitative perspective on the impulse to donate and the donation's impact.



CAPITAL AND THE COMMON GOOD: How innovative finance is tackling the world's most urgent problems

Georgia Levenson Keohane. New York City, USA: Columbia University Press, 2016. 264 p.

Climate change, public health, economic inequality, and urban revitalization are themes addressed in this book. The author presents the social importance of innovations in the field of finance. Organized into five chapters, the book argues in favor of the need for integrative and borderless thinking and proposes the resolution of problems often caused by the market using its own tools.



DIMENSIONAL CORPORATE GOVERNANCE: An inclusive approach

Nicholas Capaldi, Samuel O. Idowu and René Schmidpeter (Eds.). London, UK: Springer International Publishing, 2017. 281p.

The transformations required of private companies in the fields of corporate governance, social responsibility, and sustainability, as well as the importance of reporting these actions to stakeholders are addressed in this book. As part of the fundamental relationship between company and society, this book, which is organized into four parts, addresses these aspects in 11 different countries, showing how corporate social responsibility (CSR) can reinforce aspects of corporate governance.