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## Identifying Digital Aggression in Information Dissemination on Social Media: A Network Analytical Study

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### Abstract

Text and memes are increasingly populated and used to spread information on social media like twitter. Sometimes these memes can have different meanings or connotations. This study was aimed at highlighting how such information in the form of memes or text are diffused on social media platforms, with Twitter the selected platform. The study adopted an explanatory sequential mixed method design which allows for in-depth analysis of quantitative results from the corpus of tweets. The findings indicate a growing use of a new terminology “vawulence” over the period of eight months observed showing adoption and acceptance of the new variation for the word violence. The study also found that digital aggression (cyberbullying) has become more notable and on the rise particularly with the use of text and memes showing veiled and, in some instances, outright attempts at cyberbullying with new terminologies still arising (in the form of ‘wotowoto’ and ‘collect’ which mean a form of physical assault).

### Keywords

Social Networking Analytics, Digital Aggression, Memes, Social Media, Violence

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### Introduction

Social media in recent times has become more than just a social platform but an irrefutable means by which social interactions occur. It has taken the world by storm, and governments, corporations, agencies, and even individuals can no longer ignore the pull it has on the

general populace. The reach and penetration of social platforms has been in geometric proportions within business, civil, government and individual circles. With efforts made by some governments to control its hold among citizens (Soh, 2020; Tuwei, 2020), Nigeria as at January 2021 had about 33.9 million active social media users (Kamer, 2022), a figure that has already been surpassed due to the influence of entertainment and electioneering across the globe. TikTok, Facebook, YouTube, WhatsApp, Instagram, and Twitter are amongst the most influential social media platforms all over the globe. Twitter has had an immense impact in terms of governance (Guerrero-Solé & Lopez-Gonzalez, 2017; Agur & Gan, 2021), entertainment with much of its content simpler and more direct in terms of the possibility for engagement. Corporate entities, celebrities, government agencies and officials, have had to create accounts so as to facilitate continued interactions.

The Nigerian social media space has been inundated with vast amounts of information being generated, shared and or disseminated in recent times about varying issues from politics to sports and entertainment. This level of interaction in the Nigerian social space shows no iota of slowing down. When Twitter was banned by the Nigerian government for instance in early June 2021, the world experienced a surge in visibility of tweets about the country due to the use of virtual private networks (VPNs). This brought to the fore the ingenuity and desire of Nigerians to create social structures for themselves where they communicate and disseminate information on their daily lives. Tweeps in the bid to be a part of the national conversation have created buzz words, catch phrases, and words which become so unique and readily utilised by partakers.

Communication on social media platforms leaves behind digital traces that can be used to measure social behaviour and information disseminated. Information dissemination is important to measure how information travels across a social network and explains the dynamism of various social networks. This study analyses the spread of words with the use of social network analytics to showcase how these words influence, spread, and are diffused and understood.

### **Objective of the Study**

The study was necessitated by the growing use of the slang word for violence amongst Nigerian youth on social media platforms and everyday speech. More specifically, the study hopes to lay background analytics showcasing how information flows and can spread on social media based on the following keywords (Vawulence, Vayolence and Vahulence).

## Literature Review

### Social Media

Human interactions are grouped into three functional units; self-communication, one-to-one communication, and one-to-many (Hanson, 2016). The communications groupings help explain interactions in social spaces like social media. Social media as a communication ecosystem has merged the forms of communication channels we already know like mass communication and interpersonal communication. Communication on social media has immense reach with speed (possibility of virality) on information diffused. Evidence of the impact of social media diffusion of information already abound from its earliest influence in birthing of ‘the hashtag’ which became a symbol that aided political movements, awareness campaigns, promotion and mobilisation movements, and the numerous other activities that social media now affords users (Samur, 2018). Social media has been defined by several authors, and scholars, and from numerous perspectives, however, social media simply facilitates interactions across a broad spectrum of social circles.

Social media has already impacted the way we inform, learn, play, socialise, and generally communicate with others. Social media makes it easy for individuals to share content, promote discussions and engender relationships through interactive participation among individuals and groups. Interactive participation now more readily and easily achieved, resulting in a high amount of information shared on numerous social platforms. Due to the immense amount of information on social platforms today, analysing the massive amount of information, organisations are now applying big data for analytics purposes. Making sense of the massive amount of information helps to understand why social media users post and react the way they do. Social media, then, refers to both the technologies (platforms) and the practices (collaborate, connect, interact, inform, share) (Beneito-Montagut, 2019).

Twitter is considered among the most popular forums for information sharing and social interactions today. It began as a microblogging service that allowed users to interact with tweets with a limited character set of 140 similar to the 160-character SMS, a feature that made Twitter so unique among several other platforms. However, in 2017, Twitter doubled the 140-tweet length to 280 characters to enable users become more expressive in their interactions (Gligoric, Anderson & West, 2020). The tweet (message) length though short has not diminished the information diffusion abilities of users in the exchange of ideas, opinions, and reactions. Information diffusion can be so overwhelming due to the massive amount of information daily disseminated. In the midst of this mass of information shared,

Twitter has a feature that allows users to search and find relevant tweets. This feature identified as user-defined hashtags, helps to locate particular areas of discussion (Maclean et al., 2012) that trend. Also, allowing tracking of posts and engagements in real time.

### **Information Diffusion**

Social networks enable faster diffusion of information and the exchange of ideas, and microblogs like Twitter play an especially strong role in the diffusion of ideas today. Through Twitter's retweet function information can reach millions of people (Zhang et al., 2014). Using Rogers (1983) "S" curve that describes how quickly ideas and innovations spread as a reference point, we see that spread of ideas and innovations generally begins slowly and accelerates as the diffusion process begins to unfold fully until levels of saturation are approached. The S curve graph indicates that an idea can be accepted by persons only if they are aware of its existence. In other words, behaviour of the social network toward an idea is closely related to the distribution of information and acceptance of such new phenomena and ideas (Stieglitz & Dang-Xuan, 2013). Studies into the sigmoid graph lay further emphasis on the stages in the adoption of an idea from the early diffusion stage of an innovation, where innovators begin an idea or phenomenon which is later related to early adopters who are a relatively small percentage of a population, this idea is passed over time to early majority and the late majority who adopt the idea simply because it is cool and being used by people they know and trust. (T. Fleiter & P. Plötz, 2013, Rare, 2015, Schmidt et al., 2016 & Li et al., 2020).

### **Social Networks and Sentiment Analytics**

Social Network Analysis (SNA) is a powerful tool for representing social network structures and the information dissemination within a network. SNA characterizes networked structures in terms of *nodes* (individual actors, people, or things within the network) and the *ties* or *links* (relationships or interactions) that connect them. Conversations within a network can convey sentiments similar to normal human conversations. Bisio et al (2017), opines that interesting applications of sentiment analysis involve the spontaneous examination of social network text or messages on the foundations of the feelings and emotions conveyed within. Sentiment analysis, also known as opinion mining, is the use of compiler programs to detect and classify subjective content (Luo et al., 2013). Sentiment analysis has also found its way into businesses aiding the prediction of public opinion towards a product or service. Mozdeh however uses the "SentiStrength" to estimate the strength of sentiments based on positivity or

negativity expressed in a text or group of texts (Thelwall 2018). It is however worthy to note that though much has been done in the area of analysis of sentiments in text much remains to be improved in terms of human attitude and accuracy (Mohan Debarchan Mohanty & Mihir Narayan Mohanty, 2022).

## Memes

Memes shortened from “*mimeme*” meaning something imitated. Defining the term has always linked back to Richard Dawkins biological meme. Memes carry information either in the biological or technical sense. The definition of the meme depends on and should depend on, the concept of imitation (Blackmore, 1998). Internet memes are defined as units of popular culture that are circulated, imitated, and transformed by individual Internet users, creating a



shared cultural experience in the process (Shifman, 2003). This definition is one of the most cited regarding internet memes.

A meme is not a meme until it is replicated, Hanganu-Bresch (n.d) states that mass replication is the single most important feature. The replication feature of memes has created a new set of concerns linked with attribution.

On concerns about attribution and copyright, on first engagement, it is usually hard to determine the producer of a meme. The replication of diffused memes occurs in the majority of cases without proper

attribution. On the Nigerian Twitter space, thought is rarely given to attribution but more to the buzz of the moment. That is, the trending story/post and the immediacy of reactions have been evidenced to be of more interest to the average commenter. Soh (2020) suggests that there is something about the nature and ideologies of Internet memes, compared to other media forms, which enable their use.

Memes as information artefacts have become an easy tool for cheeky, hilarious, sometimes rude, outright demeaning, and myriad of emotions. Memes have become part of daily interactions, from easy responses to arguments (visual arguments). These interactions in social spaces are increasingly carrying negative connotations showing cyberbullying tendencies. Exploring the many social platforms where interactions have become more intolerant of ideas, thinking, and expressions from each other. Memes have become a

medium that enables vitriols to be transmitted unrestrained and replicated easily targeting the initial post.

### **Digital Aggression**

Construing the impact of memes and their usage in our online social spaces is an area that needs conscious attention. Digital aggression in the form of savagery now litters the global social media platforms and is already being designated a serious public health threat (Ferrara, Ianniello, Villani, & Corsello, 2018). Digital aggression or electronic aggression or cyberbullying is defined as “any behaviour performed through electronic or digital media by individuals or groups that repeatedly communicates hostile or aggressive messages intended to inflict harm or discomfort on others” (Tokunaga, 2010). The continued diffusion of technologies expands the possibilities for the occurrences of cyberbullying. A major section of society today now have access to personal computers, smart devices and Internet services, meaning a geometric rise in the number of active users online. These numbers of active users have major differences in terms of personalities, and temperaments that have varying support systems. Throwing tantrums, frustrations, celebrations, and oversharing has become commonplace on social media. Some of the content has exposed posters to harsh responses via posts, and memes.

Digital aggression entails use of mobile devices and practically any internet-enabled device that can propagate information via texts, calls, pictures (memes) and videos (including happy slapping - filmed attacks on people which are shared among friends on the internet) and they extend across platforms from email, websites/blogs, and social platforms. The increasing digital aggression on social media, though seen as fun by some, research into the impact of digital aggression paints a sad picture; with it already designated a public health challenge in the advanced climes like the United States and the United Kingdom (Ferrara, et al 2018). In Nigeria, this has not yet generated as much interest, albeit, Twitter has seen a huge surge in aggressive messaging since the 2015 electioneering period in Nigeria (Irenea, 2017).

Twitter has a number of interesting features from Tweets (comments), ReTweets, Follow, Mentions, Tagging, and so on, with varying opportunities for engagement. The comments section on social platforms provides room for engagement with information disseminated. Social media in Nigeria in spite of the recent ban placed on Twitter is still relatively free and as a result, netizens still post whatever they felt like without any form of

sanction (no officially documented public sanction on any individual so far). This freedom extends to engagements (comments/reactions) that the information shared generates.

On Twitter, comments and posts generate reactions and responses that either match the ‘vibe - tone or perceived intentions contained in a post’.



Targeting persons (handles) are not an uncommon occurrence. Differences in views/opinions, and association (perceived grouping one belongs - political, religious, celebrity support, and so on), have been sources for disagreements, and aggressions which have been termed or known in different names. Nigerians are a very creative group of people with a knack for developing unique words or phrases, many of these words gain much visibility and acceptance very rapidly owing to social media and influencers on such media.

1. To “Drag” - to call a person out or shade a person with a known account/handle for a perceived wrong or recognition. A ‘drag’ is mostly targeted at perceived wrongs.
2. Vawulence - the word vawulence is a homophone word for the English word violence, it is an informal terminology that has come to connote intolerance to untruths or injustice that must be called out. Though the origin of the word cannot be traced it first appeared on Twitter in response to violent acts in sports.

These terms have come to depict a form of interaction bearing content that has varying degrees of aggression and intent. Twitter NG has been noted as a place for the strong due to the high level of digital aggression (savagery, vawulence) that is usually on display in tweets, comments, posts and reactions from interested tweeps.

Twitter, like many other social media platforms, has become an environment where social interactions have broken the traditional stranglehold that television, radio, and other mass media held in the past regarding information diffusion. These platforms have an

advantage in terms of reach, immediacy, and possibility for such social interactions to go viral, prompting a probe on why we post, retweet, like, comment/quote, and foster reactions that cause communications on social platforms to trend. Connections are as simple as a friend request, follow, or like, targeted at the extremely high number of individual accounts, celebrity pages, and so on. These online platforms facilitate interactions among vast numbers of people from diverse backgrounds, and occasionally ‘viral’ events stem from such complex interactions (Hasan et al. 2022).

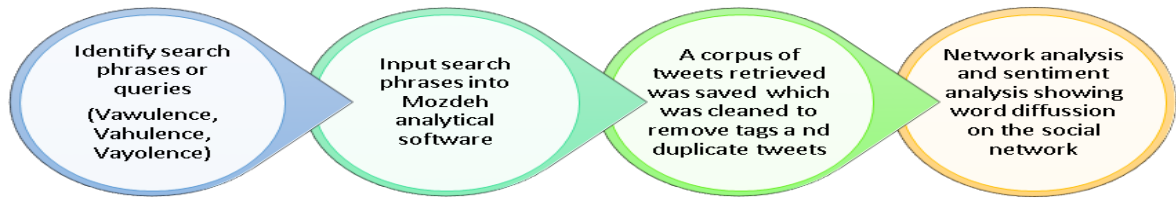
Information diffusion on social media is mostly user generated content (UGC) presented as posts, comments and reactions. These UGCs come in different shades from attempts to pass harmless information, explanations, rebuttals, intentional disinformation, misinformation, and outright verbal attacks to posted or shared content. A recent surge in UGC has been linked to the impact of influencers (a new term that has been used to describe celebrities with huge following especially on social media). Their massive following results in huge engagements anytime they share content on their handles. Many of these influencers share content that range from entertainment, religion, politics, to almost anything and everything on their platforms.

## **Methodology**

Social network analysis allows for measurement of conversations between users, the strength, the relationship between users and the most influential player. We apply these methods to explore the dissemination of the word vawulence on Nigerian twitter space using the Mozdeh analytical software. Visual trend detection is an analysis of a trend or phenomenon under review in data analytics visual trend detection is usually depicted graphically. Mozdeh offers time series analysis alongside network modelling analysis and sentiment analysis to showcase trends in data. The study used an explanatory sequential mixed method design approach, this was the most favourable design approach according to (Creswell & Creswell 2018), allowing for in-depth analysis of quantitative results. Twitter was the preferred social media platform owing to the openness of its API for educational use and the ease with which its data could be harvested and analysed. Quantitative data from the Twitter API was harvested for a period of 8 months between November 2021 to June 2022. The data was harvested through the use of Mozdeh analytical software with keywords Vawulence, Vahulence and Vayolence. The key terms were a compilation of made-up words that had gained wide visibility on Twitter space over the period being investigated.



The research methodology workflow is shown in fig 1 below;



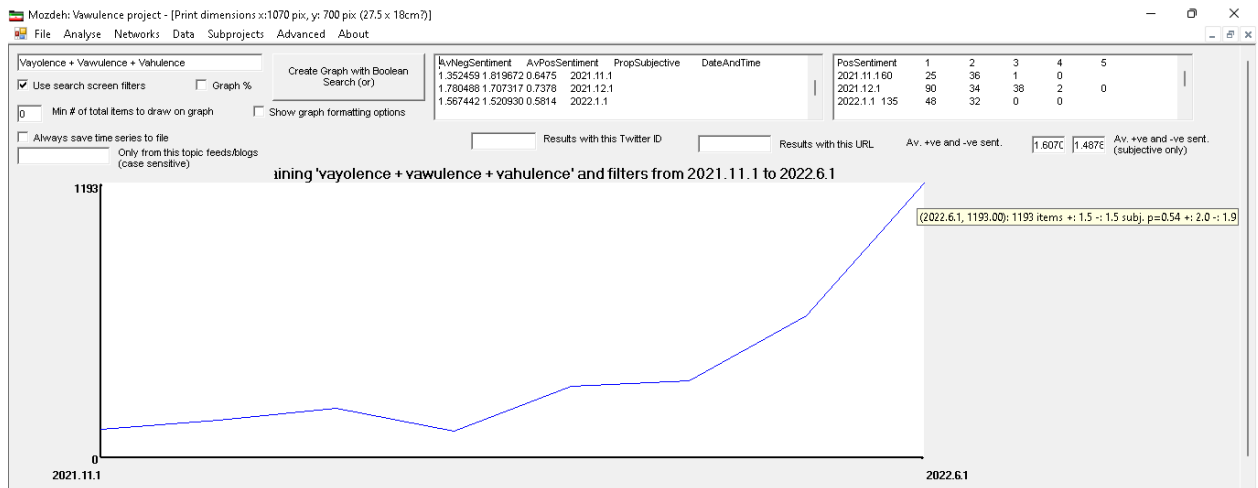
**Fig 1: Research methodology workflow**

### **Findings/Discussion**

The key terms produced a total of 149171 hits for the period harvested, removal of duplicate tweets and retweets produced a total of 146174 unique hits of tweets and retweets referring to the keywords or phrases making up 98% data validity for hits of searched key phrases. Further analysis of the data showed that the word “vawulence” had 116553 hits making up 78.1% of the harvested data while other key search terms like vayolence had 13514 hits being 9.1% and finally vahulence hits were 1209 out of the total of 149171 being 0.8% of the harvested data totaling 88% validity for searched key phrases harvested.

### **Diffusion of the keywords**

A time series graph shows geometric progression and decline in a trend for the period. For the purpose of this study the time series graph was used to lay foundation and analyze the spread or diffusion of the keywords “vawulence, vayolence and vahulence” under review. Figure 2 below is a time series mapping for the keywords for the period of November 2021 to 1st June 2022.



**Figure 2: Diffusion of the key phrases on Twitter for a period of November to June**

The figure shows the rise and fall in the use of the keyword searched on twitter space, this depicts how the word spread over time. Analysis of the wave line for the keyword indicates a wave form similar to the sigmoid curve. The gradual growth from November 1 2021 with 122 hits with a total word count of 2272 to 1193 hits in June 2022 with total word count of 51056 are responsible for the wave line which is depicted in figure 2. These findings explain the adoption rate and acceptance level for the word and agree with Rare, (2015) & Li et al., (2020) on the diffusion of innovation theory. The table 1 below further explains the diffusion of the keywords.

<b>wawulence + vayolence + vahulence</b>	<b>Per Item</b>	<b>Date</b>	<b>Tot_Items</b>
122	0.053697	2021.11.1	2272
164	0.029481	2021.12.1	5563
215	0.020178	2022.1.1	10655
117	0.014182	2022.2.1	8250
310	0.021175	2022.3.1	14640
334	0.01603	2022.4.1	20836
616	0.017159	2022.5.1	35899
1193	0.023367	2022.6.1	51056

**Table 1: Diffusion of Keywords**

Due to the vast amount of data available, analysis for the combined keywords was done by hiding duplicate tweets and hashtags or mentions further filtration was done to remove tweets and retweets greater than or equal to 50 but less than 9000. The results showed 3071 hits for the keywords (vawulence, vahulence and vayolence matching the above criteria. These Excerpts of such tweets are shown in table 2.

<i>Item no</i>	<i>Label</i>	<i>No. of Retweets</i>	<i>Tweets</i>
#34252	<i>Vawulence and Comrade</i>	302	<i>I need a job by a comrade!! Best Vawulence !!Mr.Macaroni <a href="https://t.co/7hiQQj4wh">https://t.co/7hiQQj4wh</a></i>
#125517	<i>Vawulence and Comrade</i>	67	<i>I remember when I joined Twitter 2020 I'm always afraid to reply tweet bcos I don't want to be a savage. I don't engage tweet, I only "like". I can't believe this is me ☐☐ am now a certified vawulence comrade. I'm no more afraid of toxic people☐☐ 30bg did that ☐</i>
#89317	<i>Vawulence and collect</i>	171	<i>Peter Obi is a force not to reckoned with. If u compare ur candidate with Peter Obi,ur candidate will collect, compare with competency,u will still collect,compare with proven track record,u go still collect not with vawulence but with facts and figures. #PeterObi4President2023</i>
#102229	<i>Vawulence and wotowoto</i>	936	<i>Peter Obi supporters have different departments: Vawulence dept - these guys give you wotowoto Receipt provision dept - these are the go and verify guys Defence dept - shalaye + cruise Ignore &amp; shove dept - they only post Peter Obi contents! Where you belong? <a href="https://t.co/n555VNCrap">https://t.co/n555VNCrap</a></i>

Table 2: Sample extracts on Keyword search using Mozdeh software

Analysis of table 2 which are excerpts from the corpus of tweets retrieved from Twitter API indicates subtle throws of digital aggression which have political and religious connotations even though some are entertainment in nature via comedic calling out of persons in item #102229 and #34252. This finding is in with Irenoa (2017) who found that social media has been used to propagate divisive sentiments, which today could be equated to digital aggression.

**Sentiment of the keywords**

Sentiment analysis uses natural language processing to track public opinions on a particular topic. The sentiment is measured on a scale of 1 to 5 and -1 to -5. Sentiment analysis for this study was done by examining the average sentiment of the corpus of tweets harvested. The table 3 highlights the sentiment analysis scores

<b>Sentiment Analysis Results</b>		
Score	Pos.	Neg.
1	59.13%	68.67%
2	22.83%	19.28%
3	16.38%	7.03%
4	1.53%	4.62%
5	0.13%	0.39%
Average and 95% confidence intervals:		
Pos 1.6070 (1.5779, 1.6360)		
Neg 1.4878 (1.4579, 1.5177)		
Av pos - Av neg: 0.1192		

**Table 3: Sentiment analysis score for keywords**

The table depicts a sentiment score of 0.1192 being the average positive score subtracted from the average negative score. This result indicates a positivity of the tweets on the keywords searched. Physical analysis of the tweets highlights possible reasons for this; many of the tweets harvested displayed positive connotations but were negative and misunderstood

to be positive remarks by the software. Other reasons could be linked to misunderstood words and smileys or memes like the word “vawulence” not being an English word or “collect” having a different connotation than its dictionary definition. The finding agrees with the opinion of Mohanty & Mohanty, (2022) on the accuracy of the analysis of human attitude and behaviour.

## Conclusion

The Nigerian twitter space is popularly labelled as not for the “lilly hearted” due to the lack of empathy with perceived stupidity with posts (tweets) or reactions to shared content. This trend is making the social space toxic and a fertile ground for cyberbullying activities. Nigerian social space undoubtedly remains a very interesting space, with fun guaranteed (for the neutrals), learning opportunities, business opportunities, and all forms of crazy abound. Politics, entertainment, religion, and social lifestyles have found a fertile ground on social media. Differences in opinions, ideas, and views on issues will continue to exist, and the possibilities for cyberbullying will always be an issue. Enlightening social media users, especially the youth population, on the need to show restraint when interacting on social media platforms must be put in the front burner. Digital aggression has always existed in the Nigerian social media sphere, but not much attention paid to it as an issue. So much of the local language that depicts aggressiveness, are daily finding their way into the digital lexicon on the Nigerian social space. The increasing penchant for the consumption of memes and posts which demean, attack (drag, call out) especially negatively, targeted at persons/accounts on social media, requires a cautious approach to reducing the trend.

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