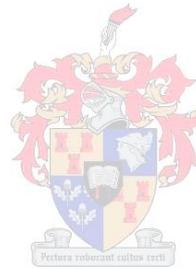


Science communication vs. public relations: The potential effect of university press releases and the changing media landscape on science journalism in South Africa

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Declaration

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Abstract

The news media has always played an important role in informing the public about scientific and technological developments, with some studies showing that the majority of the public get their information about science from the mass media (Ashwell, 2016). In today's rapidly changing news environment, it however often happens that university press releases on important discoveries are published verbatim, raising the question of whether this still constitutes science journalism or rather just a public relations exercise. South African newsrooms are of course not exempt from the sweeping changes that have characterised the media landscape worldwide, which means that journalists now have less time available to produce more content. The current media environment will also likely continue to make the practice of critical science journalism even more difficult in the future and uncritical communication of scientific results might tend to erode trust in science.

In this study, an attempt was made to see how press releases issued by universities are used in the popular media in South Africa. The results show that half of the media articles analysed had a similarity of 50% or higher to original press releases issued by the four South African research universities included in the study.

Qualitative analyses of the media articles and press releases also revealed that, with the exception of one article, none of the published articles contained any indication of research results being critically evaluated before publication. In addition, it was found that the source of the information contained in the articles is often obscured, or it is insinuated that a journalist at the publication produced the article, especially when content received from the institution is published virtually verbatim. This implies a lack of transparency on the side of the media outlet, which could erode the trust relationship between the publication and its audience, and ultimately trust in science itself.

The high degree of similarity between the published articles and the lack of critical evaluation on the side of media outlets, could serve as evidence of a changed role of journalists from critically evaluating information received to one where they merely serve as processors of supplied information. It could also be interpreted as an indication that publishers view the institutions/universities included in the study as authoritative sources of information.

The implication of these results for science communication in South Africa is that communications and public relations practitioners at universities have to realise the extent of their responsibility towards practicing and promoting good science communication in the country, so they can take up the responsibility and help bridge the growing gap between science and the media.

Opsomming

Die nuusmedia het nog altyd 'n belangrike rol gespeel om die publiek in te lig oor wetenskaplike- en tegnologiese ontwikkelings. Sommige studies dui daarop dat die meerderheid van die publiek hul inligting oor wetenskap van die massamedia ontvang (Ashwell, 2016). In vandag se vinnig veranderende nuus omgewing gebeur dit egter dikwels dat universiteitspersvystellings oor belangrike ontdekkings woord-vir-woord geherpubliseer word. Dit laat 'n mens wonder of hierdie artikels dan steeds gesien kan word as wetenskap joernalistiek en of dit eerder net 'n openbare betrekkinge oefening is. Suid-Afrikaanse nuuskamers het natuurlik nie die veranderinge wat die media-landskap wêreldwyd beïnvloed vrygespring nie, wat beteken dat joernaliste nou minder tyd beskikbaar het om meer inhoud te lewer. Die huidige media-omgewing sal in die toekoms waarskynlik voortgaan om kritiese wetenskapjoernalistiek steeds moeiliker te maak en die onkritiese kommunikasie van wetenskaplike resultate kan die publiek se vertroue in wetenskap benadeel.

In hierdie studie is daar gepoog om te bepaal hoe persverklarings wat deur universiteite uitgereik word in die breër media omgewing in Suid-Afrika gebruik word. Die resultate wys dat die helfte van die media-artikels wat ontleed is, 'n ooreenkoms van 50% of hoër gehad het teenoor die oorspronklike persvystellings wat uitgereik is deur die vier Suid-Afrikaanse navorsingsuniversiteite wat in die studie ingesluit is.

Kwalitatiewe ontledings van die mediaberigte en persvystellings het ook aan die lig gebring dat, behalwe vir een artikel, geen van die gepubliseerde artikels enige aanduiding bevat dat navorsingsresultate krities geëvalueer word voor publikasie nie. Daarbenewens is gevind dat die bron van die inligting vervat in die artikels dikwels nie duidelik gemaak word nie, of dit word aangevoer dat 'n joernalis by die publikasie die artikel geskryf het. Dit is veral problematies wanneer die inhoud wat van die instelling ontvang word feitlik woordeliks geherpubliseer word. Dit impliseer 'n gebrek aan deursigtigheid aan die kant van die media-onderneming, wat die vertrouensverhouding tussen die publikasie en sy gehoor kan skade doen, en uiteindelik tot 'n afbreek van vertroue in die wetenskap self kan lei.

Die hoë mate van ooreenstemming tussen die gepubliseerde artikels en die gebrek aan kritiese evaluering aan die kant van die media-afsetpunte kan dien as bewys van 'n veranderde rol van joernaliste van waar dit voorheen was om inligting wat ontvang word krities te evalueer, na waar hulle net as verwerkers van inligting dien. Dit kan ook geïnterpreteer word as 'n aanduiding dat uitgewers die instansies of universiteite wat in die studie ingesluit is as gesaghebbende inligtingsbronne beskou.

Die implikasie van hierdie resultate vir wetenskapkommunikasie in Suid-Afrika is dat kommunikasie- en openbareverhoudingspraktisyns by universiteite die mate van hul verantwoordelikheid om goeie wetenskapkommunikasie in die land te beoefen en te bevorder moet besef, sodat hulle die verantwoordelikheid kan opneem en kan help om die groeiende gaping tussen wetenskap en die media te oorbrug.

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Table of Contents

Declaration.....	2
Abstract.....	3
Opsomming.....	4
Acknowledgements.....	6
List of tables	8
1. Introduction.....	9
2. Literature review	10
2.1 The changing media landscape	10
2.2 The principles and ideals of journalism	12
2.3 Science communication and science journalism	13
2.4 A short overview of university public relations	16
2.5 Press releases as science communication	18
2.6 Churnalism - The copy-and-paste phenomenon	20
2.7 Hype in science reporting	22
3. Methodology	26
3.1 Collection and filtering of media articles	26
3.2 Sourcing of related press releases	27
3.3 Comparative analysis of media articles and related press releases	28
4. Analysis	30
4.1 Stellenbosch University.....	30
4.1.1 Selected articles	31
4.1.2 Similarity according to <i>Copyleaks</i> software	31
4.1.3 Qualitative analysis	32
4.2 University of Cape Town	34
4.2.1 Selected articles	34
4.2.2 Similarity according to <i>Copyleaks</i> software	35
4.2.3 Qualitative analysis	36
4.3 University of the Witwatersrand	37
4.3.1 Selected articles	38
4.3.2 Similarity according to <i>Copyleaks</i> software	39
4.3.3 Qualitative analysis	40
4.4 University of Pretoria	42
4.4.1 Selected articles	43
4.4.2 Similarity according to <i>Copyleaks</i> software	43
4.4.3 Qualitative analysis	44
5. Results.....	47
6. Conclusion and recommendations for further research.....	50
6.1 Recommendations for further research	51
7. References	53

List of tables

<i>Table 1: List of selected articles</i>	31
<i>Table 2: Similarity between published articles and the originating press release from Stellenbosch University</i>	32
<i>Table 3: Qualitative analysis of published articles from Stellenbosch University press releases</i>	32
<i>Table 4: List of selected articles</i>	34
<i>Table 5: Similarity between published articles and the originating press release from the University of Cape Town</i>	35
<i>Table 6: Qualitative analysis of published articles from University of Cape Town press releases</i>	36
<i>Table 7: List of selected articles</i>	38
<i>Table 8: Similarity between published articles and the originating press release from the University of the Witwatersrand</i>	39
<i>Table 9: Qualitative analysis of published articles from University of the Witwatersrand press releases</i>	40
<i>Table 10: List of selected articles</i>	43
<i>Table 11: Similarity between published articles and the originating press release from the University of Pretoria</i>	43
<i>Table 12: Qualitative analysis of published articles from University of Pretoria press releases</i>	44

1. Introduction

For many years, science was in the favourable position of predominantly being portrayed in a positive light by the media. Towards the mid-1970s however, media coverage became more critical of the work being done at publicly funded research institutions, thus making it imperative for researchers and scientists to justify their work and campaign for public support (Göpfert, 2007). In addition, growing competition for limited funding, staff, students and research partners, has contributed to a renewed focus on science communication activities within research institutions (Carver, 2014). This has in turn led to the expansion of communication competencies and professionalism in the communications departments of these institutions, with many employing personnel from the media dedicated to the function of generating science-related press releases to promote and communicate the institution's work to a wider audience (Autzen, 2014).

The news media has always played an important role in informing the public about scientific and technological developments and, according to the UK Science and the Media Expert Group, "the vast majority of the public get their information about science from the mass media" (Ashwell, 2016). In today's rapidly changing news environment, it however often happens that university press releases on important discoveries are published verbatim, raising the question of whether this still constitutes science journalism or rather just a public relations exercise, of which the main purpose is typically to make the institution from which it originates look good (Carver, 2014).

The implication of the above is that criticism, one of the main functions of journalism, takes a back seat to public relations, thus resulting in a biased coverage that only supports the interests of the institution that generated the press release. The danger of this is that this type of coverage could lead to a distorted view of science, and could deprive the public of a platform to discuss reservations that they might have towards specific scientific issues (Göpfert, 2007).

Although a number of studies have looked at the incidence of "churnalism" – the practice of recycling press releases and press agency copy as news – in other countries, to my knowledge, no other study has looked at this phenomenon in the context of how press releases issued by South African university press offices are used in the South African media. This study will examine the extent to which research related press releases issued by the press offices of research-intensive universities in South Africa are taken up verbatim in the popular media and what this could mean for science journalism and public relations at universities in the country against the backdrop of a rapidly changing media landscape.

2. Literature review

2.1 The changing media landscape

The last few decades have seen the media landscape undergo unprecedented change. Never before has so much information been so easily accessible to so many people. The advent of the internet and social media have initiated an almost dizzying news cycle that requires a seemingly impossible amount of content to be constantly fed into the hungry media machine. Especially the more traditional media outlets – and newspapers in particular – have suffered near “catastrophic economic damage at the hands of the information revolution” (Fuller, 2010:3). The so-called “democratisation” of the media is further contributing to the changing status quo, as social media and other digital technologies has made the means of creation, distribution and consumption of news and other types of communication exponentially easier. In the process, this has devastated the business models and traditional income streams that especially newspapers and magazines have relied on for so long (Fuller, 2010; Macnamara, 2016).

In an effort to recover costs, publications that were traditionally print-based are increasingly shifting their distribution to online platforms, despite the fact that revenue from switching to digital has consistently failed to compensate for the shortfall in newspaper advertising income (McKinnon et al. 2017). In addition, many newspapers across the world have also been reducing their permanent staff complement considerably, especially over the last few years (Mitchell & Holcomb, 2016). This has led to a situation where the remaining journalists are experiencing increased pressure to file a greater number of stories in a shorter space of time, which has in turn created an environment in which the generation of news is as much about managing the multitude of fast-moving flows of information already in circulation, as it is about locating and sharing “new” news. According to some authors, it seems that the main role of journalists is increasingly viewed as being to analyse and contextualize events, while the direct reporting of so-called facts is being “outsourced” to public relations practitioners and wire services (Currah, 2009; Van Hout & Van Leuven, 2016).

The emergence and immense growth in social media usage, which directly relates to the democratisation of the media mentioned above, have also had a significant impact on newsrooms. Due to the reach and immediacy of social media platforms, journalists are able to “publish” their articles at the same time, or even before the news is broadcast on a news channel and published on an official news site, which means that events can be covered worldwide as and when they happen – like we saw with the coverage of events like the Arab Spring. This change has influenced agenda-setting and editorial practices at media organisations, including those related to contextualization, and openness, and has also raised questions around the impartiality and accuracy of reporting on

events as they happen using information from eyewitness accounts and citizen contributions (Bélair-Gagnon, 2013).

In addition to the changes it has brought about within media organisations, social media platforms have extended the public sphere, offering opportunities for more people to participate in the production, distribution and exchange of information, as well as providing a vehicle for users to deliver commentary on various issues. This allows social media users to effectively become participants in the news-making process with some studies showing that newspapers are “constantly sourcing” ideas from social networks (Rooney, 2013). Another author also refers to this practice, explaining that the use of social media platforms has been progressively blurring the boundaries between the websites and blogs of news organizations and the platforms favoured by citizen journalists (Hujanen, 2018). This further affirms the new role of today’s journalists mentioned by Currah (2009), Van Hout & Van Leuven (2016) and others, as being mostly engaged in the analysis and contextualization of information received from various sources. The growth of especially the social media platform Twitter as a source for breaking news, and the speed at which information can spread on the network, are also influencing journalists’ ability to verify the correctness of information before disseminating it via their own channels. This often leaves journalists with a choice between “being fast or being right”, which is a difficult one, taking into account that other users can disseminate the news as easily and as quickly as the journalists themselves (Hermida, 2013).

The fact remains that the business of news is changing, and from the above it is clear that this is creating economic and managerial challenges that are affecting both news organisations and how journalism is practised. This however does not mean that the news media doesn’t still have an important role to fulfil as a reliable source of information that aims to inform the public about issues that affect them. In an article that appeared in *The Guardian* newspaper in 2009, a journalist discussed the thoughts of Richard Sambrook, then director of the BBC Global News Division, on the subject:

“...news organisations don't own the news anymore. There is a transformation for the journalist from being the gatekeeper of information to sharing it in a public space. [...] In the new media age, transparency is what delivers trust. News today still has to be accurate and fair, but it is as important for the readers, listeners and viewers to see how the news is produced, where the information comes from, and how it works. The emergence of news is as important, as the delivering of the news itself” (Bunz, 2009).

2.2 The principles and ideals of journalism

As already mentioned, informing the wider public about events and developments that happen in the world around them and have an effect on them, has traditionally been considered one of the most important aims of journalism. The “news” shapes public opinion, which is then in turn supposed to influence public decision-making.

In his book “What is happening to news”, Jack Fuller explains that “the standard model of professional journalism includes the disciplines of accuracy, disinterestedness in reporting, independence from the people and organisations reported upon or affected by the report (a mode of presentation sometimes called objective or neutral) and the clear labelling of what is fact and what is opinion” (Fuller, 2010:12). In practice, and as is clear from the state of the current media environment discussed in the previous section, these values that Fuller ascribes to the profession is not always as clear-cut as it may seem. Although many journalists may want to subscribe to these values, the nature of the news organisations that they work for can sometimes make it extremely difficult to uphold the values that they aspire to.

In “The elements of journalism”, a book by Bill Kovach and Tom Rosenstiel, the authors postulate that “in the end journalism is an act of character” (Kovach & Rosenstiel, 2001). The authors elucidate this statement by explaining that, since the profession lacks any real laws, regulations, licensing or “self-policing”, taken together with the fact that journalism can by nature be exploitative, there is a heavy burden on the shoulders of individual journalists and the organisations that employ them, to ensure that ethical behaviour and sound judgement is exercised. In addition, the public service dimension of journalism, which is the aspect of the work that is often used to justify its sometimes intrusive nature, often conflicts with the business side that bankrolls it. In this regard, the authors explain that, by necessity, newsrooms are not run as democracies, but rather, as “unruly dictatorships”, where someone at the top has to make the final decision about, for example, whether to go with a story or not, or to leave a potentially damaging quote in an article or take it out. Without this, they say, large media outlets would simply not be able to make the deadlines that they are bound to (Kovach & Rosenstiel, 2001). All of this of course makes it extremely difficult for a journalist to uphold the ideals of journalism to which they subscribe.

Several articles have made reference to and examined the changes in the roles of journalists brought about by the changing media environment (Göpfert, 2007; Lewis et al., 2008; Johnston & Forde, 2017; Saridou et al., 2017), and it has also already been alluded to in the preceding section of this thesis. A relatively recent study of Belgian journalists revealed that 80% of them now spend the majority of their time working in the newsroom rather than in the field, with journalists being

engaged in fieldwork in fact emerging as the exception rather than the norm (Van Hout & Van Leuven, 2016). Such a suggestion would have been almost unthinkable in the newsrooms of the seventies, where journalists doggedly stuck to their noble ideals of personally chasing down the facts of a story no matter the cost, and being the vanguard against corruption and falsehoods by exposing wrongdoing, providing unbiased information, and mobilizing the public (Kummerfeldt, 1975; Göpfert, 2007; Van Hout & Van Leuven, 2016).

This means that as a profession, journalists face a situation where their ideological commitment to controlling the message that they want to communicate may be giving way to a hybrid ideology where they are required to be adaptable and open, while seeing the audience as their peers, and appreciating contributions by non-journalists/members of the public. This implies a new journalistic norm that values transparency and participation, which requires listening to and reflecting a variety of voices, while stimulating discussion and engagement with the public and within communities (Hujanen, 2018).

The changes to the profession seems to have already taken hold in the new status quo of journalism and some journalism programmes have started to move from teaching journalism based on an industrial model of news production toward a journalism education model that is oriented toward collaboration between communities and citizens (Mensing, 2010; Hujanen, 2018). Hujanen (2018) also looked at how journalism students from Finland, Namibia, Tanzania, and Zambia were (re)defining the ideals of journalism in the era of digital and social media. The results revealed that the profession and its ideals were being (re)negotiated in a way that corresponds to some of the ideals of good journalism, including searching for the truth. In addition, it emerged from the participants' responses that new dimensions were being included in what is understood with regard to professional journalistic ideals particularly in terms of the challenges and opportunities offered by social media and citizen journalism. The researcher further state that discourse around participation, citizen journalism, data verification, and transparency were central to all the comments of all the participants of the study (Hujanen, 2018).

2.3 Science communication and science journalism

When defined in the broadest terms, science communication can include any type of communication activity that conveys information about research findings or concepts to a general audience (Shipman, 2014). Similarly, in this study, the term "science communication" includes all activities by science writers, science journalists, press officers and other individuals who produce content related to scientific findings that is aimed at a non-specialist audience (Jarreau, 2014).

Science communication has been a field of practice since the 19th century, when the work of scientists became so complex and specialized that a need arose to “translate” what they were doing to make it understandable for a non-specialist audience. The last two or three decades, has however seen the field turned into a thriving industry “in which many different stakeholders battle for attention and the power of definition, because there is money in the game, there are jobs to be captured, and there are professional identities at stake” (Weingart & Guenther, 2016:2).

Science journalists are specialist reporters who often have training in specific disciplines they write about, with some having completed a science degree before entering the profession, or simply having a talent for writing about scientific topics. In a book review of Martin Angler’s *Science journalism by a journalist for journalists*, Andy Ridgway quotes the author’s explanation of what the core purpose of science journalism entails: “If done properly, science journalism questions the methods scientists employ as well as their results and how the media and the public interpret them; it also investigates and unfolds possible conflicts of interest researchers may have” (Ridgway, 2018:2). In one study where science journalists from the UK were interviewed, it emerged that they saw the aspects of what is considered “good science journalism” as “newsworthiness, accuracy, acknowledgements of limitations and critical scrutiny” (McKinnon et al., 2017:573). These are clearly very closely related to the norms of journalism in general, which was previously discussed.

In an article that appeared in *The Guardian* newspaper in 2013, however, Jalees Rehman argues that too much of contemporary science writing falls under the heading of “infotainment”, a term which he defines as “science writing that informs a non-specialist target audience about new scientific discoveries in an entertaining fashion”. He points out that this type of reporting rarely challenges the validity of the research study the journalist is writing about. He goes on to explain that it seems to equate the peer-review process that research goes through before publication in a scientific journal with a “fact checker” role, thus viewing the research uncritically and in the process allowing infotainment science journalism to promote the perspectives of the researchers or institutions who conducted the studies (Rehman, 2013). This of course goes against the grain of the norms that science journalists say they ascribe to. With that said, it appears that similarly to journalistic values, the values of science journalism are changing. This is reflected in an interesting finding from interviews with UK science journalists who indicated that to them, there was “a delicate balance to strike between simplification and accuracy that required a consideration of the specific audience so as not to oversimplify or misrepresent” (McKinnon et al., 2017:573). This could be another indication that accuracy in reporting is starting to become less important to the producers of news.

The new state of affairs in the media environment has probably had the biggest negative impact on journalists who cover specialist beats like science. These positions are often the first ones to be cut by media organisations when finances are under pressure, especially when the space for the type of articles generated by specialist journalists can be filled with material received via press releases from research institutions or universities, at virtually no cost (Nature Editorial, 2009).

This has led to many specialist news desks being shut down altogether, and the journalists that used to be employed by media companies, in many instances, moving to the communications offices of universities and other research institutions (Rowe & Brass, 2011; Autzen, 2014). The ones that do remain in the mass media (often at larger companies), in many respects have to deal with the same changes in their basic role as those that the journalism profession in general has to deal with, in that they basically become processors of supplied information, leaving little time for fact checking, ensuring accuracy and editorial input (Murcott & Williams, 2013).

The sources of science or research related articles can be divided into two categories, namely stories uncovered by the journalists themselves, and stories received from another source (usually in the form of a press release), with the second category significantly outnumbering the first (Murcott & Williams, 2013). The science journalist is then usually expected to identify the most interesting and relevant stories from the “mountain of press releases” sent to them on a daily basis and present the “facts” to the publication’s editor, and ultimately to its audience in a manner that provides background, context and, insight in the shortest possible of time (Murcott & Williams, 2013). This is obviously a challenging task. Given the time constraints and massive amount of scientific information produced each year, along with the growth in science news press release services such as EurekAlert! and AlphaGalileo, it is clear that science journalists need some kind of “filter” to help them sort through the vast amount of content they receive every day. Consequently, many science journalists often rely on a small number of trustworthy sources for selecting the stories they write about (McKinnon et al., 2017). The authors explain that this feeds into what has been dubbed the ‘trust portfolio’, which can be described as “the management of relationships between an organisation and its stakeholders, including the media and the public – especially a government-funded research institution” (McKinnon et al., 2017:574). McKinnon et al. (2017:575) also specifically refers to science communication, as it is practiced by scientists, science communicators or public relations professionals, as ‘helpful in establishing and maintaining trust’.

This has however led to a shift in the balance of power between reporters and the trustworthy sources who supply them with information.

Murcott & Williams (2013:156) explain the pitfalls that this situation could entail as follows:

“It seems that in some important respects much of the job of translating or conveying this news from the scientific community is being outsourced to a growing science PR and science communication sector, while journalists are more and more forced into the role of stenographers to strong science news sources. This has potentially serious consequences for the ability of science news to play the second role mentioned above: that of holding science to account. When changes in routine journalistic practice facilitate such a shift in power from journalists to their news sources, it is far less likely that reporters will be able to play a critical, democratic, watchdog role when and where that is needed”.

2.4 A short overview of university public relations

The Merriam-Webster online dictionary defines public relations or “PR” as “the business of inducing the public to have understanding for and goodwill toward a person, firm, or institution”, or alternatively, “the activity or job of providing information about a particular person or organization to the public so that people will regard that person or organisation in a favorable way” (Merriam-Webster Online Dictionary, 2018).

As already discussed, the public relations sector plays a pivotal role in the gathering and distribution of news in today’s media environment, despite the fact that especially journalists sometimes regard it as “a necessary evil” that is eating away at the heart of journalism (Sterne, 2010:17). Macnamara (2016:119) points to several studies that have made reference to the strained relationship between journalism and public relations – with one study referring to it as a “love-hate-relationship”– and which have shown that journalists generally hold “highly negative” perceptions of public relations and feel that public relations practitioners contribute to churnalism and the corruption of both the media and the public sphere. Sissons (2016:177) describes the tense and complex relationship between the two professions as follows: “Both journalists and public relations practitioners downplay their involvement with the other. Yet, as early as the start of the twentieth century, journalists were accepting material provided by public relations practitioners while at the same time resenting it. The relationship’s tension lies in a rarely acknowledged interdependence predicated on both practices being unwilling to admit that they are now so intertwined that neither could function in its current form without the other”.

According to an article published in the *Journal of Advertising* in 1975, what may have been the first university press bureau in the United States was set up at the University of Wisconsin, Madison in 1904. Other sources suggest that the origins of public relations in higher education can be traced back to the year 1900, when Harvard University and the Massachusetts Institute of Technology appointed a Boston based publicity bureau to help them communicate with the public

(Kummerfeldt, 1975). Since then, many, if not most universities have enlarged their communications departments substantially to enhance their capacity and professionalism in this regard (Weingart & Guenther, 2016), often staffing them with ex-journalists and public relations professionals (Rowe & Brass, 2011).

As part of their role as public institutions funded by taxpayers, universities are obliged to disseminate the research produced by its academics, engage with communities, and inform and contribute to the formulation of public policy and debate (Rowe & Brass, 2011). In today's increasingly competitive environment where universities have to compete for limited public funding, research grants, partnerships, students and staff, however, research institutions and universities are becoming ever more focussed on marketing the university, building its reputation, and maintaining the value of its brand (Wernick, 2006). The so-called "crisis of legitimacy in science", which entails the increased pressure that is placed on universities and research institutions to validate themselves, is also contributing to a need for institutions to communicate new research results and scientific expertise in an effort to bring visibility and public attention to their scholarly competitiveness and responsiveness to the public (Marcinkowski et al., 2014).

This shift in the motivation for institutional communication inevitably conflates communicating scientific information to the relevant stakeholders, an activity that is in line with the original mandate of public research institutions, with institutional promotion, as it is mainly aimed at building the institution's reputation (Weingart & Guenther, 2016). The danger of such a strategy is that news cycles could start to dictate the topics deemed appropriate for press releases on institutional research, purely based on their potential for drawing media attention. The fact that most research institutions primarily target specific audiences that could ultimately benefit them, such as politicians and policy makers or the scientific community – typically using the media as a vehicle for reaching the desired audience (Claessens, 2014) – also means that the selective highlighting of research results by press offices, could lead to the politicalisation of science, allowing the results of specific studies to be used to support a particular political stance on a topic (Bennato, 2017). This could even have a ripple effect into the enterprise of science itself, leading to researchers or research departments at institutions formulating hypotheses or research agendas according to the same attention seeking criteria (Marcinkowski & Kohring, 2014).

It has also been known to happen that preliminary research "findings" are communicated before having passed the peer review process, with the results often being presented in a way that highlights positive aspects while downplaying critical consequences, thus exaggerating the real societal impact of the work, and by implication that of the institution (Marcinkowski & Kohring,

2014). There is of course also such a thing as simply “bad public relations”, which can mean that information is disseminated that is misleading or that misrepresents (or hypes up) the actual results of a study. Shipman (2014) believes that press officers rarely set out to intentionally misrepresent a researcher’s work or results, suggesting that, in most cases, this happens unintentionally, where a press release is for example, written by an inexperienced press officer who might not have fully understood what they were writing about. In most universities and research institutions the communications department usually works closely with the researchers involved while producing press releases or other forms of communication, to further reduce the likelihood of results being misinterpreted or wrongly communicated (Sumner et al., 2014; Sumner et al., 2016). The fact that university communication strategies are shaped to enhance the institution’s reputation does therefore not mean that it should be discounted as a valid form of science communication (Bennato, 2017).

Shipman (2014:1) argues that “public communication from research institutions is often both science communication and public relations” and that although there are definite differences between the two disciplines, public relations can sometimes also fulfil a science communication function. However, Autzen states: “... genuine science communication is part of the essence of relations with the public and not automatically a problematic enterprise as it sometimes seems to be presumed with PR” (Autzen, 2014:5).

An important aspect of the role of university communications/public relations departments is to manage academic engagement outside the university, and especially with the media. This aspect is critical in substantiating marketing messages about, for example, the institution’s academic prowess or excellence (Rowe & Brass, 2011). Activities in this regard also extend to highlighting community engagement activities by the institution or its staff and “telling a story” that puts the institution in a positive light. According to Rowe and Brass, this is but another way of demonstrating the high social value of universities (Rowe & Brass, 2011).

2.5 Press releases as science communication

A press release can be defined as “an official statement that gives information to newspapers, magazines, television news programs, and radio stations” (Merriam-Webster Online Dictionary, 2018).

Press releases seem to be the most popular and most important tool for public relations work by universities (Autzen, 2014; Carver, 2014; Shipman, 2014). Although this method of communication has been declared dated, irrelevant or even obsolete in some fields (such as in the marketing of new

products or services), it seems to be thriving as a communication tool in the tertiary education and research environment (Autzen, 2014). According to Carver (2014:1), it is the “most commonly used tool in institutional science communication” and therefore constitutes the “tool” through which public relations and science communication become inextricably linked in the modern science communication landscape.

As a method of science communication, the press release has many critics. Some argue that science journalism should only be practiced by practitioners that are independent from research institutions. In essence, their argument is that this is the only real way for the public to get the truth about science (Autzen, 2014). Autzen however disagrees with this point of view, as she argues that “as long as it is about understanding, explaining and informing about research results, there is no special need for independent critical voices writing up the story”. She goes on to explain that as most press releases put out by research institutions are based on the results of a single study, and are written by professionally trained science writers and former science journalists employed by these institutions, rather than insisting that all stories about science, especially when it is based on the results of a single paper, independent critical science journalists should start focussing on the bigger issues in science, such as how institutions frame science in a much broader sense instead of on how they write individual stories or press releases (Autzen, 2014).

Shipman (2014) similarly argues in favour of press releases by research institutions, saying that they play an important role in science communication by drawing attention to findings published in less well-known journals. He explains that a press release could serve to draw attention to these studies, which would otherwise never have come to the attention of journalists who don't typically have access to the journals to source stories from there.

The reality of today's mass media environment creates an opportunity for increasingly more professional university communications departments to provide their own newsworthy items to media outlets in the form of a press release, rather than having to wait for the media to approach them for coverage (Rowe & Brass, 2011). These “articles”, which are typically written in a journalistic style, are an attractive option for news editors faced with the responsibility of publishing more and more content with fewer and fewer resources, especially if they come from trustworthy scientific institutions (Autzen, 2014).

This argument is supported by research, that shows that public relations activities that rely on a “push” strategy (in other words, the communication is “pushed” from the side of the institution to the media), and specifically press releases put out by communications offices, do influence which

studies journalists want to write about and editors want to include in their publications (De Semir et al., 1998; Shipman, 2014). As Carver (2014) explains, a well written press release from a research institution, can put often complicated study results into context in understandable language, while also showing the relevance of the findings to interested readers. Shipman also believes that as long as research findings are not hyped up or exaggerated, they could be a valuable asset to increasing an institution's chances of getting funding, inspire the next generation of researchers, and bringing public attention to genuinely important work being done by its scientists (Shipman, 2014).

Marcinkowski and Kohring (2014) has also shown that public relations offices at universities have a significant effect on scientists' public communication efforts. They however caution that institutionalised push communication, with its emphasis on gaining public attention via self-promotion and image building, promotes non-scientific motives that may threaten the autonomy of science (Marcinkowski, et al., 2014).

Regardless of whether one is for or against the issuing of press releases by research institutions, the reality is that public relations is gaining influence while independent journalistic coverage is decreasing, and this phenomenon is affecting how news is being produced in newsrooms across the globe (Göpfert, 2007). Higher workloads and increased time pressure, which has become the new normal in most newsrooms, has given rise to a situation where many media outlets are increasingly publishing press releases virtually unchanged or quoting from them without attribution (Van Hout & Van Leuven, 2016).

2.6 Churnalism - The copy-and-paste phenomenon

The Collins English dictionary defines "churnalism" as a derogatory term to describe, "a type of journalism that relies on reusing existing material such as press releases and wire service reports instead of original research, especially as a result of an increased demand for news content" (Collins English Dictionary, 2018).

Although it has existed for quite some time, the term "churnalism" was first popularised by Nick Davies in his book "Flat Earth News", in which he criticized the current state of journalism and the media in general. In his book, he discusses the results of a study conducted in the United Kingdom (UK), which found that around 70% of articles published in print publications in the UK, relied to varying degrees on information supplied in the form of press releases. The findings were attributed to four interrelated aspects of the current state of the news publishing environment in the UK, namely, that journalists had become processors of information rather than generators; the

increased workload placed on the markedly decreased number of journalists; the fact that journalists had become less critical of pre-packaged copy received from public relations practitioners; and the decrease of editorial independence in many, if not most newsrooms in the country (Davies, 2009).

In their investigation of the churnalism phenomenon, Tom van Hout and Sarah van Leuven postulate that churnalism is perhaps just an aspect, or maybe a manifestation of, a changing media environment. They go on to explain that the phenomenon is largely due to the metamorphosis of the journalism profession itself.

This situation makes it easy to see how the practice of journalism increasingly rely on using content from press releases and other material from news wires without critically engaging with the content or bothering to do any fact checking, could have taken hold in an effort to comply with the new standards of cheap (often free), quick and safe news content (Davies, 2009; Saridou et al., 2017).

These changes particularly affect science journalism, as many outlets are drastically scaling down or even completely closing specialized news desks. Ashwell (2016:380) refers to a 2009 survey among UK science journalists that showed that the country's national science beat is either virtually stagnant or in decline. These results were echoed by similar studies conducted in the United States, Latin America and Europe, where it emerged that economic constraints are seriously affecting newspapers, causing them to consider closing their science reporting desks altogether (Ashwell, 2016).

Against this background, Göpfert (2007) suggests that press releases are used as an "information subsidy" for journalists allowing them to deal with the increased pressures of the "new" newsroom. In his study, Ashwell asked journalists about their opinions on the use of press releases received from research organisations. The consensus seems to be that science journalists from large newspapers use press releases as a starting point for their own stories, which they then flesh out by doing their own research on the subject, while smaller publications and trade magazines were more inclined to use them with little or no alteration. While almost all of the journalists interviewed considered it "lazy journalism" to use a press release verbatim, most of them did admit to using at least part of it in their own reporting provided that they knew that the source was credible (Ashwell, 2016).

But, is this reliance on public relations necessarily a bad thing? Lewis et al. (2008) suggests that it doesn't have to be. They say that changing newsgathering routines actually stand to gain from the

markedly increased amount of press releases that are available nowadays, “since public relations professionals may generate highly newsworthy stories and may, in this way, increase the plurality of sources of news from which journalists and editors can select for publication” (Lewis et al., 2008). One concern that comes to the fore in the use of supplied content however, is the fact that this practice allows corporate and governmental voices to dominate, while public opinion is worryingly pushed to the background.

This seems to also be true for science-related press releases from research institutions and universities, as research shows that the universities that top the university ranking lists, are also the ones that issue the most press releases and are able to attract the most attention from the media (Carver, 2014). The fact is that press releases are obviously working for research institutions and the amount of press releases that editors and journalists are able to choose from, will likely continue to grow. This however, creates a host of problems of its own, as PR professionals try to make their press releases stand out so that they are more likely to draw attention from the media.

2.7 Hype in science reporting

The media and science have clearly become inextricably linked, be it through good, critical science communication or republished press releases that originate from university press offices. As already stated above, the media play an important role in informing the public about developments in the scientific and technological realm as most people admit to getting most of their information about science from the mass media (Ashwell, 2016). In a 2010 report by the Science and the Media Expert Group, Fiona Fox writes: “Rightly or wrongly, some of the most important science debates of our times have been conducted on the front pages and in the headlines of the mainstream news. No-one could surely argue that the decisions we have made as individuals and as a society on issues like GM crops, human-animal hybrid embryos and climate change have not been hugely influenced by mass media” (UK Science and the Media Expert Group, 2010:3).

Discourse, information sharing and debate can however only happen if the public pays attention to what is being communicated, which means that the producers of ‘news’ have to break through the clamour to reach their intended audience (Kovach & Rosenstiel, 2001). In the media landscape of 30 years ago, this initially did not pose that much of a problem, as consumers had a relatively limited amount of media sources to choose from.

With the explosion of choice that social media, independent media outlets, satellite television and the internet brought about however, it has become increasingly difficult to grab and hold the public’s attention (Fuller, 2010). This has resulted in even traditionally more reserved media outlets

resorting to using more emotionally laden headlines and exaggerated content in their efforts to get attention and 'sell' their stories to the public. This overly emotionally charged content and/or overstated claims constitute hype or sensationalism. In sensationalist articles, key emotional elements such as celebrity, sexual scandal and danger signals (in the broadest sense) are amplified, distorting the underlying understanding of what is being communicated (Currah, 2009; Sachs, 2012).

Public relations professionals at universities and other research institutions, also compete for the attention of journalists to get their news featured, and this has often led to them being accused of engaging in hyping-up or sensationalising the results of scientific studies to make them more attractive to media outlets (Weingart, 2017). It is however not only PR professionals who are guilty of engaging in this behaviour. Rinaldi (2012), Sumner et al. (2014 & 2016) and Weingart (2017) all point out that scientists themselves also engage in hyping the results of their own work, as getting one's research onto the front pages of national media outlets can offer great rewards in terms of political or financial support. Views by Rinaldi (2012) are in line with sentiments expressed by Fuller (2010) and Currah (2009) stating that the blame for creating hype around research results also lies with editors and journalists, who are often far too eager to publish stories that will sell more copies of their publication, even if this is done at the cost of accuracy.

The Oxford English Dictionary defines hype as "extravagant or intensive publicity or promotion" or "a deception carried out for the sake of publicity" (Oxford English Dictionary, 2018). The phenomenon of exaggeration or "hyping" of research results is however not a new one. According to Rinaldi (2012:303), this type of behaviour in science "has existed since the dawn of research itself". The author explains that in the time when scientists relied on the patronage of wealthy benefactors who themselves knew very little about scientific endeavour, claims like the ability to turn lead into gold, or that they were on the verge of discovering the secret to eternal life, must have been at the order of the day.

Interestingly, in their 2014 study, Sumner et al. point out that most studies looking at whether hype or exaggeration were present in press releases and consequently in the media, did not make a comparison between the content of the press release and statements made in the abstracts or discussions of the associated peer reviewed journal articles. The authors explain that the exaggeration contained in the press release might therefore have originated in the journal articles themselves. In this regard, the authors make specific reference to "a study on "spin" in the reporting of randomised controlled trials (70 press releases and associated journal abstracts, 41 news stories), where, in only four cases the news contained spin where the associated journal abstract did not"

(Sumner et al., 2014:2). In a 2016 article on the same subject, Sumner et al. found that more than 30% of health-related press releases contained “stronger advice, causal statements or human claims than any found in the peer-reviewed journal article they were based on” (Sumner et al., 2016). In addition, the researchers found that the existence of these forms of exaggeration or hype in press releases also strongly predicted their presence within the resulting news items based on them. Counterintuitively, however, the researchers discovered that hyped-up press releases were not more likely to be featured as news items by media outlets, meaning that the premise upon which the exaggeration of results by both scientists and public relations practitioners are based, appears to be false (Sumner et al., 2016).

Despite this, the hyping of scientific results in reporting is still fairly common, especially in the realm of social media, and there is concern that it can be damaging to the enterprise of science itself (Rinaldi, 2012; Schmitt, 2018). Master and Resnik (2013) refer to a number of studies that have confirmed the concern that the hyping of scientific results can raise the expectations of the public, and when the results then fail to meet these expectations, the result is a loss of public trust (see also Rinaldi, 2012; Weingart, 2017).

One example of the effect of the common practice of how hype affects the way the public perceives science related information published in the media, is the worldwide public health emergency created by the H1N1 influenza pandemic in 2009. Governments all over the world attempted to address the issue by employing print, broadcast and digital media in their respective countries to inform the public of the eminent threat and provide them with advice on how to cope with the situation. Public health authorities took pains to construct their communication around the issue in such a way that it would inform the public and encourage them to take action, while avoiding the spread of fear and panic. Surprisingly, surveys conducted shortly following the height of news media reporting in both the UK and Australia showed that, while the public in general endorsed the government’s advice around how they could safeguard themselves against the disease, only a small minority of people believed that the situation really posed a serious threat. Davis et al (2014:501) refer to a number of studies that looked into possible reasons for the public’s reaction to the pandemic. These include observations that point to a pre-existing “health threat fatigue” and resistance to media “hype”, a general mistrust of news media that shaped how members of the general public responded to communication on the pandemic, and a perception among members of the public “that news media on H1N1 “hyped” risk”.

The fact that media hype was assumed in the communications efforts around the pandemic can

perhaps be construed as a lack of trust on the side of the public in the messages presented to them by the media (Davis et al., 2014). Master and Resnik (2013:322) however caution that, although the argument that hype could lead to a loss of trust in science seems intuitive, there is still not enough empirical evidence on the subject to accept it as true, and they suggest that further research on the subject is needed to “improve communication between scientists, science reporters and the public; augment evidence-based education and training on the responsible conduct of research for scientists and other scholars; and to contribute to the scholarly literature on the public understanding of science”.

The issue of credibility in science communication is one that is often discussed. In a 2007 study where researchers conducted in depth interviews with science communication actors including scientists, public information officers from large governmental scientific institutions and science journalists in Munich, Baltimore, New York and Boston, it emerged that all interviewees placed a high priority on accuracy when communicating to the public. At the same time, they however felt, that the level of accuracy was irrelevant if no one pays attention to the message that they are trying to communicate. According to the authors, this means that public information officers are often engaged in a sensitive balancing act between correctness and overstatement (Nielsen et al., 2007). As one science communicator explained during the interview: “[you] end up walking a line, because you want to be as interesting and provocative as possible, without being wrong” (Nielsen et al., 2007:7). Despite the fact that most of the interviewees apparently thought that hype was an inevitable part of science communication by institutions, which was largely driven by an intense need for visibility, recognition or financial gain, all of them nonetheless indicated that they felt that the safeguarding and protection of their credibility as a source of information was vital (Nielsen et al., 2007).

The fact remains that there is almost no situation in which, exaggerating, lying about or hyping any type of information is considered good practice or acceptable. Whether or not it leads to an erosion of trust and support for science among the wider public, the hyping of research results will ultimately be detrimental to science communication and all of its stakeholders, including science journalists, research institutions, media outlets and scientists (Rinaldi, 2012). It is therefore important that all parties involved take on the responsibility of ensuring that the integrity of science and its communication remains intact in the face of today’s rapidly changing and demanding media environment. As stated by Wylie (1989:63): “To a great extent, college and university public relations

offices speak for higher education, and the future of our institutions can be seriously diminished if they do not speak, or are not perceived as speaking, in an ethical manner”.

3. Methodology

The key research methodology used for this research project consisted of the comparative content analysis of news media articles and the press releases they originated from. This comprised the following steps:

- Gathering news articles based on science related press releases sent out by the public relations- and communications offices at the four largest research universities in South Africa – Stellenbosch University, the University of Cape Town, the University of the Witwatersrand, and the University of Pretoria over a period of five months.
- Comparing these news articles with the corresponding original press releases sourced from the relevant institutions.
- Analysing the news article against the criteria set out below.

3.1 Collection and filtering of media articles

Articles that included specific research related key words from the four universities included in the study appearing in the popular media were collected for a period of five months from 1 March to 31 July 2018. This was done by means of a media monitoring service – *Professional Evaluation and Research (PEAR)* – who provided media clippings based on the keywords provided. In this instance, the keywords specified were:

- Stellenbosch University; University of Stellenbosch (Universiteit Stellenbosch; Universiteit van Stellenbosch)
 - Keywords: research, researcher, science, scientists, study, breakthrough, finding(s)
- University of Cape Town, UCT (Universiteit van Kaapstad)
 - Keywords: research, researcher, science, scientists, study, breakthrough, finding(s)
- University of the Witwatersrand (Wits)
 - Keywords: research, researcher, science, scientists, study, breakthrough, finding(s)
- University of Pretoria (Universiteit van Pretoria)
 - Keywords: research, researcher, science, scientists, study, breakthrough, finding(s)

The aim was to identify and include 10 suitable articles per university.

The media monitoring service produced a large number of clippings based on these keywords, but not all of them were relevant to this study. As the goal of the study was to compare media articles originating from science related press releases issued by university press offices, as a first step, articles that did not make reference to a scientific study or research by researchers from the institution were excluded. These generally included articles related to awards received by academics and other institutional news, as well as opinion pieces by academics that relates to political or other issues, but which do not necessarily refer to any particular research study. This eliminated a significant amount of articles from the pool of articles suitable for further analysis.

There were also a number articles that appeared in media publications that originated from articles written by academics at the institutions included in this study and published on *The Conversation Africa*. (*The Conversation* is an “independent, not-for-profit media outlet.” Articles published on *The Conversation* are “authored by academics, edited by professional journalists and freely available online, and for republication through creative commons license” (Wikipedia, 2018)). Articles that originated from these articles were not included in the analysis as the focus was on articles supplied to the media by the press offices at the universities, and as stated, articles published on *The Conversation* are generally authored by academics, and from experience I knew that in some cases this happens without the knowledge of the university press office. It was relatively easy to identify media articles that originate from articles originally published on *The Conversation* as such, as publications usually note this at the end of the article or at minimum makes reference to *The Conversation* in the text. *The Conversation* encourages the republication of their content under a Creative Commons licence.

Articles covered in Afrikaans media were also excluded, as the universities predominantly distribute their press releases in English, which means that the text of the originating press release (in English) cannot be compared with the published media article (in Afrikaans) using the *Copyleaks* document comparison software.

In cases where an article originating from a university press release appeared in more than one publication, preference was given to publications with higher circulation numbers (as supplied in the reports from PEAR), as they would probably have reached more people and therefore would have had a greater potential influence on public opinion.

3.2 Sourcing of related press releases

The original press releases were sourced from the websites of the universities included in the study. The articles that remained after filtering the articles received from the media monitoring service as

described above, were listed and matched to press releases from the university in question. The press releases were sourced from the media office pages of the universities included in the study:

- Stellenbosch University: <http://www.sun.ac.za/english/pages/news.aspx>
- University of Cape Town: <http://www.uct.ac.za/main/media-relations/media-releases>
- University of the Witwatersrand: <http://www.wits.ac.za/news/latest-news/>
- University of Pretoria: <https://www.up.ac.za/communication-marketing/article/1972216/media-releases>

On some of the university websites, press releases are published in the form of “news stories” and are not necessarily specifically called a “press release”. In these cases, these “news stories” were deemed equivalent to a press release, provided that their publication date on the website preceded the publication date of the matching media article. Articles for which no matching press release could be found were also excluded.

In the case of the University of Pretoria, the press releases page on the university website was outdated and the university press office was contacted to obtain copies of press releases sent out by the university press office during the study period. These press releases were consequently matched to media articles in the list of articles that matched the criteria of articles relating to research findings as set out above. Unfortunately, it appears that the university press office at the University of Pretoria, was not very active in terms of distributing research related news during the study period, which resulted in a dearth of suitable research related media articles between March and August 2018. This prompted a decision to extend the monitoring period for the University of Pretoria, which allowed the inclusion of additional articles that could be analysed to ensure that ten articles could eventually be included per university for further analysis.

3.3 Comparative analysis of media articles and related press releases

Once the final 40 articles earmarked for further analysis were selected, they were compared to the original press releases published by the university. This comparative analysis was done using similarity index software – *Copyleaks* – to determine to what extent the institutional press materials corresponded with the media content (i.e., the extent of churnalism).

Copyleaks is very similar to the plagiarism software used on digital university platforms such as *Turnitin*. It is a plagiarism checker originally designed to make it easy for educators to find similarities between work produced by their students and content published elsewhere. The software is user friendly and can accommodate a variety of scanned file types including pdf, doc, html and txt.

Following this analysis, each media article was analysed based on the following questions:

1. Is anyone (researcher/expert/institution) credited as the source of the information contained in the article? In other words, does the article include a phrase such as “according to researchers at the University of Pretoria...” or “in a statement released by the university of Cape Town...” The by-line (in other words, the “line at the beginning of a news story, magazine article, or book giving the writer's name” (Merriam-Webster Online Dictionary, 2018)) of each article was also considered to see who was credited as the author of the article.
2. Is there evidence of the journalist having interviewed a researcher mentioned in the original press release, someone else from the originating university, or an expert from another university or institution for further information on the subject matter of the article? (For example, quotes that do not appear in the original press release).
3. Is there any evidence of a more critical approach to the content of the press release? In other words, did the journalist question the results in any way?
4. Is there any evidence that the original tone of the press release had been changed? As most university press releases tend to have a positive slant to promote the work of the institution and its researchers, the primary “tone” of an article can be considered as either:
 - a. Positive—meaning that after reading an article the reader will be more likely to support, or trust or recommend the particular university (this would imply no change in tone)
 - b. Neutral—the article does not convey a particular sentiment, but rather just reports the facts
 - c. Negative—where the article leaves the reader less likely to support or trust the university, or
 - d. Balanced—where the news item includes both positive and negative aspects and results in a more balanced view being expressed.
5. Is there evidence of “hype” in the press release or corresponding news article? As hype can be added to articles in any number of ways, determining whether elements of hype were present in the press releases or not was determined through a subjective content analysis. This was done by adapting guidelines originally developed to identify bias in information sources, described on the website of the New Jersey Institute of Technology (New Jersey Institute of Technology, 2018). The process involved reading through the full text of each news article and its corresponding press release and evaluating whether the language used in each document could be considered extreme or specifically designed to attract attention,

or to appeal more to the reader's emotions than to logic by, for example, using words such as "breakthrough", "ground breaking", etc. especially in cases where this was clearly not warranted. It was also considered if the content could be interpreted as over simplifying or over generalising the topic being discussed. Following this analysis, the news article and matching press release were compared to determine whether the identified hype appears just in either the original press release or resulting media article, or in both. In other words, is the journalist repeating the hype from the original article, have they removed it, or have they added hype to sensationalise the topic of the article?

The results obtained from the process explained above was then collated, interpreted and discussed.

4. Analysis

4.1 Stellenbosch University

Articles that contained specified keywords and appeared in the popular media were collected via a news monitoring service (PEAR) using the following keywords: Stellenbosch University; University of Stellenbosch (Universiteit Stellenbosch; Universiteit van Stellenbosch); research, researcher, science, scientists, study, breakthrough, finding(s).

The results were further scrutinised manually to determine which of the articles flagged by the service originated from press releases generated by the university press office. This produced a total of 14 research related articles. As previously stated however, the aim was to include a total of 10 articles for each university included in the study.

One of the 14 articles were excluded as it appeared to be an article that first appeared in the media and was then republished on the university's website, which meant that it would not have been possible to compare it to an originating press release. Another result was eliminated based on the fact that the media publicity picked up by the monitoring service was in the form of a radio interview, and another was eliminated as the press release posted on the university website stated that the article first appeared on *The Conversation* (this was not mentioned in the media article). Ten articles were selected from the remaining 11 based on the circulation numbers of the publications they appeared in. In other words, preference was given to articles carried in more popular media outlets.

4.1.1 Selected articles

Table 1: List of selected articles

Article number	Title of press release	Title of media article	Appeared in (publication)
1	Biodiversity suffers as climate warms	Global warming nears critical mass	Independent online (IOL) (25 May 2018)
2	Novel biosensor for early detection of cancer	Revolutionising cancer screening	Lab Management & Science (1 July 2018)
3	Well-planned maintenance schedules prevent load shedding	Graduate's solution to prevent load shedding	Daily News (9 July 2018)
4	Better implants key to repair damaged knees	Better implants key for damaged knees	Bolander (27 June 2018)
5	Keeping tabs on genetically modified crops	Keeping tabs on genetically modified crops	Bizz Community (7 June 2018) and republished by Green Times (8 June 2018)
6	Palmiet wetlands drying up fast	Palmiet wetlands could be lost by 2065 warning	Star (Late) (5 June 2018)
7	Alcohol, illegal drugs can trigger self-harm	Be warned: alcohol and drugs can trigger self-harm and suicidal behaviour	Sunday Times (Times Live) (10 May 2018)
8	SU scientists help develop blood test that predicts onset of TB	Stellenbosch University scientists help develop blood test that predicts onset of TB	IOL (6 April 2018)
9	Low back pain affects millions, but too many receive wrong care	Low back pain still being treated incorrectly, often including unnecessary surgery	Business Day (22 March 2018)
10	PR: Legal industry discriminates against people with dyslexia	Dyslexic people 'excluded from law jobs'	Cape Argus News (IOL) (13 April 2018)

4.1.2 Similarity according to Copyleaks software

The text of each press release and a selected corresponding article that appeared in the media were pasted into the document comparison module of *Copyleaks*. The software compares the two documents directly and assigns a percentage of similarity, which is further broken down into the degree to which the text was identical (i.e., the exact same wording was used), similar (i.e., the

wording is nearly identical but used in a different form, for example, slow becomes slowly) and the text contains words that could be considered to have a related meaning.

Table 2: Similarity between published articles and the originating press release from Stellenbosch University

Article	Similarity to corresponding press release
1	30% (26% identical, 2% similar and 2% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/6c39e914-618f-4a75-b68e-9bf50471ede4/6044717/1/1?key=73Q9cl1N3nsecJq6whbR)
2	5% (3% identical, <1% similar and 2% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/87b33d58-89c6-4a48-af51-dfc746d3b2f6/5581359/1/1?key=OC7I8VBe1cHpNd3V2URd)
3	37% (31% identical, 4% similar and 2% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/a84edf39-639c-4943-ac1c-51579f1c917d/5581344/1/1?key=RIz8S9EK0RmyuBrS1jBH)
4	96% (86% identical, 10% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/95f93eee-b211-43aa-bac0-d47b74726124/5581365/1/1?key=tnlajoJcMTSXUJRnvsRJ)
5	99% (97% identical, 2% similar and 0% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/7c72456b-1ec1-4799-afb6-4ad48e190ba2/5581374/1/1?key=JxPI7MLrJBTvzQ3SxIIN)
6	49% (42% identical, 5% similar, 2% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/bc8f9fa4-7bd5-4ab8-8afd-8dad0f66d312/5581409/1/1?key=gtYGdTmfUjJALUheGMWi)
7	67% (57% identical, 8% similar and 2% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/9a21b62c-39f7-4341-acb2-7decfcc75cdc/5581571/1/1?key=6664FrsPP6Tq2WWUZL8h)
8	99% (97% identical, 2% similar and 0% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/3a85b7b3-3e7c-4396-b163-f041786440f1/5581416/1/1?key=drF5v0pojDAlkpi4QNry)
9	7% (7% identical, <1% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/5341cb65-41b9-4909-9557-08e642ac9cf6/5581441/1/1?key=fljDWadzXxPwAZWjYUrW)
10	36% (34% identical, 2% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/15250631-efa9-4f28-aa2a-195e407993e7/5581447/1/1?key=osrmD6vKp4680pSjNLIx)

4.1.3 Qualitative analysis

Following the similarity analysis using the *CopyLeaks* online tool, each article was qualitatively analysed based on the criteria previously discussed under section 3.3 of this thesis.

Table 3: Qualitative analysis of published articles from Stellenbosch University press releases

Press Release	Crediting of source	Additional information or quotes	Critical approach	Change in tone	Hype
1	By-line attributed to journalist, no	No, all the quotes used seem to be	No	No change in tone	No

	mention of a press release	adapted from the press release. Although the similarity percentage is only 30%, the articles are very similar			
2	No mention that article originates from a press release, but information supplied seems to have been used as background	Yes, additional quotes added, researcher was contacted	No, although the topic was expanded	Very positive (more so than the original press release)	Yes (writer uses words like "revolutionising, quantum leaps, world's most dangerous illnesses, etc.)
3	By-line is that of the journalist (no mention of a press release)	No evidence that the researcher or any other sources were contacted	No (intro rewritten and article shortened, no substantive changes)	Same as original press release)	To an extent - the system developed is unproven and the article could create the idea that it presents a real solution
4	By-line attributed to Dr Alec Basson - no reference made to his affiliation or article being a press release from the institution	No (96% similarity)	No (96% similarity)	No (96% similarity)	No
5	By-line attributed to Dr Alec Basson - no reference made to his affiliation or article being a press release from the institution	No (99% similarity)	No (99% similarity)	No 99% similarity)	No
6	No by-line or reference to a press release	No	No	Same as original press release	Yes, to an extent, but also present in original press release
7	By-line attributed to "Times Live reporter" and no reference to info supplied by institution	No	No (intro and heading changed and article shortened, no substantive changes)	No	Yes, the published article's headline is much more provocative than original
8	By-line attributed to Staff Reporter, no mention of press release	No (99% similarity)	No (99% similarity, only difference is the heading, where name of university was written in full)	No (99% similarity)	No

9	By-line attributed to journalist	One additional quote added	No, research was not questioned in any way	No, similar to original release	Yes, heading of published article hyped
10	By-line attributed to journalist	No	No research was not questioned in any way (only intro and heading changed and article shortened)	No, similar to original text	Yes, especially the heading of the published article contains hype

4.2 University of Cape Town

The keywords used by the news monitoring service were: University of Cape Town, UCT (Universiteit van Kaapstad), research, researcher, science, scientists, study, breakthrough, finding(s).

Ten articles were identified by scrutinising the results supplied by the media monitoring service manually, after which they were matched with the corresponding/originating press releases on the University of Cape Town's website.

The "media" article picked up by the media monitoring service for article number 10 turned out to be the press release as it is published on the EurekAlert! website, which could not be included in the study as it would naturally produce a 100% similarity due to the nature of the EurekAlert! service. A manual Google search was therefore conducted to determine if the article was picked up by any media outlets. The only apparent publication that picked up the story seems to be *Africa Conservation News*, and the article they carried was consequently compared to the media release published on the university's website.

4.2.1 Selected articles

Table 4: List of selected articles

Article number	Title of press release	Title of media article	Appeared in (publication)
1	Study by UCT academics prompts a call for a national ban on lead bullets	Study by UCT academics prompts a call for a national ban on lead bullets (News Every Day)	News Every Day (15 March 2018)
2	Report reveals main motives of rising contract killings in South Africa	Taxi conflicts drive rise of izinkabi, SA's killers for hire	Sowetan Live (20 March 2018)
3	Flight delays: A recent study finds out why some African birds stay home longer	Some African birds leave the nest later	Cape Times (27 March 2018)
4	UCT explores female conflict and mate choice dilemmas in Southern Pied Babbler birds	Female birds fight for breeding	Cape Times (26 April 2018)

5	UCT study finds that most restaurant owners support a complete ban on smoking in restaurants	SA restaurateurs support the #smokingban	IOL (2 May 2018)
6	UCT researchers are reducing the burden of Cardiovascular Disease in Africa and beyond	UCT researchers are reducing the burden of Cardiovascular Disease in Africa and beyond	News Everyday (5 April 2018)
7	Unveiling the secrets of the Southern Sky - launch of the MeerLICHT telescope	MeerLICHT opens up new view to stars	Cape Argus Early (25 May 2018)
8	UCT study suggests the illicit trade in cigarettes targets poor communities in SA	Legal ciggy market going up in smoke	Daily News (30 May 2018)
9	New coal power will cost SA billions, UCT study finds	New coal plants to cost SA R19bn, push out renewables	IT Web (15 June 2018)
10	Road-trip survey shows decline in bird population at Africa's last greatest wilderness area	Botswana raptor declines shock researchers	Africa Sustainable Conservation News (9 June 2018)

4.2.2 Similarity according to Copyleaks software

The text of each press release and a selected corresponding article that appeared in the media was pasted into the document comparison module of *Copyleaks* and run through the software to obtain the degree of similarity between the two documents as explained above.

Table 5: Similarity between published articles and the originating press release from the University of Cape Town

Article	Similarity to corresponding press release
1	News Everyday: 100% (100% identical, <1% similar and 0% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/f692272c-9dbc-429b-b33f-45fb95ae5485/5581716/1/1?key=Y3Qm4V46C1lImKIKdJnE)
2	28% (25% identical, 3% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/102a70d6-161e-4e46-8cc1-d3eb53e85d3c/5581719/1/1?key=0TWjpd1Wblx4DOJW7VWH)
3	52% (37% identical, 12% similar and 3% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/0a051ba7-1b60-4dcd-af70-6a491fea1928/5581743/1/1?key=fbYyThiKJxYzVOlVA8O)
4	38% (36% identical, 2% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/745a42cb-45f6-4375-aa47-a4bc72f84fcd/5581753/1/1?key=i7jdAdmErfevWUiscMWG)
5	48% (48% identical, <1% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/788d819f-b140-4122-837d-01a10848e3c7/5581790/1/1?key=naBpJPcpWt6zjy5Q44kT)

6	100% (100% identical, <1% similar and 0% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/995af12e-a058-4379-b4cd-e0e3c775c7a9/5581827/1/1?key=G1fzVCbnWaAwWM4Vohrg)
7	10% (10% identical, <1% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/20bb18e5-11b0-4aac-aac7-1f585280b196/5581865/1/1?key=oz27EG94J73By7iGMLI7)
8	38% (31% identical, 5% similar and 2% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/3878b816-3353-4b6b-9db2-775e9fac70a7/5581902/1/1?key=rGPQxgNATrvBVlft4dGi)
9	90% (85% identical, 4% similar and 1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/ddee4295-4a97-474a-befa-7d52c6ca682d/5586461/1/1?key=JSi6COelnm26Mf0UWrzC)
10	71% (65% identical, 4% similar and 2% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/2ff7fa54-080c-4e21-a548-f9970f0da18d/5586424/1/1?key=2dZi69hbPmeOxjoAOV25)

4.2.3 Qualitative analysis

Table 6: Qualitative analysis of published articles from University of Cape Town press releases

Press Release	Crediting of source	Additional information or quotes	Critical approach	Change in tone	Hype
1	The article was re-published verbatim and all that is mentioned is the name of the person who submitted the article without mention of their affiliation.	100% similarity	No	Article has 100% similarity	No
2	By-line attributed to journalist – no mention of press release	Additional information added, but no obvious reference to researchers being contacted	No critical approach to research, but research was used to substantiate arguments in the article	Yes, the article is written in a provocative manner	Yes, the article is written in a very provocative manner
3	By-line attributed to Staff writer – no reference to a press release	No, article seems to basically just be a shortened version of the press release	No	No, high similarity to original press release	No
4	By-line attributed to Staff writer – no reference to a press release	No, article is just a much shorter version of the press release	No	No, the same as original press release	No
5	By-line attributed to a journalist but	No, all the info in the article appears to come	No	No, the tone of the article is the	No

	also notes the word "Supplied" in the by-line itself. The article also includes a link to the full study	directly from the press release		same as that of the press release	
6	The article only mentions the name of the person who submitted it – no mention is made to a press release or the affiliation of the person who submitted the article	No (100% similarity)	No (100% similarity)	No (100% similarity)	The article does contain hype originating from the original press release
7	By-line attributed to journalist – no mention is made of a press release	Yes, the article contains a quote from a researcher that does not appear in the original press release	No	No, the overall tone of the article is the same as that of the press release	No
8	By line attributed to Staff reporter – no mention is made of a press release	No, although the article does contain "quotes", they appear to be text adapted from the press release and made to look as though they originate from the researcher	No	No, the tone of the article is the more or less the same as that of the press release	Yes, both the article and the press release has an emotionally laden slant
9	By line attributed to the business editor of the publication – no reference is made to a press release	Yes, another source is quoted in the last part of the article	No	No, the tone of the article is the same as that of the press release	No
10	By-line attributed to a conservation agency and link included to the paper the research is based on	No, the article is very similar to the press release and quotes used originate from the press release issued by the university	No	No, the tone of the article is the same as that of the press release	Yes, the headline of the published article is more provocative than that of the press release

4.3 University of the Witwatersrand

The keywords used by the news monitoring service were: University of the Witwatersrand (Wits), research, researcher, science, scientists, study, breakthrough, finding(s).

The daily media monitoring reports received from PEAR at first only delivered eight relevant articles that could be included for further analysis. The university website was consulted to see if any

additional press releases could be found that would be suitable for inclusion. Two additional press releases were identified and send through to PEAR to do a specific search for media articles that might have originated from them. The results for the two additional press releases were filtered using the process set out above. The ten identified articles were then listed and matched with the corresponding/originating press releases on the University of the Witwatersrand’s website, after which they were analysed for similarity and the other factors specified above.

4.3.1 Selected articles

Table 7: List of selected articles

Article number	Title of press release	Title of media article	Appeared in (publication)
1	Innovative "invisible ink" detects TB	Innovative ‘invisible ink’ successfully detects TB	Medical Brief (7 March 2018)
2	New study reveals the secret of magmas that produce South Africa's national treasures	New study reveals the secret of magmas that produce South Africa’s national treasures	Mail & Guardian (9 March 2018)
3	Cold-blooded pythons make for caring mums	Why baby pythons love a warm cuddle from mom	Sunday Times (Times Live) (14 March 2018)
4	Flu vaccine protects pregnant women against pertussis	How flu vaccine can protect pregnant moms against whooping cough	IOL (16 April 2018)
5	Where hominid brains are concerned, size doesn’t matter	Mysterious ancient humans with brains like modern people prompt rethink of early evolution	Independent (14 May 2018)
6	First tetrapods of Africa lived within the Devonian Antarctic Circle	SA scientist unveils ground-breaking fossil discovery	SA News.gov.za (South African Government News Agency) (8 June 2018)
7	Scientists peep deep into a diamond to examine its defects	Scientists peep deep into a diamond crystal to get information about the nature of its defects	Creamer Media’s Engineering News (13 June 2018)
8	Fragment of impacting asteroid recovered in Botswana	Meteorite found after fireball seen over South Africa	Sunday Times (Times Live) (6 July 2018)
9	Making massive leaps in electronics at nano-scale	Putting a new spin on it	AfroVoice (Gauteng, KZN, Western Cape, Bokone Bophirima and Free State) (28 May 2018)

10	Bridging the digital divide with photonics	Let there be light: Using home-grown photonics to close digital access divide	Mail & Guardian (4 June 2018)
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4.3.2 Similarity according to Copyleaks software

Running the original text of each press release and that of the corresponding article that appeared in the media through the document comparison module of Copyleaks produced the following results.

Table 8: Similarity between published articles and the originating press release from the University of the Witwatersrand

Article	Similarity to corresponding press release
1	91% (88% identical, 3% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/7051fde1-29d3-4ae8-90e2-3bacb5a17f56/5586519/1/1?key=3BugPGINRFdbQwitoPRv)
2	96% (89% identical, 5% similar and 2% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/9f677509-fd6b-4e94-a4b1-152faedf9ee2/5586544/1/1?key=tV6aAziZsPjC13CgQnRo)
3	58% (50% identical, 4% similar and 4% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/6ebccce1-d85c-4bcd-a2b0-fc32f00de993/5586574/1/1?key=SB2XSL1xNmVU9XxU5l)
4	6% (6% identical, <1% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/3fc1999d-6594-4ed5-982a-198b544ee390/5586605/1/1?key=NFnZuJzdUHNlaTG5Zmab)
5	9% (6% identical, 2% similar and 1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/3ebafb7f-72ee-4478-b5ad-ceaa8ff07f70/5586674/1/1?key=XUswsEwyGADApw5KvjFz)
6	25% (23% identical, 2% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/ffaf857a-d3f5-4a3c-b672-0bae4245786f/5586714/1/1?key=0PrJTwm1SunEp8UP7a6X)
7	94% (94% identical, 0% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/a2a98b2c-238c-4a4d-ba52-aa82b75c2933/5586722/1/1?key=5AFRfUUI9B8QoZg3QOW7)
8	29% (25% identical, 2% similar and 2% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/323c26f7-eb5a-4f5a-8255-372c0ad0ac37/5586726/1/1?key=P4LlbYycvOpT5eUoq7Ae)
9	83% (79% identical, 4% similar and <1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/668ad133-1803-4591-b921-4a15d8a0d538/5966243/1/1?key=KCWpZ7PKIde13y4z5uf4)

10	11% (9% identical, <1% similar and 2% related meaning) https://copyleaks.com/compare-embed/compare-two-files/f8553e69-318b-4965-b1f3-7c0ed094aa1c/5966614/1/1?key=V8WZN95QjmXxW3HSb44O
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4.3.3 Qualitative analysis

Table 9: Qualitative analysis of published articles from University of the Witwatersrand press releases

Press Release	Crediting of source	Additional information or quotes	Critical approach	Change in tone	Hype
1	No by-line – an abstract of the research paper is however included along with a full reference as well as a link to the university's original press release	No, the article is virtually identical to the press release	No	The tone of the article is the same as that of the press release	No
2	By-line attributed Schalk Mouton and his affiliation as senior communications officer at the university is given at the end of the article	No, the article was supplied by the university press office and used virtually as is	No	The two articles are virtually identical so the tone is the same	No
3	By-line attributed to Tomes Live – no reference to a press release or that the information was supplied	No, all quotes and information that appears in the article seem to originate from the press release	No	The tone of the article is unchanged from that of the press release	Although the title has been changed –likely to appeal to a wider audience, the study's findings are new and therefore words like "first ever" that appear in the text do not necessarily constitute hype
4	By-line of the article accredited to the researchers and at the bottom of the page it is noted that the article was previously published on The Conversation	Yes. When one looks at the dates of the original press release and the publication date of the article, it seems plausible that the press release might have simply created awareness of the	No	The tone of the article is positive - therefore no change	No

		<p>issue as The Conversation article (which appeared a few days after the press release) was used as the source for the published article. The similarity between the article that appeared on The Conversation and the one that appeared on IOL is 87%</p>			
5	<p>By-line attributed to the publication's science correspondent – no reference made to a press release. A link is however included to a recently published journal article on the subject</p>	<p>Yes, there are lots of quotes and additional information from other sources. As the article appeared in a UK publication, it is however possible that the correspondent wrote the article based on a press release from an institution in his home country</p>	No	<p>The tone of the article is neutral, as overall it does not seem to be trying to convey a particular sentiment, rather, it just focuses on reporting the facts – no change from press release</p>	No
6	<p>No by-line, no mention of a press release or any other source</p>	<p>Yes, the article that appears on the SA government news site clearly contains information from a variety of sources, including the press release from the University of the Witwatersrand press office</p>	No	<p>No change in tone</p>	<p>Although the word ground-breaking appears in the headline, in this case it may be warranted and therefore should not necessarily be seen as hype.</p>
7	<p>Clearly stated that article originates from a media statement</p>	<p>No, highly similar content, only slightly shortened</p>	No	<p>No, article is very similar to the press release</p>	No
8	<p>By-line attributed to journalist – no mention of press release</p>	<p>No, the article is more similar than the Copyleaks analysis suggests. The press release seems to just have been shortened and some paragraphs paraphrased</p>	No	<p>No, the tone of the article is the same as that of the press release</p>	<p>Heading has been altered to appeal to a larger audience, but overall the article does not seem to contain too much hyped text</p>

9	By-line attributed to journalist – no mention of press release	No, all quotes used comes from the supplied text	No	No, the article is very similar to the press release	Heading has been altered to appeal to a larger audience, but overall the article does not seem to contain too much hyped text
10	By-line attributed to journalist. The article does mention a statement from the university, it is however not entirely clear if this refers to the press release or another statement	Yes, the journalist seems to have contacted the researcher, and has included additional quotes	No	No change in tone, although the article does not have a very high similarity percentage it is nonetheless very similar to the press release	No

4.4 University of Pretoria

The keywords used by the news monitoring service were: University of Pretoria (Universiteit van Pretoria), research, researcher, science, scientists, study, breakthrough, finding(s).

The daily media monitoring reports received from PEAR only delivered two relevant articles for the study period that could be included for further analysis. The university website was consulted to see if any additional press releases could be found that would be suitable for inclusion, but the press releases page on the university website was outdated. The university press office was contacted to obtain copies of press releases sent out by the university press office during the study period. It emerged that the university did not distribute many research related press releases between March and July.

This prompted a decision to extend the study period for this university so that ten articles could ultimately be analysed. The press officer supplied a number of additional press releases and arranged for the press releases page on the university website to be updated. The press releases received were sent to PEAR to see if they could find any media articles that could have resulted from the press releases supplied. The results were filtered using the process set out above, after which the ten identified articles were listed and matched with the corresponding/originating press releases and analysed for similarity and the other factors specified above.

4.4.1 Selected articles

Table 10: List of selected articles

Article number	Title of press release	Title of media article	Appeared in (publication)
1	Can plants beat cancer?	UP student's cancer find	The Citizen (28 March 2018)
2	How safe is the food on your plate?	How safe is the food on your plate?	Bizz Community (12 March 2018)
3	New breast cancer research shows promise for the future	The future of breast cancer	Your Family (1 October 2018)
4	Elephants migrate despite protected area boundaries and international borders	Elephants migrate despite boundaries and borders	Africa Geographic (1 August 2018)
5	Half of Super Rugby team players can expect to get injured in a season	Higher injury rate in SA teams	SA Rugby Mag (30 Julie 2018)
6	Beware of Malaria - even in the Winter	Beware of Malaria - even in the Winter	Publicnow.com (7 May 2018)
7	Oversharing in the time of selfies	Losing it in the shadow of the selfie	Pretoria News (1 October 2018)
8	Africa's Tree of Life is dying	Why Africa's 'trees of life' are dying	Oxpeckers (25 June 2018)
9	First ever lion cubs born through artificial insemination worldwide	World first as lion cubs conceived artificially in SA	Daily Dispatch (5 October 2018)
10	'Pesticides found in local fruit and vegetables could have health risks', UP academic warns at 2nd International Conference on Food Safety and Security	Health dangers of pesticides	Cape Times (31 October 2018)

4.4.2 Similarity according to Copyleaks software

Running the original text of the press release produced by the university and that of the corresponding article that appeared in the media through the document comparison module of Copyleaks produced the following results.

Table 7: Similarity between published articles and the originating press release from the University of Pretoria

Article	Similarity to corresponding press release
1	33% (27% identical, 5% similar and 1% related meaning) (https://copyleaks.com/compare-embed/compare-two-files/40f86c74-128d-4e77-8ec2-b551ff8e8095/5587074/1/1?key=q2kRh8deBk6l4tbqZNup)
2	77% (74% identical, 2% similar and 1% related meaning) (https://copyleaks.com/compare-embed/compare-two-

	files/53373a0b-0e99-4c75-afc3-66169f383f06/5587129/1/1?key=ku7Ps6VGyk1YZ5Bq6kzM)
3	29% (21% identical, 8% similar and <1% related meaning) https://copleaks.com/compare-embed/compare-two-files/570c0717-546b-4818-bd64-7886a96649ae/6012926/1/1?key=ku7Ps6VGyk1YZ5Bq6kzM
4	97% (96% identical, 1% similar and 0% related meaning) https://copleaks.com/compare-embed/compare-two-files/cf5ec6dc-c329-4329-9f8b-4e320e894ac2/5966709/1/1?key=ZLdznGgmuGLFuRDlyvey
5	83% (80% identical, 3% similar and <1% related meaning) https://copleaks.com/compare-embed/compare-two-files/af2522bb-f2fb-4083-b276-3550974aa76b/5967347/1/1?key=q8wpiwql05AKZS4X9r9N
6	93% (93% identical, <1% similar and <1% related meaning) https://copleaks.com/compare-embed/compare-two-files/bb714f1b-dd4c-4a01-9519-8e4708ee6585/5967546/1/1?key=ZwDtu7yWofpQcNrjbEun
7	81% (75% identical, 6% similar and <1% related meaning) https://copleaks.com/compare-embed/compare-two-files/2580a676-27a1-4c8b-a2ba-d9edbef9e8e6/6012896/1/1?key=FUmGA3zJ57gOQsIS4qAt
8	54% (47% identical, 4% similar and 3% related meaning) https://copleaks.com/compare-embed/compare-two-files/b4e543e0-3676-4dd9-8ff2-01b5c2efc12c/5967211/1/1?key=fs1cNGOp56Zw4AvwqTvL
9	8% (6% identical, <1% similar and 2% related meaning) https://copleaks.com/compare-embed/compare-two-files/fd6162f5-3b4f-418c-85da-fda5f6d0ebfc/6012857/1/1?key=Fla1LJu93J2GA6IPEwWf
10	25% (23% identical, 1% similar and 1% related meaning) https://copleaks.com/compare-embed/compare-two-files/de53c4ba-5d57-49a2-a51c-458b0824fb39/6012978/1/1?key=ppk49WxSAHQ2xGYEdF4d

4.4.3 Qualitative analysis

Table 8: Qualitative analysis of published articles from University of Pretoria press releases

Press Release	Crediting of source	Additional information or quotes	Critical approach	Change in tone	Hype
1	By-line attributed to journalist – no mention of a press release or any other source	No, article seems to be a shortened version of the press release	No	The tone of the article is much more “certain” about the results and impact of the research	Yes, the media article contains more hype than the original press release
2	Published article states that Research Matters is the	No, the article is an edited version of the content that	No	The tone is the same as that of the article on the website as	No

	source of the content	appears on the Research Matters website		the content is very similar	
3	No by-line	Yes, there is additional information as well as quotes from another expert not mentioned in the original press release	No	The tone of both articles is very positive	Yes, both the press release and media article contains elements of hype. The writer makes it sound as if the findings present a clear-cut solution. Although the press release does mention that the results were obtained in silico (via computer simulation/modelling) this is not repeated in the media article
4	The article clearly states that it is a press release from the University of Pretoria	No, the press release was republished virtually unchanged	No	No	No
5	It is clearly stated that the article was provided by the University of Pretoria	No, all the information seems to originate from the press release	No	No, the article is very similar to the original press release	There does not seem to be any hype present in the article
6	The by-line is attributed to the researcher who wrote the press release and it is clearly stated that the article originates from a press release	No, the article is almost identical to the press release	No	No, the published article is virtually identical to the press release	No, there is no hype present in either the press release or the article
7	The by-line is attributed to the researcher who wrote the press release and her affiliation to the university is disclosed at the end of the article	No, the article is basically just a shortened and lightly edited version of the press release	No	The published article is very similar to the press release	Although both the article and the press release are written in a conversational style, there does not really seem to be any real evidence of hype. The heading has however been changed to be more enticing for a broad audience
8	The by-line is attributed to an associate journalist with the publication, but her affiliation as a freelance	No, the similarity percentage of this article could actually be higher, as the quotes seem to be identical in both articles,	No	No	No, it cannot really be said that the findings of the research are hyped up, although the article is written to have an emotional appeal

	science writer at the University of Pretoria is also disclosed	although this seems to have not been picked up by <i>CopyLeaks</i> as their position in the article has been changed and some of them have been shortened			
9	No by-line, but right at the end of the article AFP (a newswire service) is given as the source. The article however also clearly states that the results were “announced by the University of Pretoria” which could be understood as through a press release	Yes, there is additional information as well as quotes from other parties not mentioned in the original press release	Yes, the article questions whether the new technique discussed in the article will have positive or negative effects on conservation efforts	Yes, the article is more critical about the research than the original press release	No, although words like “world-first” and “first ever” appear in both the press release and the media article, the research discussed is actually new and the use of these words could therefore be warranted.
10	By-line attributed to journalist – no mention of a press release	No, all of the information used is also present in the press release. The article seems to be more similar to the press release than the software analysis suggests, large parts seem to just have been shortened and paraphrased	No	Yes, the article has a more negative (alarmist) tone than the press release	Yes, the media article does contain some elements of hype. It places a lot of emphasis on the negative impacts discussed in the research, rather than conveying the call to action (wash fruit and vegetables before consuming them) that was present in the press release

5. Results

In general, the similarity percentage between the selected media articles and the press releases they originated from was very high, with most articles drawing heavily on the supplied text and many of them using the text virtually unchanged. 20 out of the 40 (50%) articles analysed, had a similarity percentage of higher than 50%. Out of these 20 articles, 11 (55%) had a similarity percentage of higher than 90%. Two articles had a similarity percentage of 100%, but the electronic publication that they appeared on (News Everyday), is likely a news aggregator. Only 6 articles (15%) had a similarity percentage of less than 10%. The similarity percentage of the remaining 14 articles ranged between 11% and 49%.

The similarity of the results between the universities was very equally distributed, with 5 articles (50%) each from the Universities of Cape Town and the Witwatersrand, 4 (40%) from Stellenbosch University, and 6 articles (60%) from the University of Pretoria having a similarity percentage of 50% or higher. The results for articles with a similarity percentage of 90% or higher was similarly spread between the universities, with 3 of the articles with a similarity percentage of more than 50% each from the Universities of Stellenbosch, Cape Town and the Witwatersrand, and 2 articles from the University of Pretoria having a similarity of 90% or higher.

While reviewing the results of the similarity analysis done with *Copyleaks*, it became apparent that the software is very sensitive to changes in text and style. The similarity percentage for example, decreases when an article is shortened, even when the shortened article is still word-for-word the same as the original press release. In some instances, spacing and style differences such as when a word is broken down into syllables at the end of a line, or when text in the article is moved around, also result in a lower similarity percentage (although to a lesser extent). The impact of this is that a shortened article with slightly different spacing and styling, as well as a different heading and intro, might receive a substantially lower similarity percentage than what the actual similarity between the two articles is. This was confirmed during the qualitative analyses of the articles, as there were many instances where it was evident that the articles were even more similar than the percentage ascribed by the software.

In the qualitative analyses, it emerged that the majority of articles (25 out of 40 (62%)) are not attributed as originating from a university, nor is it indicated that the information contained in the article is based on a press release. Rather, in most cases it is implied that the published article is the publisher's own work product, for example, the by-line "Staff Reporter" is used, or the by-line is omitted all together. In some instances, although the by-line was attributed to a person not from the publication, no reference is made to their affiliation or to the article being a press release from the

institution. There was, for example, two instances (articles 4 and 5 from Stellenbosch University) where a by-line was attributed to Dr Alec Basson, with no reference made to his affiliation with the press office at Stellenbosch University. A reader could therefore interpret that the article is work product by the publication. This lack of transparency on the side of the publication, could pose a threat to the trust that the public places in the media for supplying them with accurate information that affects them (Bunz, 2009).

Only 11 of the 40 articles (27.5%) contained additional information to what was supplied in the press release from the institution in the form of, for instance, additional quotes or statements by other experts not mentioned in the press release.

Media article number 4 from the University of the Witwatersrand (“How flu vaccines can protect pregnant moms against whooping cough”) was an interesting case. Although the article carried on IOL had a similarity percentage of only 6% when compared to the press release, an article on the same subject picked up on *The Conversation* prompted a further investigation. When the *Conversation* article was compared to the IOL article, this revealed a similarity percentage of 87%. It therefore seems plausible that the press release from the university might have raised awareness of the issue or peaked media interest, which then prompted the use of the *Conversation* article that appeared a couple of days after the original press release was sent out by the university.

Article 5 from the University of the Witwatersrand (Mysterious ancient humans with brains like modern people prompt rethink of early evolution) covered research involving multiple universities and a lot of international collaboration between researchers. The news about this research appeared in several international publications, and the article seems to contain a lot of additional information (it has a similarity percentage of only 9%). While the press release from the South African university was clearly used as a source of information as can be deduced from the fact that there is some similarity, it is however possible that the correspondent wrote the article based on a press release from an institution in his home country (UK). It would be interesting to compare the article eventually carried in the publication against press releases sent out by some of the other institutions.

The additional information contained in the remaining articles, were in the form of quotes or opinions by other experts, or additional quotes by the researcher named in the press release, which implies that the researcher was contacted to obtain additional information while the journalist was working on the article. The amount of additional information added also varied between the different articles. Article number 9 (New coal plants to cost SA R19bn, push out renewables) which originated from an University of Cape Town press release, for example, used the content of the

press release virtually verbatim (90% similarity), only adding a quote from one additional source right at the end of the article.

With the exception of one media article (article number 9 in the University of Pretoria analysis: World first as lion cubs conceived artificially in SA), none of the media articles analysed contained any evidence of the person who wrote it having questioned the results of the research that was being reported on in any way. There were however instances where the results were related to current social or political concerns, such as in the case of article 2 from the University of Cape Town (Taxi conflicts drive rise of izinkabi, SA's killers for hire) and article 10 from the University of the Witwatersrand (Let there be light: Using home grown photonics to close the digital access divide).

Closely related to the question of whether a critical approach was taken to the results of the research, was the question as to whether there was a change in tone in the published article in comparison to the original press release. Only five articles (12.5%) reflected a change in tone in comparison to the original press release. Four of the five articles (80%) also contained evidence of hype, which was typically the reason for the change in tone. In the case of article 9 from the University of Pretoria (World first as lion cubs conceived artificially in SA) the change in tone in the article resulted from the critical approach taken by the journalist.

In 13 of the 40 articles (32.5%), evidence of hype was found to a greater or lesser extent in especially the titles, subtitles, or intros of the published articles. In 9 out of the 13 articles (69%), the hype in the headings, sub-headings or intros appears to have been introduced by the publication. In the remaining 4 articles the hype identified in the title was already present in the press release and consequently repeated in the media article. Three additional articles (articles 3 (Why baby pythons love a warm cuddle from mom) and 6 (SA scientist unveils groundbreaking fossil discovery) from the University of the Witwatersrand and article 9 (World first as lion cubs conceived artificially in SA) from the University of Pretoria) do contain words that may be interpreted as hype. In all three cases however, the results really were novel and the words "groundbreaking", "world first" and "first ever" in the respective articles to describe the research results in question may therefore actually be warranted.

It should be noted however that the process of evaluating whether an article contained evidence of hype was subjective. As shown above the use of words like "groundbreaking", "world first" and "first ever" could sometimes be warranted, which makes it difficult to base an analysis of whether hype is present in an article or not purely on a keyword search. A process was therefore followed whereby the full text of each news article and its corresponding press release was read and evaluated in its entirety. This was done by judging whether the language used in each document could be

considered extreme or specifically designed to attract attention, or to appeal more to the reader's emotions than to logic by, for example, using words such as "breakthrough", "ground breaking", etc. especially in cases where this was clearly not warranted.

6. Conclusion and recommendations for further research

Half of the articles analysed (20 out of 40 or 50%) had a similarity percentage of higher than 50%. Of these 20 articles, 11 (55%) had a similarity percentage of higher than 90% and two articles had a similarity percentage of 100%. Only 6 articles (15%) had a similarity percentage of less than 10%. The similarity percentage of the remaining 14 articles ranged between 11% and 49%.

This points to a very high similarity between the press releases issued by the four South African research universities included in the study and the articles based on these press releases that eventually appears in the media. This could be interpreted as confirmation of the statement by Murcott and Williams (2013) that the modern day role of journalists is merely to process supplied information, rather than critically evaluating it to ensure accuracy and quality editorial input. It could also be an indication that publishers view the institutions/universities included in the study as authoritative sources of information on research as proposed by a number of authors and discussed in an earlier section of this thesis (Murcott & Williams, 2013; Autzen, 2014; McKinnon et al., 2017).

Nonetheless, the effect is that publishers and editors do not question the information received from the university press office, as was also clear from the qualitative analyses of the articles wherein it emerged that, with the exception of one article from the University of Pretoria, none of the articles contained any indication of research results being critically evaluated before publication. It is also of some concern that the source of the information contained in the articles is so often obscured, or it is insinuated that a journalist at the publication produced the article, especially when content received from the institution is published virtually verbatim. This implies a lack of transparency on the side of the media outlet, which could ultimately erode the trust relationship between the publication and its audience, and ultimately, trust in science itself.

Another interesting observation from the analyses of hype in the media articles is that there was never a decrease in the amount of hype that occurred from press release to media article. In other words, it was more likely that if a press release contained elements of hype this would be carried over to the media article. At best, the amount of hype remained the same, while in many cases it was increased, but interestingly, it was never removed. This finding corresponds to the findings of Sumner et al. (2014 & 2016) discussed in a previous section of this thesis. It can also be seen as

another indication that the press releases are not evaluated critically by the publisher before being used.

The danger of this is that in a scenario where a press officer or scientist is measured (at least in part) on their ability to get media exposure for their work, these scientists/media practitioners might be tempted to hype up scientific results, in order to draw more media attention, and this will then be repeated in the media. This could also over time erode trust in science. There are already a number of studies that have made reference to the public's "hype fatigue" and distrust of information that appears in the press (Master & Resnik, 2013; Davis et al., 2014).

The implication of these results for science communication in South Africa is that communications and public relations practitioners at universities and other research institutions have to realise the extent of their responsibility towards practicing and promoting good science communication in the country. The sweeping changes that have characterised the media landscape worldwide, has obviously also had a marked effect on South African newsrooms, meaning that journalists have less time available to produce more content. The current media environment will also likely continue to make the practice of critical science journalism even more difficult in the future and uncritical communication of scientific results might tend to further erode trust in science. It might also create opportunities for the politicalisation of results, in other words to slant and hype articles to support a specific political agenda. It is therefore extremely important that the extent of the responsibility they carry in communicating science to the public, is communicated to science communicators and communications practitioners at these institutions, so that they can take up the responsibility and help bridge the growing gap between science and the media that is being perpetuated by the new media landscape.

6.1 Recommendations for further research

In this study, an attempt was made to see how press releases issued by universities are used in the popular media in South Africa. An interesting consideration for future research could be to turn the process around, using the media article as a starting point rather than the press release. One could start by identifying specific reputable publications that carry scientific content, then tracking and identifying research related articles, and determining their source. It could also be interesting to make a comparison between the identified source of the article and the abstract of the journal article that the research discussed is based on. This could then be followed by a similar analysis as conducted in this study.

Another interesting line of enquiry could be to evaluate the large number of opinion pieces by

academics in the South African media to determine what impact they are having on the public's perception of science, as an opinion piece, by definition, tends to be subjective. In this regard, articles that are written by academics and published on platforms like *The Conversation* could perhaps also be included.

7. References

- Ashwell, D. 2016. The challenges of science journalism: The perspectives of scientists, science communication advisors and journalists from New Zealand. *Public Understanding of Science*, 25(3), pp. 379-393.
- Autzen, C. 2014. Press releases—the new trend in science communication. *Journal of Science Communication*, 13(03), p. C02.
- Bauer, M. & Bucchi, M. 2007. *Journalism, science and society: Science communication between news and public relations*. London: Routledge.
- Bélair-Gagnon, V. 2013. Revisiting Impartiality: Social Media and Journalism at The BBC. *Symbolic Interaction*, 36(4), pp. 478-492.
- Bennato, D. 2017. The shift from public science communication to public relations. The Vaxxed case. *Journal of Science Communication*, 16(02), p. C02.
- Brewer, P. & Ley, B. 2013. Whose Science Do You Believe? Explaining Trust in Sources of Scientific Information About the Environment. *Science Communication*, 35(1), pp. 115-137.
- Bubela, T. 2006. Science communication in transition: genomics hype, public engagement, education and commercialization pressures. *Clinical Genetics*, 70(5), p. 445–450.
- Bunz, M. 2009. *How social networking is changing journalism*. [Online]
Available at: <https://www.theguardian.com/media/pda/2009/sep/18/oxford-social-media-convention-2009-journalism-blogs>
[Accessed 28 September 2018].
- Carver, R. 2014. Public communication from research institutes: is it science communication or public relations?. *Journal of Science Communication*, 13(03), p. C01.
- Claessens, M. 2014. Research institutions: Neither doing science communication nor promoting 'public' relations. *Journal of Science Communication*, 13(03), p. C03.
- Collins English Dictionary, 2018. *churnalism*. [Online]
Available at: <https://www.collinsdictionary.com/dictionary/english/churnalism>
[Accessed 5 August 2018].
- Coyaud, S. 2007. Science stories that cannot be told. In: M. Bauer & M. Bucchi, eds. *Journalism, Science and Society: Science communication between News and Public Relations*. London: Routledge, pp. 109-112.
- Currah, A. 2009. *Challenges: What's Happening to Our News*. [Online]
Available at: <https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2017-12/What%27s%20Happening%20to%20Our%20News%20An%20investigation%20into%20the%20likely%20impact%20of%20the%20digital%20revolution%20on%20the%20economics%20of%20news%20publishing%20in%20the%20>
[Accessed 28 September 2018].
- Davies, N. 2009. *Flat Earth news: An award-winning reporter exposes falsehood, distortion and propaganda in the global media*. London: Vintage.
- Davis, M. et al. 2014. “We became sceptics”: Fear and media hype in general public narrative on the advent of pandemic influenza. *Sociological Inquiry*, 84(4), p. 499–518.

- De Semir, V., Ribas, C. & Revuelta, G. 1998. Press Releases of Science Journal Articles and Susequent Newspaper Stories on the Same Topic. *Journal of the American Medical Association*, 280(3), pp. 294-295.
- Entradas, M. & Bauer, M. 2017. Mobilisation for public engagement: Benchmarking the practices of research institutes. *Public Understanding of Science*, 26(7), p. 771–788.
- Fuller, J. 2010. *What is happening to news: The information explosion and the crisis in journalism*. Chicago, Ill.: University of Chicago Press.
- Glanz, J. 1998. A media darling thrives on publicity. *Science*, 282(5390), pp. 868-869.
- Göpfert, W. 2007. The strength of PR and the weakness of science journalism. In: M. Bauer & M. Bucchi, eds. *Journalism, Science and Society: Science Communication between News and Public Relations*. New York(NY): Routledge, pp. 215-226.
- Gupta, N., Hamilton, K. & Chamot, J. 2013. Conveying Cutting-Edge Discoveries to Nonscientists: Effective Communication with Media. *JOM*, 65(7), p. 835–839.
- Harcup, T. & O’Neill, D. 2017. What is news? News values revisited (again). *Journalism Studies*, 18(12), pp. 1470-1488.
- Hermida, A. 2013. #Journalism: Reconfiguring journalism research about Twitter, one tweet at a time. *Digital Journalism*, 1(3), pp. 295-313.
- Hodgson, F. 1996. *Modern Newspaper Practice: A Primer on the Press*. 4 ed. New York: Routledge.
- Hujanen, J. 2018. Renegotiating the Journalism Profession in the Era of Social Media: Journalism Students from the Global North and South. *Journalism & Mass Communication Educator*, 73(3), pp. 282-292.
- Jackson, D. & Moloney, K. 2016. Inside churnalism: PR, journalism and power relationships in flux. *Journalism Studies*, 17(6), pp. 763-780.
- Jarreau, P. 2014. When quotes matter: impact of outside quotes in a science press release on news judgement. *Journal of Science Communication*, 13(04), p. A02.
- Johnston, J. & Forde, S. 2017. Churnalism. *Digital Journalism*, 5(8), pp. 943-946.
- Kiouis, S., Popescu, C. & Mitrook, M. 2007. Understanding Influence on Corporate Reputation: An Examination of Public Relations Efforts, Media Coverage, Public Opinion, and Financial Performance from an Agenda-Building and Agenda-Setting Perspective. *Journal of Public Relations Research*, 19(2), pp. 147-165.
- Kohring, M., Marcinkowski, F., Lindner, C. & Karis, S. 2013. Media orientation of German university decision makers and the executive influence of public relations. *Public Relations Review*, 39(3), pp. 171-177.
- Kovach, B. & Rosenstiel, T. 2001. *The elements of journalism: What newspeople should know and the public should expect*. First revised ed. New York: Crown Publishers.
- Kummerfeldt, I. 1975. University Public Relations. *Journal of Advertising*, 4(1), pp. 6-10.
- Lewis, J., Williams, A. & Franklin, B. 2008. A compromised fourth estate? UK news journalism, public relations and news sources. *Journalism Studies*, 9(1), pp. 1-20.

- Lewis, J., Williams, A. & Franklin, B. 2008. Four rumours and an explanation: A political economic account of journalists' changing newsgathering and reporting practices. *Journalism Practice*, 2(1), pp. 27-45.
- Macnamara, J. 2016. The Continuing Convergence of Journalism and PR: New Insights for Ethical Practice From a Three-Country Study of Senior Practitioners. *Journalism and Mass Communication Quarterly*, 93(1), p. 118–141.
- Marcinkowski, F. & Kohring, M. 2014. The changing rationale of science communication: a challenge to scientific autonomy. *Journal of Science Communication*, 13(03), p. C04.
- Marcinkowski, F., Kohring, M., Fürst, S. & Friedrichsmeier, A. 2014. Organizational Influence on Scientists' Efforts to Go Public: An Empirical Investigation. *Science Communication*, 36(1), pp. 56-80.
- Master, Z. & Resnik, D. 2013. Hype and public trust in science. *Science and Engineering Ethics*, 19(2), p. 321–335.
- McIntyre, K. & Sobel, M. 2017. Motivating news audiences: Shock them or provide them with solutions?. *Communication & Society*, 30(1), pp. 39-56.
- McKinnon, M., Howes, J., Leach, A. & Prokop, N. 2017. Perils and positives of science journalism in Australia. *Public Understanding of Science*, 27(5), pp. 562-577.
- Mensing, D. 2010. Rethinking (again) the future of journalism education. 11(4), pp. 511-523.
- Merriam-Webster Online Dictionary, 2018. *byline*. [Online]
Available at: <https://www.merriam-webster.com/dictionary/byline>
[Accessed 16 October 2018].
- Merriam-Webster Online Dictionary, 2018. *press release*. [Online]
Available at: <https://www.merriam-webster.com/dictionary/press%20release>
[Accessed 16 October 2018].
- Merriam-Webster Online Dictionary, 2018. *public relations*. [Online]
Available at: <https://www.merriam-webster.com/dictionary/public%20relations>
[Accessed 18 June 2018].
- Mitchell, A. & Holcomb, J. 2016. *State of the news media 2016*. [Online]
Available at: <http://assets.pewresearch.org/wp-content/uploads/sites/13/2016/06/30143308/state-of-the-news-media-report-2016-final.pdf>
[Accessed 28 September 2018].
- Murcott, T. & Williams, A. 2013. The challenges for science journalism in the UK. *Progress in Physical Geography*, 37(2), pp. 152-160.
- Nature Editorial, 2009. Cheerleader or watchdog? Science journalism is under threat. What can scientists do to help?. *Nature*, 25 June, 459(7250), p. 1033.
- New Jersey Institute of Technology, 2018. *How to Evaluate Information Sources: Identify Bias*. [Online]
Available at: <http://researchguides.njit.edu/evaluate/bias>
[Accessed 24 October 2018].

- Nielsen, L., Jorgensen, N., Jantzen, K. & Christensen, L. 2007. An exploratory study of credibility issues in astronomy press releases. *CAP Journal*, 1(1), pp. 5-9.
- Oxford English Dictionary, 2018. *hype*. [Online]
Available at: <https://en.oxforddictionaries.com/definition/hype>
[Accessed 25 August 2018].
- Rehman, J. 2013. *The need for critical science journalism*. [Online]
Available at: <https://www.theguardian.com/science/blog/2013/may/16/need-for-critical-science-journalism>
[Accessed 10 October 2018].
- Rensberger, B. 2009. Science journalism: Too close for comfort. *Nature*, pp. 1055-1056.
- Ridgway, A. 2018. Science journalism by a journalist for journalists. *Journal of Science Communication*, 17(01), p. R01.
- Rinaldi, A. 2012. To hype, or not to(o) hype. Communication of science is often tarnished by sensationalization, for which both scientists and the media are responsible. *EMBO Reports*, 13(4), p. 303–307.
- Rooney, R. 2013. Social media and journalism: The case of Swaziland. *Ecquid Novi: African Journalism Studies*, 34(1), pp. 100-106.
- Rowe, D. & Brass, K. 2011. We take academic freedom quite seriously': How university media offices manage academic public communication. *International Journal of Media and Cultural Politics*, 7(1), p. 3–20.
- Sachs, J. 2012. *Winning the story wars: Why those who tell—and live—the best stories will rule the future*. Boston, Massachusetts: Harvard Business Review Press.
- Saridou, T., Spyridou, L.-P. & Veglis, A. 2017. Churnalism on the rise? Assessing convergence effects on editorial practices. *Digital Journalism*, 5(8), pp. 1006-1024.
- Schmitt, C. 2018. Push or pull: Recommendations and alternative approaches for public science communicators. *Frontiers in Communication*, 3(Article 13).
- Selvaraj, S., Borkar, D. & Prasad, V. 2014. Media Coverage of Medical Journals: Do the Best Articles Make the News?. *PLoS ONE*, 9(1), p. e85355.
- Shipman, M. 2014. Public relations as science communication. *Journal of Science Communication*, 13(03), p. C05.
- Sissons, H. 2016. Negotiating the news: Interactions behind the curtain of the journalism–public relations relationship. *Journalism Studies*, 17(2), pp. 177-198.
- Sterne, G. 2010. Media perceptions of public relations in New Zealand. *Journal of Communication Management*, 14(1), pp. 4-31.
- Sumner, P. et al. 2014. The association between exaggeration in health related science news and academic press releases: retrospective observational study. *The British Medical Journal*, 349(g7015).
- Sumner, P. et al. 2016. Exaggerations and Caveats in Press Releases and Health-Related Science News. *PLoS ONE*, 11(12).

Trench, B. 2017. Universities, science communication and professionalism. *Journal of Science Communication*, 16(05), p. C02.

UK Science and the Media Expert Group, 2010. *Science and the Media: Securing the Future*. [Online] Available at: <http://webarchive.nationalarchives.gov.uk/tna/+http://www.bis.gov.uk/wp-content/uploads/2010/01/Science-and-the-Media-Securing-Future.pdf/> [Accessed 25 July 2018].

van Hout, T. & van Leuven, S. 2016. Investigating "churnalism" in real-time news. In: B. Franklin & S. Edridge, eds. *Routledge companion to digital journalism studies*. s.l.:Routledge, pp. 117-125.

Wehrmann, C. & van der Sanden, M. 2017. Universities as living labs for science communication. *Journal of Science Communication*, 16(5), p. 1f+.

Weingart, P. 2017. Is there a hype problem in science? If so, how is it addressed?. In: K. Jamieson, D. Kahan & D. Scheufele, eds. *The Oxford handbook of the science of science communication*. New York NY United States of America: Oxford University Press, pp. 111-118.

Weingart, P. & Guenther, L. 2016. Science communication and the issue of trust. *Journal of Science Communication*, 15(05), p. C01.

Wernick, A. 2006. Rebranding Harvard. *Theory, Culture and Society*, 23(2-3), pp. 566-567.

Wikipedia, 2018. *The Conversation (website)*. [Online] Available at: [https://en.wikipedia.org/wiki/The_Conversation_\(website\)](https://en.wikipedia.org/wiki/The_Conversation_(website)) [Accessed 25 October 2018].

Wylie, F. 1989. Ethics in College and University Public Relations. *Public Relations Review*, 15(2), pp. 63-67.