

Aversano, Natalia; Nicolò, Giuseppe; Sannino, Giuseppe; Polcini, Paolo Tartaglia

Article

Corporate social responsibility, stakeholder engagement, and universities

Administrative Sciences

Provided in Cooperation with:

MDPI – Multidisciplinary Digital Publishing Institute, Basel

Suggested Citation: Aversano, Natalia; Nicolò, Giuseppe; Sannino, Giuseppe; Polcini, Paolo Tartaglia (2022) : Corporate social responsibility, stakeholder engagement, and universities, Administrative Sciences, ISSN 2076-3387, MDPI, Basel, Vol. 12, Iss. 3, pp. 1-6, <https://doi.org/10.3390/admsci12030079>

This Version is available at:

<https://hdl.handle.net/10419/275349>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/4.0/>

Corporate Social Responsibility, Stakeholder Engagement, and Universities

Natalia Aversano ^{1,*}, Giuseppe Nicolò ¹, Giuseppe Sannino ² and Paolo Tartaglia Polcini ¹

¹ Department of Management and Innovation Systems, University of Salerno, 84084 Fisciano, Italy; gnicolo@unisa.it (G.N.); ptpolcini@unisa.it (P.T.P.)

² Department of Economics, University of Campania “Luigi Vanvitelli”, 81100 Caserta, Italy; giuseppe.sannino@unicampania.it

* Correspondence: naversano@unisa.it

1. Introduction

In recent decades, there have been increasing concerns about the role of organizations in society and their impact on climate change, environmental degradation, resource depletion, health crises, and human rights' inequalities (Yáñez et al. 2019; Venturelli et al. 2021; Trireksani et al. 2021; Schimperna et al. 2022). Consequently, social and political pressures have prompted organizations to integrate social, environmental, and ethical responsibilities within their strategies and operations to create value for all their stakeholders (Chan et al. 2014; Lourenço et al. 2022; Venturelli et al. 2021). Universities are not exempt from this wave. They can be considered small cities due to their dimensions, the high number of students and employees engaged, and the magnitude of their institutional activities that exert direct and indirect social and environmental effects on the ecosystem (Lopatta and Jaeschke 2014; del Mar Alonso-Almeida et al. 2015; Nicolò et al. 2021). Therefore, along with the three canonic missions of teaching, research, and technology transfer universities, a fourth mission has emerged, requiring universities to collaborate with civil society, industry and government to ensure society's progression towards sustainable development (Trencher et al. 2014; Nicolò et al. 2021; Lucchese et al. 2022). Universities have been called to integrate Corporate Social Responsibility (CSR) and sustainability pillars in their curricula to prepare future leaders and decision-makers to contribute to driving the transition toward a more sustainable society (del Mar Alonso-Almeida et al. 2015; Di Tullio et al. 2021; Venturelli et al. 2021). Attuned, they have been enticed to exploit their multifaceted sources of knowledge and technological resources to develop research projects based on fostering the exploitation of renewable energy, waste reduction, green mobility, and transport, and circular economy (Lourenço et al. 2022; Di Tullio et al. 2021; Esposito et al. 2021). Thus, Higher Education institutions have been forced to abandon the “ivory tower” that for a long period has isolated them from external socio-economic systems to increase their engagement with local, regional and national communities and foster their economic prosperity, environmental integrity, and social equity (Marhl and Pausits 2011; del Mar Alonso-Almeida et al. 2015; Di Tullio et al. 2021).

The role of universities in advancing CSR and sustainability agendas has been reflected in several political initiatives. In 2012, at the United Nations (UN) Conference on Sustainable Development “Rio + 20”, University leaders signed an agreement to proclaim their commitment to supporting the journey towards sustainable development through five actions: (1) Teach sustainable development concepts; (2) Encourage research on sustainable development issues; (3) Create Green campuses; (4) Support sustainability efforts in the communities in which they operate; and (5) Engage with and share results through international frameworks (UN 2012). The Rio + 20 Summit laid the foundations for adopting the UN 2030 Agenda for Sustainable Development in September 2015 (Fonseca and Carvalho 2019; Esposito et al. 2021; Venturelli et al. 2021). The 2030 Agenda includes 17 Sustainable



Citation: Aversano, Natalia, Giuseppe Nicolò, Giuseppe Sannino, and Paolo Tartaglia Polcini. 2022. Corporate Social Responsibility, Stakeholder Engagement, and Universities. *Administrative Sciences* 12: 79. <https://doi.org/10.3390/admsci12030079>

Received: 6 July 2022

Accepted: 7 July 2022

Published: 12 July 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Development Goals (SDGs) and 169 targets that aim to represent a roadmap for private and public organizations to address the world's most urgent sustainability challenges and create a better future for all (UN 2015; Fonseca and Carvalho 2019). The Higher Education sector has been at the forefront of supporting and promoting the 2030 agenda (Mori Junior et al. 2019; Venturelli et al. 2021; De Iorio et al. 2022). Besides the SDG4, which specifically endeavors to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UN 2015; Venturelli et al. 2021), universities have been considered primary actors able to directly or indirectly contribute to all the 17 SDGs (Adams 2018; De Iorio et al. 2022).

The recognition of a pivotal role in enabling change toward sustainable development and the pressure for interiorizing CSR tenets within academic core functions have gone hand in hand with the need to enhance stakeholders' engagement through non-financial reporting practices (Gamage and Sciulli 2017; Nicolò et al. 2021; Esposito et al. 2021). Universities are required to be accountable to internal and external stakeholders for the impact exerted by their daily activities on social, economic, and natural environments and their commitment to ensuring sustainable development (Sepasi et al. 2019; Trireksani et al. 2021). In response to stakeholders' accountability pressures, universities have started to include non-financial information as an addendum to their traditional financial reports or as part of specific stand-alone non-financial documents such as CSR or Sustainability Reports prepared according to Global Reporting Initiative (GRI) guidelines (Sepasi et al. 2019; Nicolò et al. 2021; Trireksani et al. 2021). Furthermore, there is an increasing trend of transmitting non-financial information through universities' institutional websites or more interactive web tools based on two-way communication paths such as social media, including Facebook and Twitter (Esposito et al. 2021). In particular, the dialogic and interactive potential of social media allows universities to integrate dynamic stakeholder expectations and needs in their decision-making (Lodhia et al. 2020; Esposito et al. 2021), shifting from an "inform me" to an "engage me" paradigm (Kaur and Lodhia 2019, p. 340).

Nevertheless, the journey toward incorporating sustainability and CSR pillars into universities' missions, activities, and reporting practices is still in an early stage due to several financial, social, human, and political barriers (del Mar Alonso-Almeida et al. 2015; Sepasi et al. 2019; Nicolò et al. 2021).

In the wake of these premises, this Special Issue of *Administrative Sciences* attempted to foster research in the area of Corporate Social Responsibility (CSR), sustainability, and stakeholder engagement in the Higher Education context. It aimed to enrich the ongoing research debate focused on universities to enhance the understanding of their role in advancing the CSR, sustainability accounting, accountability, and reporting agenda.

2. The Collection of Articles

The fourteen papers published in this Special Issue have helped to provide insights on CSR, stakeholder engagement, university missions, and social impacts to discuss the role of public universities in promoting sustainability actions and SDGs embedded in the 2030 UN Agenda.

Here, we summarize the main contributions of these papers.

Two papers focus their attention on university transparency and the Processes' Complexity in Public Institutions, respectively.

The paper "The Antecedents of Transparency of Italian Public Entities: An Empirical Analysis in Universities and Public Research Institutes" by Rella et al. (2022) examines the amount of information disclosed by universities and public research institutes within the website section called "Amministrazione trasparente". Furthermore, the authors use a multiple linear regression model to examine the impact of age, size, internationalization, and complexity on transparency. Their results show that universities have a high level of transparency and that their size and internationalization positively affect it. It is evident from this study that large and most internationalized universities and public research institutes need to increase their transparency in order to gain greater legitimacy.

The article “Causes and Effects of Processes’ Complexity in Public Institutions: Some Experiences from Italian Universities”, by [Modugno et al. \(2022\)](#), through the analysis of two case studies, analyzes the in-depth ways the processes and routines enacted by two Italian universities perform back-office activities. The authors explore the complexity of administrative processes, considering this as a possible source of inefficiency and an obstacle to value creation. In the two cases examined, management recipes such as accrual accounting and performance measurement and reporting did not improve efficiency and effectiveness. However, accountability and transparency are considered essential factors for gaining legitimacy from the public’s perspective. As a result, the question is raised about the efficiency of producing a great deal of data with highly complex accounting systems imposed on politicians, managers, and citizens.

Five papers concern CSR and, more specifically, two papers focus the attention on CSR Teaching and Education, while the other three papers analyze the universities’ social responsibility initiatives.

The first paper regarding CSR Teaching “Universities and CSR Teaching: New Challenges and Trends” by Federico Schimperia, Fabio Nappo, and Federica Collaretti, points out some new challenges and trends emerging from the university context, in which CSR issues have become increasingly important. Through a Systematic Literature Review (SRL), the authors analyze how universities are improving CSR teaching through the development of new curricula and new teaching methods. Based on 31 documents, this SLR suggests that innovations in CSR teaching are an immature field from an accounting, management, and business perspective. The authors point out that universities are constantly updating their teaching methods, and they continue to need to develop new methods, techniques, and tools for teaching CSR and disseminating it to a wider audience.

The second one is “CSR Education in Economia Aziendale Curricula: An Overview” by Andrea Venturelli, Roberta Fasiello, and Simone Pizzi. This study analyzes the current state of CSR Education in Italian business administration courses. Specifically, the authors evaluate Economia Aziendale scholars’ contributions using qualitative methods. In the study, it was found that Italian HEIs have started integrating CSR into their curricula, with public universities showing greater interest in CSR than private universities.

The first paper about universities’ social responsibility initiatives is “SR Reporting Practices: The Case of University of Bari” by [Campobasso et al. \(2022\)](#). This paper examines how the University of Bari disseminates and integrates corporate social responsibility (CSR) into corporate strategy through a case study approach. Moreover, this study examines how the university ensures stakeholder involvement (professors, administrators, and students) in CSR initiatives. It was found that the investigated university plays a crucial role in promoting CSR issues and sustainable territorial development. In terms of student involvement, the interview revealed that the University of Bari fully recognizes the importance of students for disseminating CSR practices in the future.

The second paper about the universities’ social responsibility initiatives is “University Social Responsibility: The Case of Italy” by [Comoli et al. \(2021\)](#). This study aims to draw a clear picture of the current state of social reporting of Italian universities, highlighting the development and the constraints that hinder its full adoption. Using a questionnaire and interviews, the analysis found that those who are more open to introducing sustainability practices to universities or who belong to dedicated associations do not necessarily have social reporting tools. In fact, these issues have been significant to the interviewed universities that do not report or report discontinuously.

The third paper “University Social Responsibility: Challenging Systemic Racism in the Aftermath of George Floyd’s Murder” by [Meikle and Morris \(2022\)](#) examines the relevant topic of the university’s social responsibility. Using critical discourse analysis (CDA) and data triangulation (letters written by university presidents, university statements, and strategic plans), the authors try to identify recurrent discursive themes in these documents in their responses to the murder of George Floyd. Findings evidence that many university

presidents called for racial equity and justice, equality, and respect for human dignity, invoking the principles of social justice embedded in the university's intellectual roots.

Furthermore, five papers focus on the Sustainable Development Goals (SDGs) embedded in the 2030 UN Agenda.

The first paper is "Determinant Factors of SDG Disclosure in the University Context" by Serena De Iorio, Giovanni Zampone, and Anna Piccolo (De Iorio et al. 2022). The authors examine SDG disclosure from a cross-country perspective in the university context and, using multiple regression, they also study how internal and external factors affect universities' disclosure choices. A positive relationship was found between institutional macro-context, university size, age, diversity, and SDG disclosure. Therefore, governments and policymakers can use this paper to understand the characteristics of SDG disclosure adoption and then develop guidelines to assist universities in communicating more effectively.

The second paper "Gender Reporting Guidelines in Italian Public Universities for Assessing SDG 5 in the International Context" by Lucchese et al. (2022) analyzes the Gender Report of the Italian Public Universities. Through a content analysis, the authors aim to understand whether and how CRUI (Italian's Rector conference)-compliant gender reports can positively assess the university's actions toward SDG 5. The results of this study demonstrate that universities can use the CRUI guidelines to disclose gender policies that may interest stakeholders, and that these can also be synthesized in THE rankings, thus increasing the visibility of universities.

The third paper is "Corporate Social Responsibility through SDGs: Preliminary Results from a Pilot Study in Italian Universities" by Costa et al. (2021). This research focuses on the three-year strategic performance plans (2020–2022) of Italian universities to investigate the effective degree of institutionalization of CSR in universities. The results show that strategic planning for Italian universities' CSR practices and sustainable development challenges are not systematically addressed. CSR is therefore not institutionalized in the Italian university system, despite the literature showing an increase in the use of accountability tools, such as social reports and sustainability reports.

In the fourth paper, "The Contribution of Higher Education Institutions to the SDGs—An Evaluation of Sustainability Reporting Practices" by Caputo et al. (2021), the HEIs' contribution to Agenda 2030 through SDG disclosure is assessed. Specifically, through a content analysis, the authors try to identify the most disclosed SDGs in HEI reports published in the official database released by the GRI. According to the results, environmental and social issues are dominant within the disclosed information. Additionally, the analysis of SDG-related themes revealed an interest on the part of the sampled HEIs in increasing stakeholder participation.

The fifth paper "Toward a Sustainable University: Babes-Bolyai University Goes Green" by Zanellato and Tiron-Tudor (2021). It examines how the Romanian Babes-Bolyai University (BBU) implements sustainability practices and contributes to the UN SDGs. Using a combination of qualitative methodologies, the present study outlines a convinced commitment and a clear pathway for BBU toward a more sustainable future.

Taking into account how social networks have changed university communication and become powerful tools for building relationships with stakeholders, two papers of the Special Issue consider social media's role in university communications.

The first paper "Social Media for Engaging and Educating: From Universities' Sustainability Reporting to Dialogic Communication" by Patrizia Di Tullio, Matteo La Torre, and Michele Antonio Rea (Di Tullio et al. 2021), investigates how universities engage their stakeholders through social media in relation to sustainability initiatives and sustainability reporting. An analysis of some of the best practices in Italian public universities has been conducted. Besides sustainability reporting, these universities use social media (e.g., Facebook, Twitter, and Instagram) to communicate with their stakeholders about sustainability. As a result, universities with long-standing and continuous sustainability reporting experience use social media to enhance their communication, engage stakeholders, and thus

improve sustainability reporting. Furthermore, social media is used in universities to foster a sustainable culture through engagement and education.

The second paper is “Corporate Social Responsibility Engagement through Social Media. Evidence from the University of Salerno” by Benedetta Esposito, Maria Rosaria Sessa, Daniela Sica, and Ornella Malandrino (Esposito et al. 2021). It investigates whether and how social media is used in the university context to enhance CSR disclosure practices and promote public engagement with stakeholders. To this end, all posts published by the University of Salerno’s official Twitter account have been analyzed. Findings show a higher level of engagement for CSR posts and, in particular, for the philanthropic dimension. Results also highlight that, during the COVID-19 pandemic, the University of Salerno empowered CSR disclosure through Twitter.

In short, this Special Issue has contributed to the public administration literature by providing new insights into CSR Teaching and Education, universities’ social responsibility initiatives, university commitment to the SDGs, stakeholder engagement, sustainability reporting, and social media. In each contribution, avenues for research are suggested, and, most importantly, stronger analytical connections between these interconnected research areas are advocated.

Author Contributions: Conceptualization, N.A., G.N., G.S. and P.T.P.; writing—original draft preparation, N.A. and G.N.; writing—review and editing, G.S. and P.T.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Adams, Carol. 2018. Debate: Integrated reporting and accounting for sustainable development across generations by universities. *Public Money & Management* 38: 332–34.
- Campobasso, Francesco, Graziana Galeone, Simona Ranaldo, and Matilda Shini. 2022. CSR Reporting Practices: The Case of University of Bari. *Administrative Sciences* 12: 22. [\[CrossRef\]](#)
- Caputo, Fabio, Lorenzo Ligorio, and Simone Pizzi. 2021. The contribution of higher education institutions to the SDGs—An evaluation of sustainability reporting practices. *Administrative Sciences* 11: 97. [\[CrossRef\]](#)
- Chan, MuiChing Carina, John Watson, and David Woodliff. 2014. Corporate governance quality and CSR disclosures. *Journal of Business Ethics* 125: 59–73. [\[CrossRef\]](#)
- Comoli, Maurizio, Lorenzo Gelmini, Valentina Minutiello, and Patrizia Tettamanzi. 2021. University Social Responsibility: The Case of Italy. *Administrative Sciences* 11: 124. [\[CrossRef\]](#)
- Costa, Antonio, Alessandra Tafuro, Marco Benvenuto, and Carmine Viola. 2021. Corporate social responsibility through SDGs: Preliminary results from a pilot study in Italian universities. *Administrative Sciences* 11: 117. [\[CrossRef\]](#)
- De Iorio, Serena, Giovanni Zampone, and Anna Piccolo. 2022. Determinant factors of SDG disclosure in the university context. *Administrative Sciences* 12: 21. [\[CrossRef\]](#)
- del Mar Alonso-Almeida, Maria, Frederic Marimon, Fernando Casani, and Jesus Rodriguez-Pomeda. 2015. Diffusion of sustainability reporting in universities: Current situation and future perspectives. *Journal of Cleaner Production* 106: 144–54. [\[CrossRef\]](#)
- Di Tullio, Patrizia, Matteo La Torre, and Michele Antonio Rea. 2021. Social media for engaging and educating: From universities’ sustainability reporting to dialogic communication. *Administrative Sciences* 11: 151. [\[CrossRef\]](#)
- Esposito, Benedetta, Maria Rosaria Sessa, Daniela Sica, and Ornella Malandrino. 2021. Corporate Social Responsibility Engagement through Social Media. Evidence from the University of Salerno. *Administrative Sciences* 11: 147. [\[CrossRef\]](#)
- Fonseca, Luis, and Filipe Carvalho. 2019. The reporting of SDGs by quality, environmental, and occupational health and safety-certified organizations. *Sustainability* 11: 5797. [\[CrossRef\]](#)
- Gamage, Pandula, and Nick Sciulli. 2017. Sustainability reporting by Australian universities. *Australian Journal of Public Administration* 76: 187–203. [\[CrossRef\]](#)
- Kaur, Amanpreet, and Sumit K. Lodhia. 2019. Key issues and challenges in stakeholder engagement in sustainability reporting: A study of Australian local councils. *Pacific Accounting Review* 31: 2–18. [\[CrossRef\]](#)

- Lodhia, Sumit, Amanpreet Kaur, and Gerard Stone. 2020. The use of social media as a legitimization tool for sustainability reporting: A study of the top 50 Australian Stock Exchange (ASX) listed companies. *Meditari Accountancy Research* 28: 613–32. [CrossRef]
- Lopatta, Kerstin, and Reemda Jaeschke. 2014. Sustainability reporting at German and Austrian universities. *International Journal of Education Economics and Development* 5: 66–90. [CrossRef]
- Lourenço, Lemos Mariane, Mara Rosalia Ribeiro Silva, and Rafael Santana Galvão Oliveira. 2022. University social responsibility and empathy in organizations during COVID-19 pandemic in Brazil. *Social Responsibility Journal* 18: 806–24. [CrossRef]
- Lucchese, Manuela, Ferdinando Di Carlo, Natalia Aversano, Giuseppe Sannino, and Paolo Tartaglia Polcini. 2022. Gender Reporting Guidelines in Italian Public Universities for Assessing SDG 5 in the International Context. *Administrative Sciences* 12: 45. [CrossRef]
- Marhl, Marko, and Attila Pausits. 2011. Third mission indicators for new ranking methodologies. *Evaluation in Higher Education* 5: 43–64. [CrossRef]
- Meikle, Paulette A., and Lekeitha R. Morris. 2022. University Social Responsibility: Challenging Systemic Racism in the Aftermath of George Floyd's Murder. *Administrative Sciences* 12: 36. [CrossRef]
- Modugno, Guido, Ferdinando Di Carlo, and Manuela Lucchese. 2022. Causes and Effects of Processes' Complexity in Public Institutions: Some Experiences from Italian Universities. *Administrative Sciences* 12: 37. [CrossRef]
- Mori Junior, Renzo, John Fien, and Ralph Horne. 2019. Implementing the UN SDGs in universities: Challenges, opportunities, and lessons learned. *Sustainability: The Journal of Record* 12: 129–33. [CrossRef]
- Nicolò, Giuseppe, Natalia Aversano, Giuseppe Sannino, and Paolo Tartaglia Polcini. 2021. Investigating Web-Based Sustainability Reporting in Italian Public Universities in the Era of COVID-19. *Sustainability* 13: 3468. [CrossRef]
- Rella, Angela, Arcangelo Marrone, Nicola Raimo, and Filippo Vitolla. 2022. The Antecedents of Transparency of Italian Public Entities: An Empirical Analysis in Universities and Public Research Institutes. *Administrative Sciences* 12: 29. [CrossRef]
- Schimperna, Federico, Fabio Nappo, and Federica Collaretti. 2022. Universities and CSR Teaching: New Challenges and Trends. *Administrative Sciences* 12: 55. [CrossRef]
- Sepasi, Sahar, Udo Braendle, and Amir Hossein Rahdari. 2019. Comprehensive sustainability reporting in higher education institutions. *Social Responsibility Journal* 15: 155–70. [CrossRef]
- Trencher, Gregory, Masaru Yarime, Kes B. McCormick, Christopher N. H. Doll, and Steven B. Kraines. 2014. Beyond the third mission: Exploring the emerging university function of co-creation for sustainability. *Science and Public Policy* 41: 151–79. [CrossRef]
- Trireksani, Terri, Yun-Ting Zeng, and Hadrian Geri Djajadikerta. 2021. Extent of sustainability disclosure by Australian public universities: Inclusive analysis of key reporting media. *Australian Journal of Public Administration* 80: 830–48. [CrossRef]
- UN—United Nations. 2012. Higher Education Sustainability Initiative. Available online: <https://sustainabledevelopment.un.org/sdinaction/hesi> (accessed on 15 June 2022).
- UN—United Nations. 2015. *Transforming Our World: The 2030 Agenda for Sustainable Development*. New York: UN—United Nations. Available online: <https://sustainabledevelopment.un.org/post2015/transformingourworld> (accessed on 15 June 2022).
- Venturelli, Andrea, Roberta Fasiello, and Simone Pizzi. 2021. CSR Education in Economia Aziendale Curricula: An Overview. *Administrative Sciences* 11: 137. [CrossRef]
- Yáñez, Susana, Ángel Uruburu, Ana Moreno, and Julio Lumbreras. 2019. The sustainability report as an essential tool for the holistic and strategic vision of higher education institutions. *Journal of Cleaner Production* 207: 57–66. [CrossRef]
- Zanellato, Gianluca, and Adriana Tiron-Tudor. 2021. Toward a Sustainable University: Babes-Bolyai University Goes Green. *Administrative Sciences* 11: 133. [CrossRef]