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Social network analysis and the examination of the white right

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Social Network Analysis and the Examination of The White Right

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Declaration

I, Thomas David Lancaster , declare that this proposal is my own, unaided work. It is being submitted for the degree of MA in the field of e-Science at the University of the Witwatersrand, Johannesburg. It has not been submitted for any degree or examination at any other university.

Signed:

Date:

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1 Abstract

This research paper used Social Network Analysis (SNA) to examine, evaluate the influence of Twitter and other online platforms on Solidarity and Afriforum, two of the most influential white, populist organisations in South Africa. Previous studies have conducted enquiries as to the history, structure, and policies of Solidarity and Afriforum. However, to the author's best knowledge, no academic studies have sought to examine and identity influential opinion leaders within a South African context. The paper aimed to use SNA to create a visual representation of the Twitter networks of Solidarity and Afriforum to identify the most influential opinion leaders

2 Introduction and Background

During the 2016 presidential election, then-candidate Donald Trump introduced the slogan, "Make America Great Again", to his political manifesto. This phrase came to symbolise the rise of white, populist politics around the world[1]. Trump's success in becoming the Republican candidate was primarily achieved by dominating the agenda of mainstream media via his use of Twitter[2] Trump was a party outsider and not a favourite candidate. Nevertheless, he won, primarily because of social media, mainly Twitter (though he also used YouTube and Facebook). His policies also featured prominently on television and in newspaper headlines. Many of Trump's social media positions were unconventional and unpopular, as they drew attention to right-wing agendas; however, this only served to garner him more attention[2].

In response to this new approach to expanding a support base, white supremacist groups such as the Knights of the Klu Klux Klan (KKK), as well Neo-Nazi groups, such as the Proud Boys, openly supported Trump's bid for election[3]–[5]. Underpinning Trump's 2016 campaign was a sense of white grievance, focusing on the white working class, who he posited, had not benefited from economic growth and trade deals. His campaign also highlighted issues such as affirmative action and political correctness, which he maintained negatively impacted their rights. This gave populist groups a legitimate platform from which to recruit new members.

Trump's presidency, and the rise of populist politics, is just one example of international discontentment over the failure of the political establishment to deal with issues such as globalisation, economic insecurity, mass migration, and soaring inequality, years[3]. This discontent has promoted the growth and increased visibility of right-wing populism. In response, politicians are increasingly making use of protectionist and nationalist policies to further their political agendas][1]. These policies are garnering support among sections of the global population who are disheartened by a perceived lack of autonomy, which is exacerbated by the perception that these problems are the result of the spread of multiculturalism[1]. The shifting demographics, such as the election of Donald Trump as President, as well as the recent migrant crisis in Europe, have served as critical catalysing events which have influenced the reemergence of white, populist politics in the United States and Europe[1].

Previous research within established fields of Psychology has attempted to explain this shift toward right-wing populism, through the lens of Relative Deprivation Theory[3], [6], and Inter-group Threat Theory[3]. A vital pre-existing condition for incidents of intergroup aggression is relative deprivation [7]. Relative deprivation generally refers to a perceived discrepancy between concrete attainments and what an individual or group believes they deserve[7]. Other research has focused on an apparent threat to social identity and status, resulting from the increased diversity that has accompanied the spread of multiculturalism and globalisation[8], [9]. In response to these ostensible threats, right-wing populist movements have created and implemented a variety of strategies to roll back the spread of multiculturalism[1].

In Europe and the United States, white populists' movements have designed and implemented their strategies based on the knowledge that they have a sufficient amount of mainstream support and a clear demographic advantage. Demographic dominance enables right-wing organisations in Europe and the United States to achieve formal political, or legislative power, to shift policy towards their goals. However, in South Africa, white populist organisations are a demographic minority[1]. This has constrained South African white populist organisations from gaining formal political power[1]. Instead, these organisations make use of the propagation of populist discourse by using social media in order to maintain white privilege and power[1]. It seems clear that the success of populists has primarily been achieved by an undue advantage with digital media, compared to how they would have fared in traditional media[2] Populists have traditionally been adept at using mass media. They depend on the premise that the mass media generally tends to adhere to professional norms. In contrast, social media's direct link to large numbers of people helps them to elude the checks and balance of traditional media[2]. In social media, there is less likely to be editorial control, so that minor incidents swiftly gain widespread attention[10] However, Bosch suggests that social media is not entirely detached from more traditional media platforms because, as they are far-reaching, they can influence mainstream news agendas. In this way, far-right groups use mainstream news, the internet, and the growth of social media, to reach out to a broader audience[10].

One of the first groups to use social media was the Boeremag, who were responsible for the 2002 Soweto Bombings. Their leader, van Rensburg, has been an inspiration for far-right heroes such as Harry Knoesen, Simon Roche and Steve Hofmeyer. The arrest of Harry Knoesen, the leader of the National Christian Resistance Movement (NCRM) in 2019, came after police confiscated caches of weapons and bomb-making materials. Knoesen has gained notoriety through social media

posts, which call on white South Africans to arm themselves to take back the privileges they lost after the 1994 election. On his Twitter account, Knoesen announced that his focus is "on securing the future of white supremacy in South Africa" [10]

This story has broader implications as social media has allowed South Africa's white supremacists to join global, right-wing networks. Simon Roche, the leader of The Suidlanders, an Afrikaner survivalist group, marched with other white supremacists at the Charlottesville, Unite the Right, march in 2017. Social media allows easy access to far-right propaganda and has provided a clandestine world where the far-right can grow their support base[10].

Within a South African context, the advent of democracy and, in particular, policies such as Broad-Based Black Economic Empowerment (BBBEE) have served as catalysts for white populist organisations[1]. The formally whites-only trade union Solidarity successfully made their opposition to BBBEE a central issue within their process of restructuring and transforming populist discourse in post Apartheid South Africa[1]. However, in more recent years, the discourse surrounding land expropriation and a perceived war against white Afrikaner farmers have become a significant focus of the populist white right in South Africa[1].

The Solidarity movement and their subsidiary Afriforum have successfully adapted their methods and goals in adjusting to the new social environment created by the collapse of the Apartheid system. In 2001 the previously whites-only Mineworkers Union (MWU) adopted a new name, Solidarity[1]. The newly adopted name served to symbolise the transition from a small right-wing, white supremacist trade union to a popular movement with a role to play within the new South Africa[1]. Flip Buys spearheaded the rebranding of Solidarity. Buys was appointed as General Secretary in 1997 and began restructuring and rebranding the MWU to make it relevant in post-apartheid South Africa. Solidarity developed and deployed a new discourse, with a new language and ideology[1]. This modern discourse was centred around a new slogan, "We protect our people", which was adopted following the implementation of affirmative action in 1998[1]. The populist ideals and methods employed by Solidarity, echo some of the beliefs espoused by "Make America great again", as it uses populist, white identity politics, to galvanise people into accepting the rebranding, and reformation of the trade union[1]

Solidarity and Afriforum form the largest and most visibly active white, populist organisation in South Africa[1]. The Solidarity movement is the primary driving force behind a reinvigoration, and reimagination, of white populist identity politics in a democratic South Africa[1]. The Solidarity movement has recently adopted a far more forceful approach characterised by anti-establishment standpoints, which include renewed calls for autonomy and cultural nationalism. This strategy is seen

as a response to alleged corruption and growing evidence that points to a systematic failure of the state, embodied by the Zuma administration[1]. However, this anger is not merely directed at the Zuma administration or the African National Congress (ANC), but at all black South Africans, whom Solidarity portrays as a homogeneous, threatening majority, whose aim is to destroy white livelihoods and cultural identity[1]. This demonstrates that the underlying ideology of Solidarity and Afriforum is not merely one of white protectionism but is underpinned by racial beliefs [1], that has been a core part of the movement since its inception. The origins of Solidarity, previously the Mine Workers Union (MWU), sheds some light on the ideological framework, which allows the Solidarity movement to continue to function in a new, democratic South Africa[1].

The modern Solidarity movement originated from events that took place following the collapse of Apartheid and the advent of democracy in South Africa in 1994[1]. Solidarity and Afriforum, who started by fighting for workers' rights and the promotion of white civil rights, transformed into a vehicle for the dissatisfaction felt by portions of the white population at the end of Apartheid and the beginning of an egalitarian, democratic system of government[1]. According to Solidarity, the advent of democracy and the end of the Apartheid system is the central cause of many white South Africans' distress. [1]. They view the end of white minority rule in South Africa as nothing short of a betrayal of their traditional way of life[1], [11].

For many decades before the collapse of the Apartheid system, white South Africans, in particular Afrikaners, benefited from a system that allocated the majority of state resources to a minority of the population[1], [12]. The collapse of this system meant that many Afrikaners found that their closely held worldview, history and identity, had been shattered[1], [12]. The re-making of national symbols, the propagation of a new discourse centred on nation-building, and multiculturalism, which was seen to be embodied by the work of The Truth and Reconciliation Commission, resulting in the attrition of the once deep-rooted beliefs of Afrikaner history, identity and morality[1], [13], [14].

Previous studies have suggested that some white South Africans have struggled to accept their new status as a minority group in the new South Africa[1], [15] Perhaps in response to this new status, individual sections of the white community have made attempts to maintain white privilege within the context of the newly founded government of majority rule[16]. Bosch suggests that there is a 'tendency for disregarded parties to gain more leverage in groundbreaking media domains than in coverage by established media actors'[17]. Many white Afrikaners retreated from the threat posed by the seemingly hostile, democratic system[18] They

set about adopting a defensive, party line, centred around post-Apartheid, victimhood, and marginalisation, in an attempt to revisit white power, privilege and the racist, ideological belief system, long associated with Apartheid[19]–[21]. This approach includes a focus on minority rights that incorporates a more inclusive definition of Afrikaner identity that is based on language[1], [22]. Furthermore, past research suggests that the depoliticising dynamics of contemporary late-stage capitalism, and its emphasis on individual freedom and choice, has served to dilute collective ethnic identification[1]. This indicates that Afrikaners' post-Apartheid sense of ethnic identity varies widely both in terms of intensity, relevance, and meaning[16].

Populism serves as the central tool and technique of the Solidarity movement. Populism is a concept without a definitive and commonly agreed definition. However, within the public domain, there are two dominant interpretations[23]. Firstly, populism describes and refers to everyday discourse among the general population[23]. This everyday discourse is often emotional and unsophisticated and aims to challenge modern politics, with simplistic answers to complex and challenging problems[23]. While this definition may have value as a necessary explanation, it is not apposite to an operational concept within the academic world[23]. Secondly, populism refers to the opportunistic political ideologies which are used to court potential voters, securing their short term support[23]. Examples of these populist political methods are lowering taxes right before an election or making extravagant promises without additional costs[23]. The proposed paper will be adopting this second definition proposed by Mudde (2004).

The concept of political populism is said to have a central logic; namely, a constant struggle between an inherently honourable, homogeneous people, pitted against a set of all-powerful elites who are represented as depriving the sovereign people of resources and, more importantly, their rights[20], [24]. In the case of Solidarity, the elites are comprised of both black and white citizens. This group of elites' primary aim is to remove power from certain sections of the white population in South African society[1]. Using political populism, Solidarity has sought to transform a white supremacist organisation into a civil rights movement focusing on fighting for the rights of white South African, Afrikaners[1]. Solidarity, therefore, seeks to concentrate its discourse on the diminution of white economic power and mobility, both in the past and the present, in an attempt to maintain white privilege in the new South Africa[1]. In order to remain relevant within the new political climate, Solidarity has been forced to sanitise and obscure its history[1]. This process of recasting history is a central goal of both Solidarity and Afriforum. The process has been well documented in two recent studies conducted by van Zyl-Herman (2018)

and Boersema (2020).

Solidarity invents and then propagates the myth that whites lifted themselves out of poverty without any external or state-based assistance,[1] while paradoxically demanding that black South Africans should be able to pull themselves out of poverty in the same manner[1]. However, Solidarity has excluded the critical narrative of how the state, founded on the principles of white supremacy, tackled poverty amongst whites, directly assisting the white population during the great depression in the 1930's [1], continuing until the collapse of Apartheid. Thus, Solidarity aims to reinvent and recast the past to place the Afrikaner minority in a more positive light[1]. The primary aim of this discourse strategy is to remould the past in an attempt to obscure racial privilege and white supremacy to cast the white population in a more palatable historic light[1]. This sanitised discourse around the history of Solidarity is communicated to its members, employees and potential members through Solidarity's in-house media apparatus, which includes magazines, newsletters and electronic communications[1]. This communication strategy consists of a traditional mainstream media presence as well as a social media presence on several commonly used social platforms. Previous research has demonstrated that right-wing and far-right-wing groups have been early adopters of online methods to make use of the participatory culture that exists at the heart of social networking sites[25] to increase and enhance their visibility and legitimacy[25], [26], to directly or indirectly influence the political process[25].

The solidarity movement has exploited its carefully crafted media strategy to maintain and extend its central message, which is that white South Africans are living in a hostile country. This is illustrated by the establishment of the 2015 crisis council[1]. The actualisation of the belief that white South Africans are under threat is crucial to the movement's ability to maintain relevance and allow them to achieve their limited political goals[1]. The 2015 Crisis Council was formed to frame a response to the sense of growing misfortune within the country[1]. However, despite their talk of unrelenting and impending hardship, there has been no visible change in the party line[1]. It seems that the ongoing crisis is the gradual loss of white privilege and power[1]. Solidarity capitalises on this fear of inequity and prejudice by positioning themselves as spearheads of white human rights. This message has enabled Solidarity and Afriforum to continue recruiting new members to its cause. [1].

This paper makes use of Social Network Analysis (SNA) to gain an understanding of how Solidarity and Afriforum utilise social media, in particular, Twitter, within the movements larger Media strategy. While SNA represents a growing field with applications for the current time, the origins of the method go back some 80 years[27].

Social network analysis provides a way to visualise a social network, allowing researchers to identify communities, groups or even individual online social actors within a network[28]. The primary aim of SNA is to study relationships within a group of online social actors and the interactions between online social actors[29]. The Methodology of SNA provides researchers with a means of generating graphic and mathematical data, which represents human generated interactions within a social network[29]. Network graphs are made up of nodes; representing each online social actor and edges, which allow for the visualisation of the relationships and connections between individual, online social actors[28]. Relationships between nodes, which may be individuals, groups or entire communities, are represented graphically in network graphs representing the edges between the nodes[29]. The arrangement of nodes and edges is referred to as network topology and provide the researcher with additional information regarding the network[30]. Centrality measures, among other reference points, are often used by researchers to display the relative importance of each node within the network[28]. Nodes with higher centrality nodes are suggested to play a more central role within the network[28]. SNA has previously been applied to diverse fields of study in order to examine a variety of different characteristics, which highlight relationships between nodes, which illustrate relationships between online social actors within the network[29]. SNA was chosen for this research paper as it provides a sound method of understanding how Solidarity and Afriforum have used Twitter as part of the movements' larger media strategy. The decision to source data from the online social networking site Twitter was made because it allowed access to an extensive historical dataset.

Twitter has become one of the most widely used social media platforms, with over 330 million users as of May 2020. It has been widely utilised for academic research due to the accessibility of data, made possible by a patently open application programming interface (API). This has made Twitter a valuable fund for the study of online human interactions[28]. Twitter is a social networking platform that was created in 2006 as a platform dedicated to personal expression that enables millions of online social actors to interact within the minimalist framework of micro-blogging[28]. A significant feature of Twitter's micro-blogging service is the real-time nature of the SNS, in which users may write and post multiple tweets a day[28]. A large number of tweets and updates leads to multiple reports from the bigger user base, which are connected to real-world events[28]. Furthermore, Twitter allows its users to create messages of 140 characters, as well as allowing users to follow each other without any prescribed reciprocity[28]. Therefore, a user who is being followed is not required to reciprocate, making Twitter a directed network[28]. Solidarity and Afriforum both have active Twitter accounts used by the

union as part of their overall media strategy. The rapid rise of this new source of data has led to innovative ways of conducting original types of research and has led to a broader reflection on the role of the internet as a resource[25]. This radicalisation process does not focus on winning elections or taking political power. However, it attempts to move mass media into more reactionary directions by destabilising traditional viewpoints[10] Previous studies have used this new resource to examine far-right social networks and discourse[31]–[34], indicating that social networking sites do represent a viable source of data.

The development of online social media platform, and the availability of large sums of accessible data, allows users to access radical opinions, which can change their assumptions regarding many social and political issues[35]. The far-reaching impact of social media allows easy access to far-right propaganda, as well as such from white genocide to unproven myths about Covid-19[10]. Networks in the context of Twitter are, in general, organically generated by individual social actors, the topology of which may provide an indication of opinion leadership characteristics[36]. A Twitter network is often formed around individual social actors, having conversations around mutually exciting and essential topics, using the same hashtags and the tweets and retweets shared within the community. This communication represents the connections or edges of the network[36]. Retweets may or may not be reciprocal; this means that their reciprocity and direction are a signpost towards the connectivity and attitudes of a network[36]. A network created in this way may be formed by two highly polarised groups, significantly interconnected within the network but narrowly connected between them[36]. Polarised networks may be formed by liked minded people around opposing perspectives on the same topic; for example, the vaccine and anti-vaccine debate[37]. Twitter networks may also be formed around a single highly influential social actor, often visualised as a star-shaped network, who acts as the primary source of information dispersion[36]. Single highly influential online social actors may also act as gatekeepers of information, providing a bridge connecting groups that may otherwise never connect directly[36]. The nature of social networks within the context of Twitter allows for individuals to exert influence over the wider network to which they belong. These individuals are often referred to as opinion leaders.

Therefore, the Twitter-based media strategy employed by Solidarity and Afriforum is reinforced and driven by opinion leaders such as Flip Buys and others within the Solidarity and Afriforum leadership structure. However, due to the nature of Twitter networks, individuals with no official ties to Solidarity or Afriforum may play an important role in disseminating the union's media strategy. The concept of opinion leadership is founded in the theory of two-step flow of information, which

asserts that opinions or ideas flow from mass media to opinion leaders[35]. Opinion leaders are then able to disseminate this information to their followers within the broader social network[35]. In this theory of opinion leadership, it is assumed that the opinion leaders hold traditional advantageous positions within their social networks[35]. Opinion leaders are, therefore, able to collect, spread and filter the flow of information between mass media and their followers to adhere to their agendas[35]. Twitter has provided a platform in which single individuals may be viewed as trusted topic experts who can exert influence within their network in a manner that was not possible before the establishment of social networking sites[36]. The development of social networking sites has led to questions regarding the correctness of the traditional two-step theory of opinion leadership and information dispersion and the characteristics that may describe opinion leaders in the online environment.

Social actors who post new information regularly may also be viewed as experts about a particular topic that is of importance to the community[36], whether the social actor is, in fact, a recognised expert in the offline world or not. In the context of Twitter networks, conversations and communities can be formed around hashtags, with some of these social actors becoming experts or opinion leaders if they possess a significant follower base and strategic connections within the community, allowing these opinion leaders to control the flow of information[36]. Opinion leaders within these communities would be able to decide which information is shared with the network, thereby potentially exerting influence over the distribution of opinion within the network[36]. Within polarised, online social networks, these opinion leaders may not be scientists or journalists[8]. The opinion leaders within the network may not be judged on reliable, traditional credentials, but instead, they may be evaluated through agreement within the social network[36]. The solidarity movement has proved to be successful in exploiting traditional forms of discourse, as well as making use of opinion leadership in reinforcing the narrative adopted by the movement[1]. However, the extent to which Solidarity, Afriforum or their online proxies can influence the flow of information within their network is unclear. This question is of particular importance, as this paper will attempt to investigate the success of Solidarity's concerted strategy of discourse dispersion. Social network analysis is advocated to be an effective and relevant method in the study of opinion leadership, as well as the dispersion of information within an online social network[36], [38].

Twitter has created the infrastructure that allows any individual or organisation within the network to transmit information and potentially become an opinion leader, regardless of socioeconomic status or legitimacy[35]. Additionally, opinion

leaders on Twitter do not necessarily act as honest brokers between the media and the rest of the network[35]. Instead, they push their agendas, which at times may compete with, or attempt to discredit, the narrative of the traditional media[35]. Academic interest in identifying the most influential users within a social network has long been an area of study [39], with the addition of newly created data and networks; provided by the creation and propagation of SNS like Twitter, interest in this subject has only increased. The identification and examination of influential users within an online social network have been applied to numerous applications, including viral marketing and, more importantly, information propagation[39]. However, despite the increasing interest in the identification of influential users within an online social network, a significant conceptual problem remains unresolved[39]. This conceptual problem concerns a clear and agreed-upon definition of what is meant by an influential user[39]. The lack of a widely agreed definition has meant that there is no standard framework or set of statistical measures that can be applied to SNA[39]. Therefore, the current study employed a multi-measure approach to the analysis by utilising multiple centrality measures to provide a detailed analysis of the collected data.

Within this online context, it is unclear whether Solidarity and Afriforum have made full use of online social networks. This leads to an open question regarding whether Solidarity and Afriforum are the most influential opinion leaders within their online social network? The present study aims to create a graphical representation of the Twitter network associated with Solidarity and Afriforum to answer the research question. An online social network is commonly visualised as a graph, in which nodes represent the individual users; or organisation, and the edges the interpersonal connections that exist within the network[39]. Gauging the importance of an individual node within an online social network is often done through the application of centrality measure[39]. The centrality of a node refers to the nodes relative importance within the particular network to which it belongs[39]. There is a significant body of previous research, on the use of centrality measures, in regards to the pursuit of identifying the most influential users within a social network[39], [40]. Put simply, opinion leaders within a network are expected to present higher centrality scores. A higher centrality score indicates that an opinion leader is well connected to other nodes within the network and can disseminate information to a broader audience.

The current study aims to use centrality measures as the primary statistical tool in identifying the most influential opinion leaders within the Twitter network connected to Solidarity and Afriforum. To the authors best knowledge, no previous research has sought to examine the Twitter network connected to Solidarity and

Afriforum.

Twitter and other online social networks have led to the decentralisation of conventional sources of news, and therefore, pose additional questions about who the opinion leaders are within this online social networks[35]. The rise of Twitter has created an environment where Solidarity and Afriforum may not be the most centralised opinion leaders within their online social networks. This leaves an open question regarding the nature of the opinion leaders and the flow of information within Solidarity's' online social network.

Solidarity currently counts over 350 000 members throughout South Africa and is considered to be the wealthiest Non-profit Organization (NGO) operating within South Africa[1]. Through rebranding and creating a new discourse, Solidarity has begun the process of reinventing the concept of racism by changing the dialogue to focus on the tribulations of their white supporters. This is necessary to maintain their defence of white privilege and power[1]. Much online research is being done on the growth of white populist politics within a global context, but more research is required to understand these movements within a South African environment. Two recent studies conducted by van Zyl-Herman (2018) and Boersema (2020) have examined the discourse used by Solidarity. These studies included an examination of Solidarity employees' speeches and posts by in-house media. These studies provide a detailed account of the reemergence of Solidarity as well as the populist tactics employed by this movement. However, this researcher could not find any recent research that had examined Solidarity and Afriforum's online social network presence. The proposed study, therefore, aims to conduct a Social Network Analysis (SNA) in order to create a visual representation of the online social network connected to the Solidarity movement in order to identify and measure the relative importance; primarily in terms of centralisation, of opinion leaders within the network. In pursuit of this aim, the current paper attempted to answer the following research question:

RQ1: Who are the most central opinion leaders within the Twitter networks of Solidarity and Afriforum?

This study aimed to fill a gap in the current literature by examining the Twitter network associated with the Solidarity movement and Afrifourm, the largest and most influential white populist organisation in South Africa[1]. While previous studies have conducted studies that examine both the structure and the discourse of Solidarity and Afriforum, to the authors best knowledge, no academic studies have sought to examine the online presence, as represented by the movements' Twitter network and community connected to Solidarity and Afriforum. The recently adopted methods that have evolved out of traditional SNA are suggested as being

an essential and valuable tool in drawing insight out of the vast amounts of data produced daily by social networking sites.

3 Methodology

3.1 Research Design and Background

An observational approach was adopted by conducting a Social Network Analysis to identify the most influential opinion leaders within a sample of the Twitter network, connected to the Solidarity movement and its subsidiary Afriforum. Social network analysis aims to examine and evaluate relationships within a group of individuals who interact with each other within the constraints of a social network[29], in this case, a Twitter network. Social network analysis is viewed as a growing field due to the significant amount of data produced by the emergence of the internet. However, the area of social network analysis stretches back more than 80 years[27]. Social network analysis allows researchers to pinpoint individual social structures within larger groups, as well as identifying individuals actors within online communities[27]. The methods employed within the field of SNA allow for the comparisons of different online communities. Additionally, social network analysis is viewed to be an effective methodological framework in the examination of information dispersion within a social network[36]. Within the context of a Twitter network, the distributions of tweets, retweets and mentions serve to effects the distribution of the network[36].

Due to the vast amount of data produced daily by social networking sites; such as Twitter, there is a natural tendency to make use of software to analyse and visualise collected social network data[27]. The current study used three software packages to collect the data, build and transform the data, and finally, visualise and analyse the data.

The data was collected for the current paper using the python library Twitterscraper. Twitterscraper allows the user to bypass certain limitations imposed the Twitter's search API. Twitterscrpaer is limited only by the user's bandwidth, allowing the user to collect more tweets than the Twitter API search tool usually allows. Additionally, Twitter's search API limits the user by only allowing access to tweets less than seven days old. Twitterscraper provides the user with the ability to collect tweets within any date range specified by the user. For example, the current paper collected tweets that used the hashtags Solidarity and Afriforum between October

2009 and May 1st, 2020. Hashtags were used to identify and collect relevant data as this method appears to be the norm within SNA and, particularly, when dealing with Twitter data. Additionally, Solidarity first created a Twitter account in October 2009. Therefore, it was decided to set a date range that included the establishment of the union's Twitter account. Due to the current study's limitations, data collection was limited to May 1st due to the time constraints. Despite the utility of Twitterscraper, the library does include certain limitations with regards to the returned data. In particular, Twitterscraper does not return the follower count, the number of retweets or mentions. Therefore, the collected Twitter data was then transferred into the open-source statistical software R, where further data was collected and added to the data set.

The open-source statistical software R was used to collect further twitter data as well as transforming the raw data into a suitable format for visualisation and analysis. The primary package used by the current study was Rtweet. Rtweet was used to collect further data, including the follower count for each of the unique twitter users within the more extensive data set and retweet and mention count. The dyplr and tidyverse packages were used to create a node and edge list from the transformed data. It was decided to focus on creating a retweet network graph as this would provide more information around opinion leader influence and information dispersal; rather than a simpler follower network. Retweet networks have been widely utilised on Twitter for information dispersion[41]. By retweeting online social actors not only share information but may publicly agree or disagree with the shared information[41], which may be particularly important concerning opinion leaders. Once the data had been transformed into a node and edge list, the data was transferred to the open-source visualisation software Gephi.

Gephi is an open-source data visualisation software that has been used in exploratory data analysis, link analysis, biological network analysis and social network analysis. Gephi was chosen as the primary visualisation software due to the inbuilt metrics and centrality measures. Gephi is also well suited to process large network graphs while producing visualisations that enabled answering the primary research question posed by the current study. The analysis made use of inbuilt layout algorithms in order to visualise the network better. The Force Atlas 2 algorithm was chosen and applied to the network data; the resolution was set to 0.9. The Force Atlas 2 layout algorithm originates from the set of force-directed algorithms. The Force Atlas 2 algorithm improves on the Force Atlas algorithm by striking a balance between the accuracy of the final layout and speed. These elements make the Force Atlas 2 algorithm a suitable choice for large datasets. Several final network visualisation was produced using Gephi, which formed the basis of the final data

analysis.

It was decided to employ a multi measures approach in the course of the analysis, as suggested by Himelboim (2017), in order to gain a fuller understanding of the distribution of the network[38]. The measures were primarily based on centrality measures. Centrality is viewed as a measure that has proved to help quantify the importance of nodes and edges within a network graph[28]. The data analysis made use of Eigenvector centrality, Degree centrality, Indegree and Outdegree, and Betweeness centrality. Additionally, the paper employed a Modularity algorithm to identify community clusters within the network.

3.2 Data

The data set consisted of 156 151 unique tweets and 27 906 unique Twitter users. A retweet network was created and then transformed into a node and edge list before being transferred into the open-source data visualisation tool Gephi. The retweet network contained 32 948 nodes and 139 368 edges. The final graphical representation of the networks was anonymised to protect the identities of the individuals online social actors. However, identifying information connected to accounts held by public figures, such as politicians or activists, may be included in the final paper. The data was collected from Twitter using the Python application twitterscraper as well as the R package Rtweet. Due to the limited scope of the research project, it was decided to limit data collection to Twitter and exclude other potential data sources. The data collected examined tweets produced between 2009 and May 1st, 2020.

3.3 Measures

This paper conducted a social network analysis to identify the most central opinion leaders within the Twitter network associated with Solidarity and Afriforum. The Methodology's that have grown within social network research and analysis have generated graphic and mathematical methods of representing human interaction within the context of a social network[29], [42]. A social network structure is created when connections, known as links or edges, are formed between social actors, known as nodes[38]. Traditionally, research into social networks focused on the individual relationships between social actors; however, with the rise of social media, this focus has shifted to the examination of relational traits between social entities[38]. By examining collections of edges that are formed between social actors or groups of social actors, patterns of communication and structure may be

extracted and analysed[38]. Social networks found on Twitter are composed of individual online social actors and the connections that they form with other online social actors when they mention, retweet and reply to one another[38].

Relationships between nodes, which may be individuals, groups, communities, countries or companies, are represented graphically, while interactions between actors are represented as paths between nodes[29]. These relationships may include many types of nodes, including; economic, relational, motivational, communications, emotional or family-based nodes[29]. SNA falls within network science, which is viewed as a broad approach to research and academic investigation that makes use of a relational lens to examine a wide range of domains, including biological, physical, social and informational systems[43]. The current study creates several visual representations of the Twitter networks connected to the Solidarity movement and its subsidiary Afriorum and statistical measures developed within the field of SNA.

The current paper made use of the Methodology and measures outlined in Himbelboim et al. (2017) in attempting to answer the research question[38]. In order to answer the proposed research question, the proposed paper aims first to understand the overall structure of the network to gain an understanding of how information can flow throughout the network[38], with the primary aim of identifying the most influential social actors within the network.

To gain an initial understanding of the network's overall structure, the paper used several packages within the open-source statistical software R to create a visual representation of the network. In addition, the proposed paper will make use of the measurement metrics outlined in Himeboim et al. (2017). These metrics will include:

1. Centralisation
2. Density
3. Clustering and Modularity

Centralisation is a measure that describes the dispersion of centrality of nodes through the network[38]. For example, if a particular node is connected or linked to the majority of the rest of the nodes in the network, then this would reflect a high centrality score[38]. Centrality is viewed as a crucial measure in potentially identifying well-connected individuals who may act as opinion leaders within the network. The current paper made use of several centrality measures to gain a greater understanding of the overall structure of the network, as suggested by Himelboim (2017). The data analysis made use of three centrality measures within the analysis:

1. Betweenness Centrality

   Betweenness centrality refers to a statistic that measures the number of the shortest paths that pass through a particular individual node within a network[27]. This measure is suggested to measure the degree to which information or social interactions are mediated; have to flow through a particular node[27]. Additionally, betweenness centrality is suggested to be useful in measuring an online social actor's importance as an intermediary within an online social network[27], often referred to as Intermediation. Higher betweenness centrality suggests a higher level of connectivity within the network[44], which may suggest that these online social actors may act as brokers of information within the network[45].

2. Degree Centrality

   Degree centrality refers to the statistical measure, which is used to describe the number of ties that a particular node has within the wider network[46]. The degree value of a node is suggested to indicate the ability of any given node to receive information flowing through a network[46]. In the context of Twitter, Indegree centrality purportedly reports the

   In the case of a directed network, such as Twitter, two additional centrality measures are usually calculated; Indegree and Outdegree centrality[46]. Indegree refers to the number of ties that have been directed towards a node, and Outdegree refers to the number of ties that a node has directed out into the network[46]. Indegree is often used as a proxy for the level of a node of popularity, while Outdegree may be associated with the level of the activity of a node within the network[46].

3. Eigenvector Centrality

   Eigenvector centrality is a statistic that can quantify the relative importance of a node within a wider network[47]. A nodes score is higher when a node's connections are, in turn, highly connected[47].

   Eigenvector centrality was the primary measure used within the analysis to identify opinion leaders within the network. Eigenvector centrality is able to make use of network information to quantify the influence of a particular node

within the network[48]. Previous research has suggested that eigenvector centrality is the most suitable measure of influence within a retweet network as it goes beyond simply measuring the number of retweets or the number of people who have retweeted an individual's tweet[48]. Additionally, the measure is also able to calculate the relative level of influence associated with the users who are retweeting a particular users tweet[48].

Centrality measures were calculated using the open-source data visualisation software Gephi 0.9.2.

Network density is represented as the ratio of the number of vertices that exist within a network when compared to the maximum possible number of vertices that could exist within a given network[38]. Density values may range between 0 and 1. Density is viewed as being a useful measure that can represent the interconnectivity of social actors within a network; how well connected are the social actors who populate the network[38]. The levels of Density are directly connected to the ability of information to flow through a particular network[35], [38]. For example, information is better able to flow through well connected or high-density networks than through loosely connected or lower density networks[35], [38].

Modularity is a measure that is useful in determining the level of clustering within a network. Modularity can capture the extent to which clusters within a network are connected or disconnected from each other[38]. Modularity values may range between 0 and 1. Identifying and measuring the characteristics of clusters within a particular network can provide valuable information regarding the understanding of the flow of information within a network[38]. Modularity was calculated using the inbuilt modularity algorithm utilised by the open-source data visualisation software Gephi 0.9.2.

4 Results and Discussion

The analysis's primary aim was to identify the most central opinion leaders within the Twitter network connected to Solidarity and Afriforum. The social network analysis was able to create a visual representation of the Twitter networks associated with Solidarity and Afriforum. Throughout the application of the Centrality measures, the analysis revealed that Afriforum was more influential within the context of Twitter. Online actors who present with higher centrality scores were identified as opinion leaders. More central online actors have greater access to the rest of the network, thus allowing these opinion leaders more opportunity to disseminate information. Afriforum was shown to have larger centrality scores across all centrality measures utilised within the analysis.

The centrality analysis revealed that high ranking member of both Afriforum and Solidarity were identified as influential opinion leaders with the network. Additionally, organisations connected to both Solidarity and Afiforum were identified as influential opinions leaders. In particular, Afriforum's youth league was identified as an account that was consistently shown to have a large centrality score.

The analysis was also able to identify both public figures and private citizens who were shown to have large centrality scores. Therefore, indicating that these accounts were exerting influence over the network despite having no formal ties to Solidarity or Afriforum.

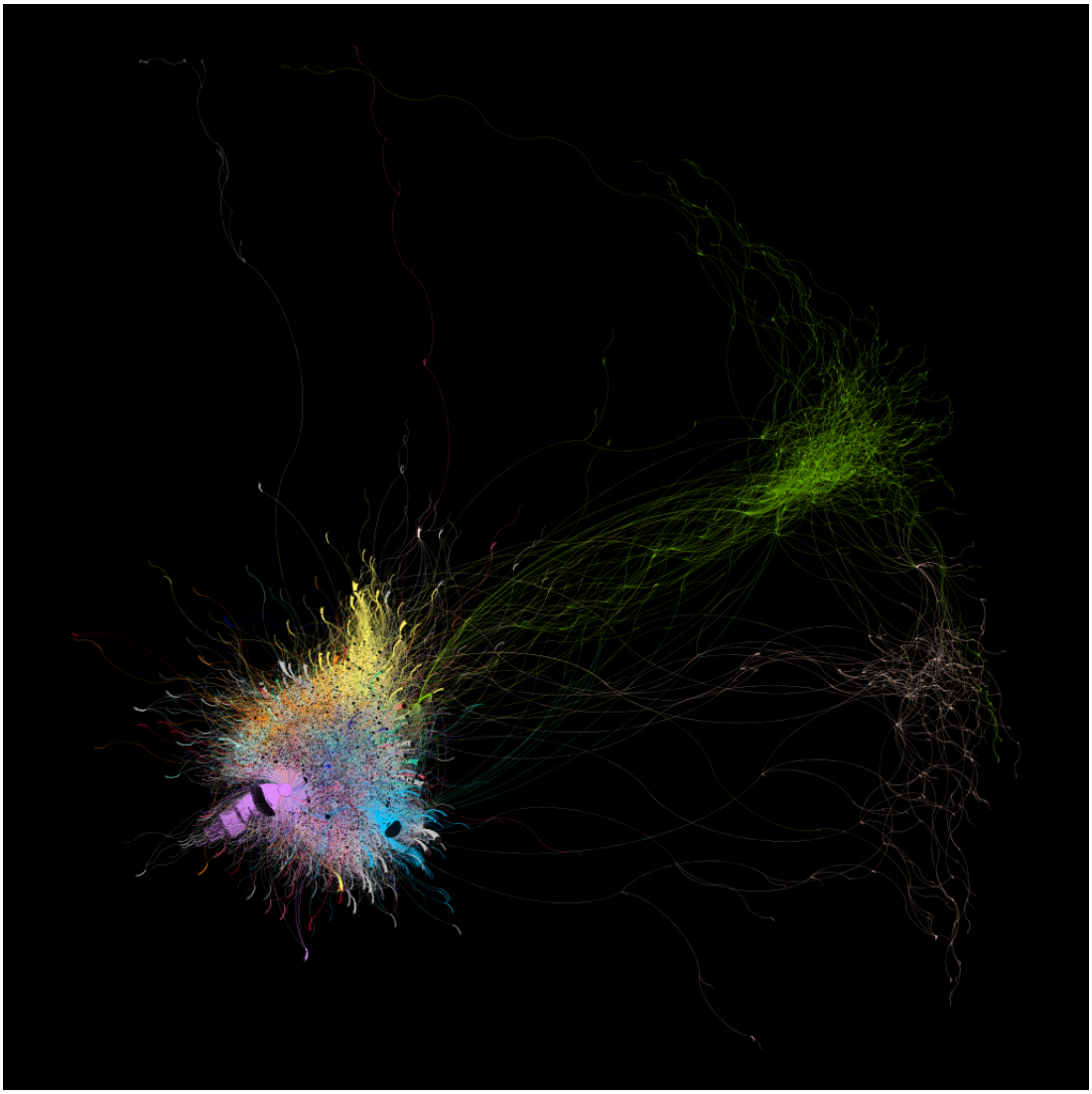
The presentation of the results was divided into three parts, representing the three measures that were utilised in the analysis, namely Centrality, Modularity and Density.

4.1 Eigenvector Centrality

Eigenvector centrality was calculated using the existing centrality function contained within the open-source data visualisation software Gephi. The initial Eigenvector calculation was calculated and applied to the entire network; this included the Twitter accounts for Solidarity and Afriforum. The size of each node in the network is determined by the nodes Egienvectort centrality calculation. The network

graph can be seen in figure 3.1 below. Additionally, Modularity was calculated using Gephi and applied to the network graph represented by the differently coloured nodes and associated edges. Each different colour represents a sub-community within the more extensive network which the modularity algorithm has identified.

FIGURE 4.1



The Force Atlas 2 algorithm was applied to the network to visualise the network; this algorithm is included in Gephi. The Force Atlas 2 algorithm is commonly used within the field of social network analysis and is suitable when working with large datasets.

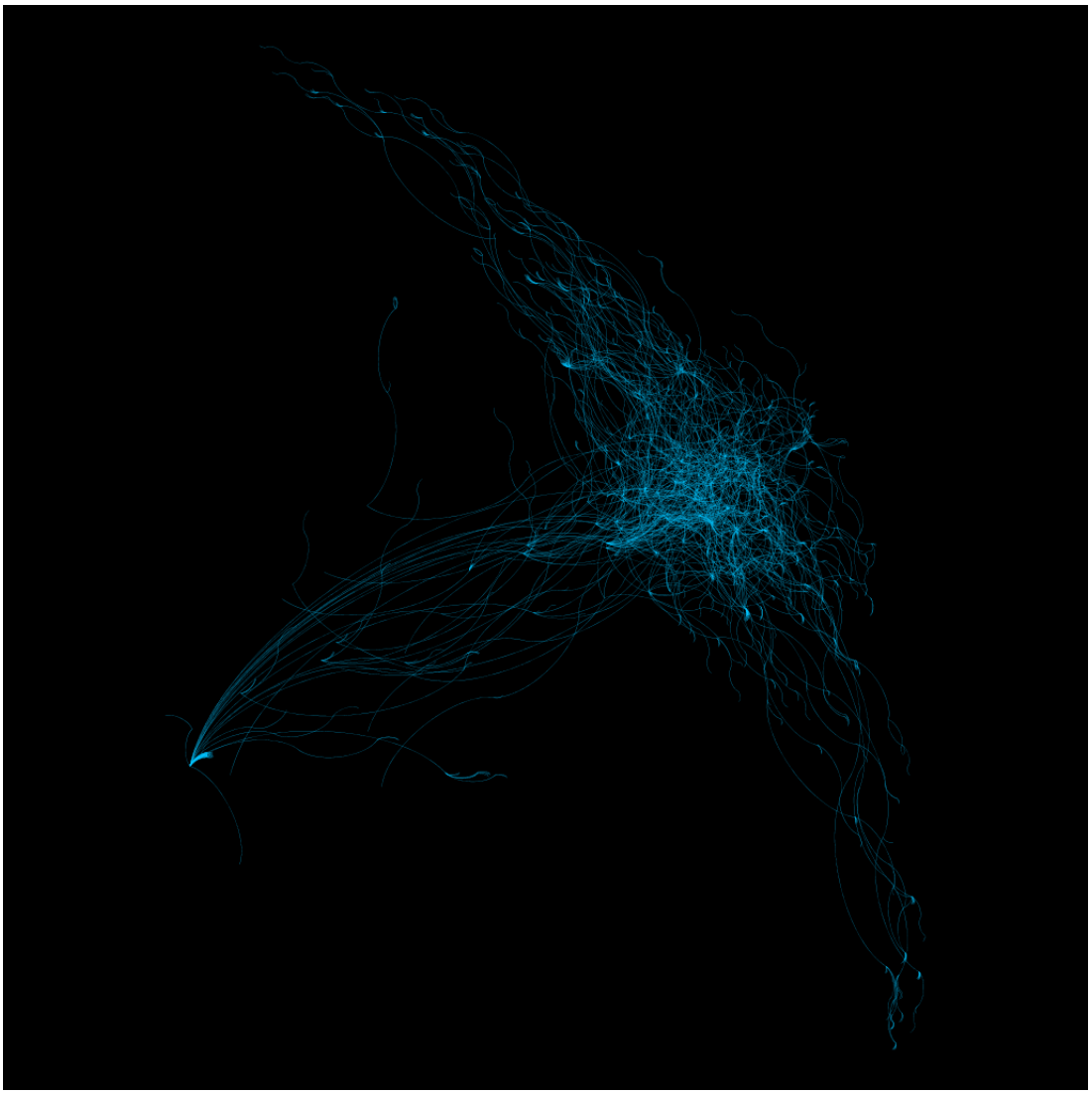
Two separate, more sparsely populated communities extend outwards from the central star-shaped structure. These two smaller communities have fewer direct connections to the central star-shaped central structure and fewer individual nodes. As seen in figure 3.2, represented in blue, the larger of the two outlying structures comprises businesses, political parties, and politicians based in the Netherlands. This

community is connected back to the main star-shaped structure by a single individual. The nodes Twitter handles suggests that the individual is promoting information denouncing the murder of farmers in South Africa. This individual node appears to form a bridge between the large star-shaped structure and two smaller periphery clusters on the network's edge. This individual may be an expatriate South African who is attempting to bring attention to important issues.

Additionally, the second outlying structure comprises Twitter accounts representing politicians, political parties, and private individuals who appear to be primarily based in Finland. The Finland network is connected back to the central network by the same individual node that serves as a bridge to the Netherlands cluster. This cluster is also connected to the main star-shaped structure by a few bridging nodes, as seen in figure 3.2.

The two periphery clusters may result from expatriate South Africans who have remained engaged with the issues that Solidarity and Afriforum and seek to gain support or exposure within their adopted countries.

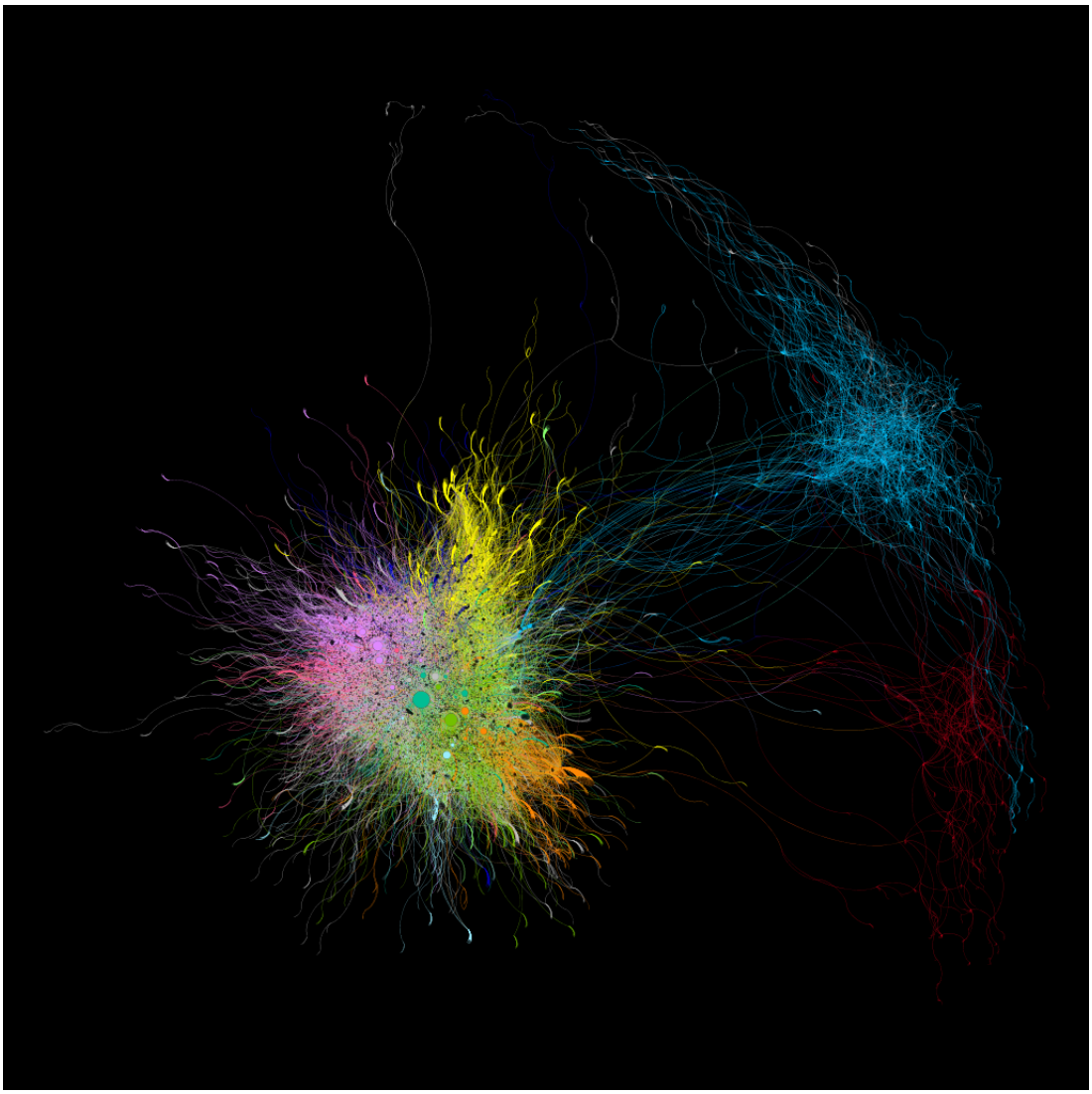
FIGURE 4.2



Afriforum was shown to be the node with the highest Eigenvector score of 1.0. Afriforum is represented in purple as calculated using the modularity function in Gephi. Solidarity proved to be the second-highest scoring node with an Eigenvector score of 0.34. These results were expected due to the collection method used to acquire the data. In particular, the hashtag search, focusing on the hashtags solidarity and Afriforum, led to the prominent place of both the Solidarity and Afriforum nodes. However, despite Afriforum having created a Twitter account over a year after Solidarity, Afriofrum has produced a significantly higher Eigenvector score. This may suggest that Afriforum has been more successful or at least active in making use of Twitter when engaging with and passing on vital information to the public. It is unclear whether this result was due to a concerted effort made by the union to utilise Afriforum in the online environment. As Solidarity and Afriforum were expected to be the most influential opinion leaders in the complete data set, it was

decided to remove the nodes representing both Afriforum and Solidarity for the remaining analysis. This would allow the visualisation and identification of the most influential opinion leaders within the network. The network graph may be viewed in Figure 3.3 below.

FIGURE 4.3



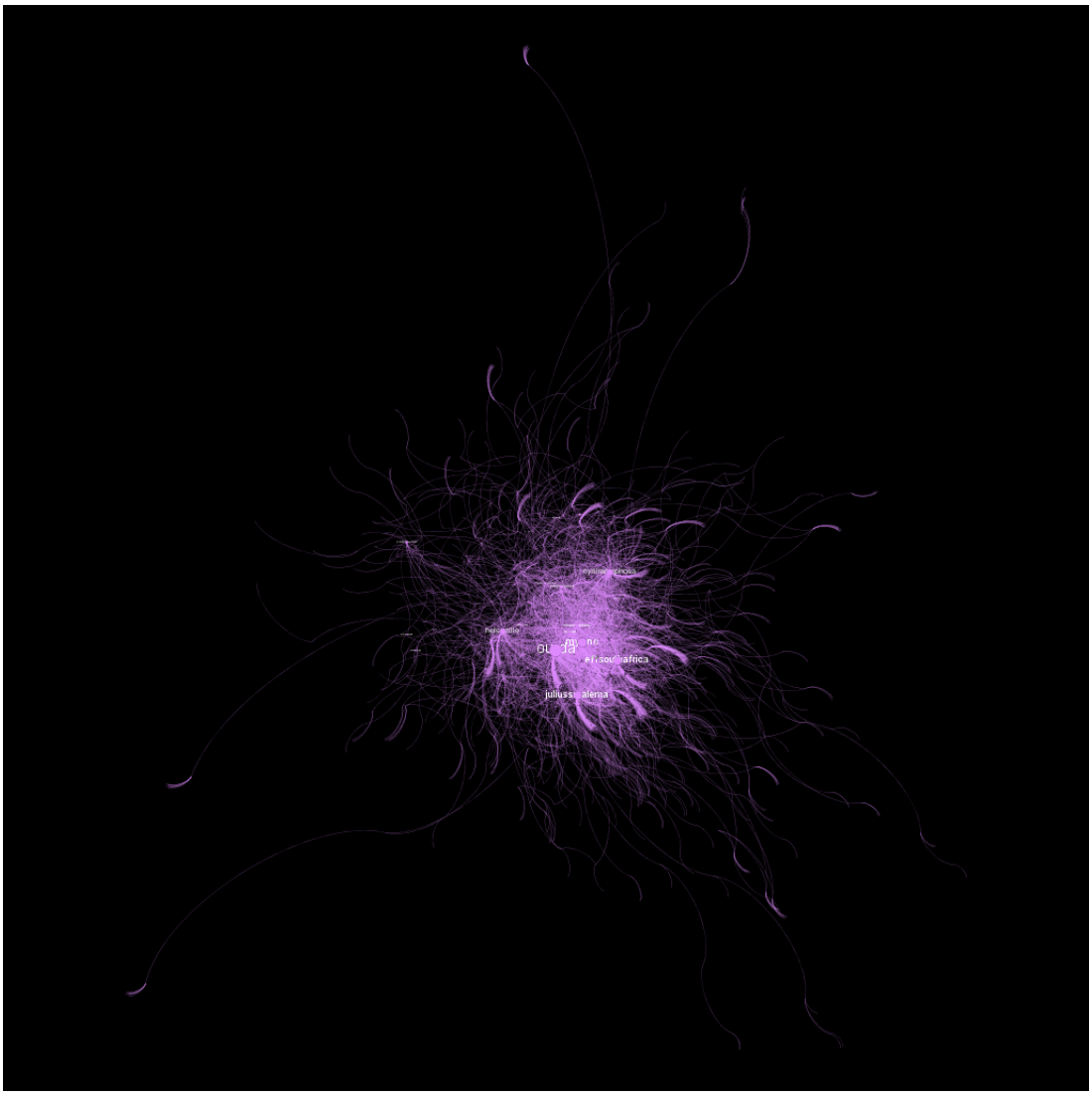
Ernst Roets was shown to be the individual node with the highest Eigenvector value, with an Eigenvector score of 1.0. Ernst Roets is currently serving as the deputy CEO of Afriforum, a position he has been in since his appointment in 2011. Within the network graph, Roets has significant connections to the youth wing of Afriforum as well as Kallie Kriel, currently the CEO of Afriforum. This result suggests that individuals employed in prominent positions by the union, in particular Afriforum, have been active on Twitter. The Eigenvector score suggests that Roets

and other prominent union employees have played an influential role in the dispersion of information and community engagement within the network. It is unclear whether this is a concerted strategic effort on the part of the union as a whole or down to individual decisions made by the individuals involved, which are illustrated by high-ranking individuals such as Roets as a central online social actor within the network.

South African musician and right-wing activist Steve Hofmeyr was shown to be the second most influential online social actor with the network with an Eigenvector score of 0.75. Hofmeyr seems to form an essential part of the wider network. The network graph shows that Hofmeyr has significant ties to Afrifoum's youth and DA politician Helen Zille. The modularity algorithm has classified Hofmeyr as a hub of his separate community within the wider network, indicating his influence within the network. The network graph also shows that Hofmeyr has strong ties to Maroelamediam, which describes itself as an independent news organisation that focuses on news within the Afrikaans community. This connection appears to mirror the two-stage flow of information, with Hofmeyr possibly amplifying information published by the Maroelamediam. It is, therefore, possible that Hofmeyr acts as an information broker between more traditional media platforms and the online social actors within his wider network. The graph suggests that Hofmeyr may be viewed as an influential opinion leader about Eigenvector centrality, particularly when considering that Hofmeyr has no formal relationship with Solidarity or Afriforum.

The opposition political party, the Democratic Alliance (DA), is the third most influential online social actor in Eigenvector centrality, with an Eigenvector score of 0.58. Represented by the Twitter handle ourda, the DA is at the centre of a cluster of South African political parties and individual political actors, as seen in figure 3.4. This group comprises organisations such as the ruling African National Congress (ANC) and the Economic Freedom Fighter (EFF). Prominent individuals include current president Cyril Ramaphosa, DA political agent Helen Zille, the leader of the EFF Julius Malema and former leader to the DA Musi Maimane. The network graph suggests the political parties and mainstream political agents are playing some role within the dispersion of information throughout the network. Despite Solidarity and Afriforum not seeking formal political power, interactions within their network suggest that the narrative is being spread and, in some cases reaching the mainstream political actors and organisations. The cluster may be viewed in figure 3.4 below.

FIGURE 4.4



The network graph suggests that Afriform has made good use of their youth wing's Twitter account, which show notable levels of centrality within the network. The Twitter account run by Afriforum's youth organisation was the fourth most influential opinion leader; in terms of Eigenvector centrality within the network with an Eigenvcetor score of 0.46. Afriforum's youth league has significant connections to both Ernst Roets and Steve Hofmeyr. Additionally, Afriforum's youth league has significant ties with Maroelamediam and Kallie Kriel and Helen Zille. Within the youth leagues network, three Afrikaans news organisations feature prominently, including Netwerk24, the Beeld newspaper, and Jacaranda News. It may perhaps, be expected that the union's youth league should be occupying a more central role than it does in the network, considering that a younger cohort of the population is generally more active on social media.

The current CEO of the Solidarity union Dirk Herman was shown to be the fifth

most influential opinion; in terms of Eigenvector centrality, with an Eigenvector score of 0.45. Herman is shown to primarily connected to Kallie Kriel, the current CEO of Afriforum. Additionally, Herman shows connections with Maroelamediam as well as politician Helen Zille. This result does suggest that both the leader of Solidarity and Afriforum have been active within the context of Twitter.

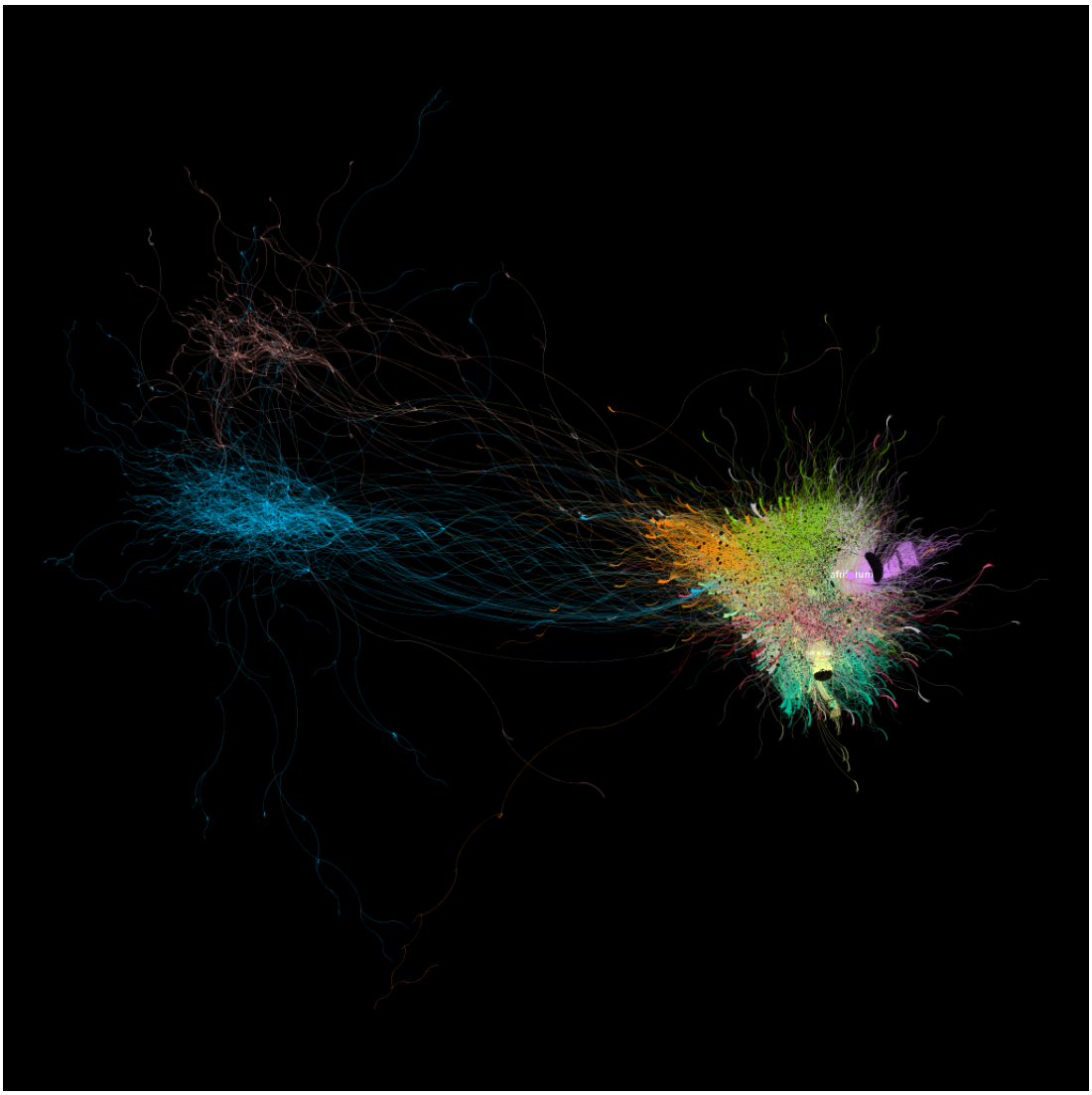
This result is another indicator that Solidarity and Afriforum have taken an active role in disseminating information throughout their own Twitter network. Several high ranking members of both Solidarity and Afriforum were shown to hold central positions, according to Eigenvector centrality, within the network.

4.2 Betweeness Centrality

Betweenness centrality was calculated and applied to the entire network using the open-source data visualisation software Gephi. The Force Atlas 2 layout algorithm was applied to the network to visualise the network structure better. The modularity algorithm within Gephi was calculated and applied to the network to identify and visualise sub-communities within the network. Each identified sub-community is assigned a different colour, which is applied to both the node and edge. The initial Betweeness centrality calculation was run on the entire network, including both Solidarity and Afriforum. The network may be viewed in figure 3.5.

The overall structure of the network retains a similar topology when compared to the Eigenvector network graph. The Betweeness network graph dominated by the nodes representing Solidarity and Afriforum with two periphery sub-communities, connected by relatively few edges, ranged at the network's edge. Afriforum was shown to have the highest Betweeness centrality measure with a score of 2.61, followed by the node representing Solidarity with a Betweeness centrality score of 1.51. This result shows that Afriforum again proved to be more central; in terms of Betweeness centrality, and therefore, better able to disperse information than Solidarity. It is unclear whether a strategic decision was made for Afriforum to take the lead regarding the union's Twitter network. However, the results appear to show that Afriforum is more influential than Solidarity within the context of Twitter.

FIGURE 4.5



With the nodes representing Solidarity and Afriforum removed, the analysis again continued by identifying the most influential online social actors according to Betweeness centrality. The overall topology of the network remained relatively stable, with a central cluster connected to two peripherally sub-communities extend out to the edge of the network. The node that produced the largest level of Betweeness centrality represented the Afriforum youth league, with a Betweeness centrality score of 1321389.32. This very large score may indicate that the network is dominated by a few very influential nodes, the primary source of Intermediation. Afriforum's youth league shows significant interaction with Morelamedia, again suggesting an interaction between a traditional news source and an influential opinion leader; in this case, a formal structure of Afriforum. The youth league was also shown to have ties with an online social actor with the Twitter handle toxinews. Toxinews appears to be a right-wing leaning independent news account expressing

dissatisfaction with the ANC-led government and the political parties liberal ideology. The youth league was also shown to connect to the Solhelpendehand; a charity organisation connected to the solidarity movement, which focuses on uplifting community programs, primarily within Afrikaans communities. This is suggested to show further cooperation between Solidarity and Afrifoum. The youth leagues were also shown to have retweeted a significant amount of the nodes own tweets, possibly suggesting the league's attempts to amplify their online message further.

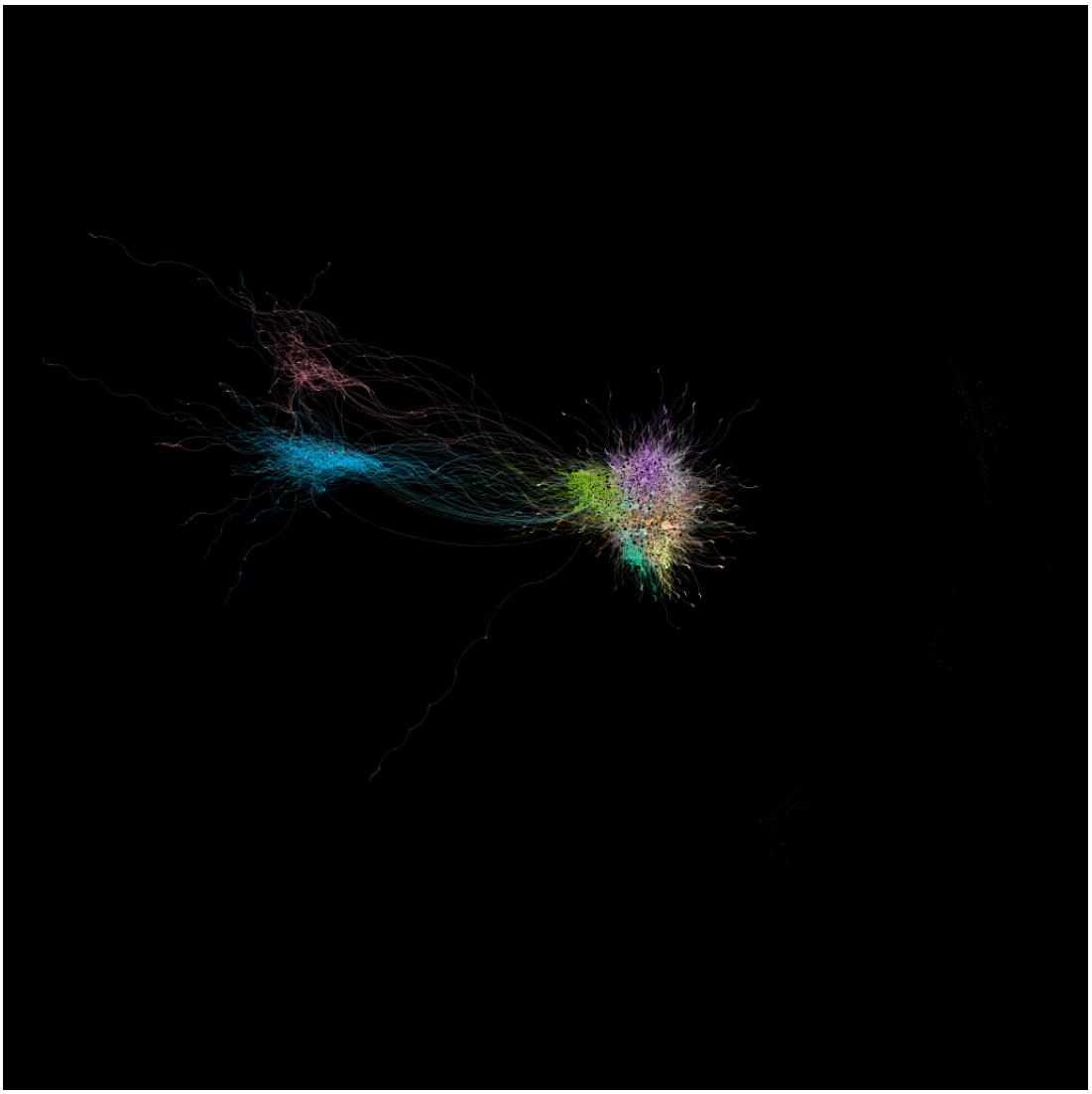
Maroelamedia was shown to be the second most influential opinion leader; in terms of Betweeness centrality, with a Betweeness centrality score of 1062563.06. As previously stated, Maroelamediam shows significant ties with the Afriforum youth league. Additionally, the newspaper was shown to have significant interactions with Kallie Kriel, the current CEO of Afriforum. Maroelamediam was also shown to have significant ties to the previously identify toxinews account.

Toxinews; the right-wing leaning news account, was identified as the third most influential opinion leader in terms of Betweeness centrality, with a score of 922767.36. Toxinews showed significant ties with both Morelamediam, the Afriforum youth league as well as Dan Root. Roodt is an Afrikaans author and commentator who in 2019 participated in a campaign seeking to retain the right to display the Apartheid era national flag. Roodt displays a right-wing ideological stance through his Twitter platform, with recent Tweets lamenting the fall of the white supremacist Rhodesian regime in April 1980.

Solhelpendehand was shown to be the fourth most influential opinion leader in terms of Betweeness centrality with a score of 821691.57. Solhelpendehand showed ties with both the Afriforum's youth league as well as Kallie Kriel. Additionally, Solhelpendehand shows ties with Maroelamediam. Further evidence of a close connection between Afriforum and Solidarity within the online realm of Twitter.

Kallie Kriel was shown to be the fifth most influential opinion leader within the network in terms of Betweeness centrality with a score of 605404.20. Kriel was shown to have significant ties to Afriforum's youth leagues as well as Morelamediam. Additionally, Kriel was shown to have significant ties with Afrikaans right-wing author Dan Roodt.

FIGURE 4.6



4.3 Indegree Centrality

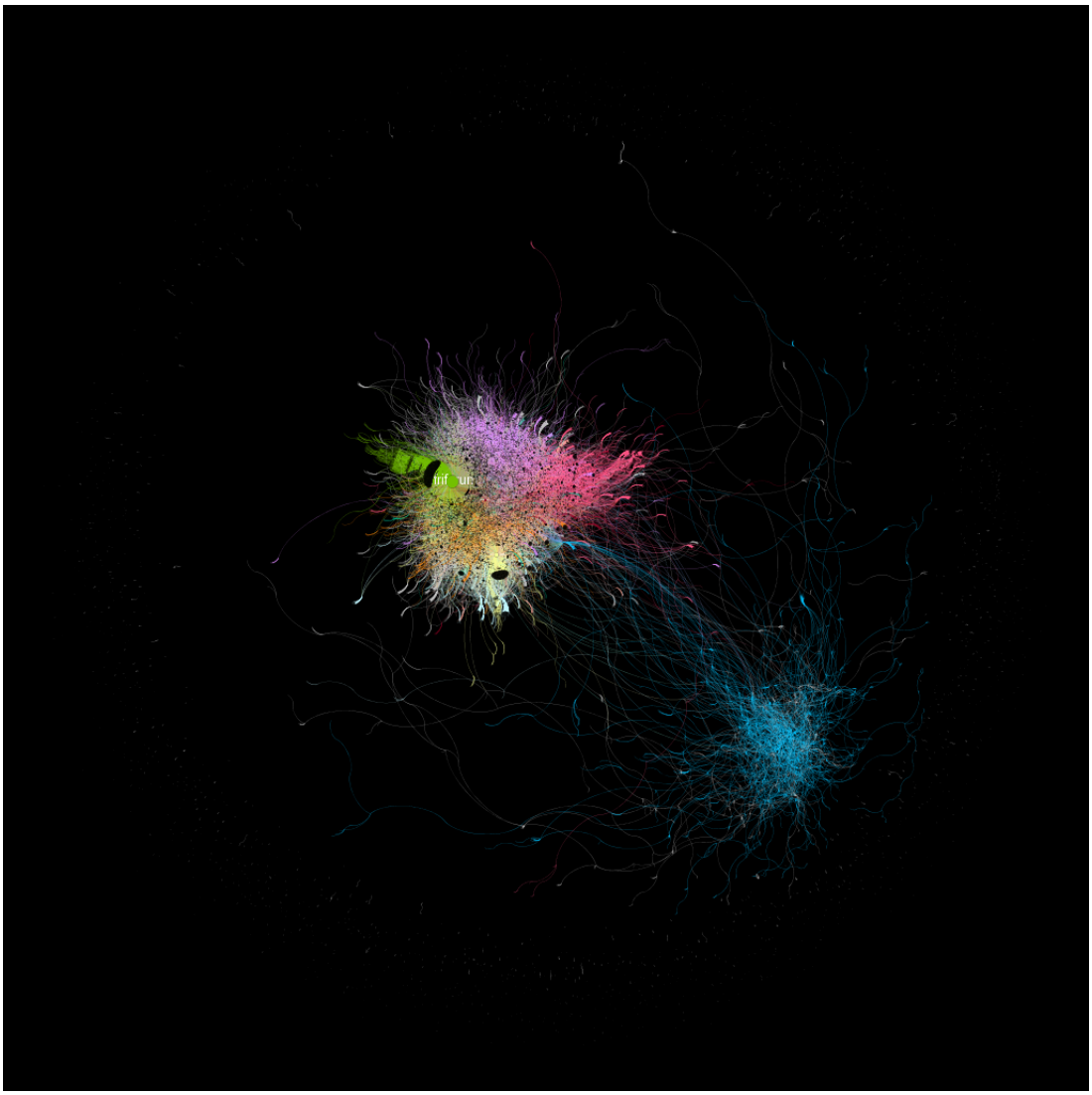
Indegree centrality was calculated and applied to the entire network using the in-built function found within the open-source data visualisation software Gephi. The Force Atlas 2 layout algorithm was again applied to the network using a resolution of 0.9. The modularity algorithm contained in the Gephi software was calculated and applied to the network in order to identify sub-communities within the overall network. Each identified sub-community was assigned a different colour applied to each node and edge within the unique sub-community.

The Indegree centrality results showed that Afrifourm and Solidarity again dominated the network, with Afriforum producing a score of 7753 and Solidarity scoring

2500. Afriforum was again proving to be more central than Solidarity in terms of Indegree centrality. The overall topology of the network proved to be different when compared to Eigenvector and Betweeness centrality. While the central star-shaped structure remains the dominant feature of the network, the Indegree network did not produce the two periphery sub-communities. Instead, a single sub-community is present; seen in blue in figure 3.7.

When examining this outlying structure, both the cluster representing accounts representing companies, political parties and politicians originating from the Netherlands is now far more closely grouped with the cluster representing nodes from Finland. This reorganisation of the topology of these two clusters is likely a result of the application of the Indegree centrality measure to the network.
The Indegree centrality results showed that, including Afriforum and Solidarity, the network was dominated by ten nodes with high Indegree centrality scores. Therefore, to better understand the network, the nodes representing Solidarity and Afriforum were removed.

FIGURE 4.7



With the nodes representing Solidarity and Afriforum removed, the network's topology remained stable with no significant changes.

Ernst Roets was shown to have the largest Indegree score, with a score of 1084. Roets was shown to have significant connections to Kallie Kriel, Moroelamediam and right-wing author Dan Roodt. Additionally, Roets was shown to have connections with the Afriforum youth league and toxinews.

Afrikaans musician and activist Steve Hofmeyer was shown to have the second-highest Indree centrality score, with a score of 792. Hofmeyer was shown to have a significant connection to DA politician Helen Zille and Afriforum's youth league, Maroelamediam, Toxinews and Dan Roodt. This result reinforces previous evidence suggesting that Hofmeyer plays an essential role within this network and may be considered an opinion leader.

The official Twitter account for the Democratic Alliance, ourda, was shown to have the third-highest Indegree centrality score, with a score of 728. Interestingly, ourda did not appear to have a meaningful connection to other accounts. As this result was produced by applying Indegree centrality, this may suggest that online social actors who are engaging with the Solidarity and Afriforum network are also engaging with the DA. Whether this engagement is positive or negative is unclear and would require further study, focusing on text analysis.

The official Twitter account run by the African National Congress, MyANC, was shown to be the node with the fourth-highest Indegree score, with a score of 535. In the same vein as ourda, MyANC did not show any connections with other accounts. Instead, all activity was inbound, suggesting that online social actors engage directly with the ANC through retweets and mentions. It is again unclear whether this engagement is positive or negative.

The official account for the Economic Freedom Fighters, effsouthafrica, was shown to be the node with the fifth-highest Indegree score, with a score of 448. Unlike the DA or ANC accounts, effsouthafrica shows a strong connection to Kallie Kriel. There have often been historical tensions between the EFF and Afriforum. Both organisations are on the opposite edge of the political and ideological spectrum. The graph clearly shows that there is a significant engagement between the two organisations.

Indegree centrality purports to indicate which nodes within a network are the recipient of inbound traffic[46], in the case of Twitter, this may take the form of mentions or retweets. Ernst Roets and Kallie Kriel seem to have taken on a role of authority within the network. They were viewed as an individual whom supporters of Solidarity and Afriorum may share information, concerns etc. Additionally, Roets position may be making him the target of individuals or organisations who disagree with the unions' ideological stance. This is illustrated by the strong connection between the EFF and Afriforum CEO Kallie Kriel, who produced the sixth-highest Indegree score. Political parties have also shown a strong influence in terms of Indegree centrality. This result may be expected, as community engagement between political parties and individuals is a common occurrence on Twitter.

Future research could focus on examining further the connection between the Democratic Alliance and Solidarity. The graph suggests that there is an interaction between the DA, Solidarity and Afriforum.

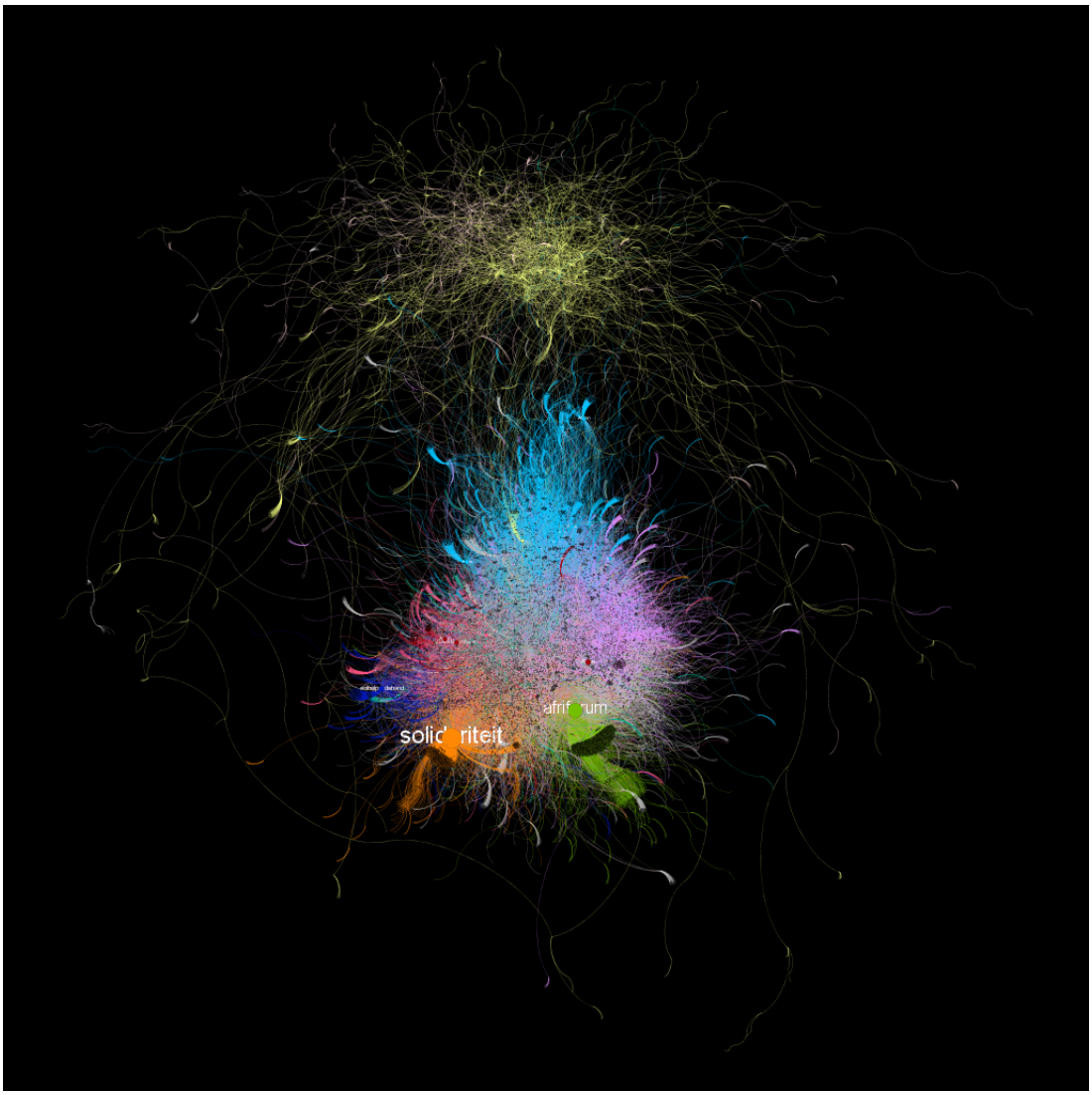
4.4 Outdegree Centrality

Out-degree centrality was calculated and applied to the entire network using the in-built average degree function in the open-source data visualisation software Gephi.

The Force Atlas 2 layout algorithm was again applied to the network at a resolution of 0.9. The modularity algorithm contained in the Gephi software was calculated and applied to the network in order to identify sub-communities within the overall network. Each identified sub-community was assigned a different colour applied to each node and edge within the unique sub-community.

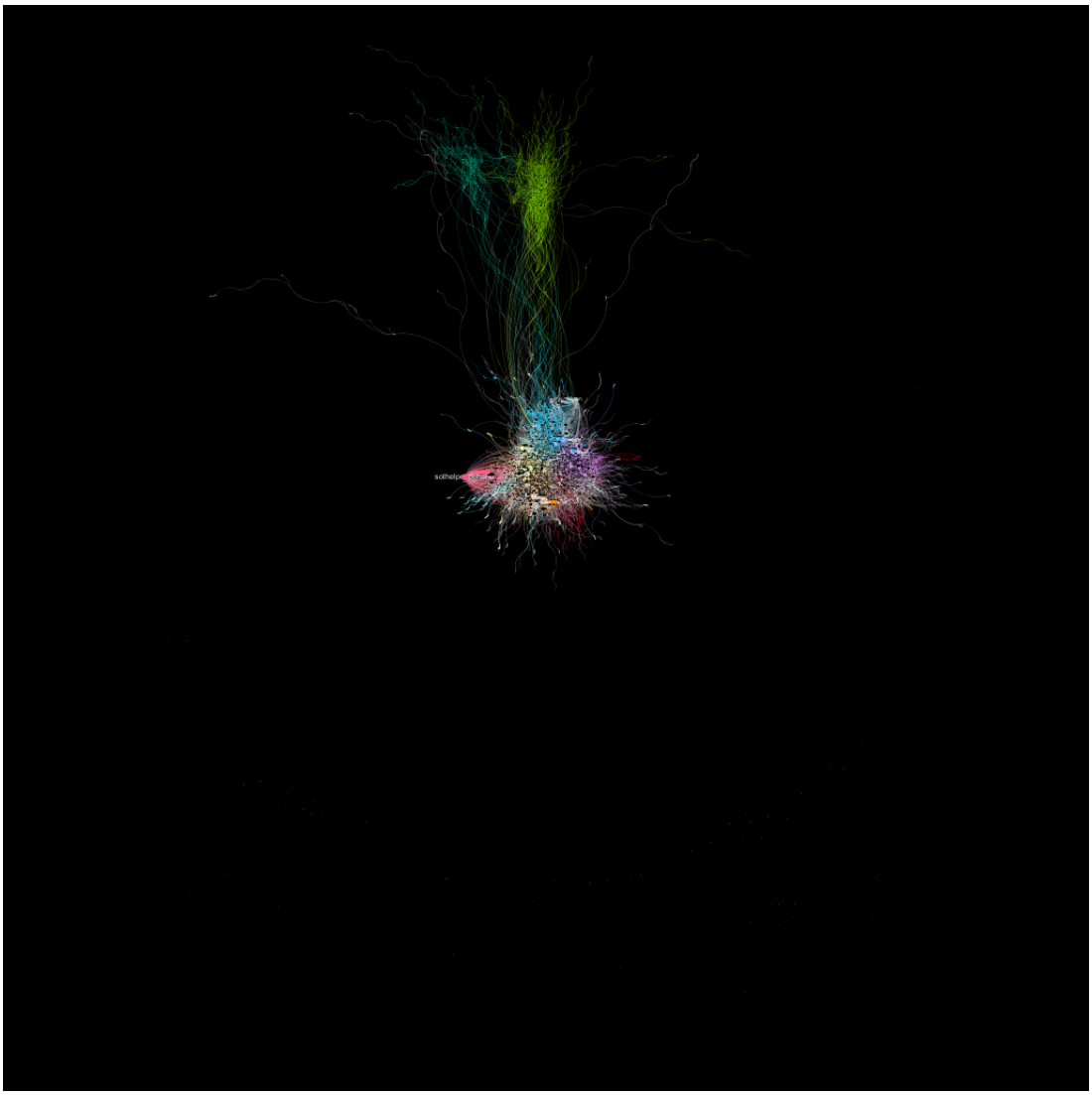
Solidarity and Afriforum again dominated the network. Solidarity was shown to be the node with the highest Out-degree centrality score, with a score of 1365. Afriforum was shown to the second-highest scoring node, with a score of 976. The overall topology of the network remains relatively stable, with a large star-shaped structure at the centre and two peripheral sub-communities reaching out towards the edge of the network. The network may be viewed in figure 3.8 below.
To better understand the network, the nodes representing Solidarity and Afriforum were removed. Out-degree centrality and Modularity were rerun following the removal of Solidarity and Afriforum.

FIGURE 4.8



With the nodes representing Solidarity and Afriforum removed, the network's topology can be seen to have changed slightly. The star-shaped centre of the network has contacted, while the periphery network has deviated further from the centre of the network. The network may be view in figure 3.9 below. The application of Out-degree centrality to the network, with Solidarity and Afriforum, removed, saw a change to nodes with high levels of centrality within the network. According to Out-degree centrality, the most central nodes were primarily representing private individuals with little or no formal connection to Solidarity or Afriforum. Very few of the most prominent nodes are public figures, politicians or organisations.

FIGURE 4.9



In terms of Out-degree centrality, the most prominent node was solhelpendehand, with a score of 368. Solhelpendehand; as previously explained, is a charity organisation run by Solidarity, whose focus is on the Afrikaans community. The sub-community representing solhelpendehand can be viewed in figure 3.10 below. The network graph reveals that solhelpendehand often retweets the organisations own Tweets. This is represented by the red arch that extends from and back to the node. Solhelpendehand was shown to have ties to other prominent private individual nodes within the network. As out-degree centrality is purported to measure the ability a node has to send out information within a network, this result suggests solhelpendehand plays a central role in distributing information to the Solidarity and Afriforum Twitter network.

FIGURE 4.10



In terms of Out-degree centrality, the second most prominent node represented a private individual who is neither an activist, public figure or politician. The individual recorded an Out-degree centrality score of 364. When examining the individual's Twitter account, it becomes clear that the individual holds a right-wing political ideology. The individual Twitter stream is a combination of information warning of the danger of farm murders, theories around white replacement theory, links to articles about incidents of crime in South Africa, and consistent criticism of the current ANC led government. This individual plays a central role within the network in terms of outgoing retweets and mentions. Despite having no formal connection to Solidarity or Afriforum, it is clear that as a private individual, it can use the platform provided by an online social network such as Twitter to spread information to a much wider audience effectively. The individual shows connections to Afriforum's youth league as well as solhelpendehand. Additional strong ties

include another individual private account, which appears to be an expatriate currently living in the United States, whose Twitter stream appears to be a combination of American right-wing politics and issues pertinent to the Solidarity community, including farm murders.

In terms of Out-degree centrality, the third most prominent node, Julius Kleynhans, the current CEO of the public division of the Organisation for Undoing Tax Abuse (OUTA), with an Out-degree centrality score of 297. OUTA is a non-profit organisation that aims to empower the general public to fight for state corruption. The organisation does not claim to follow any particular political idealogy, which makes it a prominent place within this network an exciting result. However, this result may be a result of Kleynhans acting in his capacity as a private citizen. Kleynhans was shown to have strong ties with Morelamediam, Afriforum's youth league and solhelpendehand. The network graph does suggest that there is significant engagement between Kleynhans and other nodes that have formal connections to Solidarity and Afriforum. The nature of the engagement is, however, unclear and would require further investigation.

In terms of Out-degree centrality, the fourth most prominent node is a private individual who produced an Out-degree score of 282. The individual describes themselves as a born again Christian and paster, and when examining the individual's Twitter stream, these belief comes through strongly. The individual post Tweets around a range of topics that include heavy criticism of the current government and homophobic rhetoric disguised as religious beliefs. The individual node shows a wide range of ties; however, there is evidence of ties with Afriforum's youth league, solhelpendehand and Morelamediam. This result is another example of an individual who, despite having no formal ties to Solidarity or Afriofurm, forms a central part of the network. In particular, when examining Out-degree centrality, this individual is affecting the flow of information through the network.

In terms of Out-degree centrality, the fifth most prominent node was shown to be a private individual account with a score of 267. This account, as mentioned previously, appears to be an expatriate living in the United States. When examining the individual's Twitter stream, it is clear that the individual holds strong right-leaning political and religious beliefs. The account posts are a mixture of topics, including American politics as well as South African politics. The individual appears to be intent on spreading awareness about important issues, such as corruption within South African politics and farm murders and the possibility of land expropriation. This result is yet another example of how an individual may disproportionality influence a wider network; despite having no connection to any formal structure of Solidarity and Afriorum. This individual account, in particular, appears to align

with many of the topics that are contained within the narrative spread by Solidarity and Afriforum.

4.5 Density

The network presents a loosely connected network with a density of 0.00017, with interconnections between the separate sub-communities. The low-density level indicates there is much for improvement in terms of network cohesion. Additionally, a low-density measure may indicate that the network is vulnerable to disruption. For example, if a few central individuals left the network, this would cause a disproportionate disruption. This appears to be the case for the Twitter network connected to Solidarity and Afriorum, where there are a small number of very influential individuals. The individuals include individuals who have formal connections with the union as well as influential private individuals.

4.6 Modularity

For the detection of communities and sub-communities into the broader network, a resolution factor of 0.9 was used. This value was chosen to reduce the number of communities chosen by the Modularity algorithm. The value for Modularity was 0.50, with 1087 separate communities detected.

The vast majority of the sub-communities identified by the algorithm appeared to be made up of nodes representing online social actors centred around opinion leaders based in South Africa. The opinion leaders included Ernst Roets, Kallie Kriel and Steve Hofmeyr. Additionally, the algorithm was able to identify a sub-community made up of South African political parties and individual politicians. Additionally, the algorithm could correctly identify Twitter accounts connected to traditional media organisations such as newspapers, magazines and television stations. Interestingly, the algorithm separated predominantly English speaking news organisations from Afrikaans news organisations, placing them in separate sub-communities.

Although the vast majority of nodes within the network appear to be connected to online social actors based in South Africa, accounts based outside of South Africa were also present. Most prominently, a sub-community seemingly based in the United States featured prominently. Centred around the official Twitter account used by the current president of the United States, Donald Trump, the sub-community

comprises public figures, politicians, news organisations, and right-wing activists. The sub-community is represented in yellow and may be viewed in figure 3.1.

The modularity measure was shown to be a useful tool for identifying sub-communities within the broader dataset by identifying unnoticed groupings of node and edges. Modularity serves as a tool for focusing attention on significant data areas that may have been previously unnoticed.

4.7 Discussion

The end of Apartheid and the implementation of governmental policies, such as Broad-Based Black Economic Empowerment, aiming to redress the damage caused by Apartheid, have spurred a reemergence and reimagination of white populist politics in South Africa[1]. Unlike white populist movements in the United States or Europe, groups in South Africa do not seek formal political power[1]. Instead, white populist groups seek to further their agenda is through the reimagination of their history in order to re-position themselves as victims within the new South Africa[1]. Among the most successful organisations seeking to further the prospects of white populists, politics is the former whites-only labour union Solidarity and its affiliate Afriforum. Solidarity developed and deployed a new narrative that aims to rebrand the union and furnish it with new language and ideology, which is more suited to the current political environment in South Africa[1]. Driven by the current leader of Solidarity, Flip Buys, the union's new ideological stance made us of a new slogan, "We protect our people", a phrase which rings true to the messages of other white populist organisation in the United States and Europe.

Solidarity and Afriforum form the largest and loudest white populist organisation in South Africa, serving as the organising force behind the reemergence of white populist politics in South Africa[1]. Solidarity and Afriforum have in recent year adopted a more active and visibly forceful public narrative which focuses on anti-establishment ideals, autonomy and cultural nationalism[1]. This ideological stance may be seen as the union's response to the perceived and real cases of systemic corruption within the ruling ANC executive, primarily during the years of the Zuma administration[1]. However, it is essential to note the Solidarity and Afriforum do not simply reserve their anger for the ANC or the Zuma administration, but to all black South Africans[1]. The union portrays black South Africans as a vastly threatening homogeneous group whose aim is to destroy white livelihoods, cultures and political participation in democratic South Africa. This view serves to highlight the

core ideological belief of the union that venture past white protectionism towards white supremacy[1].

Solidarity and its affiliate Afriforum make use of populism as a tool to best disseminate their ideological narrative. Solidarity and Afriforum have made use of political populism; whose central logic describes a constant struggle between a profoundly honourable and pure group of homogeneous people, battling against a group of all-powerful elites who seek to exert control over the sovereign people through the limitation of access to resources and the restriction of their rights[20]. Through deploying the tool of political populism, Solidarity has sought to rehabilitate their history and image, removing the remnants of the unions white supremacist foundation; this serves as a central goal of both Solidarity and Afriforum[1].

If deployed by Solidarity and Afriforum through the union's in-house media apparatus, the now safely sanitised discourse includes newsletters, newspapers, and digital communication such as emails. This strategy has, in recent years, been extended to take advantage of the evolution and massive growth of online social media networks such as Facebook and Twitter[1]. Previous research has indicated that right-wing populist groups have been at the forefront of making use of and weaponising online social media platforms in order to increase their ability to reach target audiences and exert direct influence on political processes[25].

Since the rebranding of the Solidarity movement, the union has deployed their strategically crafted narrative in an attempt to sow racial and class division with the express aim of driving home their underlying message, that white South Africans are trying to survive and a hostile country[1]. In this pursuit, the unions narrative maintains the belief that the impending doom may strike at any moment, a tactic often used by right-wing populist groups in the United States and Europe. This tactic maintains high levels of motivation and engagement within Solidarity's membership, furthering the organisation aims. Solidarity capitalises on fear and positions itself as a saviour[1]. This narrative strategy has enabled Solidarity to grow the organisation's membership and influence within South Africa.

In order to gain an understanding of the extent to which Solidarity and Afriforum have made use of online social networks, a social network analysis was chosen as the primary method of analysis. Social network analysis provides the researcher with a set of methodological tools to visualise and analyse an online social network[28]. In particular, social network analysis allows the researcher to identify important online social actors within the network[28]. Additionally, social network analysis allows the identification of opinion leaders responsible for influencing the flow of information throughout a network[28]. Opinion leader may act as information brokers within a network, choosing what information is prioritised within a

network[28]. Within this online content, it is unclear to what extent Solidarity and Afriforum serve as opinion leaders within online social networks connected to the organisation.

Therefore, a social network analysis was conducted in order to identify the most central opinion leader within the Twitter networks connected to Solidarity and Afriforum. Twitter was chosen as the source of data due to the platforms easily accessible API as well as a large amount of data available.

The results of the social network analysis suggest that Solidarity and Afriforum do play a prominent role in terms of opinion leaders within the network. The Eigenvector centrality analysis showed that; once the node representing Solidarity and Afriforum had been removed, the current CEO of Afifruom was the most influential node within the network. The fact that the current leader of Afriforum is the most influential node within the network shows that, in the case of Afriforum, high ranking members have been actively involved in the implementation of the organisation narrative strategy on Twitter. Additionally, the node representing the Afriforum's youth league account was identified as the fourth most influential node according to Eigenvector centrality. Ernst Roets was also identified as the node with the highest In-degree centrality score, indicating that Roets is seen as an authority within the network with many of online actors directed mentions towards Roets. It is important to note that Roets was not identified as a central node when examining Out-degree centrality, suggesting that Roets is less influential in terms of dispersing information within the network. Roets was shown to be an essential opinion leader within the network, illustrated by the presence of the node representing Roets in multiple centrality measures. The results may suggest that Roets has embraced the opportunities that online social network may present to Afriforum and well as his agenda.

Individual employees of Solidarity and Afriforum and affiliated organisation featured prominently through the course of the analysis. When examining the Betweeness centrality analysis results, both Kallie Kriel and Afriforum and Solhelpendehand were identified as amongst the highest scoring nodes in the network. This result suggests that Solidarity and Afriforum are using both the Twitter accounts of individuals employees and affiliated arms of the organisation. The Solhelpendehand charity organisation is well placed to continue the narrative that white South African are victims living in a hostile country. Additionally, Solhelpendehand was identified as the node with the highest Out-degree centrality score. This result suggests that Solhelpendehand has been active in terms of outgoing retweets and mentions. This may be further evidence that Solidarity and Afriforum have identified

Solhelpendehand as an opportunity to disperse information detailing the organisation's charity efforts to boost public sentiment. These results further suggest that Solidarity and Afriforum have played a vital opinion leadership role within the network.

The social network analysis revealed that several individuals were had no formal affiliation with either Solidarity or Afriforum but who have been identified as prominent opinion leaders within the network. The unique context of online social networks has raised questions surrounding the assumptions on which the two-step flow of information theory is based[35].

Primarily, that individuals with higher socioeconomic status will take on the role as an information broker between traditional media sources and the generally public[35]. Twitter, as well as other social media platforms, have created an environment where a single individual may prove to be in the position to influence others within the network without processing the traditional characteristics of an opinion leader in the offline world[35]. Additionally, individuals may be viewed as experts within the online experiment and, therefore, afforded a high level of trust and influence within the network. The current analysis produced results that serve to validate this description of opinion leadership in the context of Twitter.

Most prominently, Steve Hofmeyr was found to be a central opinion leader within the sampled network. When examining the Eigenvector centrality analysis results, Hofmeyr was found to be the second most influential node within the network. Hofmeyr was shown to have strong ties to both Afriforum, Ernst Roets, and the Afrikaans media organisation Maroelamedia. Additionally, Hofmeyr was shown to have ties with Afriforum's youth league, toxinews and right-wing author Dan Roodt. Hofmeyr was also found to be the second most influential node, according to In-degree centrality. This result may be an indication that Hofmeyr not only serves as a broker of information but is also viewed as an authority or expert within this community. The In-degree centrality scores suggest that other online actors within this group look to Hofmeyer as a means to amplify their message and a trusted expert. Hofmeyr's connection to the Afrikaans media organisation Marolemdiam may suggest that Hofmeyrif fulfilling the more traditional role of a broker between traditional media sources and his wider follower base, selectively filtering which news stories he chooses to amplify. WHile Hofmeyr has no formal affiliation with Solidarity or Afriforum, the results of the social network analysis suggest that he maintains a position of major influence within the network. Hofmeyr may be a particularly important part of the narrative dispersion within the sampled network with his large follower base. However, although Hofmeyr is not directly or formally

affiliated with Solidarity or Afriforum, it is clear that his status as a successful musician provides him with a more influential platform than a private individual within the network.

However, the analysis results demonstrate that individuals who may not have the traditional offline characteristics of an opinion leader may still exert influence within the online environment of Twitter. When examining the Out-degree centrality measures results, two individuals were shown to be amongst the highest scoring nodes within the sampled network.

The first private individual online user was shown to be the fourth-highest scoring node according to Out-degree centrality. When examining the individual's Twitter account, it is clear that the individual is conservative in terms of both political and religious views. The account included numerous Tweets that focus heavy criticism towards the current government and homophobic slurs parcelled up as religious musings. The individual's high Out-degree centrality score suggests that this individual is very active in terms of dispersing information in the form of retweets and mentions. The individual was shown to have ties with Afriforum's youth league as well as Marolamediam and Solhelpendehand. This individual was shown to be a central node regarding the dispersal of information throughout the network.

The second private individual identified within the Out-degree centrality analysis was shown to be the fifth-highest score node. When examining the individual's Twitter account, it suggests that the individual an expatriate living in the United States. The individual's Twitter stream suggests both the right political and religious leaning with Tweets that focus on bringing attention to the corruption in South Africa and the plight of white farmers. The individual appears to subscribe to white nationalist theories such as white replacement theory and white genocide. This individual was shown to be particularly active within the sampled network.

Despite evidence that private individuals can exert influence within the sampled network, the majority of the highest-scoring nodes across the various centrality measures were shown to be either official Solidarity or Afriforum affiliates, Solidarity or Afriforum employees or public figures who were working off an existing follower base. The result of the analysis does, however, suggest that Afirfroum played a more significant role within the context of Twitter than did Solidarity. When examining the full data set, with the nodes for Solidarity and Afriofrum included, Afriforum produced a higher centrality score on all occasions. Therefore, suggesting that Afriforum's aims may be different from that of Solidarity or that a strategic decision was taken to prioritise the role of online engagement to Afriforum. This is further reinforced by at least two high-ranking Afriofurm members being identified

as high scoring nodes. The results suggest that Solidarity and Afriforum are central in terms of both opinion influence and information dispersal within the sampled network.

5 Conclusion

The research question aimed to identify the most influential opinion leaders within a sample Twitter network connected to the white populist trade union Solidarity and its affiliate Afriforum. Additionally, the paper sought to use social network analysis to produce a visual representation of the sampled Twitter network.

By applying three separate centrality measures, the most influential, high scoring nodes were identified to be a mixture of individuals and organisations, formally connected to the union, public figures and private individual online social actors. The results of the social network analysis suggest that Afriforum holds a more influential position within the sampled network. Whether this is a result of a concerted strategic decision remains unclear.

Amongst individual online social actors, Ernst Roets was shown to the most influential Afriforum employ as this account was identified as a high scoring node when examining both the Eigenvector and Betweeness centrality analysis. Other high ranking members of the organisation who were identified included Kallie Kriel and Dirk Herman.

The most influential public figure that was identified in the analysis was Afrikaans musician Steve Hofmeyr. Hofmeyr represented an authority figure and an information broker, serving as a connection between primary stream sources of information and the wider community. By using his already existing following on Twitter, Hofmeyr was identified as the single most influential individual online actor within the network.

Several private individual online actors were identified as influential opinion leaders, despite not possessing the traditional characteristics required for opinion leaders in an offline context.

Although social network analysis and centrality measures, we can identify influential opinion leaders, limitations about access to historical Twitter data, and the limitations of Twitter data as a proxy for offline human data, suggesting that further study of the white populist organisation is required. Despite the defeat of Donald Trump in the 2020 presidential election, white populist politics have continued to remain a reality in the United States and Europe[1]. In a South African context, recent developments within the official opposition party, the Democratic Alliance, suggest

a further spread of these ideological stances. Understanding why specific individuals feel comforted and welcomed within this community and who is driving these communities online merits further study.

5.1 Future Work

Future work may include text analysis to social network analysis of white populist organisations in South Africa. A better understanding of what the conversation is about and who are the most critical speakers could add an extra layer of understanding to our understanding of the dynamic of white populist communities in South Africa.

Conducting a linkage analysis may also be an area of future study. Although connections between Solidarity and Afriforum's Twitter network and the accounts in the United States were discovered, further in-depth analysis may be transnational connection within the realm of the white populism community.

Finally, extracting data from additional sources may be an area of future study. Increasingly, conservative right-leaning online social actors are looking for alternatives to traditional online social media sites. Apps such as Parler describe its self as a free speech social network, all certain individuals to express view and beliefs that would not be deemed acceptable on Twitter or Facebook.

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