Understanding Open Source data to improve daily engagement in a policing organisation

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Final Report

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Abstract

Over the last ten years Open Source data has increased dramatically mostly due to the emergence of social media. The police organisation and daily tasks seemingly do use social media for three key areas: Intelligence, Investigation and Engagement. With many studies surrounding the initial two, however few UK based studies around the area of engagement. With the growing number of the public on social media platforms, and a high percentage of communications online, it is a tool that the police organisation should be able to control and support the community with.

The focus on engagement has been derived from the police's continual task of community engagement, and the aim of the report to aid development for additional policies to be created for online community engagement.

By studying two different samples of police accounts: official force account list and a geographically obtained list, correlations and differences will be observed and finding statements developed to best describe the data. Finally justified recommendations that are produced in a way to easily adapt into the police organisation. Two forms; mechanical and policy recommendations (mechanical being the supporting technology to aid the recommendations, and policy being the link to support the change in the organisation).

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Contents

Table of Figures

Police and Open Source Data

In this technology age it is a reported that 72% of internet users are on social media (Statista, 2016) and these platforms taking up an estimated total of 62 million hours for Britons each day. It has seen a rise to some of the communications of everyday life move online (Hurst P, 2013). To keep up with the growing trend of online communications corporations and organisations have spent ample time improving their online presence, and since 2009 (development of Facebook) over 88% of companies worldwide have one or multiple social media accounts, government services included. It can be seen today that each police forces in the UK has at least one social media account, with the majority using it daily. The ways in which the police forces use these accounts will be researched in this paper, along with any differences between force and local departments use and will conclude with ways to improve their overall presence on social media. These broad areas will be the focus, with an emphasis on engaging with the communities to provide a deeper analysis.

This report is focusing on social media as an information system, as a technology that collects, presents and encourages data to be published online; in other words Open Source data. The aim of the report is to fully understand Open Source data and its role within social media, and to ultimately provide information system recommendations based around policies and mechanisms. Giving the police recommendations of technology that could aid the findings (mechanisms), and business policies to allow it to be adapted into the organisation with relative ease.

Main Activities

The World Wide Web has rapidly increased the amount of Open Source data there is available, and this type of information is of increasing importance in the policing environment. Open Source data is a term used to describe any material that can be freely obtained by the public, including those sources that require a payment to purchase the information (Steele R.D, 1996). With the emergence of social media platforms, starting in 1997, the phenomenon of this type of platform has rapidly gained popularity, thus further increasing the amount of Open Source data. With the development of Facebook (2004) and Twitter (2006) Open Source data became a very simple way of gathering information on users, places, or celebrities. The main focus of these social media platforms however is communication, whether this be communicating with people known to the user, or communicating with those connected on the platform. For example, Twitter users all have a follower base, other users who follow the account and can see everything that is posted.

In looking at a policing view of Twitter, it proceeds further than simple communication with the public. Investigation and intelligence could be described as bespoke ways to analyse and use Open Source data from social media. Bespoke in the way no other organisation would use the data in these ways.

Intelligence

Intelligence is officially defined as:

> *'Information that is received or collected to answer specific questions on who, what, when, where, how and why organised crime operates in the UK' (National Crime Agency)*

Intelligence is described as using the social media platforms to answer these questions on the broad spectrum of accounts, creating trends and showing patterns that can support the understanding of criminal activity. There are two broad categories that the intelligence tasks fall into, strategic and tactical intelligence. Strategic intelligence is usually used to enhance knowledge on ongoing forms of serious organised crime, usually high-level, national or international. Whereas tactical intelligence is focused on local problems, and is designed to inform specific force actions (Innes et al, 2005).

Taking a more theoretical look into intelligence we see, with the initial split of strategic and tactical intelligence, four conceptual models have been developed which are routinely practiced in an intelligence analysis (Innes et al, 2005):

- Criminal intelligence, detailing the activities of a 'known' suspect
- Crime intelligence, enhancing the police's understanding of a series of crimes
- Community intelligence, information provided by members of the public
- Contextual intelligence, relating to wider social, economic and cultural factors that may impact upon levels of crime and patterns of offending.

These categories have a wide range of techniques in which the information is collected and analysed, a few being: results analysis, evaluating different forms of intervention, crime pattern analysis, network analysis, demographic/social trend analysis, market profiles. All of which are aided by the analysis of social media accounts and the Open Source data published to them; thus making the tool very valuable.

A study which demonstrates the importance of social media for intelligence activities is the murder of Lee Rigby in London 2013. The analysis focuses on: how rumours disseminated via social media platforms work as 'soft facts' to influence patterns of collective reaction and also how social media platforms are being used to organise particular forms of spontaneous community mobilisation (Roberts et al, 2015). Community mobilisation can be defined as the act of a group of individuals organising themselves for a common goal. Through this study it was found that social media propel social reactions in the aftermath of a horrendous

crime, as it functions as a camera as well as a narrative through all the photos and videos posted. The finding that plays the most relevance for this paper is that the study has shown the shear amount of data influences both public sense-making and starts the road for collective action. Which consequently shows that rumours play an important role in shaping public sentiments and sees an initial step in spontaneous community mobilisation. For example in this event it was suggested by LBC radio that the murder was a terrorist incident, and their statements were retweeted and thought of with a degree of authority. Which lead to the tweeting of the EDL (English Defence League) to try and mobilise, which their opposition also tried to do in retaliation. With this information there are two important elements that police forces and analysists could take away which are:

- As social reaction about the crime is partly shaped on social media, rumours can have a significant impact and therefore any rumours that could be potentially harmful should be halted and correct information from the authority should be released to the public.
- Trends in the aftermath of a major crime need to be analysed and any violent community mobilisation actions need to be investigated.

This study in particular emphasises the 'contextual intelligence' as the murder of Lee Rigby started many other crimes of racism around the country, all organised on social media and required community mobilisation. Another example a group of former soldiers who firebombed a mosque in Hull to avenge the murder (Gyr. Hugo, 2013). The use of intelligence allowed analysis and the government to understand where the racially motivated attacks were going to be, and a wider understanding of areas which respond violently to violent racial events.

An outcome of intelligence can come in all shapes and sizes and one of these is the idea of 'mapping crimes'. This gives police forces in the local area an idea of all crimes and if there is any trend pattern amongst them, similar to 'contextual intelligence' relating to the theory above. An example of this can be seen in the US with their Juvenile Justice Division was formed and they use social media information locations and posts to map the individual groups to areas in New York and have got it fine grained enough to map it block by block. This gives the local police a good idea of who is residing in which area and if crimes are committed, who the most likely gangs are (Donaldson, 2012). From here the police can move into a more detailed investigation of the individuals if necessary.

Investigation

It has been surveyed that the most common use of social media is for criminal investigations, and 85.5% of agencies reporting that social media has helped solve

crime in their jurisdictions, surveyed using US police departments (IACP, 2015). Investigations differ from intelligence analysis as they look more deeply into an individual or a particular group of individuals though their social media. When conducting this analysis on the suspect's accounts three main elements are looked for:

- Evidence collecting
- Location of suspects
- Criminal network identification

The significant change between a broad analyses of a social media site (intelligence), to a detailed analysis on an individual (investigation) can provide many leads in individual cases, and has done in the past. On these social media sites police forces are able to pick up potential leads from suspect's location (through geotagging, Twitter, or checking in, Facebook), to finding stolen goods (through photos being posted). Investigation is the most commonly used method of using social media (IACP, 2015) and is perhaps the most obvious in terms of what the public believe are the police forces' main tasks, catching criminals.

There are many cases of police using social media to aid investigations, some of which have been widely reported via media outlets i.e. national news. An example of evidence collecting element would include: an escaped convict, Nicholas Grove who was in Payette County jail climbed the prison fence and fled. He later then posted selfies and various photos of himself around the Mexican city of Cancun. As police officials were tracking his social media accounts he was then arrested and taken back to prison. US Marshal stated 'social media certainly played a role originally as he bragged about his escape on Facebook' (Oshrin. S, 2015). This seems to be a common theme through social media of suspects with them bragging, seen here in another example. A US article retells an officer's story explaining that an investigation where the victim was struck with brass knuckles. The suspect denied involvement in face to face interview, but whilst investigating his Facebook page a post of himself claiming of hurting the kid and that he had dumped the brass knuckles in a trash can at the park. Following the find, the brass knuckles were located via Facebook Check-In (of the park) and a confession was an outcome of the next meeting (Donaldson, 2012). Checking in is a recent and helpful new aspect to Facebook, a similar tool in Twitter with geotagging tweets where an individual's location are imprinted onto the post, making it easier to locate a suspect or where they have been.

Similarly both suspects don't realise that police forces are able to access information on their accounts, and make incriminating posts which can get them

caught with evidence against them. It could be said that the availability of the information posted on these sites isn't fully understood by the public.

Criminal network identification, can be easily seen on social media through friend's lists, posts, likes, direct messages and replies it is fairly easy to identify who an individual's top communicated friends are over the social media platforms. This can lead to identification of possible suspects involved with a crime, or even show other gang members in photos with tags to the individuals account. However, with the average number of 'friends' on Facebook being 338, simply looking at an individual's friends list needs to be taken lightly (Smith, Aaron. 2014).

A survey of police departments in the US of their use of social media shows that in answer to the question 'How does your agency use social media in investigations' the most commonly given response (92.3%) being 'review social media profiles/activities of suspects'. Which is what would have been expected. However, the next highest investigatory point is 'review social media profiles/activities of victims'. This gives the perspective that there is evidence to be found on victims profile as well as a suspect, this could be a lead or potentially to build up a network of individuals the victim knows (IACP, 2010 and 2015). Which is supported by the National Institute of Justice (2008) which argues that between 85-90% of sexual assaults are perpetrated by someone who knows the victim. This shows that there are many different ways than the obvious where social media information can be useful, and applied correctly can give great leads.

Whilst the studies above have soon conclusively that there is a helpful aid for police forces in using social media with tasks of intelligence, mentioned before has been the reliability and validity of the Open Source information. Gladwell explains the benefit:

'The benefit of social media – especially Twitter – is in supporting those loose ties, it is a form of solidifying evidence, backing up with this dense amount of information' Gladwell (2010)

This quote works particularly well when discussing police use of intelligence on social media, as the figures and the extent of information that is being analysed does show a trend, whether it represents the whole population or only shows opinions is another matter.

It seems that investigation on social media follows a very similar pattern to how police officers operate in the physical world, and the skills are transferable. It also needs to be made clear that social media intelligence, investigation and

engagement isn't to replace the traditional methods of policing, but should be seen as an addition, and aid to help with daily tasks.

Theoretical approach to intelligence and investigation

A common theme when looking through studies of engagement, is the vast amount of data that has to be analysed. This may be a reason as to why there is a slight hesitation in the police using social media, as it takes time to process. However, there are many technological and theoretical practices that can aid this information foraging, gathering and analysing. As the recommendations will be based on background studies, reported events and application theories it is important to give a small detail about methods of how to deal with the vast amount of data.

If we were to take the Pirolli and Card Model of sensemaking loop for intelligence analysis, see figure 1, it can be adapted to make a useful process loop for social media analysis as well. Sensemaking is defined by Russell et al, 1993 as:

'The process of searching for a pre-representation and encoding data in that representation to answer task specific questions. Different operations during sensemaking require different cognitive and external resources'

In laymans terms, making sense of a large dataset by asking specific questions about the data in order to refine the data set down to a usable amount. This fits perfectly with what the police organisations would have to do when conducting an intelligence, or potentially investigation, analysis.

The Pirolli and Card model shows the different ways in which data is gathered and the steps it has to go through on its journey. The two major loops is what really gives the processes to intelligence analysists, as it shows the foraging loop that involves working from the data up to a hypothesis and findings, and the sensemaking loop which works backwards from the hypothesis to see if the data fits. It could be said that the foraging loop is similar and could work within the intelligence analysis part of police on social media, and the sensemaking loop could be adapted to work within the investigation process.

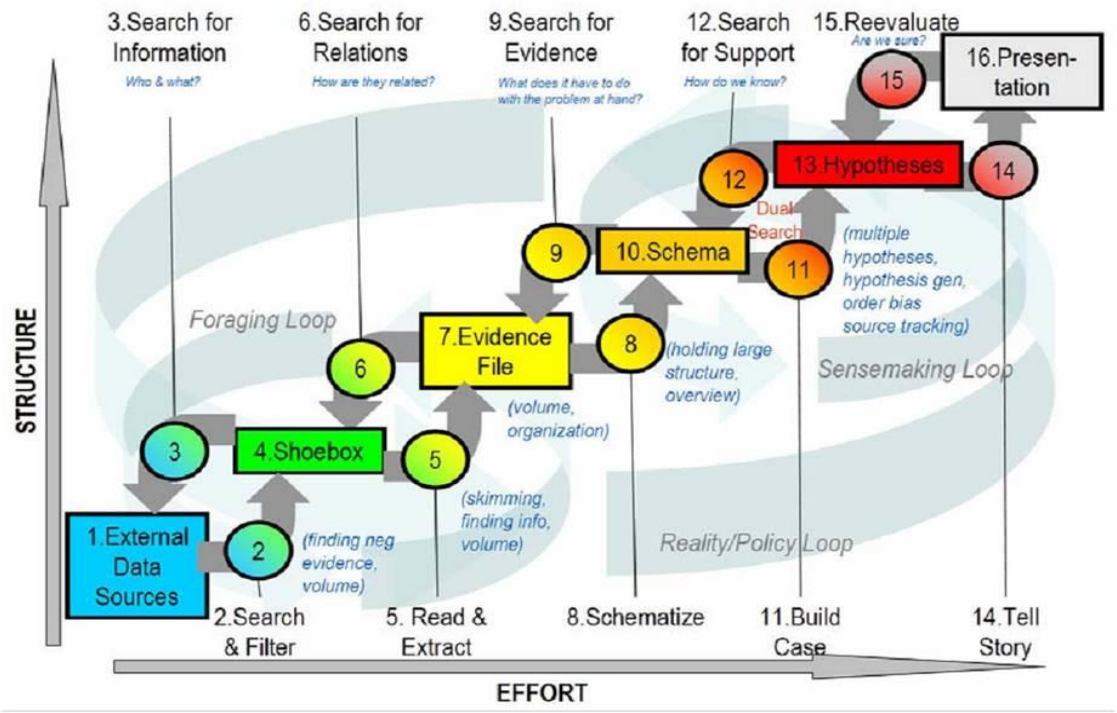

Figure 1: Pirolli and Card model of sensemaking loop for intelligence analysis

Technologies which support police with these processes are started to be developed to aid police with intelligence and investigations, as well as commercial products designed to help with maintenance of the accounts.

Commercial products such as Hootsuite, TweetDeck, MyTweetDeck and CrowdControlHQ are seen to be used with UK police forces in helping maintain their social media, especially if they have more than one. However these aren't designed with the police organisation in mind, and therefore don't support all aspects of police tasks on social media.

Engagement

Engagement returns to the original functionality and purpose of social media, communication. It embodies the idea of using the communication aspect to both reach out to the public, as well as the public reaching out to the police. Engagement and community policing have always been extremely valuable to keep trust and respect of the community. However, in the technological age with a vast amount of communication is going online, police forces need to adapt their working ways to keep communication and trust with these social media users. With an estimate of 62 million hours each day spend on Facebook and Twitter by Britons it's clear that this is a very popular form of communication in the new age (Hurst P, 2013), and suggests that individuals are more likely to go online than pick up the phone.

Having an impact on police methods, as the well-known way to contact the police is 101 to report information or 999 in an emergency.

An example to emphasise the way that engagement can be used in a way to gain spread information and asking for engagement would be a study on the Somerset floods. Although this isn't directly related to a police task it shows the power which social media can be the foundation of. The Somerset Floods of 2014 saw the UK suffer greatly from extreme wet weather, the wettest weather on record. This caused thousands of homes and communities to be flooded, causing major damage and spreading widespread hardship and disruption to the county. The study looks at 116,000 tweets that were collected and labelled 39,000 of these being related to engagement and social action. The study continues to explain that the majority of these tweets were online social action, where individuals would share information that would help others e.g. road and rail services updates, weather reports, official advice etc. A smaller amount of tweets showed offline help and support, offering their time to volunteer to help in whatever way was needed, e.g. laying sandbags, house animals for a period of time, 4 x 4 vehicles helping etc. The link into this report would come from the vast amount of help offered to those in trouble, although some online, it still does give information to those who need it. It could also be said that even though it was a smaller amount of those who volunteered offline, it was through the social media platform Twitter that this could happen.

Current Situation

Currently in the UK every police force has some social media account, and majority have two or three, Twitter, Facebook, and LinkedIn tend to be the most common. However, when descending the levels of the police structure, less departments tend to have accounts. This isn't necessarily a problem, however, it can be seen as a hindrance if the police are looking to use social media for 'community policing' as forces can cover populations of around 500,000. From initial glance, from a citizen's point of view, it looks that police forces seem to mainly tweet information. Information that informs the public about a crime in compliance with the Freedoms of Information's act (2000). As the public/followers aren't able to see how the forces conduct intelligence and investigations on social media, it would seem that the police use social media only to broadcast information.

Although engagement may not be best practiced in police forces, there are many government agencies that practice and have strong policies around Open Source intelligence and investigation all over the world.

Although we don't have access to any specific details, the creation of DNI Open Source Centre in the Central Intelligence Agency, US, in 2007 shows the perceived value of the Open Source information early on. The document states that:

'The DNI Open Source Centre represents a major strategic initiative and commitment to the value and we place on openly available information' (Central Intelligence Agency, 2005).

The relevance of this quote shows the value seen from Open Source data from a very early point, and even before social media. This could be a reason that US government and police forces seem to use social media and Open Source data better than the UK. They have an enhanced understanding and better policies and procedures surrounding the use of social media.

It's not only police forces and intelligence agencies that use social media to help support their role, it has been found that 83% of world leaders have Twitter accounts (Expanded Ramblings, 2016). There are studies which show the power of social media for politicians when looking at Obama's 2008 campaign which has been described as 'the first electoral campaign in which the use of social media had a deceive impact' (Auvienen A, 2011). This shows the power of social media to spread a message and that trust and respect of an individual can be improved through a sensible social media plan. Although the power of social media can be shown to work for other industries it cannot be directly compared to police forces as they are out to serve a different purpose and communicate to different individuals.

There are many technologies, briefly mentioned, that help the police with the everyday usage of their social media accounts. Many of which are commercial use, there therefore aren't fully applicable for all the police's tasks around Open Source data on social media. An example of this sort of technology that is designed with police tasks in mind is Sentinel (Roberts et al, 2015). Sentinel is designed to collect social media data from a variety of sources and analysis of this data guided by the 5 W's; who, what, when, where and why. It was seen in the analysis of the Lee Rigby Murder 2013, when Sentinel was used, that this system managed to draw conclusions based on a dataset of around 34 million data points. Again, seen in analysis of the Cardiff Gaza protest in 2014 with more specified parameters, providing crucial evidence to support the gathering of data. It allows the analyst to input a certain number set of parameters which help to refine the data set automatically and stores them for later analysis. This will help with the time issues that using Open Source data can produce, as well as gathering valuable information to draw conclusions from.

Ethics

With the police having the responsibility of care for the community, along with any data gathering and analysis from social media accounts comes ethical issues

around the use of this information. Recently, in 2014, a new version of the 'Police Code of Ethics' was created detailing all the ethical standards that the police had to abide by in everyday working life (College of Policing, 2014). Under a section named 'confidentiality' social media is discussed, and essentially states that the employee must have a valid reason and justification to gather data from an individual's social media profile and must fully understand the Data Protection Act of 1998.

RIPA (Regulation of Investigatory Powers Act 2000) is one of the guidelines for surveillance and counter terrorism acts (Home Office, 2013). It's a law stating that if police forces need gather information on an individual they are to use covert techniques and to conduct this investigation in a way that is appropriate and compatible with human rights. This act applies to all sorts of investigatory tasks (e.g. telephone calls, emails) and covers the use of social media platforms as well.

There are also many articles about the Police's use of social media on their own time, and many statements recommending that they are as vigilant and respectful on their own private social media accounts as well as when conducting police work.

Conclusion

Over this chapter the scene has been set to show what social media is, how it is used in police environment and what sort of tasks can be supported by using social media. The remaining chapters will look at engagement in more detail, and the importance of it in a policing environment. The focus will be on how information systems can help improve engagement, and the system used to research is social media. Because of these two focuses, engagement and social media, the following chapter will look at more related examples and studies to discuss previous events and methods used. From here research will be conducted to understand what activities UK police forces conduct on Twitter and provide recommendations to help the organisation improve their engagement tactics.

Types of Engagement within Policing

This chapter will focus on a closer look at studies into engagement, and will deepen the analysis of the proposed areas set out in chapter one. The following studies and articles will give the background into what engagement is and the different types of engagement around the world. Choosing engagement as a focus for this paper on is a new area to be explored for UK police, and as you will see throughout this chapter, most of the academic studies regarding engagement are from the US or other countries. This doesn't mean that the UK police forces don't use engagement, only that it hasn't been academically analysed. This chapter hopes to give a clear understanding of the different types of engagement online, and produced refined questions to start conducting the research from.

The official definition of engagement is: '*Participate or become involved in'* (Oxford Dictionaries), and when relating it to the context of social media engagement, it would be to participate in the online community. For the purpose of this report engagement will be defined as the police seeking information through their Twitter posts (e.g. appealing for information, asking for participation) or when the police are engaging and promoting a local event (e.g. coffee with a cop, or local fair, police participating themselves).

The below studies and articles have been chosen to give examples of different types of engagement, and how police agencies around the world use it in different ways. These are to highlight the importance of engagement and show the reported benefit of using social media as a helpful information system tool. There are also examples that show what will happen if there is no engagement online, or if the account is temporarily not monitored.

Appealing for Information from the Public

China's Missing Child Case

Earlier this year (January 2016) an image of a small three year old girl was widely shared across Chinese social media. The image showed the girl being taken away, hand in hand with a lady that wasn't her mother. Through the widespread social media campaign, led by the police forces, the little girl was found and reunited with her parents (BBC, 2016d). The use of social media from the police forces here allowed the image to reach far and wide across the country. This sort of engagement, engagement of spreading of information is a very common, and seemingly useful way of finding information to aid the resolution of the case. This report doesn't specify which social media platform was used, but if we take Twitter as an example, the use of 'retweets' would serve this purpose. A retweet is when a user sees another accounts tweet (post) and copies it to their Twitter followers as

well. As with Twitter, only those who follow your account can see your posts, therefore if these individuals following your account decide to 'retweet' your post, it will go to all of their follower base as well. Ergo the post will be seen by more users on Twitter.

Liberty Village Murder

This news article looks at the Toronto police tactics in using social media to help crack a three year old case of murder. It was reported that after leads had gone dead the lead detective took 'an unconventional approach' in an attempt to move the case forward (Pimentel. M, 2015). He started tweeting evidence about the case, week by week, hoping to encourage witnesses to come forward. The Twitter posts quickly gained international attention and ultimately ended in a suspect in custody and a year later charged with second degree murder. Similar to the last study, it was the wide spread knowledge of the case, and the images circulating that led to the conviction. In this case it specifics the use of Twitter, from the screenshots attached to the article it can be seen that they were receiving retweets and favourites. Favourites are when a user shows appreciation for the tweet, however it doesn't reach any more people. The way in which the social media platform was used in this case differs to the Chinese case earlier, as it was at a different point in the investigation. When all leads had produced dead ends and resources are exhausted, social media seems to be a helpful tool in giving that last potential aid.

The two articles above shows that social media, and how quickly and far information can go, has a real part to play in how engagement on social media can help police investigations. China's case shows how the speed of the internet can potentially be lifesaving and the Toronto case shows how social media can be applied when all other leads are expired. Both showing great value to their police teams, and provide great examples of social media engagement working. It could also be said that an interest factor helped increase engagement and sharing of the images, potentially as images attract more attention than usual word-only posts (Patel. N, 2014).

Aftermath of Major Events

Vancouver Canucks Riots

In 2011 the Vancouver Canucks lost the final of the National Hockey League championships (Donaldson, 2012). A standard process of the VPD (Vancouver Police Department) was to use their social media officer to communicate safety issues, traffic routing and crow control to the fans in the stadium. As soon as the Vancouver Canucks lost the game, almost simultaneously, riots started in two

different points within the stadium and lasted for approximately three hours. Within 20 minutes of the riots starting, tweets into @VancouverPD of suspect information and photos flooded in. The lack of resources to process the information coming in led to the accounts appealing for information in the days after the riots occurred. Meaning that the potentially key evidence during the riots weren't used efficiently. This is an example of how useful social media can be, however if processes and procedures aren't put in place to allow analysis of the information it can cause a massive time delay.

It's the aftermath of this case that showcases how the VPD used Twitter to engage with the public, and ask for tips and information about the riots. They also set up an email account and promoted this through their social media sites, and asked for evidence to be sent to the email instead of on Twitter. This may have been because of the public eye on the social media accounts due to the riot, and integrity of evidence wanted to be kept. In the first week the IRIT (Vancouver Integrated Riot Investigation Team) received more than 3,500 tips from the community. Once images of the rioters were gathered, the police created a website to see if names could be connected to the images. In order to spread the word about this website, the IRIT used a mix of traditional methods and new social media platform communications.

An interesting part of this event is also before the riots, when social media officer monitors the Twitter feeds and notes any key words referring to civil unrest. This could be called sentient analysis, and has been known to be a key indicator in the stages before riots or large scale violent acts. In this study the social media officer saw chatter around the word 'riot' and as sentiment can't be taken at face value (because tone, sarcasm and irony is difficult to understand online), the next stages are to establish the credibility and/or validity of the tweets potential being problematic, and in this case the sentiment, key word analysis was correct. A study by the University of Wolverhampton also acknowledges the importance of sentiment, and states that it is more likely to be accurate in the period of time before a major event like these riots (Thelwall et al, 2011).

Boston Marathon Investigation

This event saw engagement play a crucial role in many aspects of this case. The Boston Marathon case saw new ways of policing emerge through social media, and in April 2013 a dramatic and rapidly developing case had to keep up with the gossip on social media (Cassa et al, 2013). In April 2013, at the finish line of the Boston Marathon two separate bombs were detonated causing multiple casualties. The BPD quickly engaged in their immediate response protocol, which involved keeping the public informed through social media.

A paper by Harvard Kennedy School named 'Lessons From Boston' highlights the different ways BPD (Boston Police Department) used their social media in the aftermath of this horrendous event; keep the public informed, calm nerves, request assistance, correct mistaken information and asking for restraint in posting information from police scanners. All of these touch on engagement, however one in particular looks at a new form of engagement which has great impact. Correcting mistaken information published by the press is a new and innovative way to use social media. Currently the way the public find out information about a police investigation is through media coverage, and this isn't always the most reliable source and incorrect information was seen published by media outlets in this case. For example, a number of different rumours were revealed as false such as the amount of individuals who had died from the blast, and suspects that were/were not in custody. A 'digital hub' was set up where five individuals, two officers and three civilians worked 24 hours a day to keep information updated to the public. They were briefed five times a day and BPD tweets rapidly became the most trusted source of information about the case. To support this, the afternoon of April 17th CNN posted tweets reporting an arrest had been made which was quickly responded to by the BPD informing that no arrest had been made. The CNN post received 5,000 retweets whereas the BPD tweet was retweeted nearly 11,000 times.

From this case it can be seen that with factual and real time information being posted by the BPD, the police department is quickly gaining trust from its citizens which gives the police department a sense of authority online. This is transcribed into engagement as it is informing the public of the facts with the understanding that there are perhaps other incorrect facts out there, and the engagement being allowing the retweeting the correct information. The paper continues to explain how the advantages in gaining trust online are reciprocated offline as well, and when engaging with the community online it can have many more advantages than intelligence, investigation and engagement, it can improve the overall respect of the police.

UK Riots Study

Heading back to the UK, in 2011 riots broke out across North London in response to a fatal shooting by an officer of a civilian, Mark Duggan (Donaldson, 2012). The protests began peacefully, however soon escalated into violent riots with looting and mass violence occurring (BBC, 2011). A vast amount of information was sent in through social media accounts from members of the public, including events they had witnessed, photos and videos. However, the speed of the violence and the great amount of information sent in, similar to the Vancouver study, meant that it wasn't possible to process the information in time to have any affect before the riots were over. In the aftermath of the riots around 3,000 individuals were arrested in connection to the violence. An official document from the government

'Lessons learnt from August 2011' outlines various areas of the case, and mentions the use of social media. The document describes the use of social media in the form of reassuring the public in these crimes to be a very valuable tool, however fails to mention any aspect of gathering evidence from the platform. It highlights the significance of reassuring the public through social media and encourages its use from the police through aftermath of large scale events.

The main point to take away from the Vancouver, Boston and UK events is that the public are very willing, and almost send information in automatically in the aftermath of a major event. The engagement and willingness to help from the public to the police is already there. It is the lack of processes around gathering and analysing this information that puts the police departments on the back foot. This is where ideas such as the Pirolli and Card element of the 'Shoebox' could be applied. It also must be stated that after both events, lessons learnt contained very similar advice to police officers using social media, to reassure and advice the public, and is a great step for improving engagement online.

Consequences when lack of engagement

Gaza Protests Study

Although there have been studies as far back as 2011 (for the UK) relating to engagement with the pubic, it isn't widely used and still needs guidelines and policies around social media use. An example of when engagement with the public should have happened would be the Gaza protests in Cardiff, 26th July 2014. The event saw over a thousand people marching through the centre of the city protesting the Israeli incursions into Gaza. Similar to the protests mentioned before, violence broke out, from customers of the streets bars throwing bottles and shouting abuse at the protesters. A study conducted at the time of the protest monitored and tracked the tweets using specified parameters, and saw that the influx of tweets specifically connected to the protest, e.g. hashtags #gazaj26 and some even directing messages to the local police account @SWPolice narrating the violence (Preece et al, 2015a). However, there were no tweets from the South Wales Police Twitter account on 26th-27th July.

The lack of police presence both online and physically in the area lead to an article from BBC news containing the words 'poor policing' by the South Wales Policing team (BBC, 2014). This is a clear example of when events are occurring and the police are being directed to these events by the public, but no engagement action is taken.

The reason these studies were chosen to present in this report is that they all show different types of engagement within different situations. From conducting engagement well, to what happens when there is no engagement at all. Along with

the differences, there is one aspect all these studies have in common; they are in the aftermath of major events. This report will look at a slightly different type of engagement again; daily engagement with the community. The reason for this is that there hasn't been much analysis surrounding this type of engagement in the UK, or around the world, and it is an extremely important part of policing. Every force in the UK currently has a policy to improve community policing, and improving engagement on social media could play a role in attaining this.

As the research will be conducted on daily tasks, it will look at the bi-directional use of social media, the above studies have mainly been focused on the public giving information to the police, and however the research will look to see if there is evidence of police giving back engagement to the community.

Current UK Hesitancies Surrounding Engagement

It could be said that some forces and individuals within the police forces are hesitant to fully adopt an Open Source, more specifically a social media, strategy and this may be for a number of different reasons.

Open Source information, in the first instance, can be difficult to gather/forage, and further down the line, can be dismissed easily as unreliable as 'soft facts'. Meaning that using Open Source information can lead to using a lot of police time, and for no benefit. Especially in the early stages when, for example, detectives aren't fully competent on navigating around the social media sites, or aren't fully aware of what sort of information can be searched.

Some of those forces in the UK that have fully embarked upon a social media policy have had backlash from the media about particular posts. An article published by the Independent titles 'Anger over Merseyside Police Twitter rape joke' and continues to explain that it was in reply to a few tweet to the police account about the football side being 'raped' on the football pitched. In which the account responded with a humorous tweet which was taken by some members of the public to be offensive and insensitive towards rape victims (Bolton. D, 2015). Showing figures, the initial tweet by the forces account received 700 retweets (when members of the public send on the tweet to from their account also) and the newspaper article which printed the story received 691 shares. These figures show that this story has been exposed to a lot of members of the public, and has shown Merseyside police force in a negative light. This kind of negative press may also be part of the reasons behind some forces being hesitant on social media. Similar stories can be found with Sussex police, with the headline 'Sussex police attacked over 'Big Brother' action online' (BBC, 2010) and can also be found outside the UK with stories from Spain (BBC, 2016a).

Whilst the use of puns can be entertaining for followers of the police account, there are also ethics surrounding the use of Open Source data. Although it's not illegal to obtain Open Source information, there are guidelines that need to be adhered to by police staff. If staff are unaware of such guidelines it could be detrimental to a criminal case and can be bad press for the individual and force involved. These are easily mitigated with a strong social media policy and detailed procedures surrounding the use of the platforms.

At an OSCAR conference, held in Cardiff, January 2016, many areas of social media were discussed and a lot of questions were raised surrounding the use of social media. One of the interesting points that was raised was that of engagement, and that police can't stop crimes occurring on social media, but they can investigate afterwards and support the community during. The conference showed that there is an understanding by some and a willingness to develop methods to include social media, but the process to get there hasn't been defined yet.

Proposed Research Questions

Due to this being a narrower focus from engagement the three broad categories outlined in chapter one can be refined down to six main questions, ready for research and analysis. The following proposed questions have been derived from the elements taken in the above studies and articles to help focus on what attracts engagement and how police use it:

1. How do police currently use their Twitter accounts on a day to day basis?
2. What elements correlate to improve follower base?
3. What themes of tweets receive the most engagement?
4. Does sentiment of tweets have an impact of the comments/tweets back?
5. Does the force Twitter handles, names, have an impact on engagement?
6. Are their differences in the way force and local accounts use Twitter?

As it may be seen from previous studies in chapter two, some of these questions may have partially been answered. However, as there is no definitive study about UK police organisations, therefore some of the questions have been derived from US studies. There is no way to conclusively say that these techniques work in the UK police context, and this is the reason these questions have to be analysed for the UK police organisations as well.

If we were to look into each individual question in further detail, the relevance to the police forces can be seen more exclusively. Question one looks to provide an understanding of what the police currently do with their Twitter accounts on a daily basis. The importance of answering this question is to give a strong foundations to the further questions with an understanding and comparison model

to work against and to give an insight into the reader as to the sorts of items posted. It is also an opportunity to understand how much the police accounts are used on a weekly basis.

Question two looks to explore what, if any, elements of social media are correlated with follower base. The term 'elements' here could refer to any aspect of Twitter i.e. population size of the force in question, total amount of tweets, age of account, amount of daily tweets etc. The thoughts underlying this question is based on the assumption that the more followers the account has the more people the information is seen by which is a key reason for the police giving information out on Twitter.

The creation of question three derived from a US study (IACP, 2010 and 2015), which looks into the different uses US police departments use their social media sites, and was tailored due to the differences between US and UK forces. The question specifically refers to what categorised theme tweets gets the most engagement, with particular emphasis on the sorts of tweets that the forces are looking to be spread further (retweeted) I.E. appeal tweets. The themes will be redefined to fit with UK task as it may differ from US tasks. Discussing theme is another way which police organisations differ from corporate organisations as no corporate study on Twitter improvement mentions analysing the themes of tweets sent.

Question four is looking to understand the sentiment behind police tweets and if this has any impact on either; the sentiment of the tweets back, or any improvement on engagement. From previous studies (Vancouver Canuck Riots and Lee Rigby Murder) it can be seen that understanding sentiment is an important element for police to take notice of, as part of their role is in regard to the community. For local forces this could give good insight into areas within the community that could be improved by police presence, and for large forces it can potentially be a signal to the initiation of a violent event. Although when sentiment has been analysed it mainly shows a correlation with large scale events, where emotions are extreme, it would be interesting to understand if there is any correlation on a daily level for Twitter posts.

Question five, may not be an area that can be changed for some forces, however, is arguably worth looking into. The question looks to understand whether the police forces Twitter handle (Twitter name) has an impact on engagement or follower base. It has been seen through small amounts of background research that the usual Twitter handle for police forces in the UK follows the format: @'area name'Police (example, @DorsetPolice). Although there are a forces that use a shortened version of their area name i.e. @LincsPolice, the format can still be seen,

whereas there are forces that don't use this format at all (e.g. @HumberBeat). This question looks at if this has any impact on engagement or follower base.

The understanding behind question six, is again derived from previous research. A study by the US (Donaldson, 2012) discusses the differences between force and local accounts. The research for this question revolves around looking at the differences between the types of themes each UK type of account outputs, and if this is what is expected. For example, it would be expected would be that local accounts tweet more about community topics and local events along with conversational tweets, whereas force accounts may tweet more about national campaigns and giving the public information.

Conclusion

This chapter has looked at many previous studies and many different types of engagement. The questions proposed above will help shape the research delivered in the next chapter. The questions focus on community engagement on a day to day level as it is an area that can be improved by all police departments around the UK and can be implemented as a solution immediately.

Research and Findings on UK Police Twitter Accounts

This chapter will explore the uncertainties within engagement of police presence on social media from the questions detailed in chapter 2, and seen below. The research will be conducted from two main lists of police account and the initial analysis will be using three main initial methods, thematic, sentiment and name analysis. Then the deeper level analysis will look to bring together past studies and the following findings to form a solid and reliable list of statements and conclusions.

The questions proposed for this study:

1. How do police currently use their Twitter accounts?
2. What elements correlate to improve follower base?
3. What themes of tweets receive the most engagement?
4. Does sentiment of tweets have an impact of the comments/tweets back?
5. Does the force Twitter handles, names, have an impact on engagement?
6. Are their differences in the way force and local accounts use Twitter?

Method of Gathering Data

The initial steps of being able to understand and answer the questions, was to gather the correct and reliable data; this came in the form of gathering the Twitter accounts. There has been no prior research or studies into this area, and therefore the method for which this research was conducted was primarily based on the research itself, and how it best fitted into an organised structure of which to analysis efficiently.

The gathering of this information was conducted in two different ways; official lists and geographical location (police forces by county, explained later in the chapter). The reason for the two different ways was that the official list would give good coverage of the high level forces, and show the accounts based on the country split up into forces i.e. Avon and Somerset police, whereas the geographical list would look at how a citizen may search for accounts by county.

The official list was curated by the senior policy adviser on digital engagement and social media for UK policing, an individual called Nick Keane, and Twitter list named 'UK Police Force Twitters' (Keane, N). This list gives 49 members containing all the different forces over the UK, plus a national account. For each account that was recorded, the total amount of tweets and total amounts of followers were recorded also, (Appendix 1). This was information as of 8th March 2016.

Force Name	Twitter Handle	Total Tweets	Followers
Derbyshire Police	@DerbysPolice	16,500	47,500
Dorset Police	@DorsetPolice	8,447	32,200
Durham Constabulary	@DurhamPolice	7,367	31,700

Figure 2: Fragment of the official list and the information recorded

The geographical list was based on how the counties are spilt up over the UK, and was in the hope that this would give an idea on how citizens would look for their local police force accounts. A Google search was used to collect this information by the results it displayed when an example such as this was input: 'Police Twitter accounts in Surrey'. Searches like the example above was conducted for every county in the UK (County-Wise) and all Twitter accounts were recorded, along with total number of tweets and followers as of 23rd February 2016 (Appendix 2)

County	Twitter Handle	Total Tweets	Followers
Bedfordshire	@bedspolice	11,100	39,000
	@roadpoliceBCH	6,459	8,726
Berkshire	@ThamesVP	11,000	103,000
	@TVP_Reading	2,791	7,172
	@TVP_WestBerks	2,846	3,496

Figure 3: Fragment of the geographically gathered list and the information recorded

This method of collecting UK police Twitter accounts resulted in 222 accounts being recorded, however many of these being duplicates as forces jurisdiction sometimes covers several counties. It was also seen that some of the search engine results displayed US police departments accounts e.g. @MiddlesexPD. As this was noticed early in the research collection it was simple to remove these from the final list ready for analysis.

As the latter list is a fairly large set of data and a sample was decided as the best method for detailed analysis. The sample was chosen by firstly ranking each account by followers divided by population of the county (City Population, 2016) and then ten from the top, five from the middle, five random and eight from the bottom were chosen to be part of the sample (Appendix 3). A sample such as this was chosen as it gave a good mix of all the different rankings of account, and a mix of the types of account (17 local accounts and 17 force accounts). The official list was kept full as it was felt that the full list would give a greater view of the forces across the UK and it was deemed manageable in terms of collecting and analysing the data. There were 12 duplicates found amongst these two lists, and it was decided to keep the lists this way as the geographical list was seen to be showing

a mix of force accounts as well as local, so duplicates were expected to occur. Overall the total amount of accounts to be analysed were from two lists, one official list of 48 accounts and one geographically based list of 34 accounts. With a total of 59 accounts and just under 5,000 tweets to analyse.

In regard to the questions outlined at the start of the chapter, any question that requires a comparison between force and local accounts divided the sample sets into 17 local accounts and 17 force accounts, from the geographical list detailed above.

After the initial gathering and sampling of the account to pursue, the next steps show how the data was gathered for the six questions. Three different methods were used for initial analysis of the data; theme analysis, sentiment analysis and name/handle analysis.

Themed Methodology

Understanding the themes of an account is arguably the hardest research area that has been chosen, however is one of the most important as the majority of questions contain answers involving it (Appendix 22). The starting investigation into this area of research arose from understanding the different themes that the police accounts tweet and mainly from the different outcomes of Twitter from the events discussed in chapter two. From previous research studies, brief understanding of police activities (offline) and an initial glance at police accounts, seven broad categories were determined to be the basis of this research area, split into objective and subjective elements. These categories being:

Objective elements:

- Conversations, any tweets when the police account is communicating with another account. Direct tweets or mentions of accounts e.g.
- Photos, tweets containing photos or videos
- Retweets, anything retweeted by the police account

Subjective elements:

- Advice, any tweets from the police account giving advice, campaigns or rumours e.g.
- Appeal (engagement), tweets that involve the police account asking for information from the public, or tweets that show police involvement in community events e.g.
- Non crime information, tweeting information that isn't related to any crimes occurring e.g.
- Police information, any tweet from the police account regarding crime information e.g.

- Rumours, if a tweet acknowledges a media story, or another tweet, and responds with the police facts

The objective elements to the tweets were the easiest part to determine, retweets had 'RT' at the beginning of the tweet (Figure 3), and conversational tweets had @accounts within the tweet, these were split into tweets categorised as 'direct' if the @account was at the beginning of the tweet (Figure 4), whereas tweets were categorised as 'mentions' if the @account was anywhere by the beginning of the tweet (Figure 5).

03/04/2016	@Glos_Police	RT @childrensociety: Want to help us tackle child abuse? These are potential signs of abuse to look out for. Let's #tackleabusetogether htt…

Figure 3: Example of a tweet categorised as 'retweet'. RT at the beginning.

03/07/2016	@StaffsPolice	@andymhamilton Hi. Please report this by calling 101. Thanks.

Figure 4: Example of a tweet categorised as a 'direct' tweet.

03/02/2016	@wiltshirepolice	We're supporting the new @thinkgovuk drug drive campaign. Find out why there's more reason to be paranoid https://t.co/z3I8y6Fabv

Figure 5: Example of a tweet categorised as 'mentions'

Although these objective elements were easy to categorise, unfortunately the tool that was used to pull down the tweets didn't make clear if a photo, video or poll was attached to the tweet. In order to conduct this type of categorisation, the accounts were accessed and the individual tweets looked at and noted if there was a photo/video/poll attached. Even though this way wasn't the most efficient method of choice, it did bring to light some very interesting and unexpected findings which will be analysed later in the chapter.

Subjective elements to categorising the tweets was a harder task to conduct, and did rely on the definitions of the different categories. Advice tweets were mainly categorised if it offered some sort of support to the user reading the information, this could be a campaign for child abuse (which is one of the common themes amongst advice tweets, assuming it was a national campaign) or even traffic collision advice i.e. 'major accident on A31, please use other avoid area' (examples in Figure 6).

2/26/2016	@ASPolice	Online dating? ❤ Follow @NCA_UK for safety tips. We're supporting their #LookBeforeYouLove campaign. Stay safe https://t.co/SB9qwp3S30

Figure 6: Example of a tweet categorised as 'Advice'

Engagement tweets were categorised if they were one of two things; the police account asking for the public to get in touch and offer information back to the police, or if the police were tweeting about engaging with the public i.e. community event. Within engagement it was also noted whether the engagement was online or offline, online was mainly when accounts were asking for retweets or asking for advice, whereas offline was when the account tweeted about a 'coffee with a cop morning' or to give advice using a 101 number (Figure 7). If the tweet didn't specify the type of engagement (in regards of asking public for information), it was assumed the engagement should take the same form that the appeal took, online.

03/02/2016	@CambCops	We'll be discussing the use of stop and search in the county at a meeting next week. Come and join us. https://t.co/Hk7BdS9MxZ

Figure 7: Example of a tweet categorised as 'Engagement' and 'Offline'

Tweets were labelled as 'non crime information' if the tweet contained anything not directly related to a crime i.e. recruitment for the police, or photos of police animals (Figure 8). Similarly, for giving information, police information is named for tweets as the opposite of the 'non crime' category. Anything that is directly linked to a crime e.g. a witness appeal or an update on a case (Figure 9).

2/26/2016	@dorsetpolice	#Jobs - new vacancy for a Prevent Case Channel Support Officer based in Poole. Full details online: https://t.co/XRmgQOH1jE

Figure 8: Example of a tweet categorised as 'non-crime'

2/22/2016	@gmpolice	CCTV images of a robbery at a Co-op Store in Failsworth. https://t.co/4cb0BHXcll https://t.co/ifmp4aU44d

Figure 9: Example of a tweet categorised as 'police information'

Rumour is an interesting categories is gives information on rumours, mainly from the media, the category derived from a US study (Donaldson, 2012) where it was surveyed that many forces use social media for this purpose.

Once these categories had been defined, the next logical step was to gather and store the tweets from the accounts for analysis. With the average UK police force tweeting 69 times a week (average across local and force accounts) the data gathered was a week's worth of tweets for each account, with the dates gathered

ranging from 22.02.2016 to 08.02.2016. This two week period was picked as there was no major national or international events or incidents which could have potentially skewed the results. The tool used to help collect the tweets was an add-on to GoogleSheets (GoogleSheets, 2015). This tool pulled down the content of the Twitter handle, tweet, date of the tweet and retweets. From here each accounts data was stored in an excel spreadsheet and analysis started. It must be mentioned that the tweets can cover multiple categories, such as, a tweet giving information to the public, containing an appeal and with a photo attached, example can be seen in figure 6, where it is an advice tweet, but also mentions other accounts.

To help aid this process, as it can get very confusing, in the spreadsheet more columns were added with headings of these categories. Meaning that the headings to each spreadsheet had the following headings:

- Date – displaying the date the tweet was sent
- Screen name – the Twitter handle for the account e.g. @WMPolice
- Tweet text – content of the tweet
- Retweet (R.)/ Mentions (M)/ Direct (D)/ Normal (N) – analysis of type of tweet, objective
- Photo (P)/ Poll (X) – whether photo or poll was attached to the tweet (photo included video), objective
- Police (P)/ Non Crime (N) – whether the tweet was related to police or crimes, subjective
- Giving Information: Advice (A)/ Police (P) /Rumour (R.) – stating information to the public on the categories listed, subjective
- Appeal/Engagement: Online (On)/ Offline (Off) – asking for or discussing engagement either online or offline, subjective
- Retweets – the number of retweets the tweet received

The headings allowing each column next to the tweet content to be filled in by one, or more of the categories (each tweet has to be categorised into at least one). The bottom of the spreadsheet then contains 48 formulas that count each of the different categories, and the amount of retweets and favourites each category got. This was for ease of use but also efficiency as it avoided the human error aspect of counting. The data gathering for each account can be found in (Appendix 22). An example can be seen below in Figure 10.

Date	Screen Name	Tweet Text	Retweet (R) /Mention (M) /Direct (D) /Normal (N)	Photo(P)/Poll(X)	Police(P) /Non Crime (N) Content	Giving information: Advice (A)/ Police (P)/ Rumour (R.)	Appeal/Engagement: Online (On)/ Offline (Off)	Retweets
2/28/2016	@OrkneyPolice	Hello humans, I'm at the police station. I wasn't bad, I'm just a little bit lost. Parents please pick me up https://t.co/IzTcASEt75	N	P	P	A	On	368
2/28/2016	@OrkneyPolice	Sam is now home with his family, thank you for all the retweets folks	N		P	A		3
03/01/2016	@OrkneyPolice	KGS pupils received inputs today on cybercrime and NPS https://t.co/5VRtDf5JvA	N	P	P	A		1
03/01/2016	@OrkneyPolice	Any other young people wanting to learn more about cybercrime and NPS there will be a session at the youth cafe at 1700 hours	N		P	A	Off	2
03/01/2016	@OrkneyPolice	Police Scotland's Drug Co-ordinator Detective Inspector Miller teaching the young folk about NPS https://t.co/GX529xTS8l	N	P	P	P		1

Figure 10: Example of Twitter Analysis Spreadsheet

A master table was created to show each account, with the figures for each category, for easier comparison across the accounts (Appendix 4 and 5).

Sentiment Methodology

Sentiment, as seen from studies such as Lee Rigby and Vancouver Riots, has shown to give a good understanding of user's opinions and emotions, and the creation of social media has brought about publishing that emotion. It was decided to look into sentiment of police accounts as an experiment, to see if there are any differences between the sentiments that is delivered in the form of tweets, with a further look into what sentiment users give back as a form of engagement. The gathering of these accounts was chosen to be a mix of force, local and national, and again, was ranked based on population/follower base. 19 accounts were chosen to be analysed for sentiment, and analysis were recorded based on the sentiment the account sends out and the sentiment received back.

The tool used to gather the sentiment results is called 'happygrumpy' (Zoral Limited, 2016). This analysis tool looks at the specific sentiment of each word in the tweet, rather than the tweet as a whole. The tool gives the search query an overall HG score (happygrumpy) as well as a percentage break down of the tweets into happy/grumpy/neutral and emotional. The main focus for this research is on the comparison between happy and grumpy, and if this has a correlation with the happy/grumpy respondents back.

HappyGrumpy uses SENTRA an AI/ML based emotional analysis tool which represents nearly 80 years of research and development. On the company's website they provide studies and examples of where the sentiment analysis of presidential campaigns have proven to be correct (Zoral Limited, 2016b). SENTRA itself specialises in artificial intelligence, machine learning and natural language processing and applies this to sentiment analysis (Sentra, 2012).

Of course it cannot be said that sentiment gives a solid view into the lives of their follower base, however, if looking at averages, and in this case the comparison between the accounts, the results and analysis can be used as a guide.

For each of the 19 accounts the HG score was recorded along with the percentage of happy and grumpy sentiment word count (Appendix 6). It is hopeful that this will give an insight into the sort of sentiment police accounts send out with their social media, and the main aim is to understand and hopefully prove that there is correlations that can be applied to situations in regard to sentiment analysis.

Name Analysis Methodology

The idea of analysis on the impact of the Twitter handle was first noticed in a very early background reading, and through personal use of Twitter. When collating the lists in the two different methods, it was clear to see that there was a main format that the majority of accounts used, however there were several that were almost obscure, and was hard to realise they were police affiliated.

The analysis for the name was purely based on the forces list, due to the fact that it would be the main account for individuals in particular areas. The table contained the username (Twitter handle), display name, and whether the username was one of three different formats:

- Shortened name + Police (e.g. @BedsPolice)
- Full name + Police (e.g. @CumbriaPolice)
- Name + _ + Police (e.g. @Kent_Police)
- Other (e.g. @HumberBeat)

The relevance of these being that when a Twitter user searches for a particular police force on the site, unless you search for a display name (without @) it may not display the force which is being looked for.

In regards to engagement and even follower base, if the users looking for the account aren't able to find it, there could be a significant difference in follower base.

With all the accounts in the spreadsheet and analysis was conducted on each account, and with the results collected and compared to follower base, averages were taken (Appendix 7)

Research Findings; Statements and Graphs

The following numbered statements show a headline to a finding produced in the research. Each statement has been grouped into the area in which the results was collected from, along with graphs, tables or screenshots to help support the statement.

Theme Findings

The research involving looking into the themes of the police tweets displayed a number of interesting areas, all of which contributing to areas of the questions defined at the start of this chapter. The method of gathering the initial lists of accounts can be found below, and each graph can be traced back to each list with (L1) or (L2) in the title, meaning:

- L1, List 1, is the geographical search list of 34 accounts, 17 local, 17 force
- L2, List 2, is the official list of 49 accounts, all force.

From the master lists discussed above the following graphs, tables and statements were concluded. Please note, that the resulting graphs, figures and statements seen below are purely based on the sample groups defined above (geographical and official groups), and doesn't look to speak on behalf of all the force Twitter accounts in the UK. The various graphs used have been selected as they visually portray the data in the best way possible.

1) Accounts that tweets more get retweeted more

Table of data can be found in (Appendix 8). Figures 11 and 12 (respectively) show graphs that took the data from the 'total tweets' column and the data from 'total retweets' column and plotted. The trend line was added to help show the correlation, and the extent of the correlation. The two positive trend lines was expected to be seen, and it is also seen in commercial Twitter accounts and US police accounts.

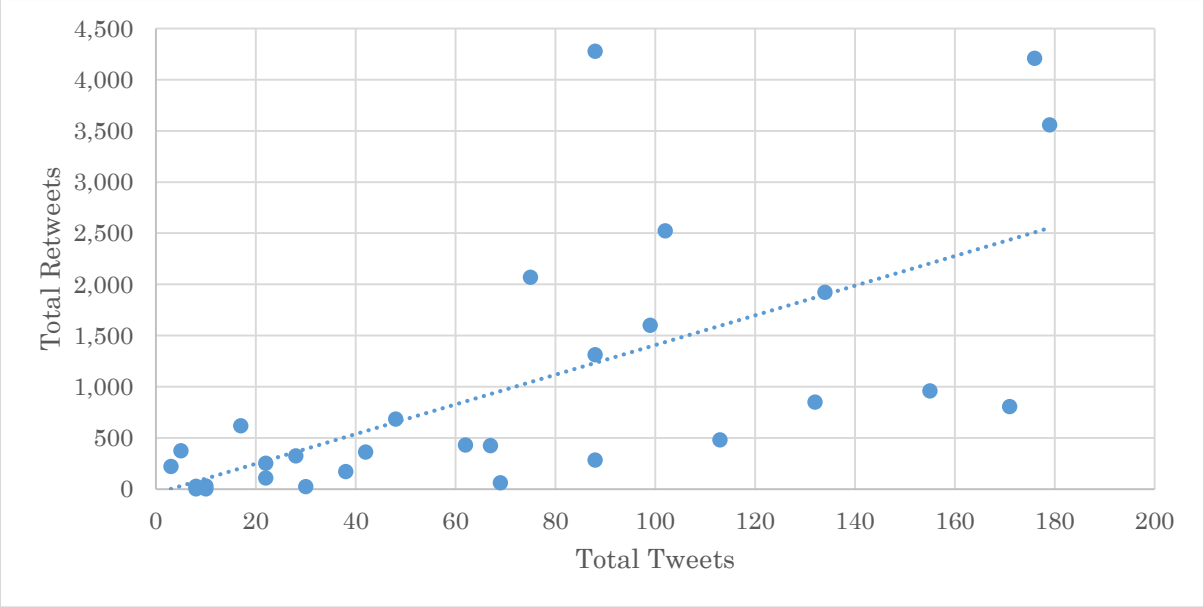

Figure 11: Total tweets and total retweets comparison (L1)

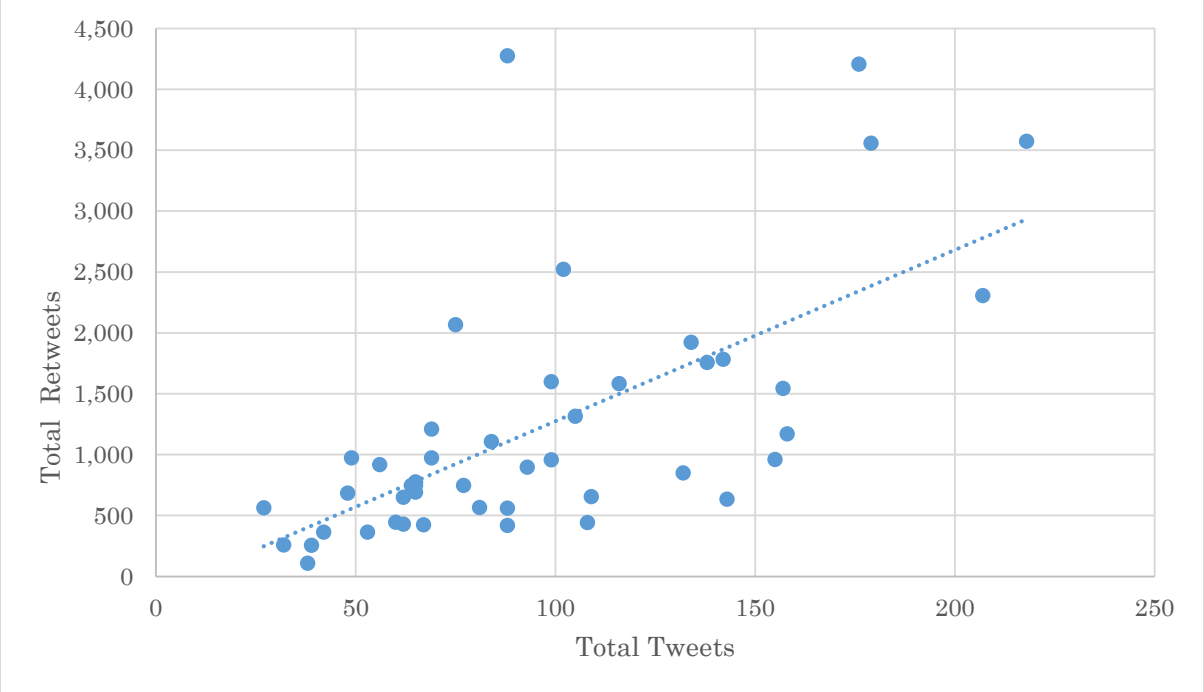

Figure 12: Total tweets and total retweets comparison (L2)

2) Positive correlation between proportion of tweets with photos, and follower base

Table of data can be found in (Appendix 9). From the master spreadsheet from both datasets, the figures 13 and 14 show the plotted data from the column 'percentage' and 'followers'. The percentage of tweets was produced by understanding the amount of tweets with photos and the amount of tweets without photos. Each was then divided by the total amount of tweets, with the final figure being presented as a percentage. This was conducted for each

account for both lists. A scatter chart was chosen to show the individual points for each account, and the trend line is to help visualise the trend in both cases.

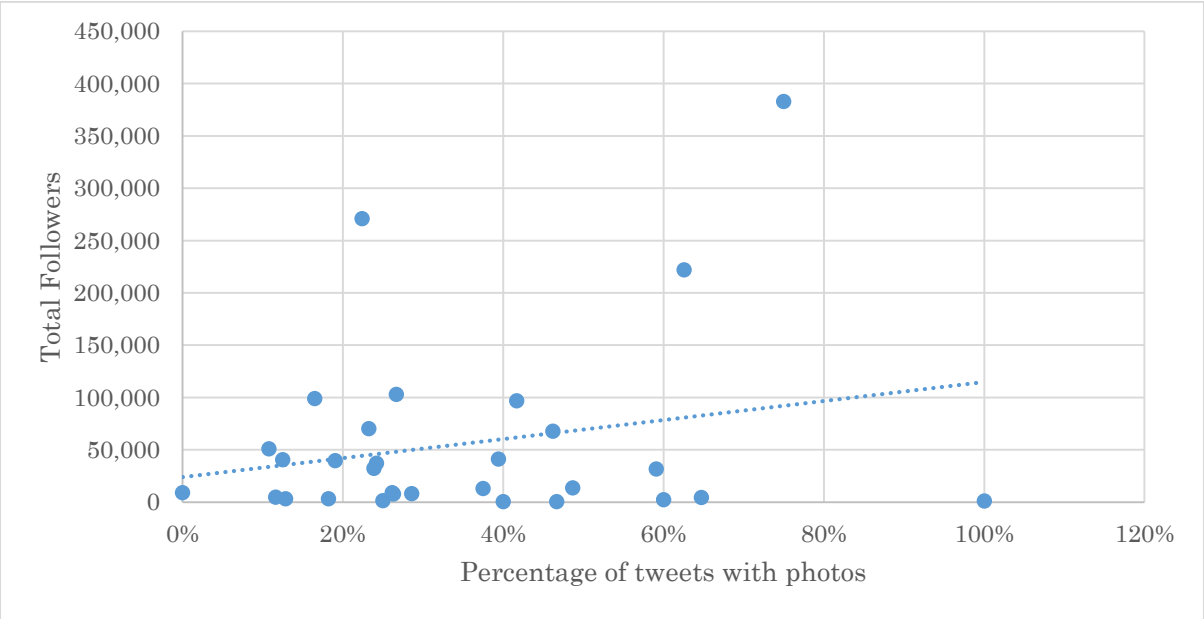

Figure 13: Percentage of tweets with photos and followers comparison (L1)

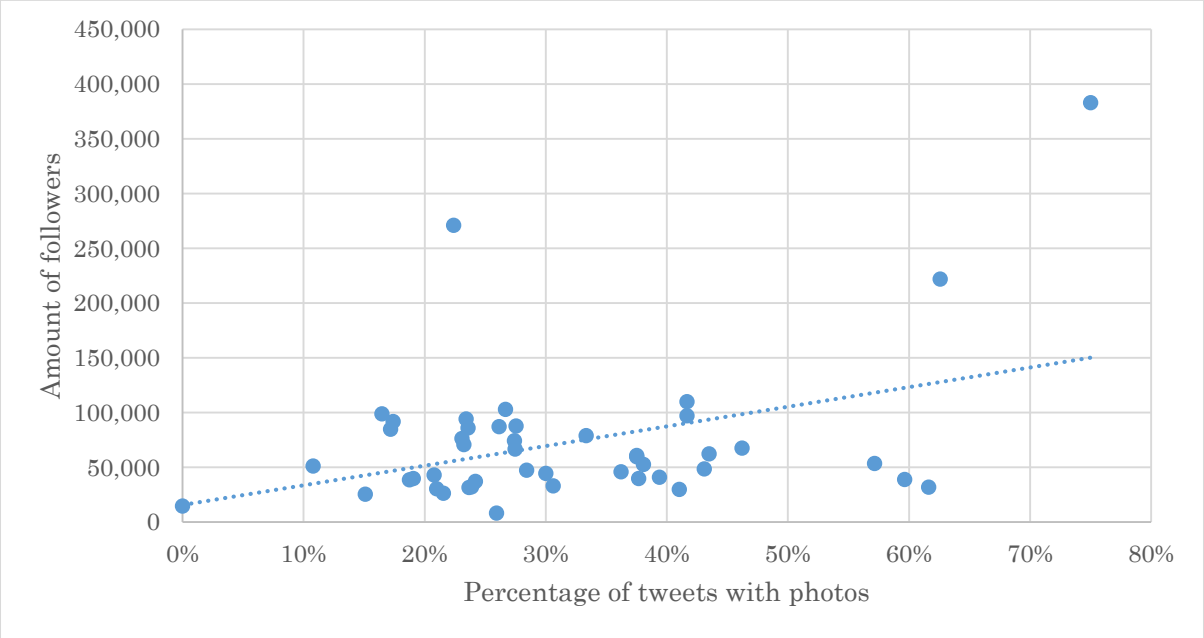

Figure 14: Percentage of tweets with photos and followers comparison (L2)

3) Slight positive correlation between number of direct tweets and follower base

The table of data can be found (Appendix 10). The data for the graphs in figures 15 and 16 were taken from the master spreadsheet for both lists, and from the headings of the columns 'direct tweets', which is contained within 'conversational tweets' and followers. Although the trend line doesn't show a strong correlation,

as there is a positive correlation it means the two elements influence each other and the trend line helps to make that fact known, and visually obvious.

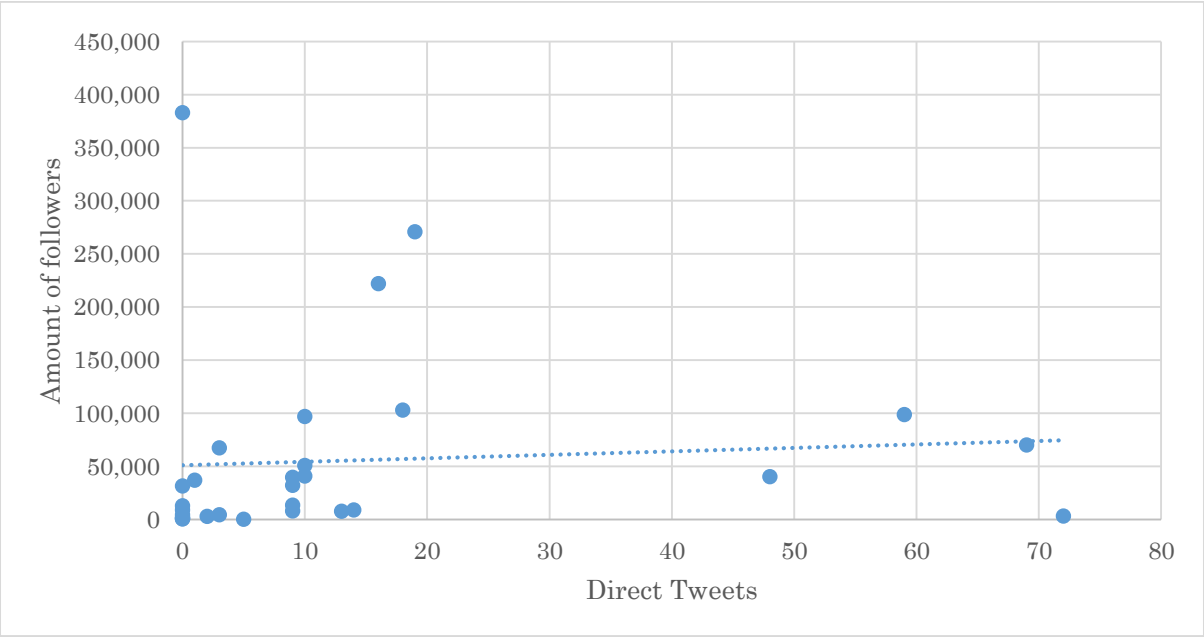

Figure 15: Direct tweets and amount of follower's comparison (L1)

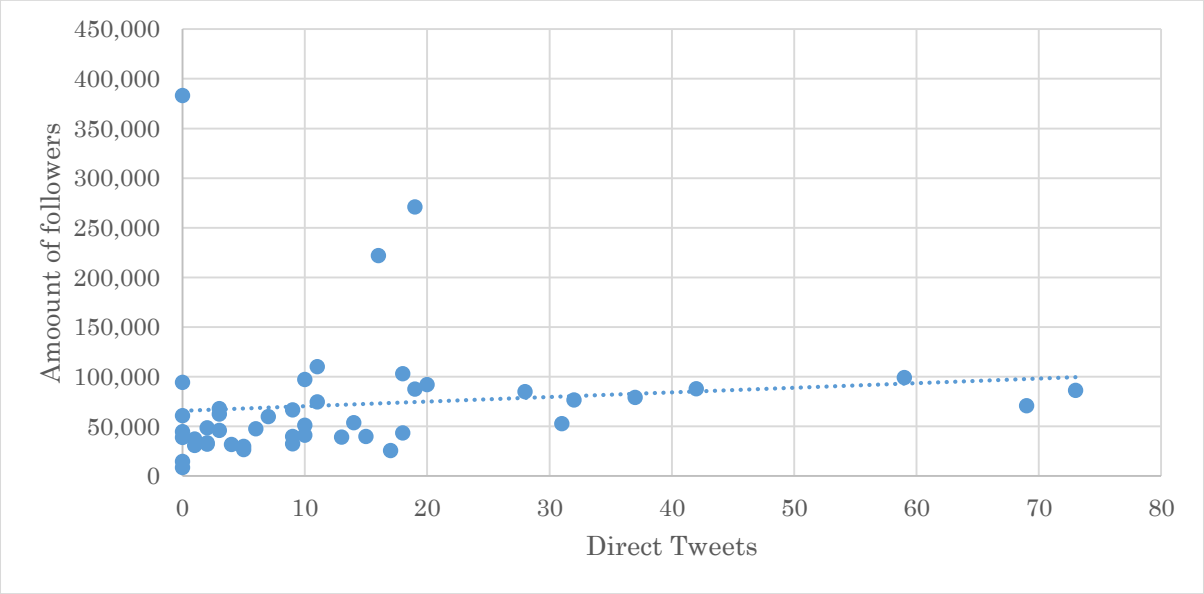

Figure 16: Direct tweets and amount of follower's comparison (L2)

4) Appeal tweets are the least tweeted theme on average

The table of data can be found (Appendix 11). The charts in figures 17 and 18 are simply to show what police forces currently do with their social media accounts and to highlight what types of information the accounts are giving out. The data for these two charts was taken from the master lists for each category, and the

average was taken from across all the accounts. Rumours, which is a category on the master spreadsheet isn't on this list, as the figures of this category is so low it would look like an outlier category on these charts.

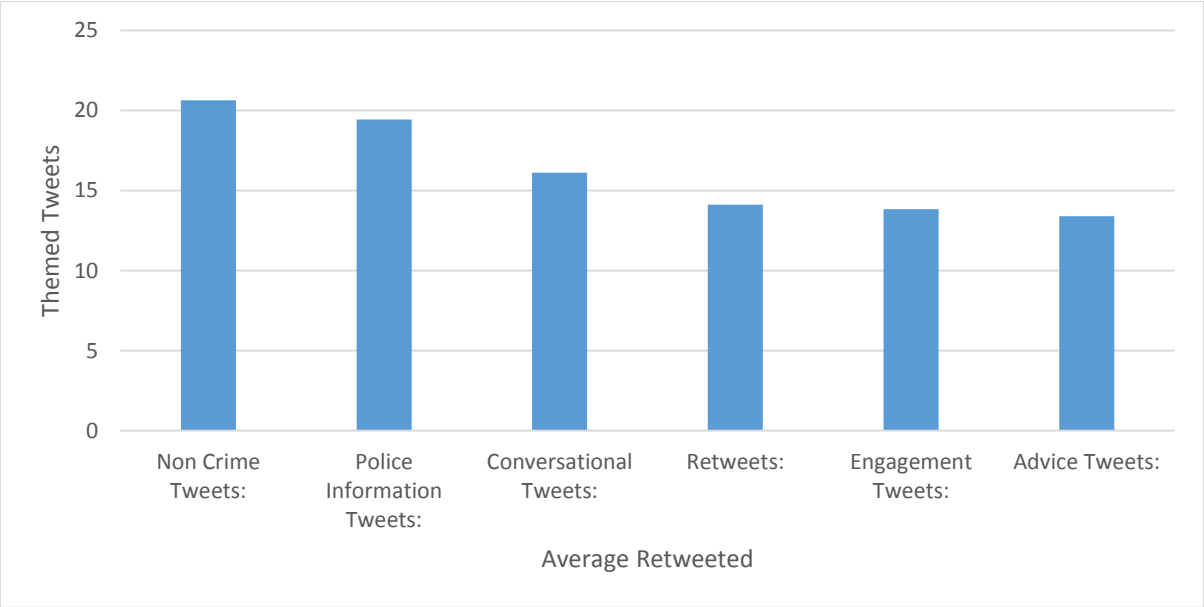

Figure 17: Average amount of themes tweeted per week, per account (L1)

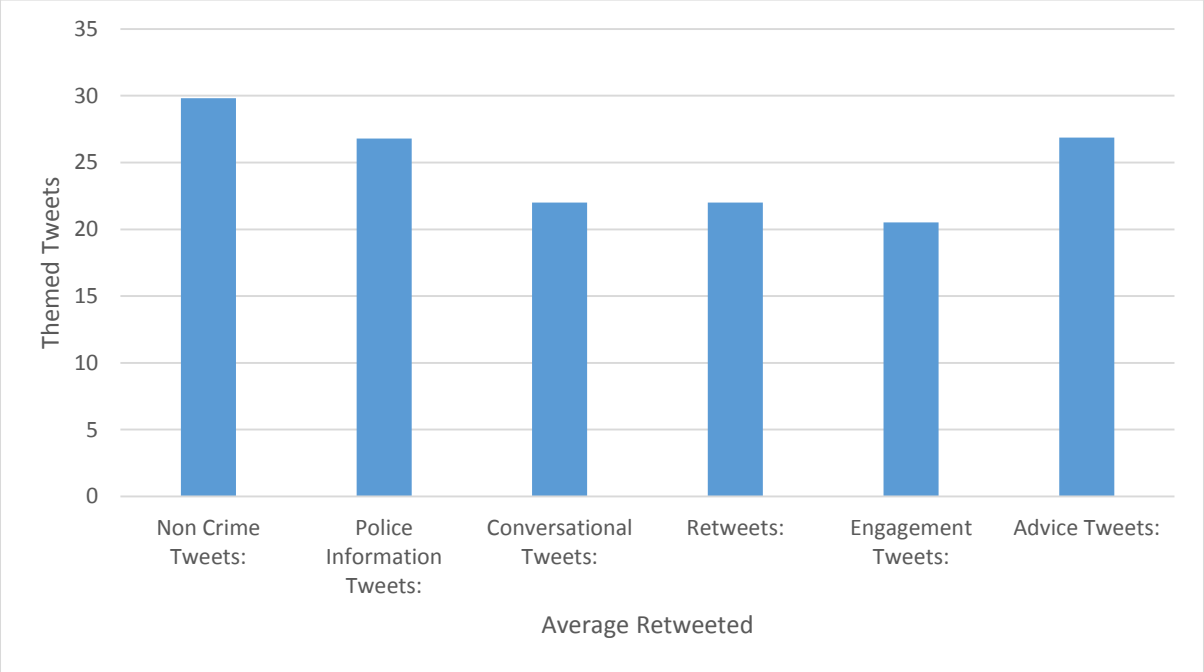

Figure 18: Average amount of themes tweeted per week, per account (L2)

5) Non-crime tweets get the least retweeted on average

The table of data can be found (Appendix 12). Similar to the figures above, figures 19 and 20 were taken from the averages on the master spreadsheets for all accounts listed. A table in the above appendix displays all the exact figures.

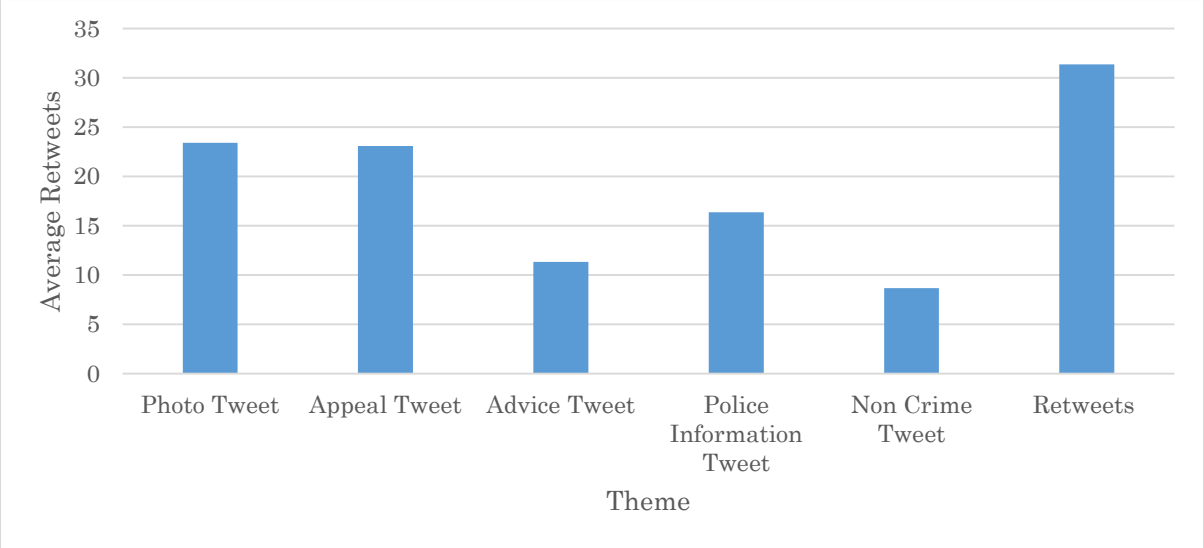

Figure 19: Average number of retweets per theme (L1)

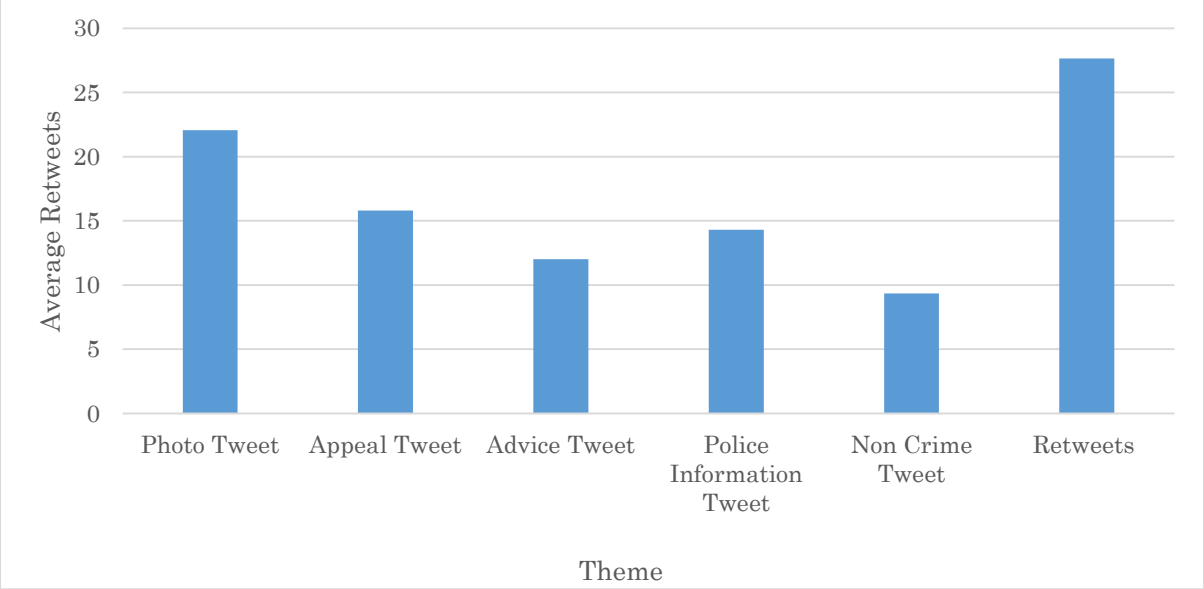

Figure 20: Average number of retweets per theme (L2)

6) Retweets don't follow the same trend line as other theme of tweet

By 'not following the same trend line' it means that it shows a different exponential rate to the other themes. The table of data can be found (Appendix 4 and 5). The graph below looks to compare the trend lines of all the different categories in regards to the engagement level (retweets). Figures 21 and 22 show different findings from figures 19 and 20, and it displays which categories require less amount of a particular tweet in order to gain retweets. It's to be noted that the similarity in trend lines for the majority of categories, apart from retweets.

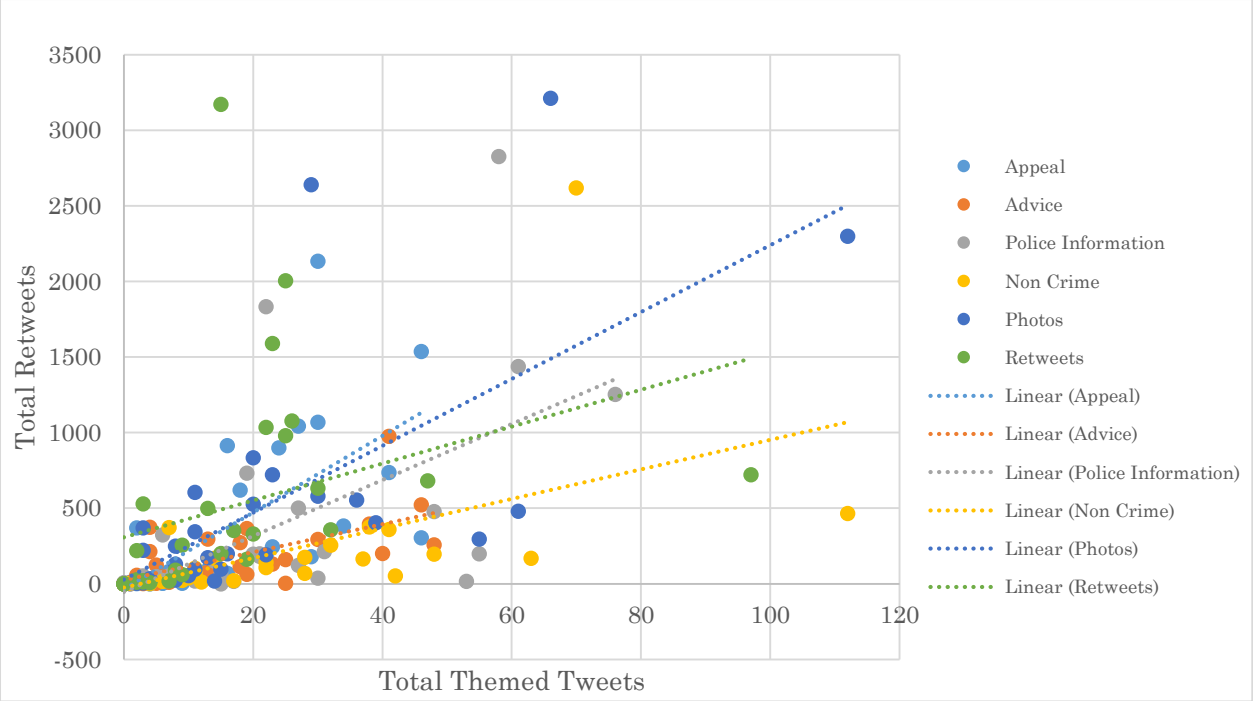

Figure 21: Total themed tweets and retweets comparison (L1)

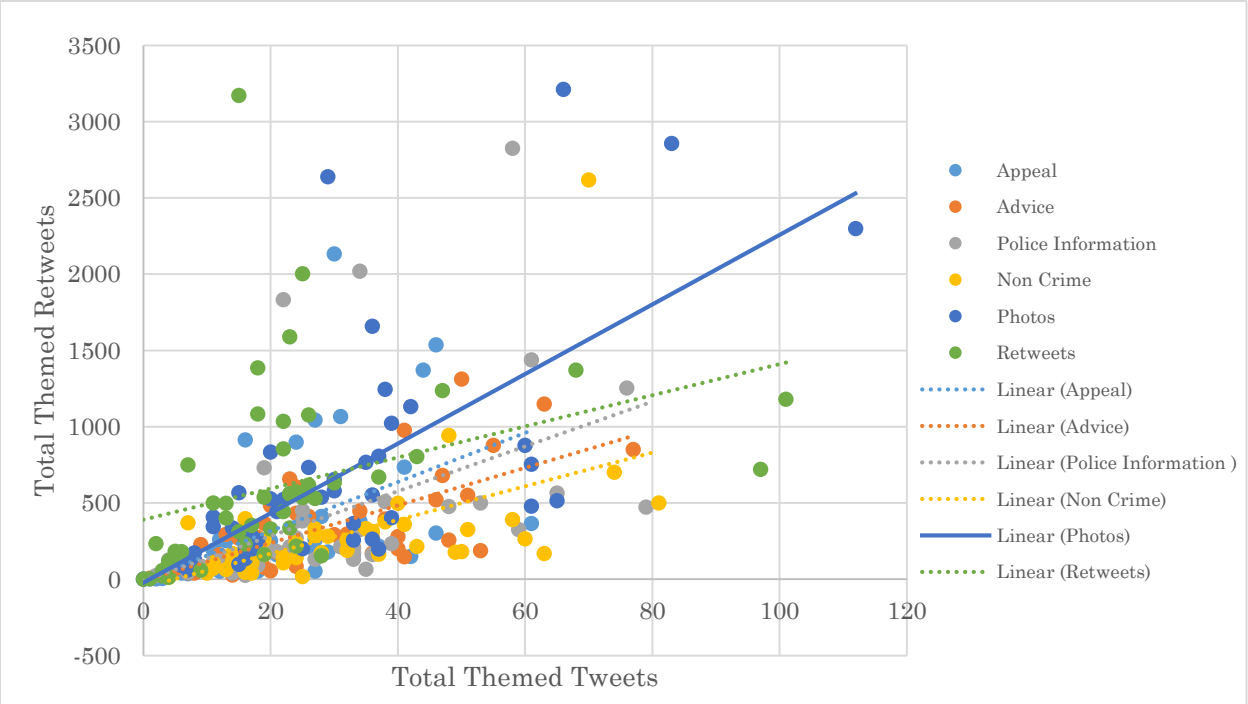

Figure 22: Total themed tweets and retweets comparison (L2)

7) All categories show an increase of retweets when photos are attached. A minimum of 29% increase across all themes

The table of data can be found (Appendix 13). As the main focus of the research is in engagement, the 'appeal' theme graphs are displayed in figures 23 and 24,

however graphs of the other themes can also be found in this appendix. The graph's main intentions are to show the great difference in trend line from the tweets with photos and without photos. In all of the graphs it can be clearly seen that the blue, 'with photo', trend line is predominantly higher than the orange 'without photo', line.

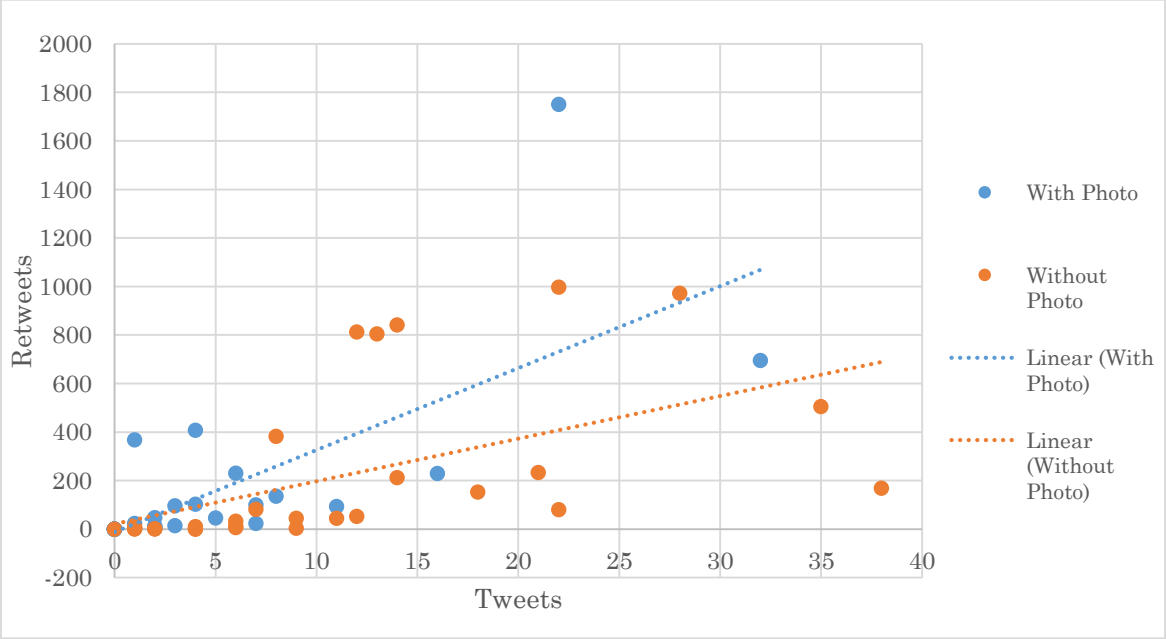

Figure 23: Appeal tweets, photo vs non photo (L1)

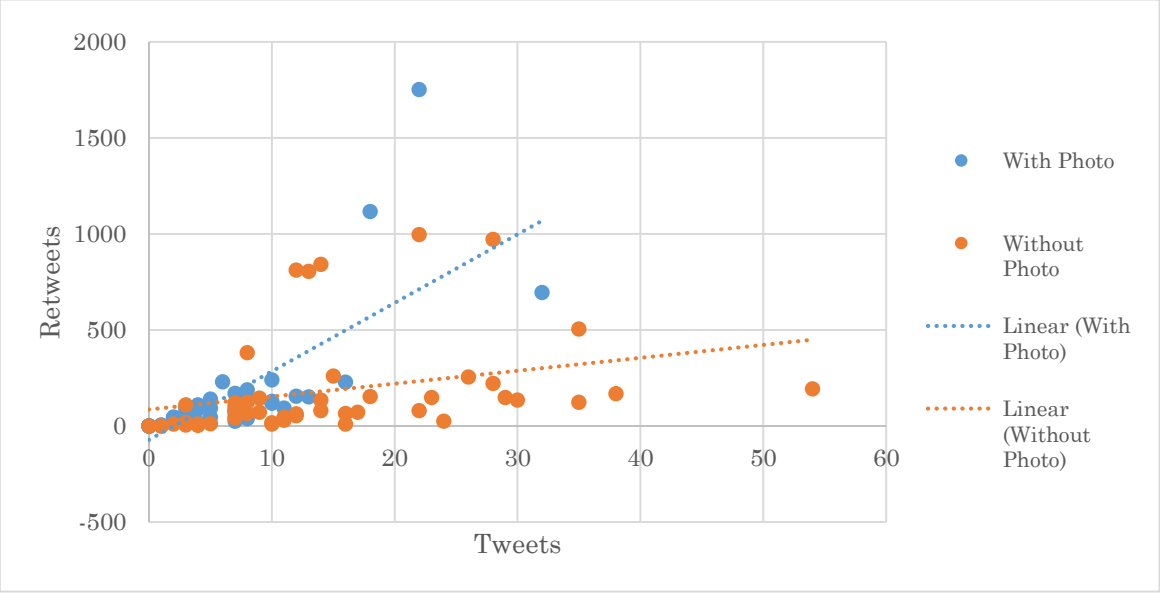

Figure 24: Appeal tweets, photo vs non photo (L2)

8) Non crime and advice tweets from force accounts show a 200% increase in retweets when photos are attached.

The table of data can be found (Appendix 14). The tables below, figure 25, help to put a figure on the amount of increase that is seen above, and to highlight those which improve significantly.

L2	Average Retweets of tweet with photo	Average Retweets of tweets without photo	Percentage increase from no photo to with photo
Retweets	37	24	54%
Non Crime	17	5	231%
Police Information	18	13	38%
Advice	26	7	269%
Appeal	17	13	29%

Figure 25: Table showing the percentage increase between retweets of tweets with and without photos

9) Appeals show the most dramatic incline in retweets when photos are attached.

This shows that fewer appeal tweets with photos are required to increase retweets. The table of data can be found (Appendix 15). The data from the graph in figure 26 was derived from the amount of tweets in each category with photos, and their retweets. It can be seen that appeals trend line is steeper, which implies that it takes less appeal tweets to increase retweets.

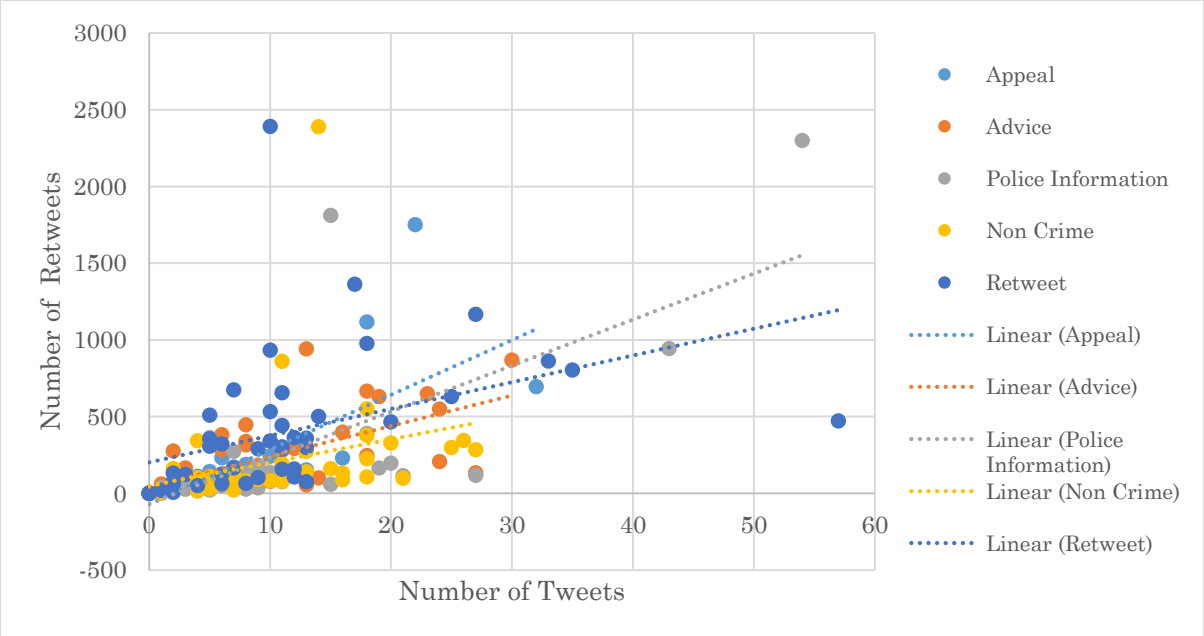

Figure 26: Tweets with photos attached, in categories (L2)

10)Appeal tweets don't get more tweets if 'APPEAL' is at the start of the tweet.

Forces that have been noted to use this format for appeal tweets is: IOMPolice, Kent_Police and SYPTweet. Figure 27 shows a table ranked based on the final column, retweet divided by total appeal tweets. This was type of format of tweet, particularly for appeals, but would also be seen for 'MEDIA' and 'UPDATE'. This format for appeal tweets was looked into in more depth, due to the focus of the research, in an attempt to understand if this did in fact improve engagement/retweets.

L2	Online	Offline	Total	Retweets of appeal tweets	Retweeted/Total
MetPoliceUK	25	5	30	2133	71.10
ThamesVP	6	10	16	914	57.13
WMerciaPolice	23	4	27	1043	38.63
CumbriaPolice	19	5	24	899	37.46
CheshirePolice	11	20	31	1068	34.45
WMPolice	22	24	46	1537	33.41
NYorksPolice	27	17	44	1372	31.18
GwentPolice	4	0	4	111	27.75
HertsPolice	12	0	12	261	21.75
DC_Police	12	1	13	252	19.38
GMPolice	24	17	41	736	17.95
DyfedPowys	6	5	11	189	17.18
NorfolkPolice	24	4	28	413	14.75
PoliceScotland	7	13	20	252	12.60
MerseyPolice	12	6	18	223	12.39
CambCops	3	4	7	82	11.71
LancsPolice	15	3	18	205	11.39
NorthumbriaPol	9	25	34	382	11.24
WiltshirePolice	1	6	7	75	10.71
LeicsPolice	12	9	21	160	7.62
SurreyPolice	19	8	27	259	9.59
Sussex_Police	26	7	33	315	9.55
Beds Police	21	3	24	219	9.13
PoliceServiceNI	4	5	9	72	8.00
NWPolice	13	3	16	120	7.50
LincsPolice	10	3	13	92	7.08
DerbysPolice	24	3	27	190	7.04
Kent_Police	13	4	17	118	6.94

NorthantsPolice	3	3	6	41	6.83
AS Police	30	16	46	303	6.59
DorsetPolice	25	4	29	180	6.21
CityPolice	0	3	3	18	6.00
WestYorksPolice	49	12	61	365	5.98
Humberbeat	21	2	23	137	5.96
NottsPolice	35	2	37	216	5.84
NCA_Uk	2	5	7	40	5.71
WarksPolice	4	3	7	36	5.14
ClevelandPolice	25	8	33	167	5.06
SuffolkPolice	9	1	10	48	4.80
HantsPolice	4	8	12	53	4.42
SYPTweet	27	15	42	149	3.55
JerseyPolice	0	1	1	3	3.00
SWPolice	4	14	18	53	2.94
Glos_Police	22	5	27	54	2.00
IOMPolice	3	0	3	6	2.00
StaffsPolice	0	2	2	3	1.50

Figure 27: Table showing the ranking of accounts when the average appeal retweet per appeal tweet is calculated

11) Only one account confronts media stories and tweets the true information.

Full list of rumoured data for each police account can be found (Appendix 16). However, the only data of relevance, is seen in figure 28 which was the only tweet placed in the 'rumour disprover' category. Norfolk police tweeted:

03/01/2016	We can confirm that rumours of a stabbing between fans on Prince of Wales Rd are NOT true. There have been no incidents involving#NCFC #CFC

Figure 28: Norfolk police tweet categorised as rumour

12) Local forces are 35% more likely to retweet police information than non-police information

Data taken from the master table (Appendix 4 and 5). The relevance behind looking at any correlations between retweets and splitting down further into non police and police retweets, is to understand if the local accounts are likely to retweet information passed down by the force; seen in figure 29.

	Account	Police	Non Police	Total	% Police	% Non Police
Local	LochabSkyePol	6	1	7	86%	14%
Local	OrkneyPolice	0	0	0	0%	0%
Local	ArgyllandBute	0	0	0	0%	0%
Local	OakhamPolice	11	36	47	23%	77%
Local	AyrshireEPolice	2	0	2	100%	0%
Local	LincsPolice	1	2	3	33%	67%
Local	FifePolice	3	0	3	100%	0%
Local	SurreyRoadCops	5	3	8	63%	38%
Local	SWPCardiff	13	19	32	41%	59%
Local	StroudPolice	0	0	0	0%	0%
Local	TVP_Kidlington	1	1	2	50%	50%
Local	SwpMerthyr	0	4	4	0%	100%
Local	MPSWestminster	17	8	25	68%	32%
Local	MPSHammFul	4	5	9	44%	56%
Local	MPSSouthwark	2	0	2	100%	0%
Local	GPCaerphilly	1	1	2	50%	50%
Local	NPAS_Exeter	3	0	3	100%	0%
				Average:	50%	32%
			Percentage difference:		36.83%	

Figure 29: Table showing the difference in types of retweets, police and non-police

13) Local departments have more engagement themed tweets as 'offline' than 'online'. Whereas force accounts have more 'online'.

The data for this can be found in figure 20 in order to understand if there is a difference between online or offline engagement was the focus for this. Potential reasons for this can be found later in the chapter.

	Average Online	Average Offline	% Online	% Offline
Local	3	5	38%	63%
Forces	15	11	58%	42%

Figure 30: Table showing the difference between engagement tweets, either online or offline

Radar Chart Findings

The way the radar chart were created was very much based off the themes analysis research and results. It's used to show visually which areas a person, or in this projects case, a Twitter account, uses the most. The usual visual graph that would

have been used may have been a pie chart, however, as the categories can overlap a pie chart wouldn't have been accurately representative. The radar chart allows categories to be plotted on the graph and easily visualises the shape that the account has. It must be made clear that this graph outlines what the account does itself on the account, rather than looking at engagement from others. The categories defined for the radar chart were similar to the above themed analysis, however not identical, this was due to the grouping of categories into a broader five:

- Broadcaster, simply stating information. Categories that fell into this from the above theme analysis were: retweets, giving information (both police and non crime)
- Media supplier, sending photos or videos out with the tweets
- Community engager, tweets that are non crime and about the community, categories being conversational, polls and non crime
- Appealer, tweets that appeal for information
- Rumour disprover, tweets that fall into the rumour category

To work out the radar charts the data was taken for each type of account, local and force account, the split further into top accounts and bottom accounts, plus averages for each group. The percentage of the overall total (from the theme data) for each point was calculated, and given a figure on a five point scale. E.g. 47% would be given 2.5 (as rounded to the nearest 5% would be 50%, 50 divided by 10 then divided by 2). These accounts were ranked 'top' or 'bottom' by several different categories:

- Total amount of retweets
- Total amount of tweets
- Total tweets compared to total retweets

The top and bottom five of the force accounts were calculated, and the top and bottom five of the local accounts were plotted. Accounts that appeared in two or all of these categories were included in the radar map (Appendix 17 and 18).

The idea behind these being that it would show a general shape of what the top accounts do, compared to the bottom accounts, and compares force and local accounts visually.

The below four radar charts, figures 31 to 34 show the difference between the 'top' force accounts and the 'bottom' force accounts. The data behind these charts can be found (Appendix 19). The way the charts were created was to first gather the data on the themes of the tweets, and add the sections together which were outlined above (broadcaster, media supplier, community engager, appealer and

rumour disprover), the percentage of the overall total calculated, and given a figure on a five point scale.

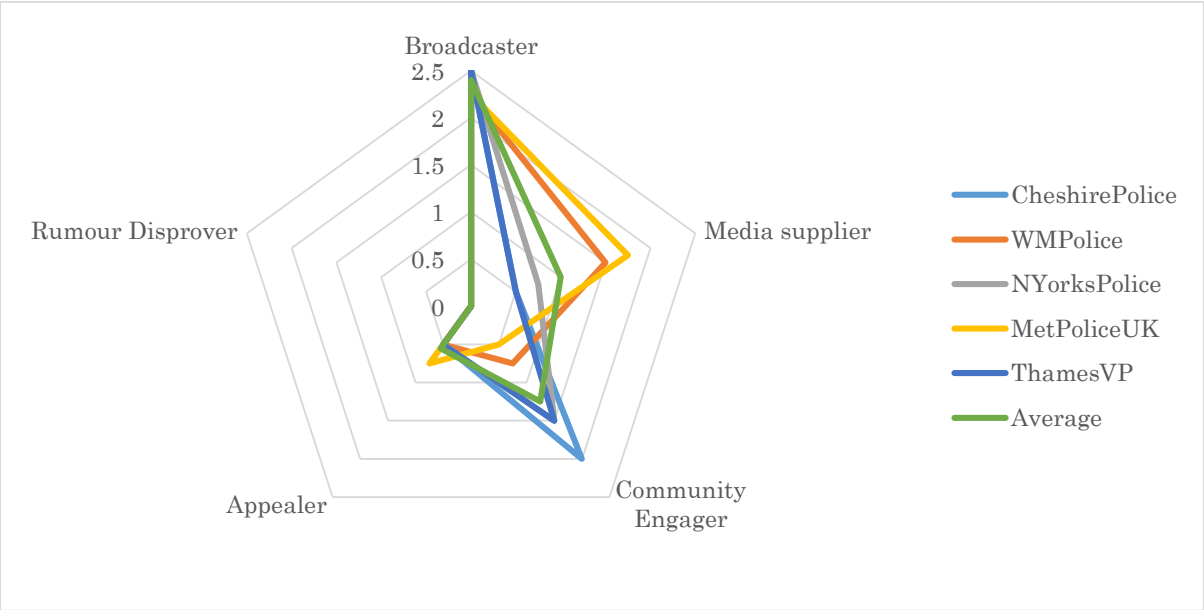

Figure 31: Radar Chart: Top Police Force Profiles

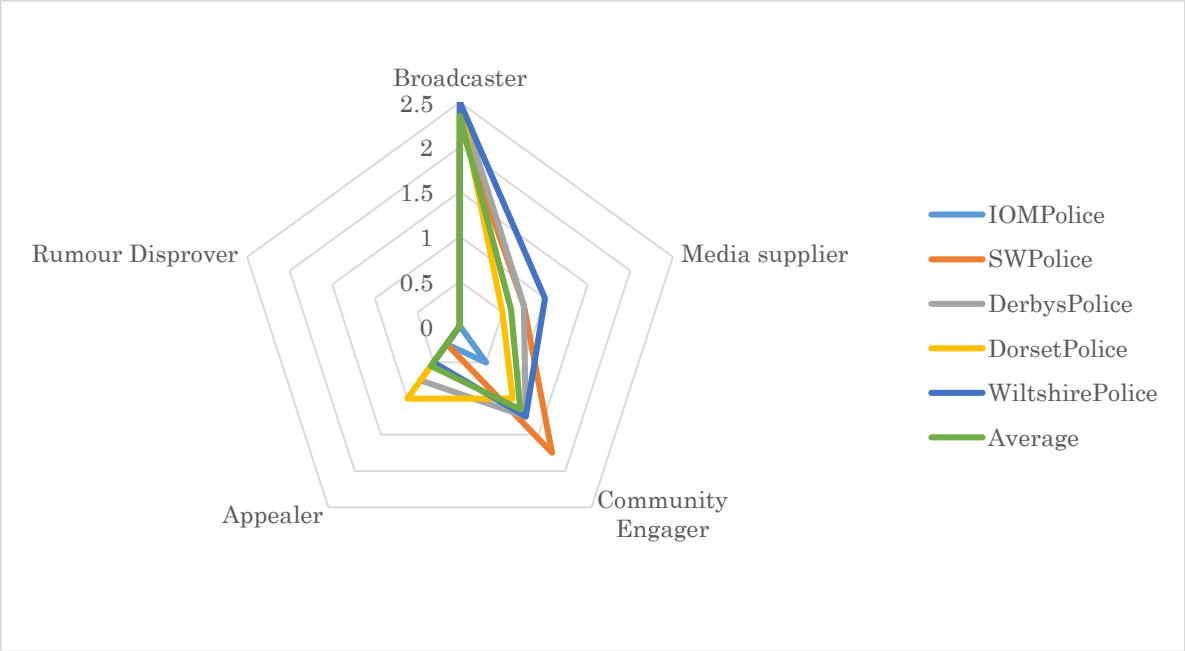

Figure 32: Radar Chart: Lowest Police Force Profiles

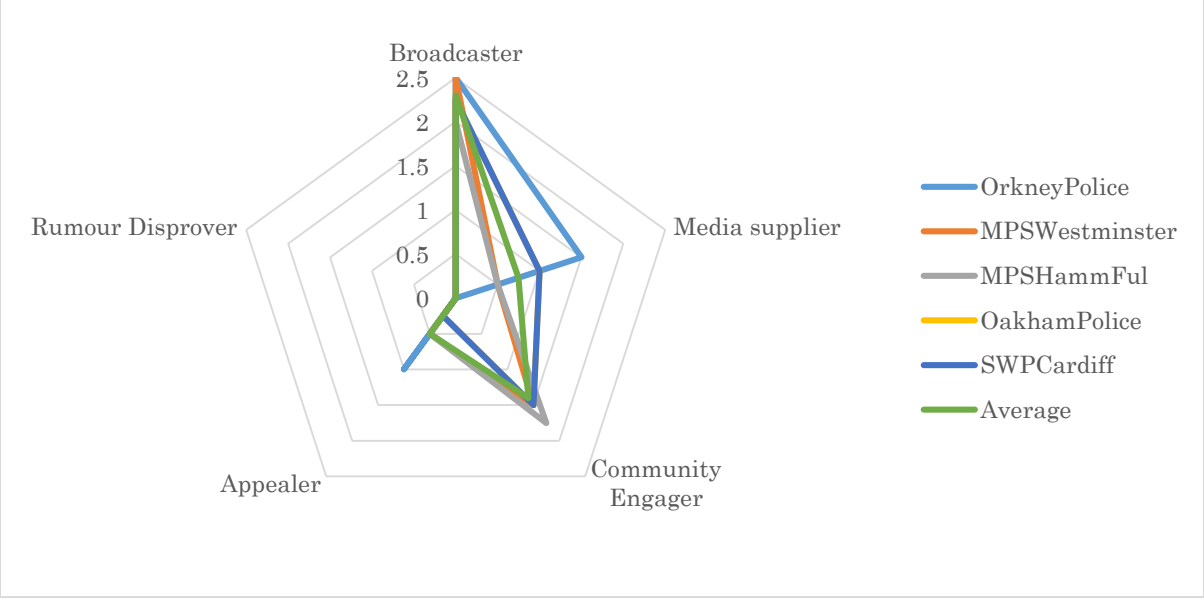

Figure 33: Radar Chart: Top Local Force Profiles

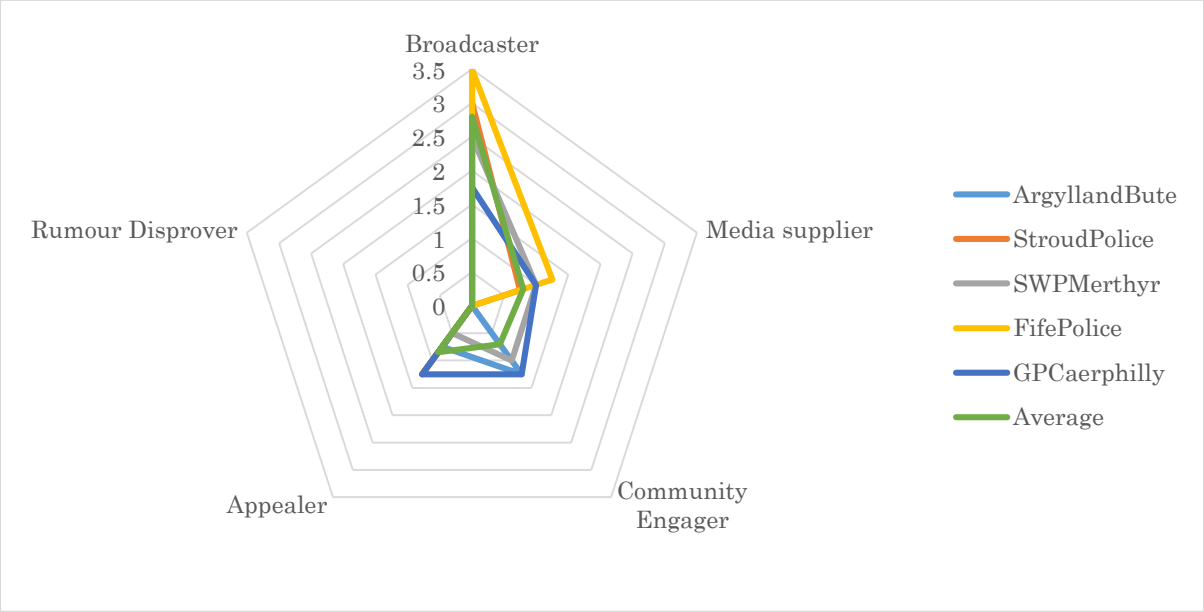

Figure 34:Radar Chart: Lowest Local Force Profiles

From figures 31 to 34 above the following statements can be drawn:

14) Top UK forces broadcast less and tweet media more than bottom UK force accounts.
15) Top UK forces engage more with community than bottom UK force accounts
16) Shows a similar shape when comparing top force and top local accounts, meaning that both types of account do similar things with their social media, Twitter accounts.

17) Force accounts send more engagement tweets out than local accounts

Sentiment Findings

18) Sentiment shown in tweets from the police accounts are more likely to be received from users tweeting @ the account

Full table of data can be found in (Appendix 20). The percentages were calculated from listing the different accounts as either having the same or different sentiment value between their tweets and tweets @ the account. The different sentiment values could have either come from the forces tweets being analysed as 'happy' and the tweets @ the account as 'grumpy' or vice a versa. The totals were then created, and a percentage of the total was calculated for both likelihood of the same sentiment, and likelihood of a different sentiment.

Percentage of accounts that have the same sentiment:	63%
Percentage of accounts that have different sentiment:	37%

Figure 35: Percentage likelihood of accounts receiving the same sentiment as being sent out

Name Analysis Findings

19) Accounts that don't follow the usual Twitter handle format, on average, have 26% less followers

Master table of data for the name analysis can be found (Appendix 7). The data in figure 36 was gathered from the master list, and the percentage difference between the highest average followers, and lowest average followers was calculated. With the intent of showing the difference in accounts that follow the format, and those that use completely different format.

Types of format	**Number of accounts**	**Average followers**
Shorterned name + Police	21	77,383
Full name + Police	14	75,530
Name + _ + Police	4	59,925
Other	6	57,067

Figure 36: Table showing the amount of force accounts with the different formats of Twitter handle and their average followers

20) Names of forces Twitter accounts has been seen to have an impact on how easy/difficult it is for the public to find the account

Figure 37 shows an initial look into this statement, however, is worth including in this research as it provides good support to the importance of Twitter handles for police. A full range of screenshots can be found in (Appendix 21).

The below screenshot (figure 37) shows that for the Twitter account @HumberBeat individuals are trying to contact the police force using a standard Twitter handle @HumbersidePolice, however the account doesn't exist.

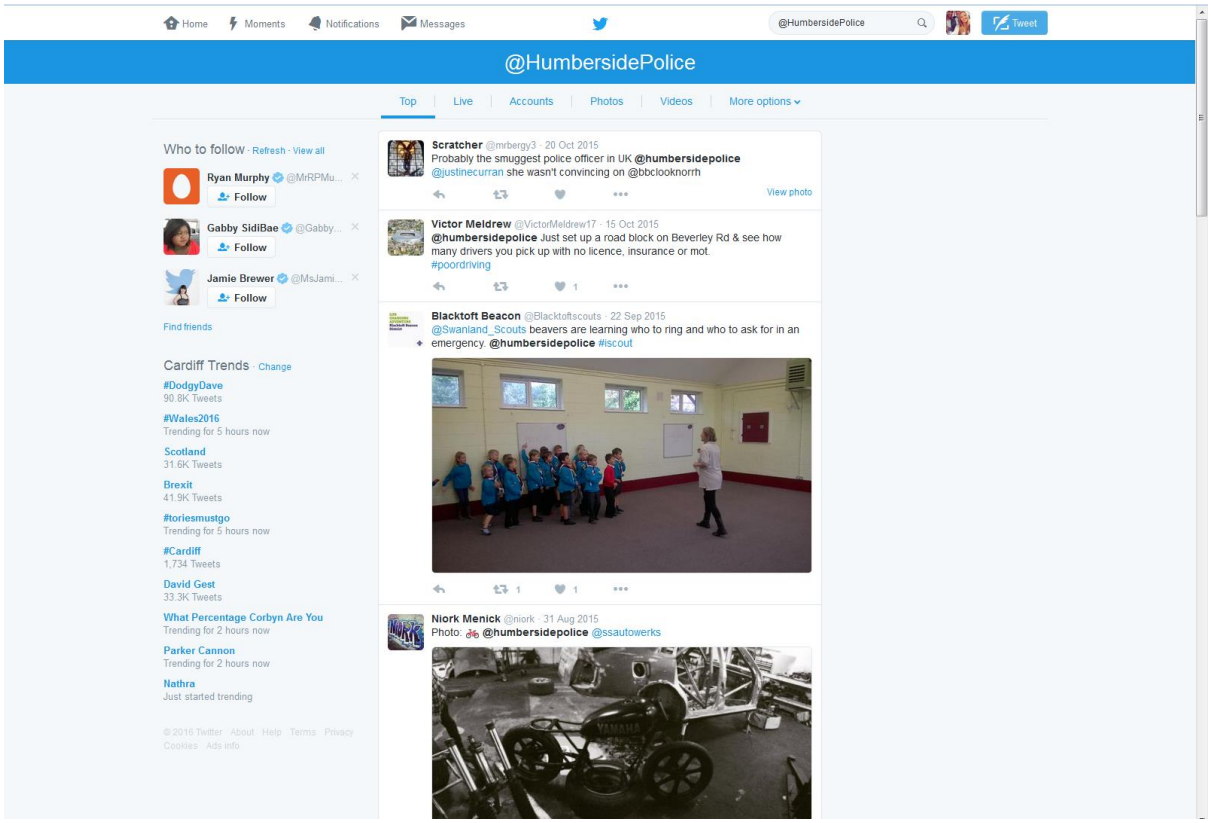

Figure 37: Screenshot of Twitter users trying to contact @HumbersidePolice, without the account existing

Other Observation Findings

These are observations that weren't directly linked to any of the question areas, however were felt to be relevant and interesting enough to be included.

21)There is no correlation between local population and follower base

As this was one of the first areas investigated, it was decided that the geographical list was the best list, with the easiest population size to research. As the correlation was carried out on the whole list, not the sample list, it includes the majority of force accounts as well. Figure 38 is without the outliers: @WMercia, London County and Greater Manchester County

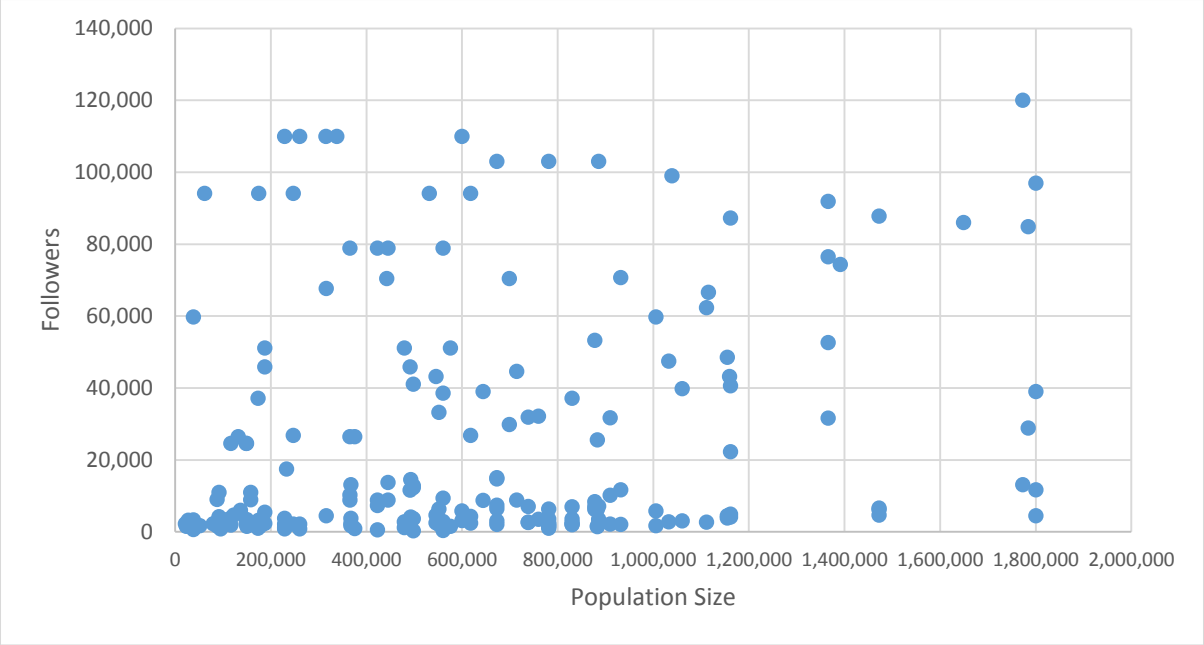

Figure 38: Follower base to local population comparison

22) The accounts that performed the best with appeal tweets are: MetPoliceUK, ThamesVP and WMercia accounts

The phrase 'perform the best with appeal tweets' means that those that have the highest averages of retweets per appeal tweet.

		Retweets of appeal tweets	
	Total		**Retweeted/Total**
MetPoliceUK	30	2,133	71.10
ThamesVP	16	914	57.13
WMerciaPolice	27	1,043	38.63
CumbriaPolice	24	899	37.46
CheshirePolice	31	1,068	34.45
WMPolice	46	1,537	33.41
NYorksPolice	44	1372	31.18
GwentPolice	4	111	27.75
HertsPolice	12	261	21.75
DC_Police	13	252	19.38
GMPolice	41	736	17.95
DyfedPowys	11	189	17.18
NorfolkPolice	28	413	14.75
PoliceScotland	20	252	12.60

MerseyPolice	18	223	12.39
CambCops	7	82	11.71
LancsPolice	18	205	11.39
NorthumbriaPol	34	382	11.24
WiltshirePolice	7	75	10.71
LeicsPolice	21	160	7.62
SurreyPolice	27	259	9.59
Sussex_Police	33	315	9.55
Beds Police	24	219	9.13
PoliceServiceNI	9	72	8.00
NWPolice	16	120	7.50
LincsPolice	13	92	7.08
DerbysPolice	27	190	7.04
Kent_Police	17	118	6.94
NorthantsPolice	6	41	6.83
AS Police	46	303	6.59
DorsetPolice	29	180	6.21
CityPolice	3	18	6.00
WestYorksPolice	61	365	5.98
Humberbeat	23	137	5.96
NottsPolice	37	216	5.84
NCA_Uk	7	40	5.71
WarksPolice	7	36	5.14
ClevelandPolice	33	167	5.06
SuffolkPolice	10	48	4.80
HantsPolice	12	53	4.42
SYPTweet	42	149	3.55
JerseyPolice	1	3	3.00
SWPolice	18	53	2.94
Glos_Police	27	54	2.00
IOMPolice	3	6	2.00
StaffsPolice	2	3	1.50

Figure 39: Table showing the ranking of average number of retweets per tweet for each account

23) On average the UK force accounts tweet 95 times a week, per account, with local forces only 45. US accounts tweet 67 times a week, on average, per account

24) Some accounts delete appeal tweets after a certain amount of time e.g. MetPoliceUK.

This was seen as interesting as it wasn't seen in many accounts, and reasons for this can only be speculated. It was picked up upon, when the initial part of the gathering data lead to having to go back onto the accounts Twitter page and report on which tweets had photos.

Conclusion

Although there are 24 statements regarding the results, there are five which give a thorough understanding of the data, and which are the most significant for the report. These are:

- Accounts that don't follow the usual Twitter handle tend to, on average, have 26% less followers
- Positive correlation between percentage of tweets with photos and followers
- Non crime related tweets get the least retweeted on average, then advice, police information, appeals and retweets
- All categories show an increase of retweets when photos are attached. Minimum 30% increase.
- Only one account confronts media stories in pursuit of the true facts

The Open Source information studied in this chapter has given a great amount of insight into the world of Twitter and how the police organisation use it. These statements alone provide recommendations of best practice, however the analysis of findings will produce recommendations to align with both the technology aspect as well as a policies to help with the change in the organisation

Analysis of Findings

As there are over twenty statements from the research detailed above and the most effective way of analysing these results is through grouping them together in answer to the six questions:

1. How do police currently use their Twitter accounts?
2. What elements correlate to improve follower base?
3. What themes of tweets receive the most engagement?
4. Does sentiment of tweets have an impact of the comments/tweets back?
5. Does the force Twitter handles, names, have an impact on engagement?
6. Are their differences in the way force and local accounts use Twitter?

It will be seen that some of the research statements in the above section are relevant to more than one question, and an each question will have a different amount of statements to support the answer, however it has been found that there are analysis and research to support each of these questions. The analysis have been conducted and presented in a way to support an organisational structure when describing the answer.

How do police currently use their Twitter accounts?

This question was to broadly understand what the forces and local police departments do on Twitter. It was to highlight differences between the police accounts and other commercial companies that use Twitter. It shows the analyst and police organisations the averages across the board of what is being posted on social media, and can delve deeper into individual accounts if so wish (Appendix 22)

The evidence and figures which helps answer this question are statements:

- Accounts that tweet more, get retweeted more.
- On average, the force accounts tweet 95 times a week, per account and local forces tweeting 45 times a week, per account
- Appeal tweets are the least tweeted theme.
- Local departments have more engagement themed tweets as 'offline' than 'online', whereas force accounts have more online.
- Top force accounts broadcast less, tweet media more and engage more than bottom accounts.
- Force accounts send more engagement tweets out than local accounts.
- Only one account confronts media stories and tweets the true information.
- Some accounts delete appeal tweets after a certain amount of time e.g. MetPoliceUK

These statements along with their data and graphs to support the statement all give an insight into how an average force or local account in the UK uses their Twitter account, an overall view.

Some of these statements in line with previous studies, and was what would be expected, in regards to what background reading has set our expectations from police forces to do with their social media. For example the first six statements aren't surprising findings from the context of the research, and support and are supported by the current research from chapter 2. However, the bottom two statements are slightly more interesting, and may not have been the assumed answers when initially conducting the research. Only one account out of both lists, for a week's worth of tweets (which is an average of 70 tweets per account), shows a tweet which confronts a media study. The categories were chosen to try and get an understanding of the types of themes police accounts tweeted, disproving rumours being one of these categories. The thinking behind adding rumour as a main category was that it was expected that it would be one of the top themes to arise, and from background reading of the Boston Marathon investigation this seemed acceptable. As this paper is based on US accounts it is a prime example of how the US and UK police departments use their Twitter accounts differently, and how their day to day tasks differ.

The last statement was a supplementary finding, as it wasn't something that was initially looked for. It was whilst gathering information on these tweets that it was noticed that some tweets were missing, and all of these missing tweets were appeal tweets. As this a simple observation no figures or data was collected on the amount of tweets, however, it is interesting to speculate why these tweets may have been deleted, and what purpose it would serve. One theory could be that the appeal timeline had finished, and perhaps the individual or stolen good were found. Or it could be that the case attached to the appeal had taken a new route, and perhaps a criminal investigation was taking place that wanted to be out of the public eye. As this report doesn't look into the processes and tasks of the police it can't be fully examined, but it does make for an interesting finding.

Overall, in answer to this question, there have been many answers covering different parts of the use of social media. From how many tweets total they post a day, to the different themes breakdown within these tweets, the differences in themes from local to force accounts and the theme no account in the UK seems to cover much. Averages have been created to show how the accounts are performing as of now, and this may also be helpful comparison for a later study.

What elements correlate to improve follower base?

This question was to understand what, if any, elements provide a positive correlation with follower base. The importance of increasing follower base for any Twitter account is that the tweets that are posted are seen by that amount of users, the amount in the follower base. It has also been seen from the research in the above section that the more followers an account has the more retweets, on average, they get (statement 1, figures 1 and 2). Meaning that it can also be seen by all the users who follow the initial user who retweeted the information. For the police organisations this is a factor that wants to be increased, to ensure the information that is being given out gets as far as possible, reaches as many users news feeds as possible.

The evidence listed above and figures that help answer this question are:

- There is no correlation between local population and followers.
- Slight positive correlation between number of direct tweets and follower base.
- Positive correlation between proportion of tweets containing photos, and follower base.
- Accounts that don't follow the usual Twitter handle format, on average, have 26% less followers.

With the initial development of this question, it was considered an almost obvious answer; that followers would correlate with local population size. However, when the data was gathered and the graph created, it was a surprising conclusion to draw; that there was no correlation.

As this was a surprising finding, it became an interesting question to try and answer, and many different combinations of Twitter elements were compared. The middle two statements are the combinations that showed a gimps of positive correlation. The number of direct tweets to users being correlated with follower base could be because the users like to see that the force are willing to communicate and have conversations online, especially if the user has information about an investigation. It could give the users a sense of community, even it if is online.

It could be said that as the geographical correlation for Twitter doesn't exist, perhaps it shows that the online communities behind these Twitter accounts aren't restricted to the geographical barriers of counties or towns; it may be seen as a local community online without much worry about the geographical locations, it's more in regard to which accounts get noticed and the interest of the information output by that account.

It can be theorised that individuals follow accounts for different reasons: 1) that they actively seek out the account to follow, or 2) that someone on they follow has

retweeted information of interest. With this in mind, the strong positive correlation between the amount of tweets containing photos and the follower base gives a good indication that media catches users attention, and the percentage of tweets with photos plus the increase in retweets is perhaps the way the police accounts are receiving most of their followers.

The final statement doesn't fully answer the question, as it isn't looking into a correlation to improve Twitter accounts, however it does shed light on an important difference in accounts that can increase the follower base. This statement doesn't provide a suggestion on what to improve on the Twitter account, as the Twitter handles are one of the first aspects to be set up, yet it could be an explanation as to any differences in amount of followers between accounts.

In answer to the question the elements to improve follower base for police Twitter accounts are: percentage of tweets containing photos and amount of direct tweets to users. The Twitter handle does seem to have an impact, and care should be taken when an account is being set up.

Which themes of tweets receive the most engagement?

As it might be obvious from the amount of statements listed above in the findings section, the themes of the Twitter account was the most in depth analysis conducted on this topic.

The following statements provide support in answering the question:

- Non-crime tweets get the least retweeted.
- Appeals show the most dramatic incline in retweets when photos are attached.
- Appeal tweets don't get more tweets if 'APPEAL' is at the start of the tweet.
- Non crime and advice tweets show a 200% increase in retweets when photos are attached.
- All categories show an increase of retweets when photos are attached. A minimum of 29% increase across all themes.

- Accounts that tweet more, get retweeted more.
- Positive correlation between proportion of tweets containing photos, and follower base.
- Retweets don't follow the same trends as other theme of tweet.

The separation between the two sets of statements is to demonstrate the statements that answer the question (top set) and the statements that support the answers. It necessary in a question such as this, one of the main focuses of the report to ensure that all the findings are used, and backed up when possible.

For a police organisation, it is important to understand which of your tweets are of interest to the follower base (as seen in study Liberty Village Murder case, when photos of the case were tweeted and received engagement). In the case of this report we are assuming interest means a retweet. With the first statement it can be seen that non-crime tweets receive the least amount of retweets, potentially showing the least interested theme. This does come into cross paths with the 'community policing' idea when on Twitter, and it could be said that the interest in police accounts purely lies within crime and investigation information.

To follow this line of enquiry, it can be seen from statement 4 that when understanding what police do with their social media, categorised by theme, the order of average amount of themed tweets per week, per account is different between local and force accounts. If we were to look at purely force accounts (L2) appeal tweets are tweeted the least amount of times, with non-crime tweets the highest. However, when looking at retweets, it can be seen that non-crime tweets are the lowest retweeted with appeal tweets being the second highest. This supports the theory above which suggests that individuals on Twitter are more interested tweets relating to crime and investigation.

More specifically with appeal tweets, these show the steepest trend line when total appeal tweets and total retweets for appeals are plotted. Meaning that this theme receives the most interest in a smaller amount of tweets than other themed tweets. Potentially showing again, that the interest is within these types of tweets more than any other theme. These points are supported by the previous readings of the Liberty Village murder case, when photos of the case are posted, it attracts attention and interest, leading to widespread knowledge and hopefully leads.

Similarly to other statements, a semi-consistent theme of almost titling the tweet was seen among the dataset. 'APPEAL:' was seen in three accounts tweets to start appeal tweets, and therefore it was analysed if this had any impact on the amount of engagement it received. The three accounts that were used in this analysis weren't major city forces, which may have had an impact on the total amount of engagement retweets. However, the figures show that on average the amount of retweets these accounts received was in the bottom end of the total appeal tweets ranking. Showing that this either doesn't have an impact on improving retweets for appeals, or that it decreases the engagement, as these accounts sent out an average amount of appeal tweets.

The combination of elements that saw the sharpest increase in retweets was non crime and advice tweets containing photos or other media. Although all themes saw a great increase, on average, with the amount of retweets when photos are attached, these two themes had the most dramatic impact. Also shown from previous news article on the Chinese case of the missing child, when a CCTV image was widely spread via social media. This may have been because these two

themes received such low retweet figures generally, and photos have been seen to grab user's attention that the difference in the figures was the largest. This could also be due to the types of information they are posting that naturally requires a photo. For example, many accounts had images and tweets relating to their canine unit, where they would attach an image or video of the dogs in training. This was one of the highest engagement types of tweet within the non-crime theme. So in summary it could be said that these two themes naturally flow with media attached.

The supporting statements simply are to help explain or add extra detail to the statements above. The last statement, which indicates a difference in the retweeting trend line in respect to the other trend lines for the themes, identifies an interesting aspect to communications that Twitter emphasises. Retweets, the idea of pushing information further has seen to be widely used within the police accounts, and has been met with a greater amount of retweets from the user base. The difference in trend line is to be expected on some level, as it's not a usual tweet, its pre published information from another account. The trend line shows a very high start to the trend line, however with week positive incline until its finish. The difference in trend line from other themes trend lines may be due to a number of different factors. 1) That the tweet has already been of interest to the account retweeting, and the interest continues to their follower base, 2) The information is duplicated, as many users follow more than one police account and 3) a mix of the two. The high start to the trend line may be due to the majority of retweets being from other police accounts or some sort of police information, information of interest. However, with the growing number of retweets duplications could start to appear, which could be a reason for the only slight positive incline. The difference in retweet activity and trend lines could be an indication that they shouldn't be included in the same context as engagement for the account, as they aren't original postings and the amount of different factors affecting them can be seen to skew the results. It should still be analysed and has great presence within the police accounts, however should be analysed differently from themes of original postings.

In summary, and to answer the question above, the themes that increase engagement is crime related tweets and all increase engagement when photos that are attached. With the removal of retweets from the analysis, it would paint a much clearer picture of the police accounts engagement.

Does sentiment of tweets have an impact of the comments/tweets back?

As sentiment has to be understood with caution, a very general statement has been created to describe the research and to help answer this question:

- Sentiment shown in tweets from police accounts are more likely to be received from users tweets to the account.

This statement itself does answer the question, however there is a much deeper meaning and analysis that can be conducted behind it. As it has been described earlier, sentiment is the study of the emotion behind the tweet, which for police could give useful insights into upcoming riots/protest/large scale events (as shown in the Vancouver Cusack riots). The focus on this paper is on daily police activity rather than examples of events listed above. With the focus in mind, the sentiment would show the average emotion of the average Joe in the community. There hasn't been enough analysis of sentiment conducted as of yet, however, as it does show to be a correlation between the sentiment the tweets send out and the engagement tweets back, it does need to be understood by the police. This is in line with previous studies on sentiment (Thelwall et all, 2011), where sentiment was seen to give a mild indicator before a major event occurred.

Does the force Twitter handles have an impact on engagement?

The underlying meaning of this question being does the Twitter handles make it harder or easier to find a particular force online. Having theorised different reasons users follow accounts, one being in regard to seeing retweets of the account on the newsfeed, and the other actively searching for the account, the latter is regarded as the focus for this question.

- Accounts that don't follow the usual Twitter handle format, on average, have 26% less followers.
- Names of forces accounts have been seen to have an impact on how easy or difficult it is for the public to find.

The first statement shows that accounts that don't follow the usual format, or the format that the majority of forces in the UK follow, there is a significant dip in the amount of followers. The second statement backs this up with a suggested reason; that the accounts are harder to find.

The second statement suggests, and provides a very basic look at the different ways that users try to communicate with the accounts. By tweeting @the-usual-format or #the-usual-format it is an attempt of the user to start a conversation or provide information to the police account, engagement. However, with the obscure Twitter handle, or even the display name being unable to be picked up in the search query, users simply cannot find the account. If the account cannot be found, and the way Twitter works, it is obvious that the user cannot engage with the account.

Whilst this is a perfectly valid reason, that users may not be able to find the police account with an obscure name, there are other ways in which the account gains users. Without further research into how the majority of users connect or find the police accounts the impact of these handles won't be understood fully.

Are their differences in the way force and local accounts use Twitter?

This question was derived from the background reading, from a US study discussing the differences between three types of accounts, force, local and individual. The reason that it is in this study is to understand if the local accounts engage with the community more, online or offline as well as understanding any other differences that may arise.

Statements which suggest answers to this question are:

- On average force accounts tweet 95 times a week, per account. Local forces 45 times a week per account.
- Local forces are 35% more likely to retweet police information than non-police information.
- Radar maps show a similar shape when comparing top force and top local accounts.
- Force accounts send more engagement tweets out than local accounts.
- Local department have more engagement tweets as 'offline' than 'online' whereas force accounts have more 'online'.

The first statement gives a basic figure which shows a large difference in force and local accounts from the off. The amount the two types of account tweet shows that the force accounts give out more information, which is to be expected, and which was seen to be retweeted by the local accounts (statement 2).

With the radar maps showing similar shapes to one another when comparing local and force account activities, it could suggest that the local accounts are taking direction from the force accounts, and are tweeting similar things as these accounts. However, previous research, and the difference in tasks for local forces would suggest that they should be doing different things than the force accounts. For example, it was seen that force accounts send out more engagement tweets than local accounts (statement 3), which in theory should be the other way around, with community engagement being more aligned with the local forces tasks.

The final statement aligns more, and makes sense when keeping in mind local forces tasks and presence within the community, with more engagement happening offline. This could be because they are asking for appeals to come in the form of phone calls, or it could be that they take part in community events and fundraisers more often.

In summary, the answer to this question would be that there are significant differences between local and force accounts. However, if an analysist who understood the difference in task between the two types of account, the ideal radar map of the two types of accounts are likely to be different.

Conclusion

To conclude there has been answers provided for all the questions which are backed up by previous research and the findings. Although the findings are conclusive in themselves, they need to be aligned into the police environment and context in order to be fully made useful. The following chapter will see these answers/analysis to the questions be the basis of recommendations for police to follow.

Mechanical and Policy Recommendations to UK Police Forces, Based on the Research Questions

Previously, the understanding of Open Source data through social media for police organisations have been discussed and more detailed questions set. This chapter will look to analyse the previous chapter's works together and produce a deliverable in which a police organisation use to improve their engagement on social media.

Recommendations have been split into two groups; policy and mechanism. Policy recommendations are those which involve a human aspect, this could be a new process or way of working or an understanding the information system (social media). Mechanism recommendations are something that can aid the police organisation in achieving this policy, this could be through information systems of techniques within Twitter. Within an organisation such as the police, it is important to make the distinction between the policy and mechanisms as they both require different elements to bring together the intended outcome. Like most technical procedures within business, it requires the technical side change and processes, as well as the human-business side change and processes.

The recommendations have been laid out in the format of the questions and answers, to ensure full coverage from findings to recommendations has been delivered. Some of the recommendations may mention a 'dashboard' and may specify some specific features. This is an initial look at ways technology can be mechanisms to aid the policy, and a more detailed description bringing all the dashboard elements will be brought together later in the chapter.

How do police currently use their Twitter accounts?

Policy recommendation: It will be providing a general understanding across the whole police force to all employees a basic understanding of what Twitter is, and the ways that it can aid police tasks and engagement. This will entail a wider grasp of what each account does on their social media, in terms of the themes that are sent, and will look to improve the general coverage that is sent out on Twitter. The focus will be on the types of themes that are sent, and with the basic understanding, the forces will be able to tailor their themed tweets to their area. This recommendation could be approached in the form of training or an online session where the individuals will gather insightful information about Twitter and the amount of people it touches in the UK. There could then be further sessions regarding who posts on the account, which would require a more in depth knowledge about the types of themes and engagement.

Mechanism recommendation: The above policy could be aided by a dashboard for the account, which shows the different themes the posted tweets fall into. In essence, this would give the force an overview of the amount that the account is tweeting, along with the breakdown of the types of tweets. From this the force can see whether they would like to tweet more or less of a certain type of theme. This mechanism is a starting point of the next recommendations and will delve deeper into how a dashboard such as this can aid police Twitter use.

What elements correlate to improve follower base?

Mechanism recommendation: Focusing on percentage of photo tweets and direct messages, as results from the research. The supporting aid would be included in the dashboard idea with the percentage of tweets containing a photo being monitored, it could also show the amount of direct messages tweeted. The dashboard could show the overall figures for the direct messages responded to, against the direct messages with no response to. It could give the account a view of how well they use their 'conversational themed' tweets.

Which themes of tweets receive the most engagement?

Mechanism recommendation: The recommendation would be to ensure to attach a photo to the majority of tweets. The mechanism that would aid this would, again, be in the form of a dashboard. A dashboard that allows the force to see what percentage of tweets that day/week/month have been sent out with a photo attached. Potentially, also the figures for the amount of retweets per theme the account got. (Perhaps different themes do better in different geographical locations, i.e. city or in the country side). If this dashboard was to show the above, there would be many statements that would steer the police account in the right direction in terms of engaging their followers. Such as: Tweet less non crime information (as it is retweeted the least), if there is a particular advice tweet that the account wants to get far, add a picture.

Does sentiment of tweets have an impact of the comments/tweets back?

Policy recommendation: This could be difficult to convey in terms of a policy or procedure, however research could be made clear to police employees that sentiment does play a crucial role in the tone that the police produce in their tweets as well as the tone that the users respond with. It could be said that this would have more effect on the local accounts, as they are more likely to be responding to community issues and engaging in conversational tweets

Police accounts need to be aware that there is a trend showing that the sentiment sent out is the sentiment you are likely to see return to the account.

Mechanism recommendation: This recommendation will be supported more in the form of the mechanism, as sentiment is usually analysed by a computational algorithm. Keeping with the idea of a dashboard, it could show the overall

sentiment of tweets sent out per day/week/month which can allow the account to steer it into a more positive area if so desired. The idea that it would look at overall sentiment, rather than specific tweet sentiment would be because it would be assumed that some police information would be serious, and therefore may not be appropriate to be positive sentiment attached to the tweet. The research has looked at the overall sentiment, and that is where the finding statement has been derived from; an overall look at the accounts sentiment.

Do the force Twitter handles have an impact on engagement?

Policy recommendations: From the research, it would be advised that any local police forces that don't currently use Twitter, to have set up their username in a particular format. The format being: @'Force Name' Police. This could be advised in a document passed down from forces or perhaps on a knowledge base for the police (if such exists).

Mechanism recommendations: For accounts that already have an existing follower base, change Twitter handle to the new format. Easily changed on account settings (Twitter Help Centre). This doesn't affect the follower base, direct messages or replies as the followers follow the account, rather than the handle. The handle is seen as an element to aid communication. The only aspect it may affect is if the user is tweeting the account, and doesn't wait to see the suggestions. If the username and photo is kept the same as before, it shouldn't cause too much impact for the current follower base. This has been listed under 'mechanisms' as it touches upon the technology platform Twitter, and does require the Twitter platform as a mechanism to change to the new format.

What are the differences between force and local accounts?

Policy recommendation: The essence of this recommendation is that there needs to be guidelines set which shows the difference between what force accounts and what local accounts should be tweeting. Currently they are very similar in what they tweet it could be said that from the vast difference in size of population each serves, it perhaps be that they have different tasks and therefore should tweet different amounts of each theme. For example, Force accounts are tasked with reporting on national campaigns, and national criminal investigations (or large scale for the area), giving geographically relevant advice. Local accounts should be duplicating some of this information, in the form of a retweet, responding to users queries and spreading local information. From the initial geographical list created, it looks as if there should be more 'local' accounts created.

Mechanism recommendation: To aid the above policy a similar dashboard explained in the above recommendation could help in cases like this. It could show a 'target' line which would differ between the forces and local accounts. This 'target' line could be as simple as: send out 10 advice tweets each week or ensure

to have an over 60% score on tweets containing photos for local accounts. The account would then have to try and conform to this target on a week/month basis.

More work would have to go into understanding the difference between local and force accounts, and what the perfect amount of particular themes of tweets would be. The 'target' line would give the account an indication on what should be being done.

Dashboard Design

This dashboard design will look to pull all the mechanism recommendation that mentioned a dashboard element together, to help cover all the different recommendations into one technology. Having all of the following elements in one place for a Twitter platform can lead to a greater understanding of Twitter, as well as an easier way to track how well the recommendations are being implemented. Pulling all of the system recommendations that involve a dashboard type platform to the police accounts the overall view would have to include:

- Percentage of tweets containing photos
- Number of themed tweets sent (with 'perfect score' line)
- Total number of tweets
- Amount of engagement received for each theme
- Overall sentiment sent out in tweets
- Amount of new followers gained

For maximum flexibility and overview these elements should be able to be studied by day/week and month, as some of the recommendations occur more/less than others. Mentioned in the above recommendations, for some elements there could be a 'target line' which would show the accounts optimum amount of tweets for that area, based off findings and previous research.

For the dashboard to work, in particular the theme analysis and counting, the platform would have to encourage the individual sending the tweet to categorise the tweet (the subjective categories). It could give suggestions, based on types of words used, but it would have to be confirmed before the tweet is sent. This is the only way to ensure that the themes of the tweets are accurate as auto categorisation is not fully accurate. Where for every tweet it suggests a category/categories that the tweet belongs in (based on key words) and the user has to confirm or change this before the tweet is sent.

The main aims behind designing a dashboard such as this would be to surround and monitor the six main questions asked at the start of the research, and would be an aid to try and meet the recommendations. From the findings it is also discussed that there are differences between local and force accounts, and the difference in these would mean a difference to the target lines.

A simple user interface has been designed for this type of dashboard, to highlight the simplicity of the idea. Figure XX.

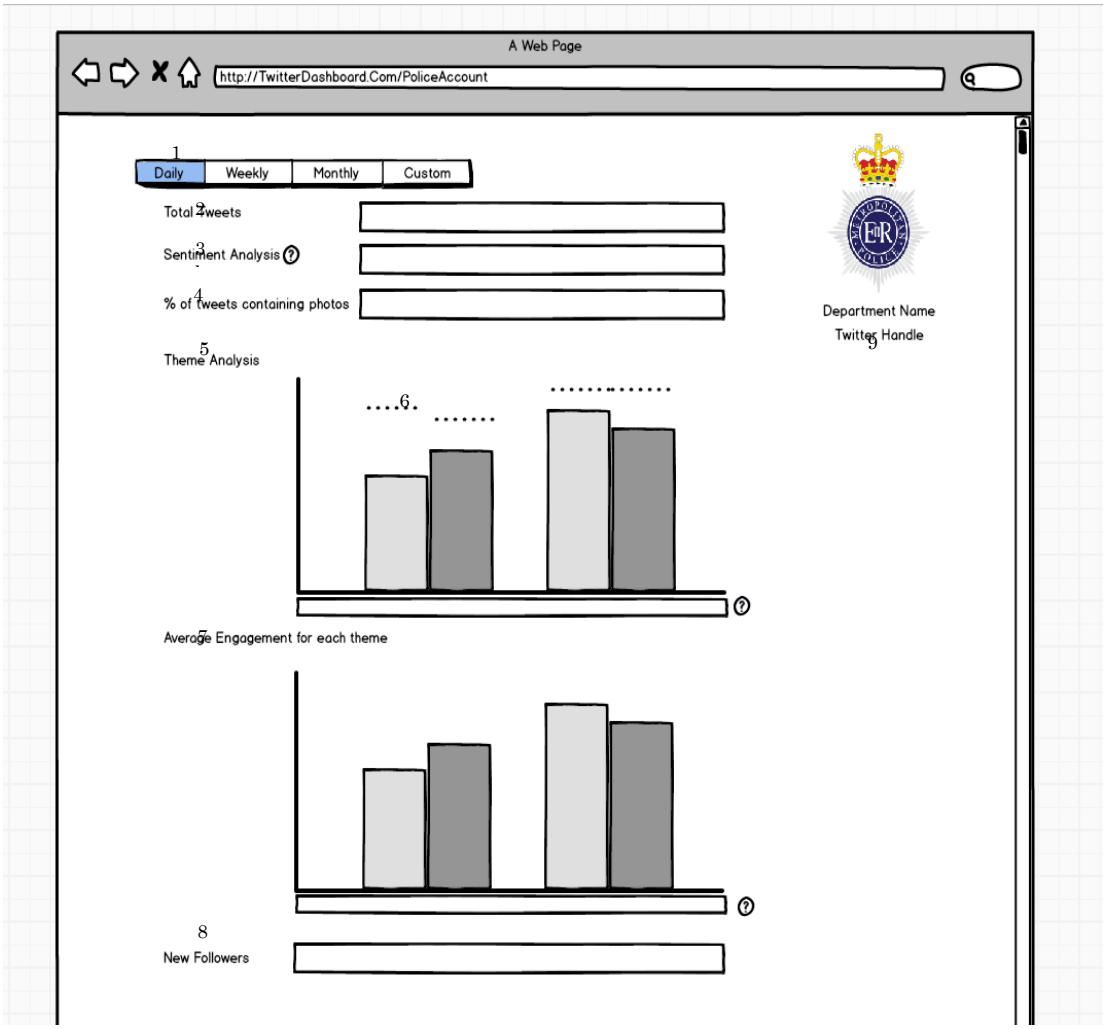

Figure 40: User Interface Design for Dashboard proposal

1. This would be used for the different time scales of viewing the data, custom could be used if the account was particularly interested in the tweets surrounding an event, protest/riots etc.
2. A simple counting of the number of tweets sent by the account in the time frame specified.
3. A sentiment analysis of the tweets posted, based on the same analytical framework as happygrumpy, this will show a HG score
4. Percentage of tweets containing photos in the time frame specified
5. Theme analysis, for the main theme categories: Advice, conversations, appeal (engagement), non-crime information, photos, police information and rumours. (Retweets isn't included reasons why explained in recommendations)
6. The 'target lines' for each theme
7. The total number retweets per theme divided by the total amount of tweets per theme. To show which theme has the best engagement for that specific time frame

8. Amount of new followers in that time frame, this is with the idea that if the account sends out an interesting tweet, followers are likely to increase
9. A logo, name and Twitter handle of the account, making it unique and pleasing to the eye

Further Research Topics

Although there have been recommendations provided, there are some areas which could use some more research to make it fully conclusive. There are also additional areas that have been detailed as the research has progressed as being a potential area of interest, all within the police organisation environment. The further research has been proposed as questions that would require answers.

- How different are local department and high level forces? – What is the optimum level of detail without wasting police time? i.e. detail in daily tasks/aftermath of major crimes procedures
- More detailed analysis, with looking into police daily tasks: how the local accounts should be tweeting? i.e. more community engagement.
- What types of photos/videos receive most engagement? I.e. national campaign photos, or photos of the local police dog, or an Efit of a potential suspect.
- Research to see if different themes do better in different parts of the country i.e. central city, suburbs, small town, village.
- Look into, in regards to conversational tweets, whether the majority of these tweets are to other police accounts, or to citizens.

Conclude

This report has shown the steps of a project, with the focus of improving the information system, social media and ways use it to improve engagement for police. The recommendations provided have outlined technology recommendations (mechanisms) that will support the organisation, and the policies around helping the organisation as a whole, the people side of the business, understand and adapt (policy).

Project Reflection

I have really enjoyed working on this project, and am happy with the work I've produced. I've been lucky enough to work with some great individuals thought-out this time, and also invited to attend conferences with police personnel on the current state of social media use within the forces. Through understanding of the issues discussed in this conference and previous background reading, I believe that the recommendations I have delivered would be of great improvement to the way police conduct their social media engagement practices.

The project has taken a slightly different route to previous described in the initial plan. The question proposed was: 'How can conversational sensemaking aid the process of interpreting Open Source intelligence, investigation and engagement in the context of everyday policing?' and although this is a very high level broad question, the paper still follows this with more depth; how to improve engagement online. Sensemaking and interpreting Open Source information are more in the realms of intelligence and investigation, whereas I decided to take a direction to explore engagement. The decision was made for many reasons, the conference discussions, previous readings, and the lack of engagement for UK police forces on social media. I felt the area had very little exploration and analysis, and wanted to help an area that could be extremely beneficial but the area not explored.

As the project took a different route to previously expected, the aims that were delivered in the initial plan are also inapplicable. The delivered aims mainly discussed the use of Moira technology with the development of a SHERLOCK type game design, however these two technologies aren't complimentary of the engagement path that was chosen. As Moira can be argued to be a more investigation analysis tool, and SHERLOCK is a crowdsourcing tool, this wouldn't have fit with a report focused on engagement.

The change in direction I found difficult to prepare and organise myself for, as I do like to make plans and be aware of the amount of work I have to produce. This meant that I feel I may have wasted some time at the beginning, reading and researching different sources that haven't been used in the final report. However, if I hadn't completed the thorough background, I feel I wouldn't have been in such a strong position to know to explore engagement.

Conducting the research for this report, and in the initial stages, preparing the method to conduct the research I found difficult. As there were no prior studies to base the method off, I took an approach to separate the phases of research into stages; gathering, sorting, findings and analysing the findings. With the focus of the six initial questions it mean that my focus wasn't broad and the research had some structure. The large dataset which was gathered looked daunting at first,

however, once I had the excel spreadsheets, with the titles, it made the analysis of the data far easier to work with, and also meant that I could go back and look for any anomalies if I so desired (which did happen occasionally, e.g. with the APPEAL: at the start of tweets). My idea behind this was so others could track my work and potentially be able to work from it if it was needed. I wanted to be as clear as possible as well as working efficiently.

The analysis of the data, once it had been sorted into the categories, I also found myself to be slightly hesitant to produce. There was so much interesting data, it was difficult to know what areas to compare, and then what graphs to use to best visualise this.

The report writing side of the project I have also struggled with initially, as I had all these great sources, that were really useful, but not in an engagement way. I found that my first few drafts of chapters one and two were far too long, and contained information that was too detailed and sometimes irrelevant to the main focus of the report. However, once I realised this, I detailed the main focus of the report, with main aims for each chapter, and I feel that this has helped me to keep the chapters on target and give all the information necessary.

There have been many lessons learnt that I will take through to my graduate job with me. One, that it isn't always helpful to plan a report, especially when the focus can change. Two, to be confident with the methods I believe help to work efficiently and three when report writing make sure to keep on target with the focus of the whole report as well as each chapter. It's all leading up to the final deliverable, and the research (both background reading and data findings) need to support this.

Skills Improved and Lessons Learnt

Report writing, I have realised that even if the research and findings have great impact themselves, the way these are structured and presented in the report are just as important. The way the analysis and recommendations are presented will be affected by how well structured and articulated the previous work are. Since realising this I have put more hours in than originally planned to ensure that the structure and the writing style of the report matches that of the findings and recommendations. I have realised the importance of these elements if the work wants to be taken seriously and be fully understood.

Within report writing, and mentioned previously, I initially struggled with the literature analysis. With the realisation that the key was to keep to the focus of the whole report, and from here gather and write the literature review, I believe this shows an improved skill.

Many aspects in this report required problem solving, and it's a skill that I already believed I had great experience and knowledge for, however this has improved

over the course of the project. The main area that required problem solving was the gathering and initial analysis of the data. As mentioned before the method I used to proceed through this step took some new steps in analysis of Twitter data, as the elements I was looking to analyse, themes of tweets, was a new technique. Through application of logic to the problem and the idea that my analysis may have to be checked, I organised the work in a very visual and simple way. I used excel formulas to auto calculate the different amounts once the initial analysis was completed, and this was to avoid any human error and to make the whole task more efficient. My data analysis skill has also been refined through this process, by writing out definitions for each theme before the initial analysis started allowed me to be consistent through each of the accounts.

Justification for the data analysis and recommendations was a key factor to get correct as well, and have really tried to focus on this throughout this report. It wasn't only the recommendations that I have tried to justify, but the reasons for putting in particular studies and the proposed questions as well. All throughout this report I have focused on adding links from background reading to proposing questions, and from recommendations to previous studies. I believe that I have improved this skill throughout this report, and have tried to make strong justifications all the way through.

This project required me to work in an independent fashion. Although teamwork is one of my strong points, I believe this project has also shown me that I am able to produce great work independently of others as well. Although I have had support from my supervisor I have conducted every aspect of this project by myself, which has shown to me that I can keep focused on one task for months at a time. The interest in this type of project, social media in a policing environment, has been a huge factor in the amount of hours I have put into completing this project, and this has shown me that it once I'm interested in a project I can always be determined to finish it to a high standard.

As previously mentioned, I enjoy being organised, and I like to conduct a piece of worked with organisation and a plan. One way which I could organise in advance was the meetings with my supervisor, and my time keeping skills and the understanding that the help was so valuable, ensured that I attended each meeting on time and made detailed notes. As spoken about, this project has challenged me in a way that I couldn't plan from the beginning what the report was going to detail, or what the deliverable could be. Although I did learn that planning and writing 'to-do lists' as I went along helped, and meant that I wasn't disheartened when my long term plan didn't occur. Every week I wrote a to-do list for the next stages of the project, and when it came to the report writing I wrote a plan for each chapter. I've improved my planning and organisational skills through a new understanding and different ways to plan and organise.

Future Applications

All the skills and lessons learnt outlined above, I believe, will have a positive effect on any career or role I find myself in. After graduation I have managed to get myself a job working on a project graduate management scheme working for an international construction company. The role entails me to move around every six months, starting in the UK, and potentially moving abroad if I would like to. Along with the move, comes different roles in different areas of the construction industry, and with my current skills and which aspects this project has displayed to me, I will be choosing to work within project management and then hopefully business/technology consultancy. This project has had clear applications to this scheme, as I now realise that I am able to adapt to different working environments and change the way I work if necessary. It has also acted as almost a consultancy project, as I have been handed a problem to improve, police engagement on social media, and have concluded with recommendations, both policy and technical. Although this wasn't the intended route of the project, there is a massive positive to be taken out of this in regards to my future career.

I've thoroughly enjoyed working on this project, and hope that my hard work and the hours I've spent on the work is reflected through this report.

Glossary

Term	Definition
Engagement	'Participate or become involved in'
HG Score	HappyGrumpy score, sentiment analysis
Intelligence	'Information that is received or collected to answer specific questions on who, what, when, where, how and why organised crime operates in the UK'
Open Source Data	Open Source data is a term used to describe any material that can be freely obtained by the public, including those sources that require a payment to purchase the information
Retweets	Linked to the social media site Twitter, the act of forwarding on a post
Tweets	The postings on the social media platform Twitter
Twitter	A social media platform
Twitter handle	The unique identifier of a Twitter account starting with an @

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Appendices

Appendix 1 – Initial List (L2)

Appendix 2 – Initial List (L1)

Appendix 3 – Ranked Initial List (L1)

Appendix 4 – Master Table (L1)

Appendix 5 – Master Table (L2)

Appendix 6 – Master Sentiment Analysis Data

Appendix 7 – Twitter Handle Data

Appendix 8 – Total Tweets and Total Retweets Comparison Data

Appendix 9 – Percentage of Tweets with Photos and Followers Comparison Data

Appendix 10 – Direct Tweets and Amount of Follower's Comparison Data

Appendix 11 – Average Amount of Themes Tweeted per Week, per Account Data

Appendix 12 – Average Number of Retweets per Theme Data

Appendix 13 – Increase Across Themes when Photos are Attached Data

Appendix 14 – Percentage Increase Between Engagement of Tweets with Photos Data

Appendix 15 – Tweets with Photos Attached, in Categories Data

Appendix 16 – Rumour Tweet Data

Appendix 17 – Top and Bottom Accounts (L1)

Appendix 18 –Top and Bottom Accounts (L2)

Appendix 19 – Radar Graph Data

Appendix 20 – Sentiment Analysis Data

Appendix 21 – Name Analysis Screenshots

Appendix 22 – Full Tweet Data Analysis

Appendix 1 - Initial List (L2)

Initial data of the official list

Twitter name	Username	Tweets Total	Followers
Avon&Sommerset Police	@ASPolice	19,200	70,400
Bedfordshire Police	@BedsPolice	11,100	39,000
Cambs police	@CambsCops	8,465	37,100
Cheshire Police	@CheshirePolice	23,600	99,000
City Police	@CityPolice	6,589	60,800
Cleveland Police UK	@ClevelandPolice	11,800	30,000
Cumbria Police	@CumbriaPolice	13,600	41,100
DevonCornwall Police	@DC_Police	14,100	43,200
Derbyshire Police	@DerbysPolice	16,500	47,500
Dorset Police	@DorsetPolice	8,447	32,200
Durham Constabulary	@DurhamPolice	7,367	31,700
Dyfed Powys Police	@DyfedPowys	12,800	26,500
Essex Police	@EssexPoliceUK	13,400	120,000
Glos Police	@Glos_Police	12,100	25,600
G M Police	@GMPolice	36,900	271,000
Gwent Police	@GwentPolice	22,500	38,600
Hampshire Police	@HantsPolice	9,445	97,000
Herts Police	@HertsPolice	6,483	48,500
Humberside Police	@Humberbeat	15,500	31,600
Isle of Man Police	@IOMPolice	5,583	14,400
States of Jsy Police	@JerseyPolice	7,242	8,215
Kent Police (UK)	@Kent_Police	16,100	84,900
LancsPolice	@LancsPolice	15,900	87,800
LeicestershirePolice	@LeicsPolice	21,400	59,800
Lincolnshire Police	@LincsPolice	10,000	39,800
Merseyside Police	@MerseyPolice	8,553	74,400
Metropolitan Police	@MetPoliceUK	10,600	383,000
NationalCrimeAgency	@NCA_UK	2,201	39,000
Norfolk Police	@NorfolkPolice	9,221	53,300
Northants Police	@NorthantsPolice	18,000	44,600
Northumbria Police	@NorthumbriaPol	35,800	67,700
Notts Police	@NottsPolice	15,900	66,600
North Wales Police	@NWPolice	18,500	45,900
NorthYorkshirePolice	@NYorksPolice	21,800	52,600
Police Scotland	@PoliceScotland	9,088	110,000
PSNI	@PoliceServiceNI	13,600	94,100
Staffordshire Police	@StaffsPolice	14,600	62,300
Suffolk Police	@SuffolkPolice	7,703	31,900
Surrey Police	@SurreyPolice	15,400	87,300
Sussex Police	@Sussex_Police	41,100	86,000
South Wales Police	@SWPolice	10,900	78,900
SouthYorkshirePolice	@SYPTweet	13,500	76,500
Thames Valley Police	@ThamesVP	11,000	103,000
Warwickshire Police	@WarksPolice	10,800	33,200
WestYorkshire Police	@WestYorksPolice	35,200	91,900

Wiltshire Police	@WiltshirePolice	4,860	29,800
West Mercia Police	@WMerciaPolice	17,000	51,100
West Midlands Police	@WMPolice	47,000	222,000

Appendix 2 - Initial List (L2)

List of police accounts when google search conducted
Example of google search: 'Twitter accounts in Buckinghamshire'
(Population size and area are to help rank for the sample)

	Population Size	Area miles (squared)	Twitter accounts	Total number of tweets	Followers
England					
Bedfordshire	643,962	477	@bedspolice	11,100	39,000
			@roadpoliceBCH	6,459	8,726
Berkshire	885,654	487	@ThamesVP	11,000	103,000
			@TVP_Reading	2,791	7,172
			@TVP_WestBerks	2,846	3,496
Bristol	442,474	110	@ASPolice	19,200	70,400
Buckinghamshire	781,167	723	@ThamesVP	11,000	103,000
			@TVP_Aylesbury	5,753	6,308
			@TVP_Witney	1,632	2,165
			@TVP_Kidlington	1,295	1,035
			@TVP_Bicester	1,360	1,723
			@TVP_Slough	1,485	3,562
			@TVP_Bracknell	1,587	2,552
			@TVP_SouthBucks	1,294	1,414
Cambridgeshire	830,279	1,309	@CambsCops	8,465	37,100
			@SouthCambsCops	3,301	2,155
			@PboroCops	4,823	6,948
			@CambridgeCops	4,789	2,571
			@FenCops	4,849	3,538
			@EastCambsCops	1,489	1,995
Cheshire	1,039,171	905	@CheshirePolice	23,600	99,000
City of London (and greater London)	8,546,761	608	@MetPoliceUK	10,600	383,000
			@CityPolice	6,589	60,800
			@MPSHackney	12,300	36,500
			@MPSHammFul	7,948	8,161
			@MPSWestminster	4,501	9,175
			@MPSSouthwark	4,535	7,887
			@LPSMediaOffice	6,234	29,700
			@OnePoliceUK	6,462	131,000
			@MetPoliceEvents	2,187	82,100
			@NPASLondon	21,900	131,000
Cornwall	545,355	1,376	@DC_Police	14,100	43,200
			@CCPSmedia	2,920	2,470
			@NPAS_Exeter	1,103	4,621
Cumbria	497,874	2,613	@CumberlandPD	350	249
			@CumbriaPolice	13,600	41,100
			@CumbriaRoadsPol	4,765	12,800
			@CarlislePolice	3,242	3,643
			@BarrowPolice	13,500	12,300
Derbyshire	1,032,267	1,013	@DerbysPolice	16,500	47,500
			@DerbyshireRPU	991	2,747
Devon	1,159,832	2,590	@DC_Police	14,100	43,200
			@NPAS_Exeter	1,103	4,621
Dorset	759,768	1,024	@DorsetPolice	8,447	32,200
			@PCCDorset	5,756	3,489
			@DurhamPolice	7,367	31,700

Durham	909,849	1,051	@DurhamRPU	4,026	10,200
			@DurhamPoliceSC	1,305	2,129
Essex	1,773,154	1,417	@EssexPoliceUK	13,400	120,000
			@NPAS_Boreham	7,290	13,100
Gloucestershire	882,888	1,216	@Glos_Police	12,100	25,600
			@GlosRoadPol	7,990	6,206
			@ForestPolice	1,630	1,627
			@StroudPolice	809	1,403
Greater Manchester	2,732,854	493	@GMPolice	36,900	271,000
			@GMPCityCentre	27,100	54,600
Hampshire	1,800,511	1,455	@HantsPolice	9,445	97,000
			@HantsPolRoads	7,959	39,000
			@SouthamptonCops	8,819	4,429
			@EastleighPolice	21,800	11,700
Herefordshire	187,160	842	@SouthSideCops	7,882	5,430
			@OPUHereford	890	2,372
			@WMerciaPolice	17,000	51,100
			@WMPolice	47,000	222,000
Hertfordshire	1,154,766	634	@HertsPolice	6,483	48,500
			@HertfordPolice	5,475	4,426
			@CIMcDonald	5,342	3,844
Huntingdonshire	173,605	912	@HuntsCops	1,233	973
			@CambsCops	8,465	37,100
Kent	1,784,369	1,442	@Kent_Police	16,100	84,900
			@KentPoliceRoads	11,000	28,900
Lancashire	1,471,979	1,187	@LancsPolice	15,900	87,800
			@PrestonPolice	4,364	6,147
			@LancsRoadPolice	2,932	4,669
			@BlackpoolPolice	1,703	6,641
Leicestershire	1,005,558	833	@LeicsPolice	21,400	59,800
			@ATCLeicester	8,854	5,820
			@Lboropolice	3,315	1,712
Lincolnshire	1,060,567	2,687	@LincsPolice	10,000	39,800
			@SpaldingPolice	8,841	3,086
Merseyside	1,391,113	249	@MerseyPolice	8,553	74,400
Norfolk	877,710	2,074	@NorfolkPolice	9,221	53,300
			@NorwichPoliceUK	4,181	8,416
			@NSRoadsPolicing	8,534	7,064
			@KingsLynnPolice	2,932	6,224
Northamptonshire	714,392	913	@NorthantsPolice	18,000	44,600
			@Northants_RPU	16,800	8,814
Northumberland	315,987	1,936	@NorthumbriaPol	35,800	67,700
			@NPNewcastle	10,900	4,476
Nottinghamshire	1,115,658	834	@NottsPolice	15,900	66,600
Oxfordshire	672,516	1,006	@TVP_Oxford	2,197	6,440
			@ThamesVP	11,000	103,000
			@TVPSouthandVale	3,923	2,035
			@NPAS_Benson	5,544	7,409
			@TVPRP	5,256	14,700
			@OxfordPolice	4,246	15,100
			@TVP_Wokingham	4,274	3,077
Rutland	38,022	147	@RutlandPolice	3,174	1,664
			@OakhamPolice	14,900	3,351
			@LeicsPolice	21,400	59,800
			@UppinghamPolice	390	646
Shropshire	479,561	1,374	@WMerciaPolice	17,000	51,100
			@ShrewsburyCops	3,142	2,797

			@OPUShropshire	486	1,172
Sommerset	931,784	1,610	@ASPolice	19,200	70,700
			@NPAS_Filton	4,561	11,700
			@SomersetPD	274	2,065
Staffordshire	1,111,192	1,048	@StaffsPolice	14,600	62,300
			@PoliceStafford	1,960	2,674
			@WMPolice	47,000	222,000
Suffolk	738,512	1,467	@SuffolkPolice	7,703	31,900
			@StEdsPolice	8,620	2,561
			@NSRoadsPolicing	8,534	7,064
			@MidSuffPolice	3,368	2,695
Surrey	1,161,256	642	@SurreyPolice	15,400	87,300
			@SurreyRoadCops	21,300	40,600
			@GuildfordBeat	9,265	4,900
			@NPAS_Redhill	5,805	22,300
			@WokingBeat	6,831	4,122
Sussex	1,649,240	1,461	@Sussex_Police	41,100	86,000
Warwickshire	551,594	763	@WarksPolice	10,800	33,200
			@OPUWarks	6,299	6,377
			@RugbyCops	2,589	2,038
			@WMPolice	47,000	222,000
Wiltshire	698,942	1,346	@WiltshirePolice	4,860	29,800
			@ASPolice	19,200	70,400
Worcestershire	575,421	672	@WMerciaPolice	17,000	51,100
			@SWorcsCops	3,166	1,557
			@WMPolice	47,000	222,000
Yorkshire	1,365,847	11,903	@NYorksPolice	21,800	52,600
			@WestYorksPolice	35,200	91,900
			@HumberBeat	15,500	31,600
			@SYPTweet	13,500	76,500
Wales					
Clwyd	491,100	1,124	@NWPolice	18,500	45,900
			@NWPControlRoom	7,203	11,600
Dyfed	375,200	2,231	@DyfedPowys	12,800	26,500
			@NPTCarmsWest	1,260	927
Gwent	560,500	599	@GwentPolice	22,500	38,600
			@GPCaerphilly	268	363
			@SWPolice	10,900	78,900
			@NewportBeachPD	798	9,365
			@NewportCops	2,785	1,175
			@GwentPCC	3,846	2,906
Gwynedd	187,400	1,259	@NWPolice	18,500	45,900
Mid Glamorgan	423,200	302	@SWPolice	10,900	78,900
			@SWPNorth	9,988	7,336
			@SwpMerthyr	692	551
			@SWPcentral	6,914	8,853
Powys	132,000	2,006	@DyfedPowys	12,800	26,500
South Glamorgan	445,000	183	@SWPolice	10,900	78,900
			@SWPCardiff	11,400	13,700
			@SWPcentral	6,914	8,853
West Glamorgan	365,500	316	@DyfedPowys	12,800	26,500
			@SWPSwansea	8,894	10,300
			@SWPolice	10,900	78,900
			@SWPcentral	6,914	8,853
Scotland					
Inverclyde	79,860	64	@GreenockPolice	733	2,266
Renfrewshire	174,230	102	@EastRenPolice	1,937	3,038

West Dunbartonshire	89,730	68	@WestDunbartPol	2,174	1,582
East Dunbartonshire	106,730	68	@EastDunbPolice	1,420	2,283
Glasgow	599,650	68	@GlasgowCPolice	2,499	5,801
			@GlasgowWPolice	2,345	3,128
			@PoliceScotland	9,088	110,000
East Renfrewshire	92,380	65	@EastRenPolice	1,937	3,038
North Lanarkshire	337,950	184	@PoliceScotland	9,088	110,000
Falkirk	157,640	113	@FalkirkPolice	8,773	11,000
			@ForthValPolice	3,463	8,876
West Lothian	177,150	165	@WestLothPolice	1,629	3,103
Edinburgh	492,680	100	@EdinburghPolice	3,968	14,500
			@EdinNorthPolice	2,520	4,097
			@PoliceScotland	9,088	110,000
Midlothian	86,210	135	@MidLothPolice	980	2,510
East Lothian	102,050	257	@EastLothPolice	988	2,633
Clackmannanshire	51,190	61	@ClackmanPolice	527	1,718
			@TrafficScotland	206,000	130,000
Fife	367,260	517	@FifePolice	3,029	13,100
			@NorthFifePol	5,227	1,711
			@KirkcaldyPolice	2,267	3,741
			@DunfermlinePol	1,281	2,323
Dundee	148,260	21	@TaysidePolice	4,994	24,600
			@DundeePolice	1,759	2,255
Angus	116,660	843	@AngusPolice	1,799	1,910
			@TaysidePolice	4,994	24,600
Aberdeenshire	260,500	2,439	@GrampianPolice	5	835
			@PoliceScotland	9,088	110,000
			@AberdeenNPolice	1,749	2,144
Aberdeen	228,990	70	@GrampianPolice	5	835
			@PoliceScotland	9,088	110,000
			@AberdeenPDMD	889	1,249
			@AberdeenCPolice	1,129	3,733
			@AberdeenNPolice	1,749	2,144
Moray	94,750	864	@GrampianPolice	5	835
Highland	233,100	11,838	@NorthernPolice	7,344	17,500
Na H-Eileanan Siar	27,250	1,185	@LochabSkyePol	1,625	3,198
Argyll and Bute	87,660	2,712	@WestDunbartPol	2,174	1,582
			@ArgyllandBute	3,473	9,052
Perth and Kinross	148,880	2,083	@PerthKinPolice	3,400	2,976
			@TaysidePolice	4,994	24,600
Stirling	91,580	866	@StirlingPol	2,553	4,240
			@FalkirkPolice	8,773	11,000
North Ayrshire	136,450	343	@AyrshireNPolice	16,300	5,939
East Ayrshire	122,150	492	@AyrshireEPolice	4,381	4,668
South Ayrshire	112,510	475	@AyrshireSPolice	4,964	3,616
Dumfries and Galloway	149,940	2,489	@NithsdalePolice	3,370	1,541
			@DumfriesGPolice	2,687	3,440
South Lanarkshire	315,360	686	@PoliceScotland	9,088	110,000
Scottish Borders	114,030	1,825	@BordersPolice	1,701	2,567
Orkney	21,590	396	@OrkneyPolice	939	2,255
Shetland	23,230	568	@ShetlandPolice	599	1,521
Northern Ireland					
Antrim	618,108	1,176	@PSNIAntrim	1,446	2,377
			@PoliceServiceNI	13,600	94,100
			@PSNITraffic	4,447	26,800
			@PSNINabbyCarr	2,536	4,268
			@PoliceServiceNI	13,600	94,100

Armagh	174,792	512	@PSNIArmagh	1,286	1,722
			@PSNICraigavon	2,382	3,226
Down	531,665	952	@PoliceServiceNI	13,600	94,100
Fermanagh	61,170	653	@PoliceServiceNI	13,600	94,100
Londonderry	247,132	801	@PoliceServiceNI	13,600	94,100
			@PSNIFoyle	1,699	2,180
			@PSNITraffic	4,447	26,800
Tyrone	177,986	1,259	@PSNIDungannon	1,637	1,585

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Appendix 3 - Ranked Initial List (L1)

Ranked list of geographical list. Ranked of followers divided by population size.

Twitter accounts	Total number of tweets	Followers	Followers/ Population size
@CambsCops	8,465	37,100	0.3690
@NorthumbriaPol	35,800	67,700	0.2142
@PoliceServiceNI	13,600	94,100	0.1522
@LochabSkyePol	1,625	3,198	0.1174
@OrkneyPolice	939	2,255	0.1044
@ArgyllandBute	3,473	9,052	0.1033
@GMPolice	36,900	271,000	0.0992
@CheshirePolice	23,600	99,000	0.0953
@WMPolice	47,000	222,000	0.0915
@OakhamPolice	14,900	3,351	0.0881
@CumbriaPolice	13,600	41,100	0.0826
@SurreyPolice	15,400	87,300	0.0752
@NorthernPolice	7,344	17,500	0.0751
@GwentPolice	22,500	38,600	0.0689
@EssexPoliceUK	13,400	120,000	0.0677
@WestYorksPolice	35,200	91,900	0.0673
@ThamesVP	11,000	103,000	0.0669
@ShetlandPolice	599	1,521	0.0655
@NorthantsPolice	18,000	44,600	0.0624
@NorfolkPolice	9,221	53,300	0.0607
@bedspolice	11,100	39,000	0.0606
@WarksPolice	10,800	33,200	0.0602
@NottsPolice	15,900	66,600	0.0597
@LancsPolice	15,900	87,800	0.0596
@TaysidePolice	4,994	24,600	0.0594
@LeicsPolice	21,400	59,800	0.0573
@ForthValPolice	3,463	8,876	0.0563
@StaffsPolice	14,600	62,300	0.0561
@SYPTweet	13,500	76,500	0.0560
@HantsPolice	9,445	97,000	0.0539
@MerseyPolice	8,553	74,400	0.0535
@Sussex_Police	41,100	86,000	0.0521
@Kent_Police	16,100	84,900	0.0476
@StirlingPol	2,553	4,240	0.0463
@DerbysPolice	16,500	47,500	0.0460
@MetPoliceUK	10,600	383,000	0.0448
@FalkirkPolice	8,773	11,000	0.0441
@SWPolice	10,900	78,900	0.0439
@RutlandPolice	3,174	1,664	0.0438
@AyrshireNPolice	16,300	5,939	0.0435
@SuffolkPolice	7,703	31,900	0.0432
@WiltshirePolice	4,860	29,800	0.0426
@DorsetPolice	8,447	32,200	0.0424
@HertsPolice	6,483	48,500	0.0420

@NYorksPolice	21,800	52,600	0.0385
@AyrshireEPolice	4,381	4,668	0.0382
@LincsPolice	10,000	39,800	0.0375
@FifePolice	3,029	13,100	0.0357
@SurreyRoadCops	21,300	40,600	0.0350
@DurhamPolice	7,367	31,700	0.0348
@ASPolice	19,200	70,400	0.0341
@ClackmanPolice	527	1,718	0.0336
@AyrshireSPolice	4,964	3,616	0.0321
@SWPCardiff	11,400	13,700	0.0308
@DyfedPowys	12,800	26,500	0.0303
@EdinburghPolice	3,968	14,500	0.0294
@MidLothPolice	980	2,510	0.0291
@SouthSideCops	7,882	5,430	0.0290
@Glos_Police	12,100	25,600	0.0290
@GreenockPolice	733	2,266	0.0284
@SWPSwansea	8,894	10,300	0.0282
@EastLothPolice	988	2,633	0.0258
@CumbriaRoadsPol	4,765	12,800	0.0257
@BarrowPolice	13,500	12,300	0.0247
@NWPControlRoom	7,203	11,600	0.0236
@HumberBeat	15,500	31,600	0.0231
@DumfriesGPolice	2,687	3,440	0.0229
@BordersPolice	1,701	2,567	0.0225
@OxfordPolice	4,246	15,100	0.0225
@TVPRP	5,256	14,700	0.0219
@HantsPolRoads	7,959	39,000	0.0217
@EastDunbPolice	1,420	2,283	0.0214
@PerthKinPolice	3,400	2,976	0.0200
@GMPCityCentre	27,100	54,600	0.0200
@NWPolice	18,500	45,900	0.0194
@NPAS_Redhill	5,805	22,300	0.0192
@PSNICraigavon	2,382	3,226	0.0185
@WestLothPolice	1,629	3,103	0.0175
@SWPNorth	9,988	7,336	0.0173
@UppinghamPolice	390	646	0.0170
@NewportBeachPD	798	9,365	0.0167
@AngusPolice	1,799	1,910	0.0164
@AberdeenCPolice	1,129	3,733	0.0163
@KentPoliceRoads	11,000	28,900	0.0162
@NPASLondon	21,900	131,000	0.0153
@DundeePolice	1,759	2,255	0.0152
@NPNewcastle	10,900	4,476	0.0142
@WMerciaPolice	17,000	51,100	0.0136
@roadpoliceBCH	6,459	8,726	0.0136
@OPUHereford	890	2,372	0.0127
@NPAS_Filton	4,561	11,700	0.0126
@Northants_RPU	16,800	8,814	0.0123
@OPUWarks	6,299	6,377	0.0116

@EastRenPolice	1,937	3,038	0.0113
@DurhamRPU	4,026	10,200	0.0112
@NPAS_Benson	5,544	7,409	0.0110
@NithsdalePolice	3,370	1,541	0.0103
@KirkcaldyPolice	2,267	3,741	0.0102
@PSNIArmagh	1,286	1,722	0.0099
@GlasgowCPolice	2,499	5,801	0.0097
@MetPoliceEvents	2,187	82,100	0.0096
@NorwichPoliceUK	4,181	8,416	0.0096
@TVP_Oxford	2,197	6,440	0.0096
@PSNIDungannon	1,637	1,585	0.0089
@WestDunbartPol	2,174	1,582	0.0089
@PSNIFoyle	1,699	2,180	0.0088
@PboroCops	4,823	6,948	0.0084
@EdinNorthPolice	2,520	4,097	0.0083
@DC_Police	14,100	43,200	0.0082
@TVP_Reading	2,791	7,172	0.0081
@TVP_Aylesbury	5,753	6,308	0.0081
@NPAS_Boreham	7,290	13,100	0.0074
@CarlislePolice	3,242	3,643	0.0073
@CityPolice	6,589	60,800	0.0071
@SWPcentral	6,914	8,853	0.0071
@KingsLynnPolice	2,932	6,224	0.0071
@GlosRoadPol	7,990	6,206	0.0070
@PSNINabbyCarr	2,536	4,268	0.0069
@EastleighPolice	21,800	11,700	0.0065
@DunfermlinePol	1,281	2,323	0.0063
@ShrewsburyCops	3,142	2,797	0.0058
@ATCLeicester	8,854	5,820	0.0058
@HuntsCops	1,233	973	0.0056
@AberdeenPDMD	889	1,249	0.0055
@GlasgowWPolice	2,345	3,128	0.0052
@GwentPCC	3,846	2,906	0.0052
@NorthFifePol	5,227	1,711	0.0047
@PCCDorset	5,756	3,489	0.0046
@TVP_Wokingham	4,274	3,077	0.0046
@TVP_Slough	1,485	3,562	0.0046
@CCPSmedia	2,920	2,470	0.0045
@BlackpoolPolice	1,703	6,641	0.0045
@NSRoadsPolicing	8,534	7,064	0.0043
@AberdeenNPolice	1,749	2,144	0.0043
@MPSHackney	12,300	36,500	0.0043
@FenCops	4,849	3,538	0.0043
@GuildfordBeat	9,265	4,900	0.0042
@PrestonPolice	4,364	6,147	0.0042
@TVP_WestBerks	2,846	3,496	0.0039
@PSNIAntrim	1,446	2,377	0.0038
@HertfordPolice	5,475	4,426	0.0038
@RugbyCops	2,589	2,038	0.0037
@MidSuffPolice	3,368	2,695	0.0036
@WokingBeat	6,831	4,122	0.0035

@LPSMediaOffice	6,234	29,700	0.0035
@StEdsPolice	8,620	2,561	0.0035
@CIMcDonald	5,342	3,844	0.0033
@TVP_Bracknell	1,587	2,552	0.0033
@LancsRoadPolice	2,932	4,669	0.0032
@CambridgeCops	4,789	2,571	0.0031
@TVPSouthandVale	3,923	2,035	0.0030
@SpaldingPolice	8,841	3,086	0.0029
@TVP_Witney	1,632	2,165	0.0028
@SWorcsCops	3,166	1,557	0.0027
@DerbyshireRPU	991	2,747	0.0027
@SouthCambsCops	3,301	2,155	0.0026
@NPTCarmsWest	1,260	927	0.0025
@SouthamptonCops	8,819	4,429	0.0025
@OPUShropshire	486	1,172	0.0024
@PoliceStafford	1,960	2,674	0.0024
@EastCambsCops	1,489	1,995	0.0024
@DurhamPoliceSC	1,305	2,129	0.0023
@SomersetPD	274	2,065	0.0022
@TVP_Bicester	1,360	1,723	0.0022
@NewportCops	2,785	1,175	0.0021
@ForestPolice	1,630	1,627	0.0018
@TVP_SouthBucks	1,294	1,414	0.0018
@Lboropolice	3,315	1,712	0.0017
@StroudPolice	809	1,403	0.0016
@GrampianPolice	5	835	0.0014
@TVP_Kidlington	1,295	1,035	0.0013
@SwpMerthyr	692	551	0.0013
@MPSWestminster	4,501	9,175	0.0011
@MPSHammFul	7,948	8,161	0.0010
@MPSSouthwark	4,535	7,887	0.0009
@GPCaerphilly	268	363	0.0006
@NPAS_Exeter	1,103	4,621	0.0006
@CumberlandPD	350	249	0.0005
@PoliceScotland	9,088	110,000	
@TrafficScotland	206,000	130,000	
@PSNITraffic	4,447	26,800	

Appendix 4 - Master Table (L1)

Master list of L1 showing the data gathered from the in depth tweet analysis

Rank	Type	Name	Followers/ Population	Amount of tweets recorded	Including Others usernames						
					Retweets		Conversation		Mentioning	Photos	
					Police	Non Police	Continuing	Starting		Reteweted	Posted
Top	Force	CambsCops	0.3690	62	16	3	1	0	2	8	7
Top	Force	NorthumbriaPol	0.2142	132	68	29	3	0	3	57	4
Top	Local	LochabSkyePol	0.1174	22	6	1	2	0	1	1	3
Top	Local	OrkneyPolice	0.1044	5	0	0	0	0	0	0	3
Top	Local	ArgyllandBute	0.1033	10	0	0	0	0	0	0	0
Top	Force	GMPolice	0.0992	134	11	2	19	0	10	6	24
Top	Force	CheshirePolice	0.0953	176	4	11	59	0	15	10	19
Top	Force	WMPolice	0.0915	179	14	11	16	0	6	27	85
Top	Local	OakhamPolice	0.0881	171	11	36	72	0	13	12	10
Top	Force	CumbriaPolice	0.0826	99	18	8	10	0	4	11	28
Random	Force	ThamesVP	0.0669	75	12	11	18	0	3	11	9
Random	Force	HantsPolice	0.0539	48	6	14	10	0	3	6	14
Random	Force	DorsetPolice	0.0424	67	5	4	9	0	0	4	12
Random	Force	MetPoliceUK	0.0448	88	15	7	0	0	7	7	59
Random	Force	WMerciaPolice	0.0136	102	9	21	10	0	15	5	6
Random	Force	DurhamPolice	0.0112	22	8	7	0	0	0	10	3
Middle	Local	AyrshireEPolice	0.0382	69	2	0	0	0	7	1	7
Middle	Local	LincsPolice	0.0375	42	1	2	9	0	0	0	8
Middle	Local	FifePolice	0.0357	8	3	0	0	0	0	1	2
Middle	Local	SurreyRoadCops	0.0350	88	5	3	48	0	1	2	9
Middle	Force	ASPolice	0.0341	155	2	15	69	0	6	9	27
Middle	Local	SWPCardiff	0.0308	113	13	19	9	0	19	25	30
Bottom	Local	StroudPolice	0.0016	8	0	0	0	0	0	0	2
Bottom	Local	TVP_Kidlington	0.0013	3	1	1	0	0	0	2	1
Bottom	Local	SwpMerthyr	0.0013	30	0	4	0	0	3	2	12
Bottom	Local	MPSWestminster	0.0011	88	17	8	14	0	10	12	11
Bottom	Local	MPSHammFul	0.0010	28	4	5	9	0	4	5	3
Bottom	Local	MPSSouthwark	0.0009	38	2	0	13	0	8	1	9
Bottom	Local	GPCaerphilly	0.0006	10	1	1	5	0	0	2	2
Bottom	Local	NPAS_Exeter	0.0006	17	3	0	3	0	0	1	10

Acconts Tweets							Interaction f			
Other Posted										
Polls	**Engagement**		**Giving Information**		**Rumour disprover**	**Non Crime**				**Retw**
	Online	**Offline**	**Police activity**	**Advice**			Retweets	Appealing	Non crime	Photos
0	3	4	21	7	0	10	163	82	40	97
0	9	25	15	40	0	37	721	382	165	479
1	3	4	7	8	0	4	19	56	7	32
0	1	1	1	4	0	0	0	370	0	370
0	1	1	1	5	0	4	0	1	1	0
0	24	17	61	48	0	22	498	736	107	580
1	11	19	48	46	0	70	3,172	1,068	2,618	2,639
0	22	24	76	41	0	41	2,004	1,537	359	2,298
1	7	16	30	23	0	112	680	245	464	192
0	19	5	20	38	0	32	1,078	899	256	404
0	6	10	19	13	0	28	1,589	914	175	834
0	4	8	14	19	0	14	330	53	169	527
0	25	4	31	13	0	22	60	180	142	198
1	25	5	58	1	0	7	1,035	2,133	371	3,212
0	23	4	22	18	0	38	633	1,043	377	345
0	0	3	5	5	0	9	200	13	23	173
0	1	5	55	4	0	6	11	6	15	25
0	10	3	17	8	0	11	21	92	72	130
0	1	0	4	1	0	0	11	9	0	6
0	4	5	21	19	0	42	91	4	52	96
0	30	16	53	30	0	63	353	303	168	553
0	2	14	27	18	0	48	356	68	197	295
0	1	2	5	3	0	0	0	4	0	3
0	0	0	0	1	0	2	219	0	8	222
0	0	6	15	4	0	12	7	3	11	18
1	9	9	15	25	0	28	979	619	70	722
0	1	8	6	3	0	11	256	27	103	248
0	1	3	11	7	0	17	27	0	21	55
0	1	5	3	2	0	1	12	17	4	19
0	1	0	0	2	0	11	528	1	84	605

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Police Info	Advice	Total	TR/TT
182	42	431	**14.35**
60	200	851	**23.91**
51	50	111	**19.88**
1	374	375	**4.72**
0	3	4	**16.17**
1,438	257	1,923	**27.59**
478	522	4,208	**14.25**
1,253	976	3,559	**6.36**
37	131	807	**48.59**
195	395	1,601	**24.73**
732	295	2,069	**11.50**
149	366	684	**0.93**
212	78	426	**8.64**
2,826	7	4,276	**3.63**
1,833	273	2,522	**3.25**
46	124	253	**6.19**
30	16	64	**4.26**
198	87	363	**0.50**
16	2	29	**74.00**
121	63	286	**0.83**
501	293	960	**14.93**
47	114	481	**11.68**
0	4	4	**4.50**
0	214	222	**3.20**
9	4	25	**36.41**
323	160	1,314	**#DIV/0!**
19	1	327	**#DIV/0!**
52	39	171	**#DIV/0!**
8	9	32	**#DIV/0!**
0	57	619	**#DIV/0!**

Appendix 5 - Master Table (L2)

Master list of L2 showing the data gathered from the in depth tweet analysis

			A						
			Including Others usernames						
Name	**Amount of tweets recorded**	**Followers/Population**	Retweets		Conversation		Mentioning	**Photos**	
			Police	**Non Police**	**Continuing**	**Starting**		**Reteweted**	**Posted**
AS Police	155	0.0341	2	15	69	0	6	9	27
Beds Police	109	0.0606	4	11	13	0	11	11	54
CambCops	62	0.3690	16	3	1	0	2	8	7
CheshirePolice	176	0.0953	4	11	59	0	15	10	19
CityPolice	56	0.0071	15	8	0	0	9	10	11
ClevelandPolice	81	0.4444	9	4	1	0	3	7	10
CumbriaPolice	99	0.0826	18	8	10	0	4	11	28
DC_Police	77	0.0082	9	7	18	0	0	9	7
DerbysPolice	88	0.0460	0	1	6	0	20	0	25
DorsetPolice	67	0.0424	5	4	9	0	0	4	12
DyfedPowys	65	0.0303	11	12	5	0	16	11	3
Glos_Police	53	0.0290	2	0	17	0	5	2	6
GMPolice	134	0.0992	11	2	19	0	10	6	24
GwentPolice	32	0.0689	1	4	0	0	3	2	4
HantsPolice	48	0.0539	6	14	10	0	3	6	14
HertsPolice	65	0.0420	13	13	2	0	0	20	8
Humberbeat	93	0.0231	16	11	4	0	3	11	11
IOMPolice	38	0.1700	0	0	0	0	0	0	0
JerseyPolice	27	0.0835	5	14	0	0	0	6	1
Kent_Police	64	0.0476	9	2	28	0	2	5	6
LancsPolice	138	0.0596	20	27	42	0	3	18	20
LeicsPolice	88	0.0573	13	11	7	0	16	12	21
LincsPolice	42	0.0375	1	2	9	0	0	0	8
MerseyPolice	62	0.0535	3	1	11	0	3	0	17
MetPoliceUK	88	0.0448	15	7	0	0	7	7	59
NorfolkPolice	105	0.0607	4	3	14	0	5	5	55
NorthantsPolice	60	0.0624	3	2	0	0	2	3	15
NorthumbriaPol	132	0.2142	68	29	3	0	3	57	4

NottsPolice	142	0.0597	42	26	9	0	25	33	6
NWPolice	116	0.0194	10	8	3	0	12	10	32
NYorksPolice	218	0.0385	70	31	31	0	36	35	48
PoliceScotland	84	0.0208	12	10	11	0	19	13	22
PoliceServiceNI	158	0.1522	10	13	0	0	10	12	25
StaffsPolice	69	0.0561	19	24	3	0	4	25	5
SuffolkPolice	99	0.0432	19	18	2	0	8	14	47
SurreyPolice	65	0.0752	4	2	19	0	4	2	15
Sussex_Police	157	0.0521	17	7	73	0	12	12	25
SWPolice	108	0.0439	11	17	37	0	13	13	23
SYPTweet	143	0.056	1	2	32	0	12	1	32
ThamesVP	75	0.0669	12	11	18	0	3	11	9
WarksPolice	49	0.0602	11	11	2	0	6	10	5
WestYorksPolice	207	0.0673	7	11	20	0	14	17	19
WiltshirePolice	39	0.0426	1	3	5	0	5	2	14
WMerciaPolice	102	0.0136	9	21	10	0	15	5	6
WMPolice	179	0.0915	14	11	16	0	6	27	85

cconts Tweets									I
Other Posted									
Polls	**Engagement**		**Giving Information**		**Rumour disprover**	**Non Crime**			
	Online	**Offline**	**Police activity**	**Advice**			Retweets	Appealing	Non crime
0	30	16	53	30	0	63	353	303	168
0	21	3	27	32	0	35	311	219	332
0	3	4	21	7	0	10	163	82	40
1	11	20	48	46	0	70	3,172	1,068	2,618
0	0	3	14	12	0	17	560	18	103
0	25	8	35	21	0	19	402	167	162
0	19	5	20	38	0	32	1,078	899	256
0	12	1	25	14	0	43	232	252	214
0	24	3	59	8	0	16	2	190	45
0	25	4	31	13	0	22	60	180	142
0	6	5	9	33	0	24	562	189	240
0	22	5	18	12	0	25	233	54	18
0	24	17	61	48	0	22	498	736	107
0	4	0	16	5	0	11	183	111	107
0	4	8	14	19	0	14	330	53	169
0	12	0	16	15	0	27	618	261	330
0	21	2	33	26	0	27	529	137	287
0	3	0	14	20	0	4	0	6	13
0	0	1	0	15	0	16	539	3	398
0	13	4	23	17	0	17	501	118	41
0	15	3	24	50	0	74	1236	205	701
4	12	9	15	36	0	32	218	160	190
0	10	3	17	8	0	11	21	92	72
0	12	6	34	9	0	17	121	223	111
1	25	5	58	1	0	7	1,035	2,133	371
0	24	4	33	40	1	24	750	413	141
0	3	3	36	16	0	7	135	41	94
0	9	25	15	40	0	37	721	382	165

0	35	2	12	63	0	60	1372	216	265
0	13	3	32	55	0	29	1083	120	283
0	27	17	34	47	0	81	1181	1372	501
0	7	13	4	34	0	40	444	252	498
0	4	5	65	32	0	51	336	72	327
0	0	2	2	23	0	36	805	3	274
0	9	1	33	24	0	36	670	48	314
0	19	8	25	24	0	14	181	259	118
0	26	7	38	51	0	58	573	315	392
1	4	14	7	41	0	49	154	53	177
3	27	15	39	53	0	50	58	149	181
0	6	10	19	13	0	28	1,589	914	175
0	4	3	7	24	0	17	856	36	232
0	49	12	79	77	0	48	1386	365	944
0	1	6	7	19	0	13	14	75	63
0	23	4	22	18	0	38	633	1,043	377
0	22	24	76	41	0	41	2,004	1,537	359

nteraction from others

Retweets

Photos	Police Info	Advice	Total	**TR/TT**
553	501	293	960	**6.03**
515	130	232	657	**6.95**
97	182	42	431	**23.91**
2,639	478	522	4,208	**16.39**
443	132	138	918	**7.01**
198	66	178	568	**16.17**
404	195	395	1,601	**9.70**
257	450	28	747	**4.77**
201	326	40	420	**6.36**
198	212	78	426	**11.51**
336	86	209	748	**6.85**
173	90	160	363	**14.35**
580	1,438	257	1,923	**8.09**
91	25	71	259	**14.25**
527	149	366	684	**11.94**
538	110	149	776	**9.67**
524	172	412	899	**2.84**
0	40	55	108	**20.93**
62	0	270	565	**11.70**
409	212	60	749	**12.73**
1245	271	1312	1757	**6.38**
365	164	171	561	**8.64**
130	198	87	363	**10.48**
261	326	227	650	**48.59**
3,212	2,826	7	4,276	**#REF!**
879	200	279	1315	**7.43**
255	163	179	446	**6.45**
479	60	200	851	**12.56**

1023	118	1148	1783	**13.66**
1133	198	879	1584	**16.39**
2857	2019	680	3574	**13.20**
766	126	448	1109	**7.42**
199	565	297	1172	**14.13**
653	24	657	975	**9.68**
754	130	434	958	**10.65**
283	383	84	692	**9.84**
807	508	550	1545	**4.09**
264	70	147	442	**4.43**
256	234	187	634	**27.59**
834	732	295	2,069	**19.90**
567	44	606	975	**11.15**
1659	472	851	2308	**6.56**
136	119	79	256	**24.73**
345	1,833	273	2,522	**19.88**
2,298	1,253	976	3,559	**#DIV/0!**

Appendix 6 - Master Sentiment Analysis Data

Table showing the data when HappyGrumpy analysis was run for each account

Account Name	Rank	No. Tweets	Account Analysis			Tweets AT Account Analysis		
			HG Score	% Happy	% Grumpy	HG Score	% Happy	% Grumpy
UK								
@GMPolice	Top	36,900	-15.2	14%	29%	-15	18%	33%
@MetPoliceUK	Top	10,600	-13.4	7%	20%	-50.9	9%	59%
@NorthumbriaPol	Top	35,800	4.2	12%	8%	1.6	11%	9%
@TrafficScotland	Top	206,000	2.2	9%	7%	-4.4	8%	12%
@WMPolice	Top	47,000	-16.1	18%	34%	-12.4	12%	24%
@OnePoliceUK	Top	6,462	-5.2	24%	29%	10.6	23%	12%
@NPASLondon	Top	21,900	54.9	55%	0%	41	42%	1%
@GwentPolice	Middle	22,500	-8.3	10%	19%	10.1	21%	11%
@CambsCops	Middle	8,465	-4.2	7%	11%	-22.9	10%	33%
@MPSHackney	Middle	12,300	-2.2	22%	24%	-4.2	3%	7%
@WarksPolice	Middle	10,800	4.8	16%	11%	-25.8	12%	38%
@DorsetPolice	Middle	8,447	-15.3	17%	32%	-31.7	7%	39%
@SuffolkPolice	Middle	7,703	-3.1	9%	12%	-2.1	26%	28%
@DurhamPolice	Middle	7,367	11.1	16%	5%	26.9	44%	17%
@GrampianPolice	Bottom	5	2	9%	7%	-29.5	8%	38%
@UppinghamPolice	Bottom	390	37.5	48%	10%	31.1	41%	10%
@SwpMerthyr	Bottom	692	-4	15%	19%	32.6	45%	13%
@GPCaerphilly	Bottom	268	5.1	22%	17%	43.5	54%	11%
@CumberlandPD	Bottom	350	8.5	16%	8%	-6.7	19%	26%

Appendix 7 - Twitter Handle Data

Analysis of Twitter handles

Username	Shortened name + Police	Full name + Police	Name + _ + Police	Other	Follower base
@ASPolice	Y				70,400
@BedsPolice	Y				39,000
@CambCops				Y	37,100
@CheshirePolice		Y			99,000
@CityPolice		Y			60,800
@ClevelandPolice		Y			30,000
@CumbriaPolice		Y			41,100
@DC_Police			Y		43,200
@DerbysPolice	Y				47,500
@DorsetPolice	Y				32,200
@DyfedPowys				Y	26,500
@Glos_Police			Y		25,600
@GMPolice	Y				271,000
@GwentPolice		Y			38,600
@HantsPolice	Y				97,000
@HertsPolice	Y				48,500
@Humberbeat				Y	31,600
@IOMPolice	Y				14,400
@JerseyPolice		Y			8,215
@Kent_Police			Y		84,900
@LancsPolice	Y				87,800
@LeicsPolice	Y				59,800
@LincsPolice		Y			39,800
@MerseyPolice	Y				74,400
@MetPoliceUK		Y			383,000
@NorfolkPolice		Y			53,300
@NorthantsPolice		Y			44,600

@NorthumbriaPol				Y	67,700
@NottsPolice	Y				66,600
@NWPolice	Y				45,900
@NYorksPolice	Y				52,600
@PoliceScotland		Y			110,000
@PoliceServiceNI	Y				94,100
@StaffsPolice	Y				62,300
@SuffolkPolice		Y			31,900
@SurreyPolice		Y			87,300
@Sussex_Police			Y		86,000
@SWPolice	Y				78,900
@SYPTweet				Y	76,500
@ThamesVP				Y	103,000
@WarksPolice	Y				33,200
@WestYorksPolice	Y				91,900
@WiltshirePolice		Y			29,800
@WMerciaPolice	Y				51,100
@WMPolice	Y				222,000
	21	14	4	6	

Average of tweets with shorterned names:	77,383
Average of tweets with full names:	75,530
Average of tweets with _ names:	59,925
Averages of 'other' types of tweets:	57,067

Appendix 8 - Total Tweets and total retweets comparison

Tables displaying the data for the graphs: Total tweets and total retweets comparison

	Tweets	Retweets
L1		
CambsCops	62	431
NorthumbriaPol	132	851
LochabSkyePol	22	111
OrkneyPolice	5	375
ArgyllandBute	10	4
GMPolice	134	1,923
CheshirePolice	176	4,208
WMPolice	179	3,559
OakhamPolice	171	807
CumbriaPolice	99	1,601
ThamesVP	75	2,069
HantsPolice	48	684
DorsetPolice	67	426
MetPoliceUK	88	4,276
WMerciaPolice	102	2,522
DurhamPolice	22	253
AyrshireEPolice	69	64
LincsPolice	42	363
FifePolice	8	29
SurreyRoadCops	88	286
ASPolice	155	960
SWPCardiff	113	481
StroudPolice	8	4
TVP_Kidlington	3	222
SwpMerthyr	30	25
MPSWestminster	88	1,314
MPSHammFul	28	327
MPSSouthwark	38	171
GPCaerphilly	10	32
NPAS_Exeter	17	619
L2		
AS Police	155	960
Beds Police	109	657
CambCops	62	431
CheshirePolice	176	4,208
CityPolice	56	918
ClevelandPolice	81	568
CumbriaPolice	99	1,601
DC_Police	77	747
DerbysPolice	88	420
DorsetPolice	67	426
DyfedPowys	65	748
Glos_Police	53	363
GMPolice	134	1,923
GwentPolice	32	259
HantsPolice	48	684
HertsPolice	65	776

Humberbeat	93	899
IOMPolice	38	108
JerseyPolice	27	565
Kent_Police	64	749
LancsPolice	138	1757
LeicsPolice	88	561
LincsPolice	42	363
MerseyPolice	62	650
MetPoliceUK	88	4,276
NCA_Uk	69	1210
NorfolkPolice	105	1315
NorthantsPolice	60	446
NorthumbriaPol	132	851
NottsPolice	142	1783
NWPolice	116	1584
NYorksPolice	218	3574
PoliceScotland	84	1109
PoliceServiceNI	158	1172
StaffsPolice	69	975
SuffolkPolice	99	958
SurreyPolice	65	692
Sussex_Police	157	1545
SWPolice	108	442
SYPTweet	143	634
ThamesVP	75	2,069
WarksPolice	49	975
WestYorksPolice	207	2308
WiltshirePolice	39	256
WMerciaPolice	102	2,522
WMPolice	179	3,559

Appendix 9 - Percentage of tweets with photos and followers comparison

Table displaying the data for the graph: Percentage of tweets with photo and followers comparison
The graph used columns F

L1	Retweets	Posts	Total Photos	Total Tweets	Percentage	Followers
CambsCops	8	7	15	62	24%	37,100
NorthumbriaPol	57	4	61	132	46%	67,700
LochabSkyePol	1	3	4	22	18%	3,198
OrkneyPolice	0	3	3	5	60%	2,255
ArgyllandBute	0	0	0	10	0%	9,052
GMPolice	6	24	30	134	22%	271,000
CheshirePolice	10	19	29	176	16%	99,000
WMPolice	27	85	112	179	63%	222,000
OakhamPolice	12	10	22	171	13%	3,351
CumbriaPolice	11	28	39	99	39%	41,100
ThamesVP	11	9	20	75	27%	103,000
HantsPolice	6	14	20	48	42%	97,000
DorsetPolice	4	12	16	67	24%	32,200
MetPoliceUK	7	59	66	88	75%	383,000
WMerciaPolice	5	6	11	102	11%	51,100
DurhamPolice	10	3	13	22	59%	31,700
AyrshireEPolice	1	7	8	69	12%	4,668
LincsPolice	0	8	8	42	19%	39,800
FifePolice	1	2	3	8	38%	13,100
SurreyRoadCops	2	9	11	88	13%	40,600
ASPolice	9	27	36	155	23%	70,400
SWPCardiff	25	30	55	113	49%	13,700
StroudPolice	0	2	2	8	25%	1,403
TVP_Kidlington	2	1	3	3	100%	1,035
SwpMerthyr	2	12	14	30	47%	551
MPSWestminster	12	11	23	88	26%	9,175
MPSHammFul	5	3	8	28	29%	8,161
MPSSouthwark	1	9	10	38	26%	7,887
GPCaerphilly	2	2	4	10	40%	363
NPAS_Exeter	1	10	11	17	65%	4,621

L2						
AS Police	9	27	36	155	23%	70,700
Beds Police	11	54	65	109	60%	39,000
CambCops	8	7	15	62	24%	37,100
CheshirePolice	10	19	29	176	16%	99,000
CityPolice	10	11	21	56	38%	60,800
ClevelandPolice	7	10	17	81	21%	30600
CumbriaPolice	11	28	39	99	39%	41,100
DC_Police	9	7	16	77	21%	43,200
DerbysPolice	0	25	25	88	28%	47,500
DorsetPolice	4	12	16	67	24%	32,200
DyfedPowys	11	3	14	65	22%	26,500
Glos_Police	2	6	8	53	15%	25,600
GMPolice	6	24	30	134	22%	271,000
GwentPolice	2	4	6	32	19%	38,600
HantsPolice	6	14	20	48	42%	97,000
HertsPolice	20	8	28	65	43%	48,500
Humberbeat	11	11	22	93	24%	31,600
IOMPolice	0	0	0	38	0%	14,600
JerseyPolice	6	1	7	27	26%	8,302
Kent_Police	5	6	11	64	17%	84,900
LancsPolice	18	20	38	138	28%	87,800
LeicsPolice	12	21	33	88	38%	59,800
LincsPolice	0	8	8	42	19%	39,800
MerseyPolice	0	17	17	62	27%	74,400
MetPoliceUK	7	59	66	88	75%	383,000
NCA_Uk	13	13	26	69	38%	39,800
NorfolkPolice	5	55	60	105	57%	53,500
NorthantsPolice	3	15	18	60	30%	44,600
NorthumbriaPol	57	4	61	132	46%	67,700
NottsPolice	33	6	39	142	27%	66,600
NWPolice	10	32	42	116	36%	45,900
NYorksPolice	35	48	83	218	38%	52,600
PoliceScotland	13	22	35	84	42%	110,000
PoliceServiceNI	12	25	37	158	23%	94,100

StaffsPolice	25	5	30	69	43%	62,300
SuffolkPolice	14	47	61	99	62%	31,900
SurreyPolice	2	15	17	65	26%	87,300
Sussex_Police	12	25	37	157	24%	86,000
SWPolice	13	23	36	108	33%	78,900
SYPTweet	1	32	33	143	23%	76,500
ThamesVP	11	9	20	75	27%	103,000
WarksPolice	10	5	15	49	31%	33,200
WestYorksPolice	17	19	36	207	17%	91,900
WiltshirePolice	2	14	16	39	41%	29,800
WMerciaPolice	5	6	11	102	11%	51,100
WMPolice	27	85	112	179	63%	222,000

Appendix 10 - Direct tweets and amount of follower's

Table of data displaying the correlation between number of direct tweets and follower base

Account	Direct Tweets	Followers
L1		
CambsCops	1	37,100
NorthumbriaPol	3	67,700
LochabSkyePol	2	3,198
OrkneyPolice	0	2,255
ArgyllandBute	0	9,052
GMPolice	19	271,000
CheshirePolice	59	99,000
WMPolice	16	222,000
OakhamPolice	72	3,351
CumbriaPolice	10	41,100
ThamesVP	18	103,000
HantsPolice	10	97,000
DorsetPolice	9	32,200
MetPoliceUK	0	383,000
WMerciaPolice	10	51,100
DurhamPolice	0	31,700
AyrshireEPolice	0	4,668
LincsPolice	9	39,800
FifePolice	0	13,100
SurreyRoadCops	48	40,600
ASPolice	69	70,400
SWPCardiff	9	13,700
StroudPolice	0	1,403
TVP_Kidlington	0	1,035
SwpMerthyr	0	551
MPSWestminster	14	9,175
MPSHammFul	9	8,161
MPSSouthwark	13	7,887
GPCaerphilly	5	363
NPAS_Exeter	3	4,621
L2		
AS Police	69	70,700
Beds Police	13	39,000
CambCops	1	37,100
CheshirePolice	59	99,000
CityPolice	0	60,800
ClevelandPolice	1	30600
CumbriaPolice	10	41,100
DC_Police	18	43,200
DerbysPolice	6	47,500
DorsetPolice	9	32,200
DyfedPowys	5	26,500
Glos_Police	17	25,600
GMPolice	19	271,000

GwentPolice	0	38,600
HantsPolice	10	97,000
HertsPolice	2	48,500
Humberbeat	4	31,600
IOMPolice	0	14,600
JerseyPolice	0	8,302
Kent_Police	28	84,900
LancsPolice	42	87,800
LeicsPolice	7	59,800
LincsPolice	9	39,800
MerseyPolice	11	74,400
MetPoliceUK	0	383,000
NCA_Uk	15	39,800
NorfolkPolice	14	53,500
NorthantsPolice	0	44,600
NorthumbriaPol	3	67,700
NottsPolice	9	66,600
NWPolice	3	45,900
NYorksPolice	31	52,600
PoliceScotland	11	110,000
PoliceServiceNI	0	94,100
StaffsPolice	3	62,300
SuffolkPolice	2	31,900
SurreyPolice	19	87,300
Sussex_Police	73	86,000
SWPolice	37	78,900
SYPTweet	32	76,500
ThamesVP	18	103,000
WarksPolice	2	33,200
WestYorksPolice	20	91,900
WiltshirePolice	5	29,800
WMerciaPolice	10	51,100
WMPolice	16	222,000

Appendix 11 - Average amount of themes tweets per week, per account

Tables show data for graphs: Average amount of themes tweeted per week, per account

L1

Theme	Total amount	Average (/34)
Appeal Tweets	471	14
Conversational Tweets	548	16
Retweets	480	14
Advice Tweets	456	13
Police Information Tweets	661	19
Non Crime Tweets	702	21

L2

Theme	Total Amount	Average (/48)
Appeal Tweets	985	21
Conversational Tweets	1024	22
Retweets	1029	22
Advice Tweets	1290	27
Police Information Tweets	1286	27
Non Crime Tweets	1431	30

Appendix 12 - Average number of retweets per theme

Table contains data for the graphs: Average number of retweets per theme

L1

Theme	Total Tweets	Total Retweets	Average
Photo Tweet	657	15,377	23
Appeal Tweet	471	10,865	23
Advice Tweet	456	5,156	11
Police Information Tweet	661	10,817	16
Non Crime Tweet	702	6,079	9
Retweets	480	15,053	31

L2

Theme	Total Tweets	Total Retweets	Average
Photo Tweet	1,412	31,139	22
Appeal Tweet	985	15,564	16
Advice Tweet	1,290	15,492	12
Police Information Tweet	1,286	18,414	14
Non Crime Tweet	1,431	13,373	9
Retweets	1,029	28,439	28

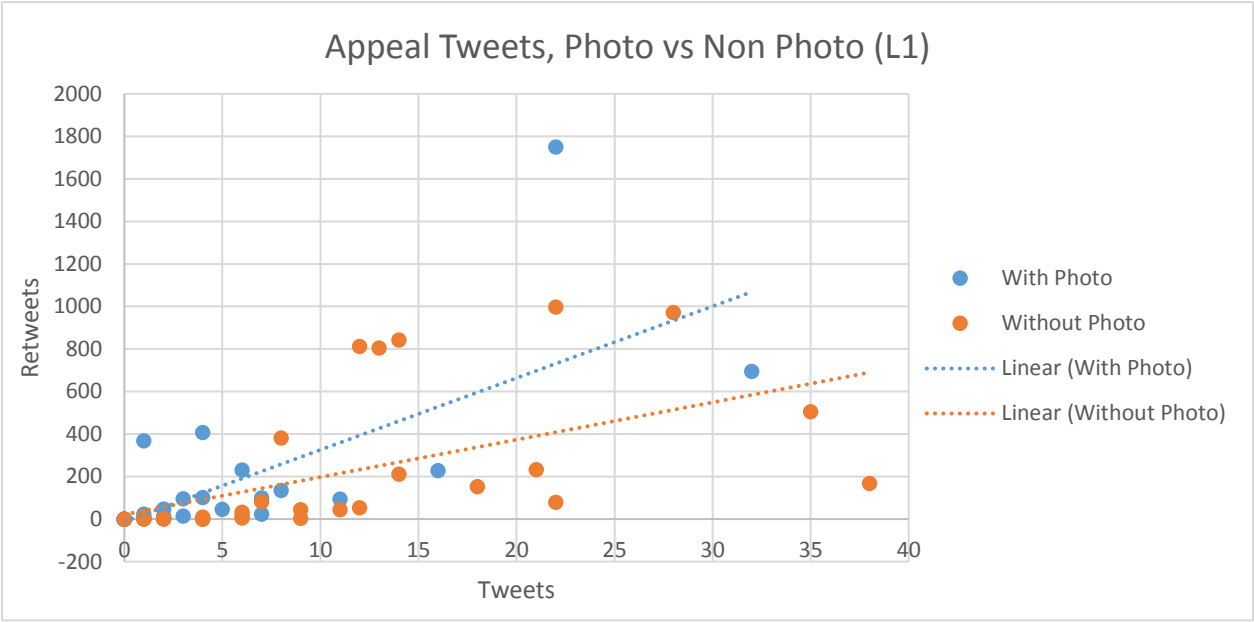
Appendix 13 - Increase across themes when photos are attached

Tables containing data for the graphs: Themed tweets, photo vs non photo

Appeal

L1	Tweets with photo	Amount of retweets of tweets with photos	Tweets without Photo	Amount of retweets of tweets with no photos
@ArgyllandBute	0	0	2	1
@ASPolice	8	135	38	168
@AyrshireEPolice	0	0	6	6
@CambsCops	0	0	7	82
@CheshirePolice	3	96	28	972
@CumbriaPolice	11	94	13	805
@DorsetPolice	7	100	22	80
@DurhamPolice	2	12	1	1
@FifePolice	0	0	1	9
@GMPolice	6	231	35	505
@GPCaerphilly	2	7	4	10
@HantsPolice	0	0	12	53
@LincsPolice	2	47	11	45
@LochabSkyePol	1	23	6	33
@MetPoliceUK	22	1751	8	382
@MPSHammFul	3	14	6	13
@MPSSouthwark	0	0	4	0
@MPSWestminster	4	407	14	212
@NorthumbriaPol	16	229	18	153
@NPAS_Exeter	0	0	1	1
@OakhamPolice	2	12	21	233
@OrkneyPolice	1	368	1	2
@StroudPolice	1	3	2	1
@SurreyRoadCops	0	0	9	4
@SWPCardiff	7	24	9	44
@SwpMerthyr	2	2	4	1

@ThamesVP	4	102	12	812
@TVP_Kidlington	0	0	0	0
@WMerciaPolice	5	46	22	997
@WMPolice	32	695	14	842

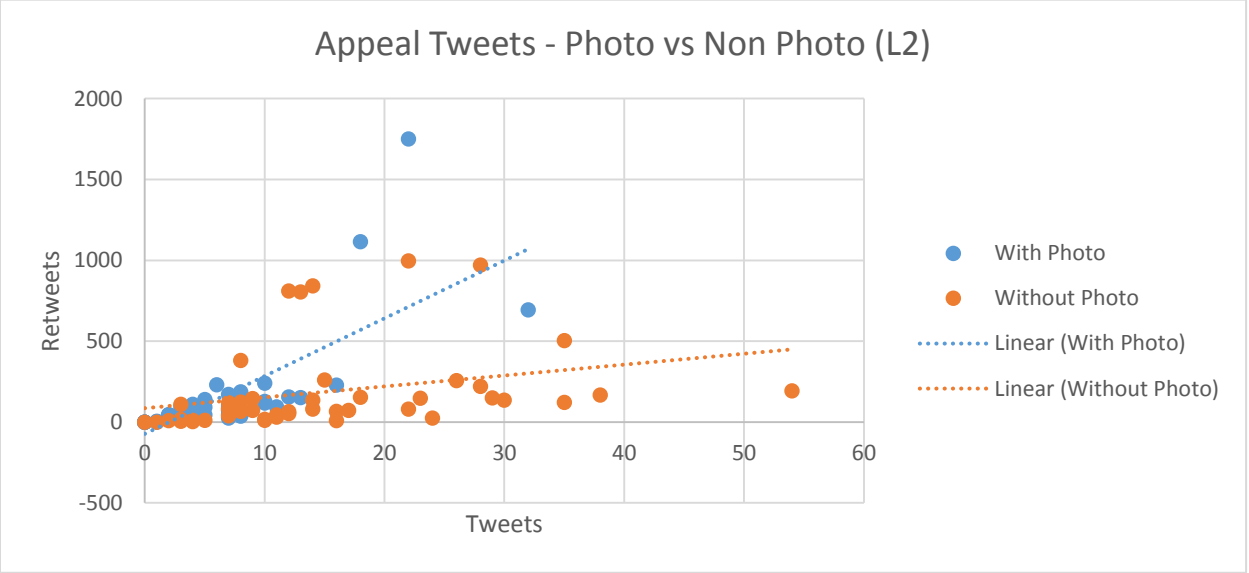


Appeal

L2	Tweets with photo	Amount of retweets of tweets with photos	Tweets without Photo	Amount of retweets of tweets with no photos
AS Police	8	135	8	382
Beds Police	12	155	12	812
CambCops	0	0	22	997
CheshirePolice	3	96	13	805
CityPolice	0	0	28	972
ClevelandPolice	4	18	14	842
CumbriaPolice	11	94	26	256
DC_Police	5	128	3	110

DerbysPolice	10	118	7	120
DorsetPolice	7	100	8	124
DyfedPowys	2	43	35	505
Glos_Police	3	29	9	146
GMPolice	6	231	15	261
GwentPolice	1	1	10	11
HantsPolice	0	0	14	136
HertsPolice	5	141	7	82
Humberbeat	7	71	10	17
IOMPolice	0	0	18	153
JerseyPolice	1	3	4	4
Kent_Police	3	38	11	31
LancsPolice	8	188	23	148
LeicsPolice	10	129	28	222
LincsPolice	2	47	12	64
MerseyPolice	4	87	8	66
MetPoliceUK	22	1751	9	72
NCA_Uk	0	0	11	45
NorfolkPolice	13	152	17	72
NorthantsPolice	2	30	14	80
NorthumbriaPol	16	229	4	11
NottsPolice	7	80	38	168
NWPolice	7	48	22	80
NYorksPolice	18	1116	3	18
PoliceScotland	10	241	54	194
PoliceServiceNI	1	6	16	66
StaffsPolice	1	3	30	136
SuffolkPolice	8	38	7	40
SurreyPolice	4	111	5	12
Sussex_Police	5	93	29	149
SWPolice	2	43	2	10
SYPTweet	7	26	12	53
ThamesVP	4	102	35	123

WarksPolice	2	24	0	0
WestYorksPolice	7	171	16	10
WiltshirePolice	3	71	24	25
WMerciaPolice	5	46	3	6
WMPolice	32	695	1	0



Advice

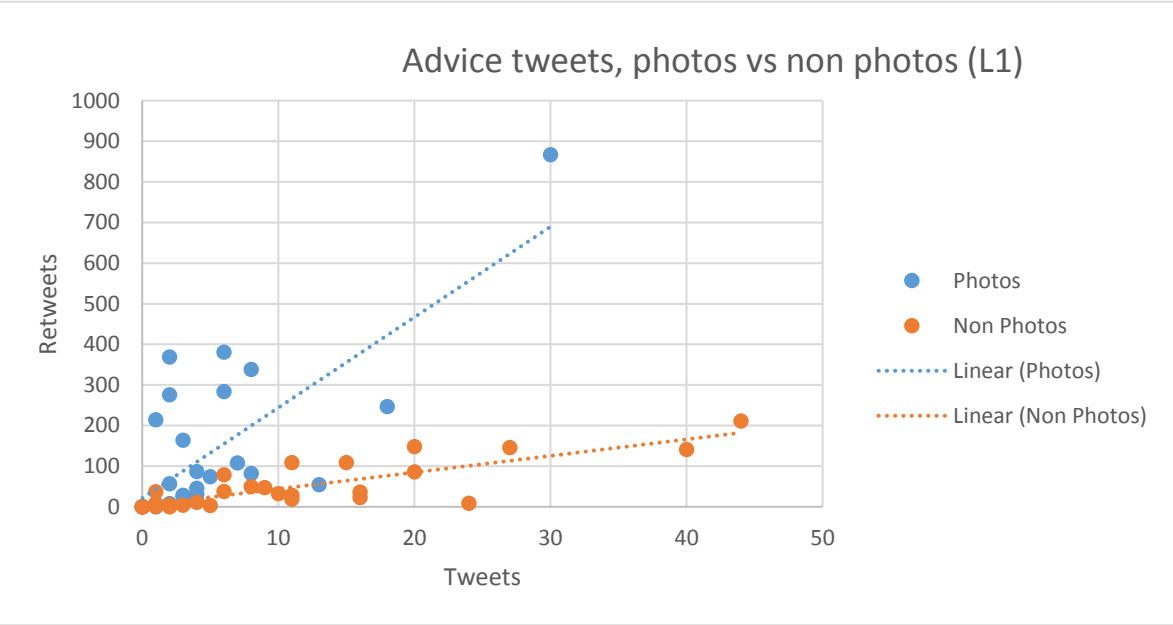
Tweets with photo	Amount of retweets of tweets with photos	Tweets without Photo	Amount of retweets of tweets with no photos
0	0	5	3
6	284	24	9
4	16	0	0
1	4	6	38
6	381	40	141
18	247	20	148
4	31	9	47
4	87	1	37
1	2	0	0
4	46	44	211
1	8	1	1
8	338	11	28
2	8	6	79
0	0	8	50
0	0	1	7
1	1	2	0
3	28	4	11
5	74	20	86
13	54	27	146
2	57	0	0
7	108	16	23
2	369	2	5
1	3	2	1
3	27	16	36
8	82	10	32
1	0	3	4

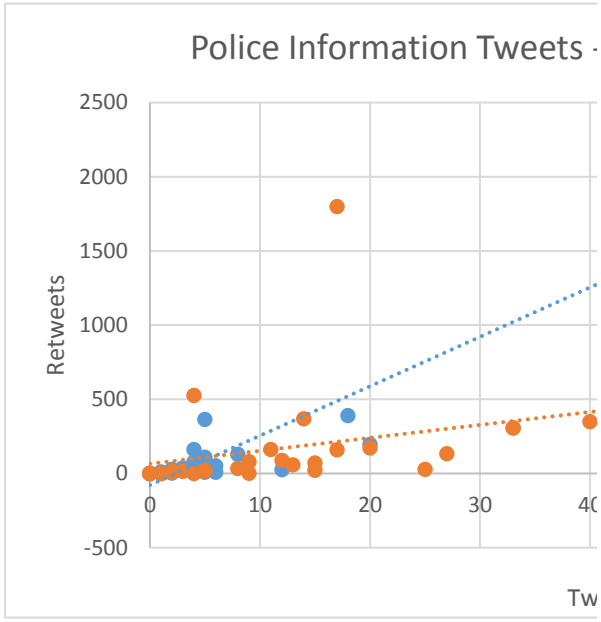
Police Information

Tweets with photos	Amount of retweets of tweets with photos
0	0
20	195
2	5
1	10
8	129
3	36
4	78
3	31
1	2
18	391
1	2
5	69
5	109
2	28
54	2299
1	4
3	17
4	161
2	3
0	0
5	9
1	1
1	0
6	51
12	26
6	8

2	276	11	19
1	214	0	0
3	164	15	109
30	867	11	109

5	364
0	0
5	35
43	944





Advice

Tweets with photo	Amount of retweets of tweets with photos	Tweets without Photo	Amount of retweets of tweets with no photos
6	284	24	9
24	207	8	25
1	4	6	38
6	381	40	141
1	26	11	112
2	19	19	159
18	247	20	148
0	0	14	28

Police Information

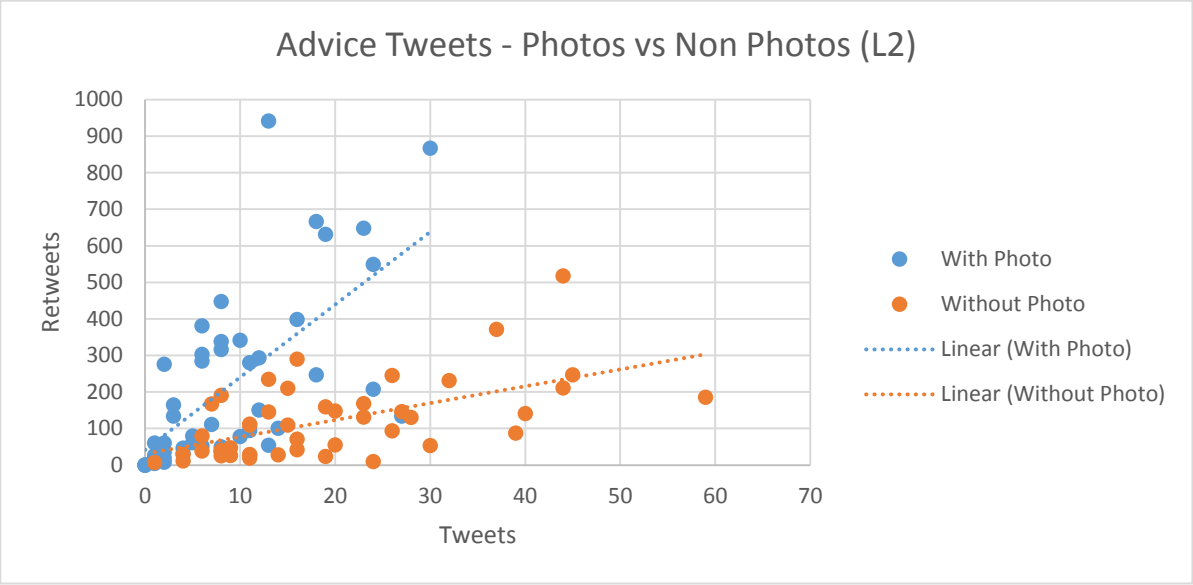
Tweets with photos	Amount of retweets of tweets with photos
20	195
15	58
1	10
8	129
3	32
8	26
3	36
7	155

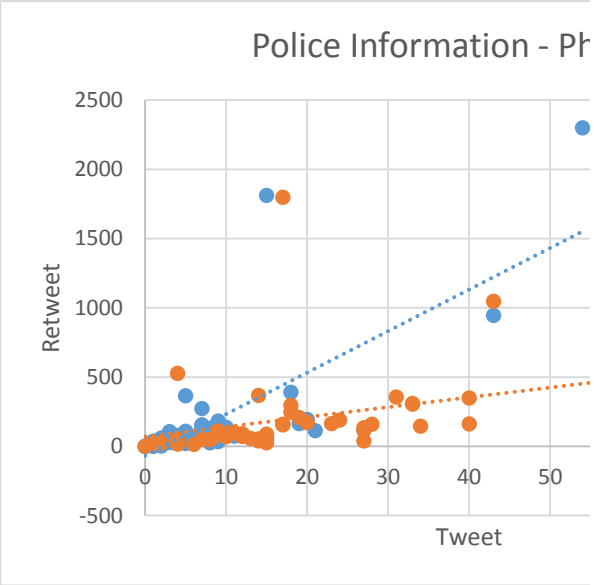
0	0	8	40
4	31	9	47
5	79	28	130
3	134	9	26
4	46	44	211
1	60	4	11
8	338	11	28
7	111	8	38
10	341	16	71
0	0	20	55
2	36	13	234
1	18	16	42
13	941	37	371
10	78	26	93
2	8	6	79
2	60	7	167
0	0	1	7
12	293	8	191
27	134	13	145
12	150	4	29
13	54	27	146
19	631	44	517
23	648	32	231
24	549	23	131
11	280	23	168
6	52	26	245
8	447	15	210
16	398	8	36
5	61	19	23
6	303	45	247
11	94	30	53
14	100	39	87
2	276	11	19

19	165
4	78
1	37
4	37
18	391
1	0
5	69
2	59
6	52
0	0
0	0
6	57
9	183
8	115
5	109
10	136
54	2299
7	273
21	114
2	18
2	3
2	49
9	35
15	1811
3	107
5	21
0	0
27	116
7	136
7	153
3	47
11	74
5	364

8	316	16	290
18	666	59	185
8	50	11	29
3	164	15	109
30	867	11	109

3	27
5	105
3	69
5	35
43	944





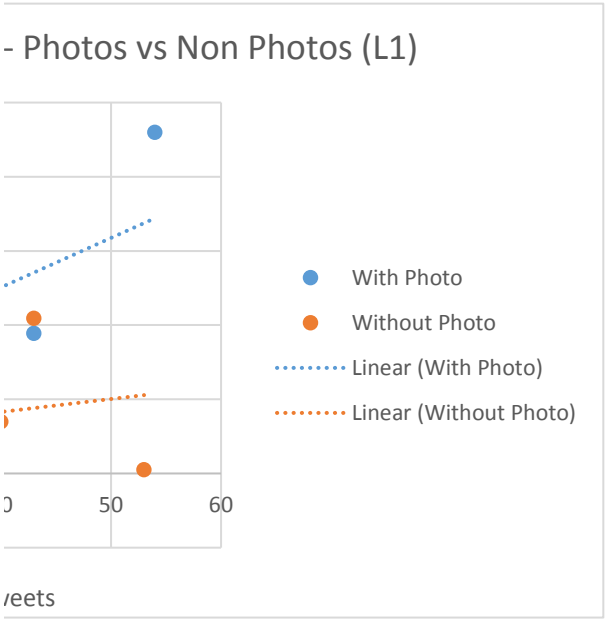
Tweets without Photo	Amount of retweets of tweets with no photos
1	0
33	306
53	25
20	172
40	349
17	159
27	134
2	15
3	14
43	1047
2	6
9	80
12	89
5	23
4	527
5	15
8	35
11	162
13	57
0	0
25	28
0	0
4	0
15	70
15	21
9	1

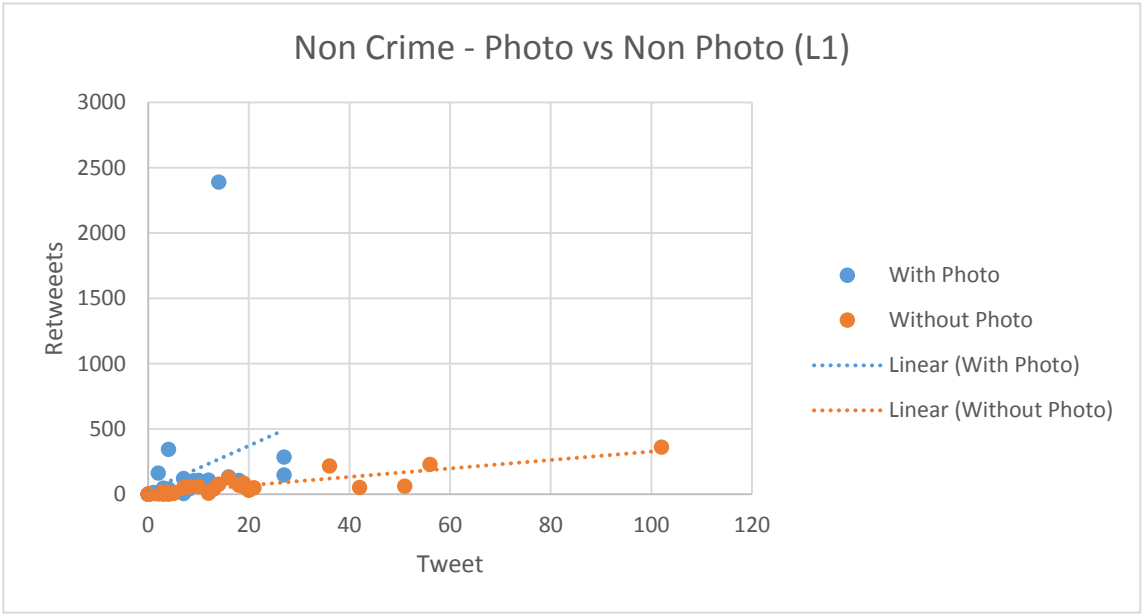
Non - Crime

Tweets with photos	Amount of retweets of tweets with photos	Tweets without Photo	Amount of retweets of tweets with no photos
0	0	4	1
12	108	51	60
2	7	4	8
7	21	3	19
14	2390	56	228
16	132	16	124
9	102	13	40
4	14	5	9
0	0	0	0
4	39	18	68
1	4	0	0
7	120	7	49
1	13	10	59
2	4	2	3
4	343	3	28
3	46	8	57
5	14	12	7
8	40	20	30
18	106	19	59
8	83	3	1
10	105	102	359
0	0	0	0
0	0	0	0
0	0	42	52
27	148	21	49
7	6	5	5

14	368
0	0
17	1798
33	309

9	92	19	83
2	8	0	0
2	161	36	216
27	284	14	75





Non - Crime

Tweets without Photo	Amount of retweets of tweets with no photos
33	306
12	72
20	172
40	349
11	100
27	40
17	159
18	295

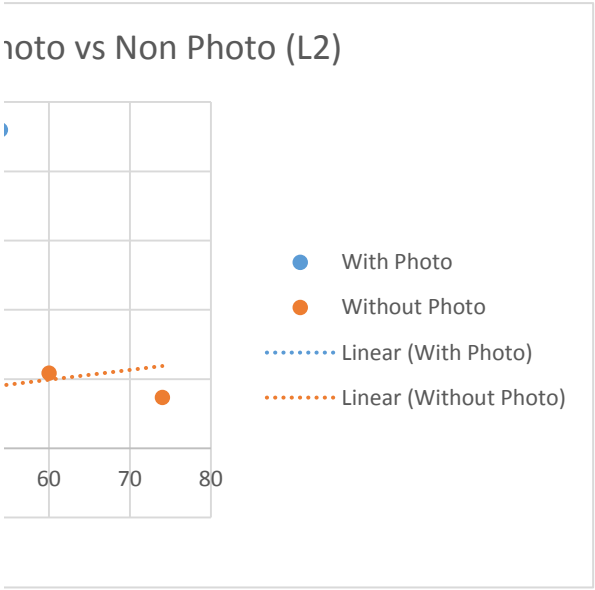
Tweets with photos	Amount of retweets of tweets with photos	Tweets without Photo	Amount of retweets of tweets with no photos
12	108	51	60
25	298	10	34
7	21	3	19
14	2390	56	288
11	77	6	26
5	108	14	54
16	132	16	124
7	80	36	134

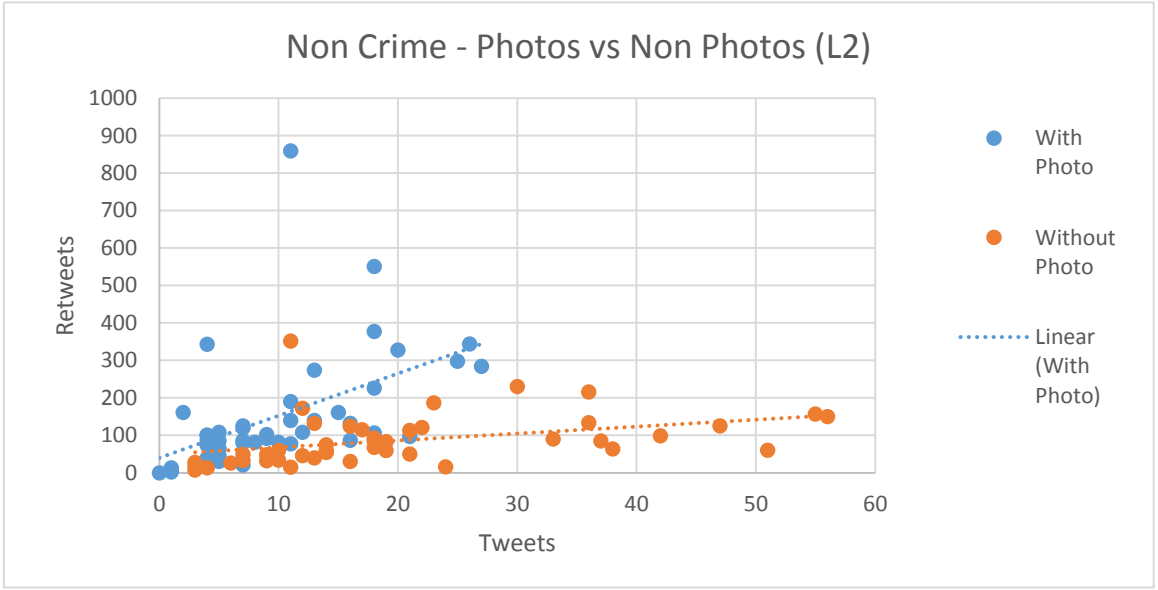
40	161
27	134
8	49
14	53
43	1047
15	25
9	80
14	51
27	120
14	40
0	0
17	155
15	88
7	49
12	89
24	190
4	527
9	111
12	86
34	145
13	57
10	69
23	163
19	208
1	19
60	544
2	24
6	14
18	247
31	355
4	23
28	160
14	368

5	30	11	15
9	102	13	40
7	125	17	115
1	2	24	16
4	39	18	68
4	74	7	33
7	120	7	49
13	274	14	56
4	100	23	187
0	0	4	13
5	46	11	352
1	11	16	30
18	551	56	150
11	140	21	50
1	13	10	59
5	65	12	46
4	343	3	28
7	86	12	172
10	82	14	59
4	87	3	7
18	106	19	59
13	140	47	125
11	190	18	93
26	344	55	157
18	377	22	121
21	97	30	230
15	161	21	113
18	226	18	88
5	86	9	32
20	328	38	64
16	87	33	90
8	82	42	99
9	92	19	83

4	17
74	367
4	50
17	1798
33	309

4	100	13	132
11	859	37	85
4	15	9	48
2	161	36	216
27	284	14	75

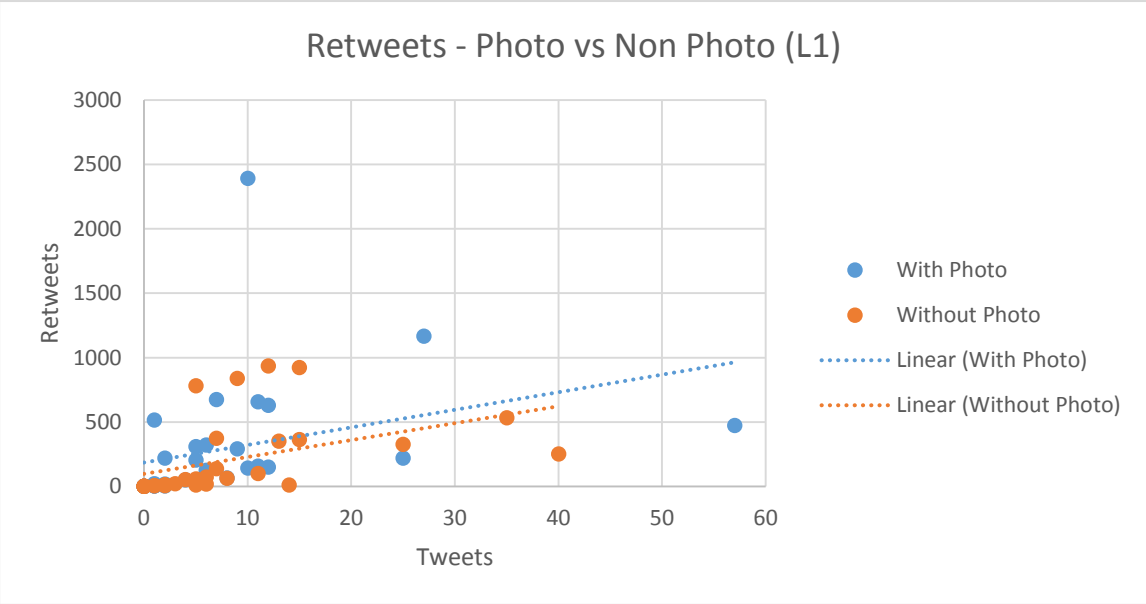




Retweets

Tweets with photos	Amount of retweets of tweets with photos	Tweets without Photo	Amount of retweets of tweets with no photos
0	0	0	0
9	290	8	63
1	6	1	5
8	64	11	99
10	2391	5	781
11	156	15	922
4	50	5	10
10	142	5	58
1	2	2	9
6	125	7	373
2	12	0	0
6	321	14	9
0	0	3	21
1	2	6	17
7	673	15	362
5	203	4	53
1	21	1	6
12	629	13	350
57	471	40	250
1	515	2	13
12	149	35	531
0	0	0	0
0	0	0	0
2	18	6	73
25	219	7	137
2	3	2	4

11	656	12	933
2	219	0	0
5	307	25	326
27	1166	9	838

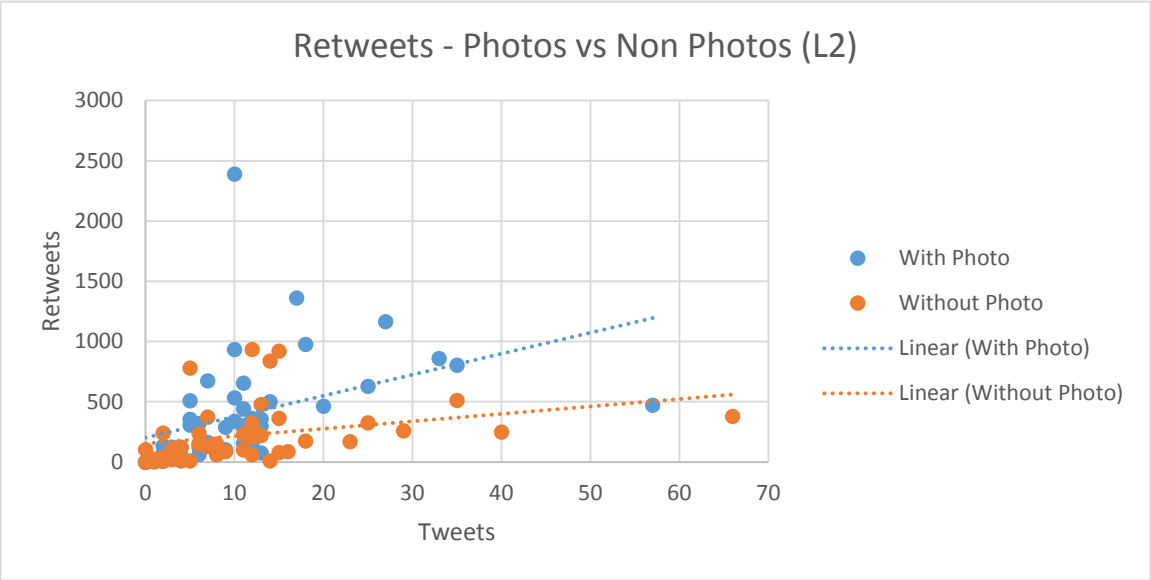


Retweets

Tweets with photos	Amount of retweets of tweets with photos	Tweets without Photo	Amount of retweets of tweets with no photos
9	290	8	63
11	302	4	9
8	64	11	99
10	2391	5	781
10	340	13	220
7	165	6	237
11	156	15	922
9	102	7	130

0	0	1	2
4	50	5	10
11	287	12	275
2	131	0	102
6	125	7	373
2	77	3	106
6	321	14	9
20	465	6	153
11	443	16	86
0	0	0	0
6	62	13	477
5	354	6	147
18	976	29	260
12	158	12	60
0	0	3	21
0	0	4	121
7	673	15	362
13	299	12	238
5	509	2	241
3	124	2	11
57	471	40	250
33	861	35	511
10	933	8	150
35	803	66	378
13	358	9	86
12	106	11	230
25	630	18	175
14	500	23	170
2	58	4	123
12	363	12	210
13	75	15	79
1	18	2	40
11	656	12	933

10	532	12	324
17	1363	1	23
2	8	2	6
5	307	25	326
27	1166	14	838



Appendix 14 - Percentage increase between engagement of tweets with photos

Tables showing the percentage increase, per theme, when photos are attached.

L1	Average Retweets of tweet with photo	Average Retweets of tweets without photo	Percentage increase from no photo to with photo
Retweets	294	208	29%
Non Crime	146	56	62%
Police Information	167	194	-16%
Advice	126	46	63%
Appeal	147	216	-47%

L2	Average Retweets of tweet with photo	Average Retweets of tweets without photo	Percentage increase from no photo to with photo
Retweets	37	24	54%
Non Crime	17	5	231%
Police Information	18	13	38%
Advice	26	7	269%
Appeal	17	13	29%

Appendix 15 - Tweets with photos attached, in categories

L1	Total Photo	Tweets photos - Appealing	Tweets photos - Advice	Tweets photos - Police Info	Tweets photo - Non Crime	Tweet photo - Retweet
ArgyllandBute	0	0	0	0	0	0
ASPolice	36	8	6	20	12	9
AyrshireEPolice	8	0	4	2	2	1
CambsCops	15	0	1	1	7	8
CheshirePolice	29	3	6	8	14	10
CumbriaPolice	39	11	18	3	16	11
DorsetPolice	16	7	4	4	9	4
DurhamPolice	13	2	4	3	4	10
FifePolice	3	0	1	1	0	1
GMPolice	30	6	4	18	4	6
GPCaerphilly	4	2	1	1	1	2
HantsPolice	20	0	8	5	7	6
LincsPolice	8	2	2	5	1	0
LochabSkyePol	4	1	0	2	2	1
MetPoliceUK	66	22	0	54	4	7
MPSHammFul	8	3	1	1	3	5
MPSSouthwark	10	0	3	3	5	1
MPSWestminster	23	4	5	4	8	12
NorthumbriaPol	61	16	13	2	18	57
NPAS_Exeter	11	0	2	0	8	1
OakhamPolice	22	2	7	5	10	12
OrkneyPolice	3	1	2	1	0	0
StroudPolice	2	1	1	1	0	0
SurreyRoadCops	11	0	3	6	0	2
SWPCardiff	55	7	8	12	27	25
SwpMerthyr	14	2	1	6	7	2
ThamesVP	20	4	2	5	9	11
TVP_Kidlington	3	0	1	0	2	2
WMerciaPolice	11	5	3	5	2	5
WMPolice	112	32	30	43	27	27

L2	Total Photos	Tweets photos - Appealing	Tweets photos - Advice	Tweets photos - Police Info	Tweets photo - Non Crime	Tweet photo - Retweet
AS Police	36	8	6	20	12	9
Beds Police	65	12	24	15	25	11
CambCops	15	0	1	1	7	8
CheshirePolice	29	3	6	8	14	10
CityPolice	21	0	1	3	11	10
ClevelandPolice	17	4	2	8	5	7
CumbriaPolice	39	11	18	3	16	11
DC_Police	16	5	0	7	7	9
DerbysPolice	25	10	0	19	5	0
DorsetPolice	16	7	4	4	9	4
DyfedPowys	14	2	5	1	7	11
Glos_Police	8	3	3	4	1	2
GMPolice	30	6	4	18	4	6
GwentPolice	6	1	1	1	4	2
HantsPolice	20	0	8	5	7	6
HertsPolice	28	5	7	2	13	20
Humberbeat	22	7	10	6	4	11
IOMPolice	0	0	0	0	0	0
JerseyPolice	7	1	2	0	5	6
Kent_Police	11	3	1	6	1	5
LancsPolice	38	8	13	9	18	18
LeicsPolice	33	10	10	8	11	12
LincsPolice	8	2	2	5	1	0
MerseyPolice	17	4	2	10	5	0
MetPoliceUK	66	22	0	54	4	7
NCA_Uk	26	0	12	7	7	13
NorfolkPolice	60	13	27	21	10	5
NorthantsPolice	18	2	12	2	4	3
NorthumbriaPol	61	16	13	2	18	57
NottsPolice	39	7	19	2	13	33
NWPolice	42	7	23	9	11	10
NYorksPolice	83	18	24	15	26	35
PoliceScotland	35	10	11	3	18	13
PoliceServiceNI	37	1	6	5	21	12
StaffsPolice	30	1	8	0	15	25
SuffolkPolice	61	8	16	27	18	14
SurreyPolice	17	4	5	7	5	2

Sussex_Police	37	5	6	7	20	12
SWPolice	36	2	11	3	16	13
SYPTweet	33	7	14	11	8	1
ThamesVP	20	4	2	5	9	11
WarksPolice	15	2	8	3	4	10
WestYorksPolice	36	7	18	5	11	17
WiltshirePolice	16	3	8	3	4	2
WMerciaPolice	11	5	3	5	2	5
WMPolice	112	32	30	43	27	27

Appendix 16 - Rumour Tweets

Data showing those accounts giving

L1	Rumour
CambsCops	0
NorthumbriaPol	0
LochabSkyePol	0
OrkneyPolice	0
ArgyllandBute	0
GMPolice	0
CheshirePolice	0
WMPolice	0
OakhamPolice	0
CumbriaPolice	0
ThamesVP	0
HantsPolice	0
DorsetPolice	0
MetPoliceUK	0
WMerciaPolice	0
DurhamPolice	0
AyrshireEPolice	0
LincsPolice	0
FifePolice	0
SurreyRoadCops	0
ASPolice	0
SWPCardiff	0
StroudPolice	0
TVP_Kidlington	0
SwpMerthyr	0
MPSWestminster	0
MPSHammFul	0
MPSSouthwark	0
GPCaerphilly	0
NPAS_Exeter	0
L2	
AS Police	0
Beds Police	0
CambCops	0
CheshirePolice	0
CityPolice	0
ClevelandPolice	0
CumbriaPolice	0
DC_Police	0
DerbysPolice	0
DorsetPolice	0
DyfedPowys	0
Glos_Police	0
GMPolice	0
GwentPolice	0
HantsPolice	0
HertsPolice	0
Humberbeat	0

IOMPolice	0
JerseyPolice	0
Kent_Police	0
LancsPolice	0
LeicsPolice	0
LincsPolice	0
MerseyPolice	0
MetPoliceUK	0
NCA_Uk	0
NorfolkPolice	1
NorthantsPolice	0
NorthumbriaPol	0
NottsPolice	0
NWPolice	0
NYorksPolice	0
PoliceScotland	0
PoliceServiceNI	0
StaffsPolice	0
SuffolkPolice	0
SurreyPolice	0
Sussex_Police	0
SWPolice	0
SYPTweet	0
ThamesVP	0
WarksPolice	0
WestYorksPolice	0
WiltshirePolice	0
WMerciaPolice	0
WMPolice	0

Appendix 17 - Top and bottom accoutn lists (L1)

Data showing how 'top' and 'bottom' accounts were chosen

List based on the amount of total retweets / total tweets	
OrkneyPolice	75
TVP_Kidlington	74
NPAS_Exeter	36
MPSWestminster	15
MPSHammFul	12
LincsPolice	9
LochabSkyePol	5
OakhamPolice	5
MPSSouthwark	5
SWPCardiff	4
FifePolice	4
SurreyRoadCops	3
GPCaerphilly	3
AyrshireEPolice	1
SwpMerthyr	1
StroudPolice	1
ArgyllandBute	0

Order of total retweets	
MPSWestminster	1,314
OakhamPolice	807
NPAS_Exeter	619
SWPCardiff	481
OrkneyPolice	375
LincsPolice	363
MPSHammFul	327
SurreyRoadCops	286
TVP_Kidlington	222
MPSSouthwark	171
LochabSkyePol	111
AyrshireEPolice	64
GPCaerphilly	32
FifePolice	29
SwpMerthyr	25
ArgyllandBute	4
StroudPolice	4

Order of total tweets	
OakhamPolice	171
SWPCardiff	113
SurreyRoadCops	88
MPSWestminster	88
AyrshireEPolice	69
LincsPolice	42
MPSSouthwark	38
SwpMerthyr	30
MPSHammFul	28
LochabSkyePol	22
NPAS_Exeter	17
ArgyllandBute	10
GPCaerphilly	10
FifePolice	8
StroudPolice	8
OrkneyPolice	5
TVP_Kidlington	3

Top Local Accounts

	Based on TR/TT	Based on total retweets	Based on total tweets
1	OrkneyPolice	MPSWestminster	OakhamPolice
2	TVP_Kidlington	OakhamPolice	SWPCardiff
3	MPSWestminster	NPAS_Exeter	SurreyRoadCops
4	MPSHammFul	SWPCardiff	MPSWestminster
5	LincsPolice	OrkneyPolice	AyrshireEPolice

	Appears in two colums
	Appears in three colums

Acounts Chosen

OrkneyPolice
MPSWestminster
MPSHammFul
OakhamPolice
SWPCardiff

Bottom Local accounts (*Bottom no.1)

	Based on TR/TT	Based on total retweets	Based on total tweets
1	ArgyllandBute	StroudPolice	TVP_Kidlington
2	StroudPolice	ArgyllandBute	OrkneyPolice
3	SwpMerthyr	SwpMerthyr	StroudPolice
4	AyrshireEPolice	FifePolice	FifePolice
5	GPCaerphilly	GPCaerphilly	GPCaerphilly

	Appears in two colums
	Appears in three colums

Accounts Chosen

ArgyllandBute
StroudPolice
SwpMerthyr
FifePolice
GPCaerphilly

Appendix 18 - Top and bottom accounts (L2)

Data showing how 'top' and 'bottom' accounts were sampled

List based on the amount of retweets / total tweets	
MetPoliceUK	49
ThamesVP	28
WMerciaPolice	25
CheshirePolice	24
JerseyPolice	21
WarksPolice	20
WMPolice	20
NCA_Uk	18
NYorksPolice	16
CityPolice	16
CumbriaPolice	16
GMPolice	14
HantsPolice	14
StaffsPolice	14
NWPolice	14
PoliceScotland	13
LancsPolice	13
NottsPolice	13
NorfolkPolice	13
HertsPolice	12
Kent_Police	12
DyfedPowys	12
WestYorksPolice	11
SurreyPolice	11
MerseyPolice	10
Sussex_Police	10
DC_Police	10
SuffolkPolice	10
Humberbeat	10

Order of total retweets	
MetPoliceUK	4,276
CheshirePolice	4,208
NYorksPolice	3,574
WMPolice	3,559
WMerciaPolice	2,522
WestYorksPolice	2,308
ThamesVP	2,069
GMPolice	1,923
NottsPolice	1,783
LancsPolice	1,757
CumbriaPolice	1,601
NWPolice	1,584
Sussex_Police	1,545
NorfolkPolice	1,315
NCA_Uk	1,210
PoliceServiceNI	1,172
PoliceScotland	1,109
StaffsPolice	975
WarksPolice	975
AS Police	960
SuffolkPolice	958
CityPolice	918
Humberbeat	899
NorthumbriaPol	851
HertsPolice	776
Kent_Police	749
DyfedPowys	748
DC_Police	747
SurreyPolice	692

Order of total tweets	
NYorksPolice	218
WestYorksPolice	207
WMPolice	179
CheshirePolice	176
PoliceServiceNI	158
Sussex_Police	157
AS Police	155
SYPTweet	143
NottsPolice	142
LancsPolice	138
GMPolice	134
NorthumbriaPol	132
NWPolice	116
Beds Police	109
SWPolice	108
NorfolkPolice	105
WMerciaPolice	102
CumbriaPolice	99
SuffolkPolice	99
Humberbeat	93
DerbysPolice	88
LeicsPolice	88
MetPoliceUK	88
PoliceScotland	84
ClevelandPolice	81
DC_Police	77
ThamesVP	75
NCA_Uk	69
StaffsPolice	69

LincsPolice	9
GwentPolice	8
NorthantsPolice	7
PoliceServiceNI	7
ClevelandPolice	7
CambCops	7
Glos_Police	7
WiltshirePolice	7
NorthumbriaPol	6
LeicsPolice	6
DorsetPolice	6
AS Police	6
Beds Police	6
DerbysPolice	5
SYPTweet	4
SWPolice	4
IOMPolice	3

HantsPolice	684
Beds Police	657
MerseyPolice	650
SYPTweet	634
ClevelandPolice	568
JerseyPolice	565
LeicsPolice	561
NorthantsPolice	446
SWPolice	442
CambCops	431
DorsetPolice	426
DerbysPolice	420
Glos_Police	363
LincsPolice	363
GwentPolice	259
WiltshirePolice	256
IOMPolice	108

DorsetPolice	67
DyfedPowys	65
HertsPolice	65
SurreyPolice	65
Kent_Police	64
CambCops	62
MerseyPolice	62
NorthantsPolice	60
CityPolice	56
Glos_Police	53
WarksPolice	49
HantsPolice	48
LincsPolice	42
WiltshirePolice	39
IOMPolice	38
GwentPolice	32
JerseyPolice	27

Top accounts

	Based on TR/TT	Based on total retweets	Based on total tweets
1	MetPoliceUK	MetPoliceUK	NYorksPolice
2	ThamesVP	CheshirePolice	WestYorksPolice
3	WMerciaPolice	NYorksPolice	WMPolice
4	CheshirePolice	WMPolice	CheshirePolice
5	JerseyPolice	WMerciaPolice	PoliceServiceNI
6	WMPolice	WestYorksPolice	Sussex_Police
7	NCA_Uk	ThamesVP	AS Police
8	NYorksPolice	GMPolice	SYPTweet
9	CityPolice	NottsPolice	NottsPolice
10	CumbriaPolice	LancsPolice	LancsPolice

	Appears in two colums
	Appears in three colums

Acccounts Chosen:

CheshirePolice
WMPolice
NYorksPolice
MetPoliceUK
ThamesVP

Bottom accounts (*Bottom no.1)

	Based on TR/TT	Based on total retweets	Based on total tweets
1	IOMPolice	IOMPolice	JerseyPolice
2	SWPolice	WiltshirePolice	GwentPolice
3	SYPTweet	GwentPolice	IOMPolice
4	DerbysPolice	LincsPolice	WiltshirePolice
5	Beds Police	Glos_Police	LincsPolice
6	AS Police	DerbysPolice	HantsPolice
7	DorsetPolice	DorsetPolice	WarksPolice
8	LeicsPolice	CambCops	Glos_Police
9	NorthumbriaPol	SWPolice	CityPolice
10	WiltshirePolice	NorthantsPolice	NorthantsPolice

	Appears in two colums
	Appears in three colums

Accounts Chosen:

IOMPolice
SWPolice
DerbysPolice
DorsetPolice
WiltshirePolice

Appendix 19 - Radar Graph Data

Force

	Broadcaster		
	Amount	Percentage of total	5-Point Scale
CheshirePolice	179	47%	2.5
WMPolice	183	45%	2.25
NYorksPolice	263	49%	2.5
MetPoliceUK	88	44%	2.25
ThamesVP	83	49%	2.5
Average			2.40
IOMPolice	38	84%	2
SWPolice	125	45%	2.25
DerbysPolice	84	47%	2.5
DorsetPolice	75	50%	2.5
WiltshirePolice	43	48%	2.5
Average			2.35

Local

	Broadcaster		
	Amount	Percentage of total	5-Point Scale
@OrkneyPolice	5	50%	2.5
@MPSWestminster	93	50%	2.5
@MPSHammFul	29	41%	2
@OakhamPolice	212	47%	2.25
@SWPCardiff	125	46%	2.25
Average			2.30
@ArgyllandBute	10	63%	3.25
@StroudPolice	8	62%	3
@SwpMerthyr	35	50%	2.5
@FifePolice	8	67%	3.5
@GPCaerphilly	8	33%	1.75
Average			2.80

Media supplier			Community Engage	
Amount	Percentage of total	5-Point Scale	Amount	Percentage of total
29	8%	0.5	145	38%
112	28%	1.5	63	16%
83	15%	0.75	148	28%
66	33%	1.75	15	8%
20	12%	0.5	49	29%
		1.00		
0	0%	0	4	9%
36	13%	0.75	100	36%
25	14%	0.75	42	24%
16	11%	0.5	31	21%
16	18%	1	23	26%
		0.60		

Media supplier			Community Engage	
Amount	Percentage of total	5-Point Scale	Amount	Percentage of total
3	30%	1.5	0	0%
23	12%	0.5	53	28%
8	11%	0.5	24	34%
22	5%	0.25	198	44%
55	20%	1	76	28%
		0.75		
0	0%	0	4	25%
2	15%	0.75	0	0%
14	20%	1	15	21%
3	25%	1.25	0	0%
4	17%	1	6	25%
		0.80		

r	Appealer			
5-Point Scale	Amount	Percentage of total	5-Point Scale	Amount
2	31	8%	0.5	0
0.75	46	11%	0.5	0
1.5	44	8%	0.5	0
0.5	30	15%	0.75	0
1.5	16	10%	0.5	0
1.25			0.55	
0.5	3	7%	0.25	0
1.75	18	6%	0.25	0
1.25	27	15%	0.75	0
1	29	19%	1	0
1.25	7	8%	0.5	0
1.15			0.55	

r	Appealer			
5-Point Scale	Amount	Percentage of total	5-Point Scale	Amount
0	2	20%	1	0
1.5	18	10%	0.5	0
1.75	9	13%	0.5	0
2.25	23	5%	0.25	0
1.5	16	6%	0.25	0
1.40			0.50	
1.25	2	13%	0.75	0
0	3	23%	1.25	0
1	6	9%	0.5	0
0	1	8%	0.5	0
1.25	6	25%	1.25	0
0.70			0.85	

Rumour Disprover		
Percentage of total	5-Point Scale	Total Points
0%	0	384
0%	0	404
0%	0	538
0%	0	199
0%	0	168
	0.00	
0%	0	45
0%	0	279
0%	0	178
0%	0	151
0%	0	89
	0.00	

Rumour Disprover		Total Points
Percentage of total	5-Point Scale	
0%	0	10
0%	0	187
0%	0	70
0%	0	455
0%	0	272
	0.00	
0%	0	16
0%	0	13
0%	0	70
0%	0	12
0%	0	24
	0.00	

Appendix 20 - Sentiment Analysis Data

Sentiment data anlysis, comparing sentiment posted to sentiment received

Account	HG Score - tweets from account	HG Score - Tweets @	Same/Different sentiment
@GMPolice	-15.2	-15	Same
@MetPoliceUK	-13.4	-50.9	Same
@NorthumbriaPol	4.2	1.6	Same
@TrafficScotland	2.2	-4.4	Different
@WMPolice	-16.1	-12.4	Same
@OnePoliceUK	-5.2	10.6	Different
@NPASLondon	54.9	41	Same
@GwentPolice	-8.3	10.1	Different
@CambsCops	-4.2	-22.9	Same
@MPSHackney	-2.2	-4.2	Same
@WarksPolice	4.8	-25.8	Different
@DorsetPolice	-15.3	-31.7	Same
@SuffolkPolice	-3.1	-2.1	Same
@DurhamPolice	11.1	26.9	Same
@GrampianPolice	2	-29.5	Different
@UppinghamPolice	37.5	31.1	Same
@SwpMerthyr	-4	32.6	Different
@GPCaerphilly	5.1	43.5	Same
@CumberlandPD	8.5	-6.7	Different

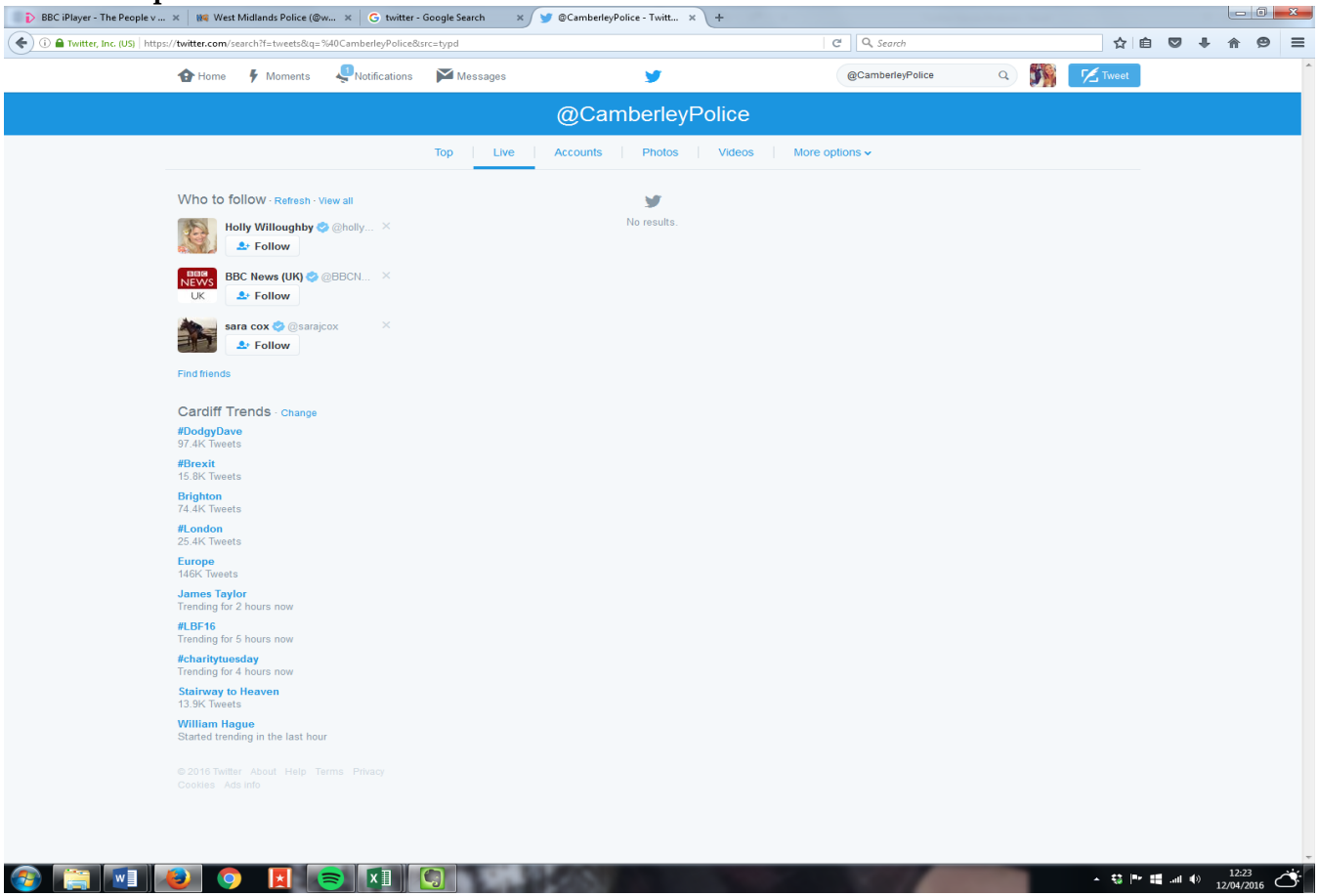
12
7

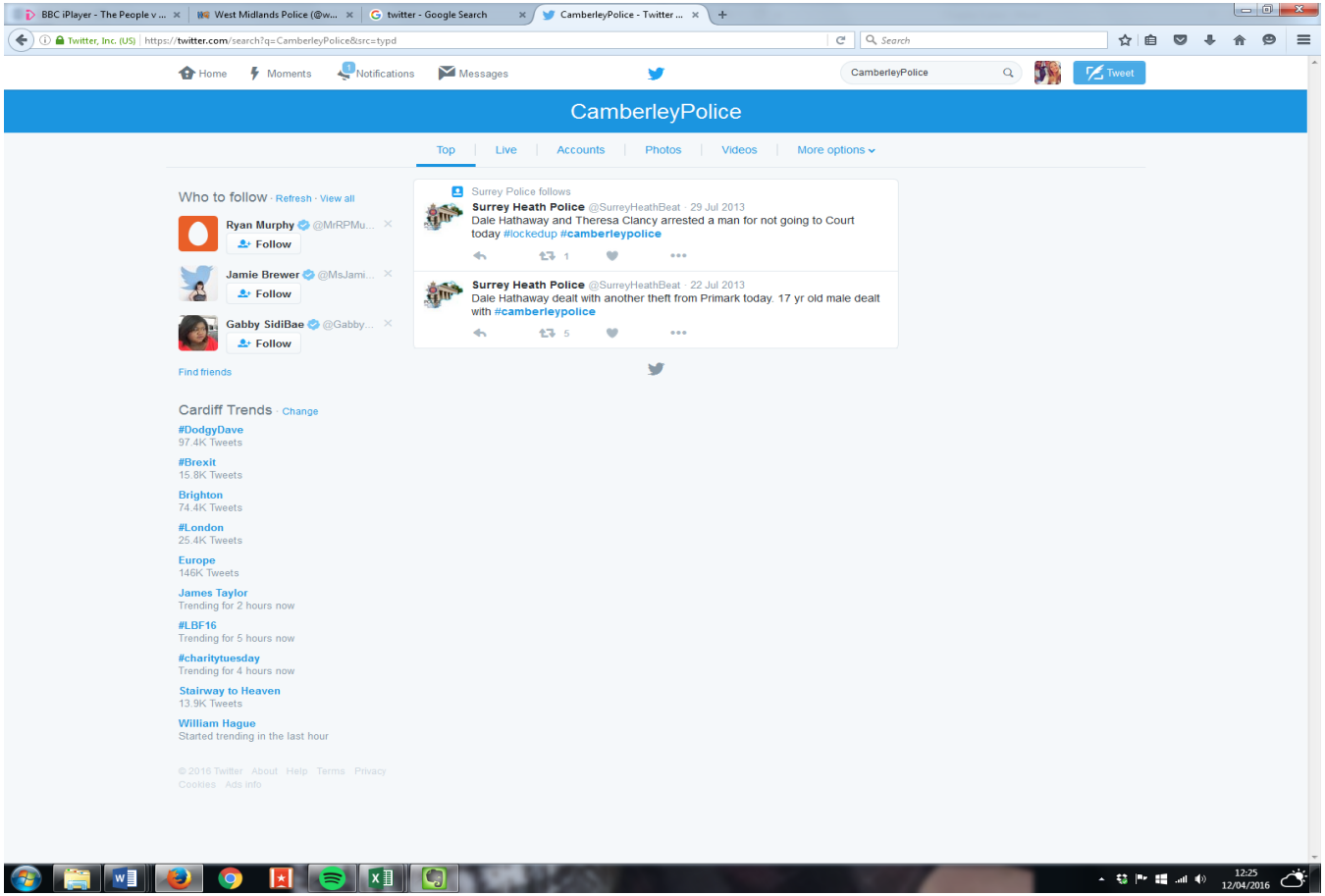
Percentage of accounts that have the same sentiment:	63%
Percentage of accounts that have different sentiment:	37%

Appendix 21 - Name Analysis Screenshots

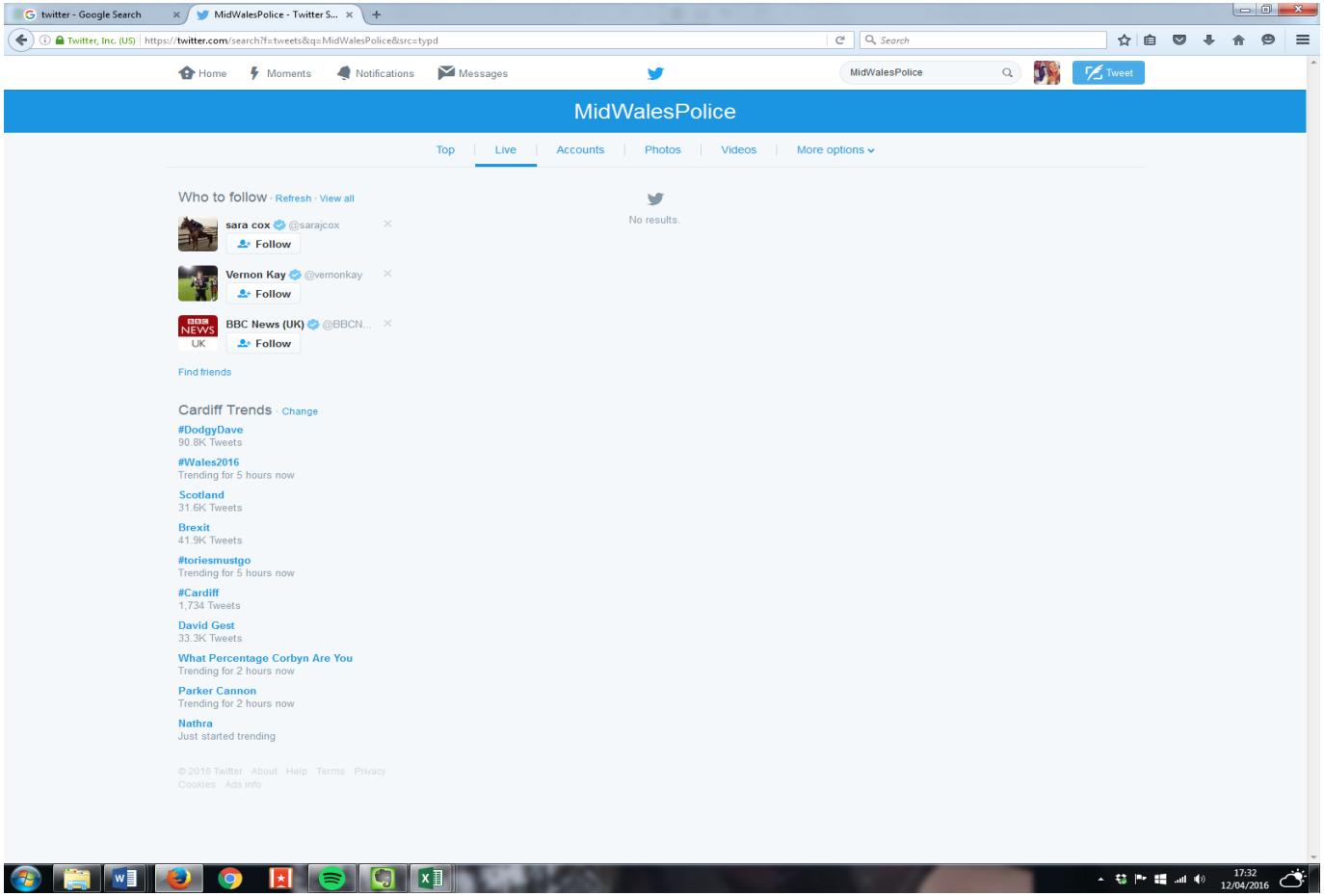
Screenshots showing what happens when the public can't find the police twitter account. Either hashtag, guess the handle, or just mention the force

CambsCops




BBC iPlayer - The People v ...
West Midlands Police (@w...
twitter - Google Search
CamberleyPolice - Twitter ...
Twitter, Inc. (US) | https://twitter.com/search?q=CamberleyPolice&src=typd
Search
Home
Moments
Notifications
Messages
CamberleyPolice
Tweet
CamberleyPolice
Top
Live
Accounts
Photos
Videos
More options
Who to follow · Refresh · View all
Ryan Murphy @MrRPMu...
Follow
Jamie Brewer @MsJami...
Follow
Gabby SidiBae @Gabby...
Follow
Find friends
Cardiff Trends · Change
#DodgyDave
97.4K Tweets
#Brexit
15.8K Tweets
Brighton
74.4K Tweets
#London
25.4K Tweets
Europe
146K Tweets
James Taylor
Trending for 2 hours now
#LBF16
Trending for 5 hours now
#charitytuesday
Trending for 4 hours now
Stairway to Heaven
13.9K Tweets
William Hague
Started trending in the last hour
© 2016 Twitter About Help Terms Privacy
Cookies Ads info
Surrey Police follows
Surrey Heath Police @SurreyHeathBeat · 29 Jul 2013
Dale Hathaway and Theresa Clancy arrested a man for not going to Court today #lockedup #camberleypolice
Surrey Heath Police @SurreyHeathBeat · 22 Jul 2013
Dale Hathaway dealt with another theft from Primark today. 17 yr old male dealt with #camberleypolice
12:25
12/04/2016

DyfedPowys


twitter - Google Search
MidWalesPolice - Twitter S...
Twitter, Inc. (US) https://twitter.com/search?f=tweets&q=MidWalesPolice&src=typd
Search
Home
Moments
Notifications
Messages
MidWalesPolice
Tweet
MidWalesPolice
Top
Live
Accounts
Photos
Videos
More options
Who to follow · Refresh · View all
sara cox @sarajcox
Follow
Vernon Kay @vernonkay
Follow
BBC News (UK) @BBCN...
UK
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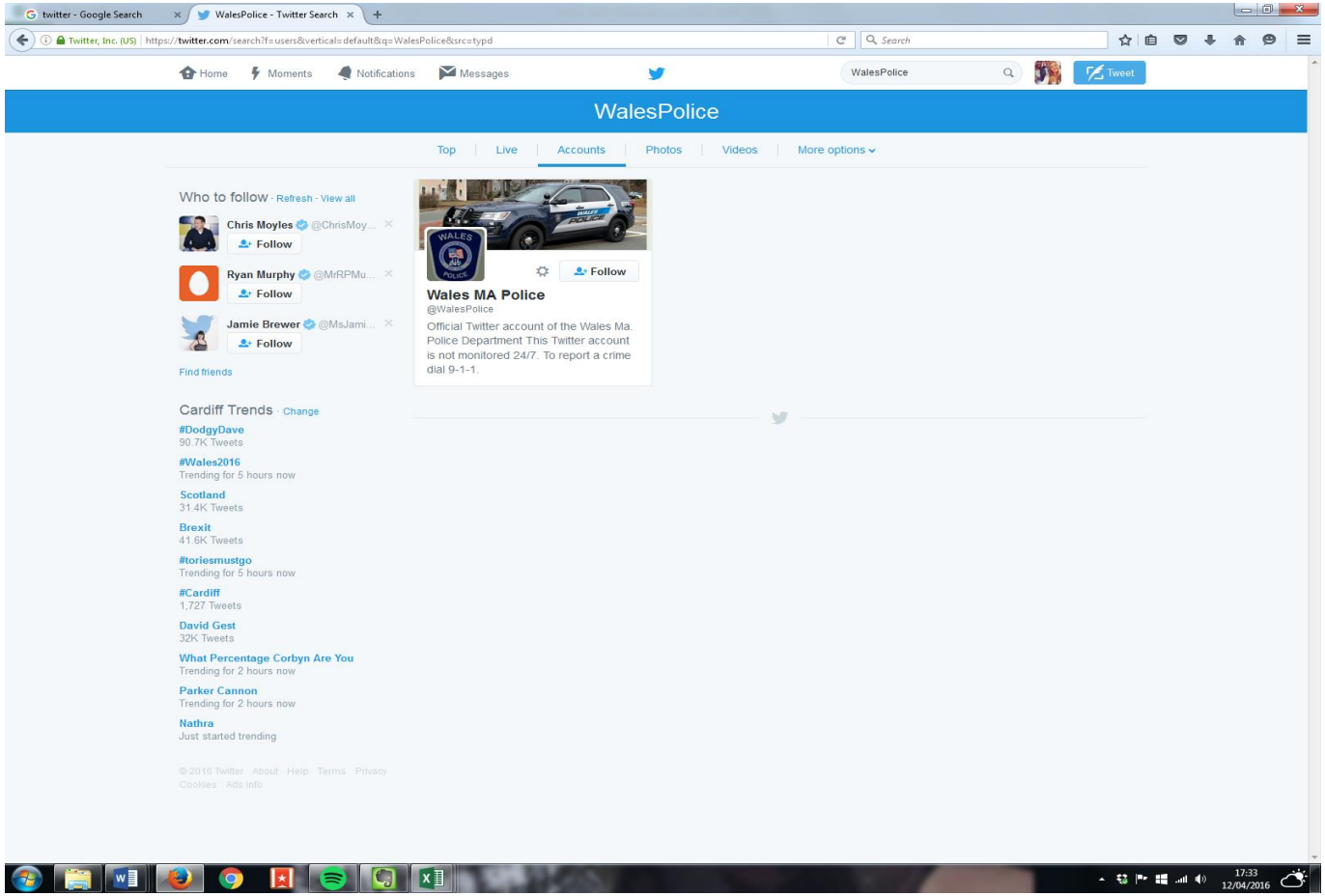
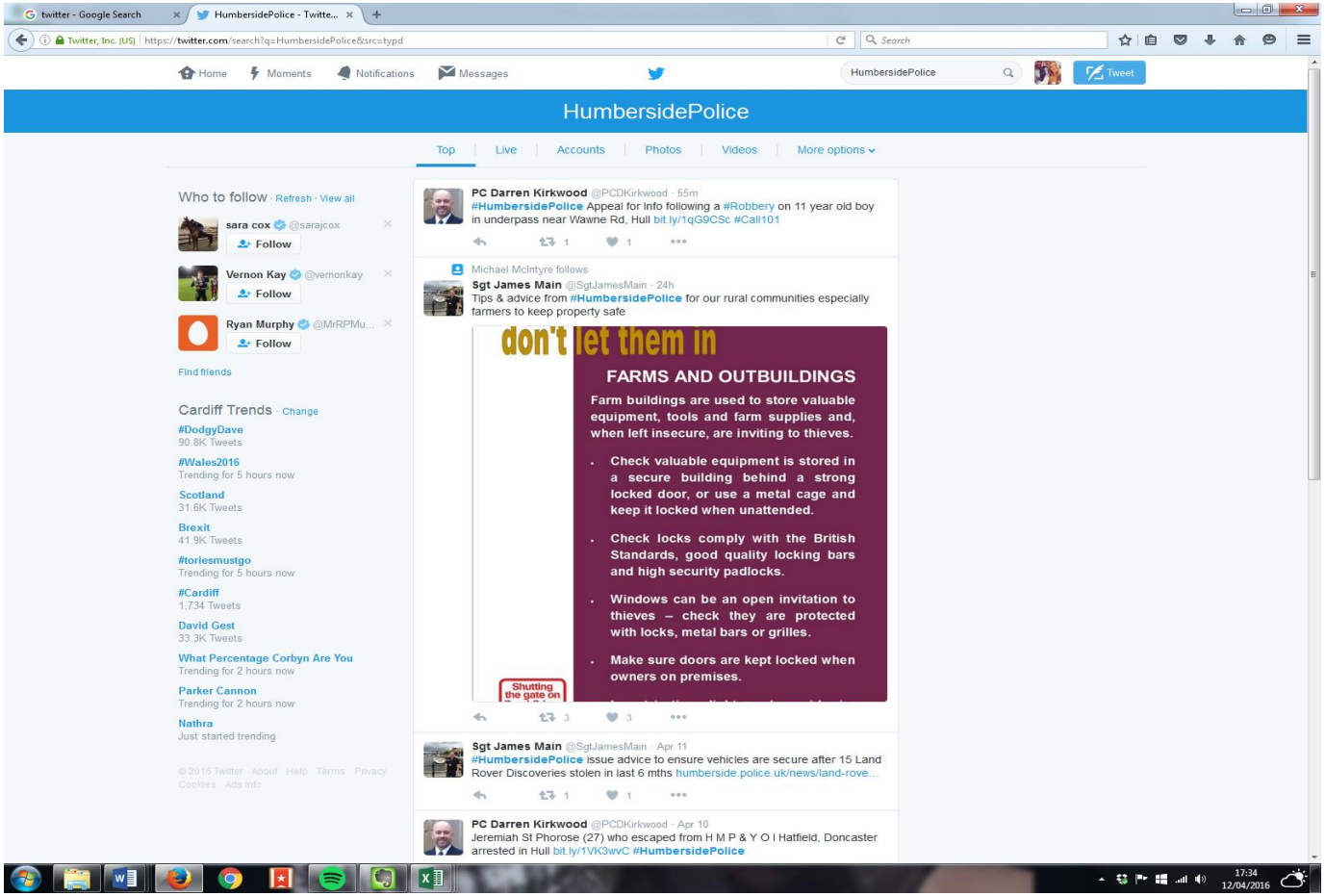
Find friends
No results.
Cardiff Trends · Change
#DodgyDave
90.8K Tweets
#Wales2016
Trending for 5 hours now
Scotland
31.6K Tweets
Brexit
41.9K Tweets
#toriesmustgo
Trending for 5 hours now
#Cardiff
1,734 Tweets
David Gest
33.3K Tweets
What Percentage Corbyn Are You
Trending for 2 hours now
Parker Cannon
Trending for 2 hours now
Nathra
Just started trending
© 2016 Twitter About Help Terms Privacy
Cookies Ads info
17:32
12/04/2016


twitter - Google Search
WalesPolice - Twitter Search
https://twitter.com/search?f=users&vertical=default&q=WalesPolice&src=typd
Home
Moments
Notifications
Messages
WalesPolice
Tweet
WalesPolice
Top
Live
Accounts
Photos
Videos
More options
Who to follow · Refresh · View all
Chris Moyles @ChrisMoy...
Follow
Ryan Murphy @MrRPMu...
Follow
Jamie Brewer @MsJami...
Follow
Find friends
Follow
Wales MA Police
@WalesPolice
Official Twitter account of the Wales Ma. Police Department This Twitter account is not monitored 24/7. To report a crime dial 9-1-1.
Cardiff Trends · Change
#DodgyDave
90.7K Tweets
#Wales2016
Trending for 5 hours now
Scotland
31.4K Tweets
Brexit
41.6K Tweets
#toriesmustgo
Trending for 5 hours now
#Cardiff
1,727 Tweets
David Gest
32K Tweets
What Percentage Corbyn Are You
Trending for 2 hours now
Parker Cannon
Trending for 2 hours now
Nathra
Just started trending
© 2016 Twitter About Help Terms Privacy Cookies Ads info
17:33
12/04/2016

Humberbeat


twitter - Google Search
HumbersidePolice - Twitte...
https://twitter.com/search?q=HumbersidePolice&src=typd
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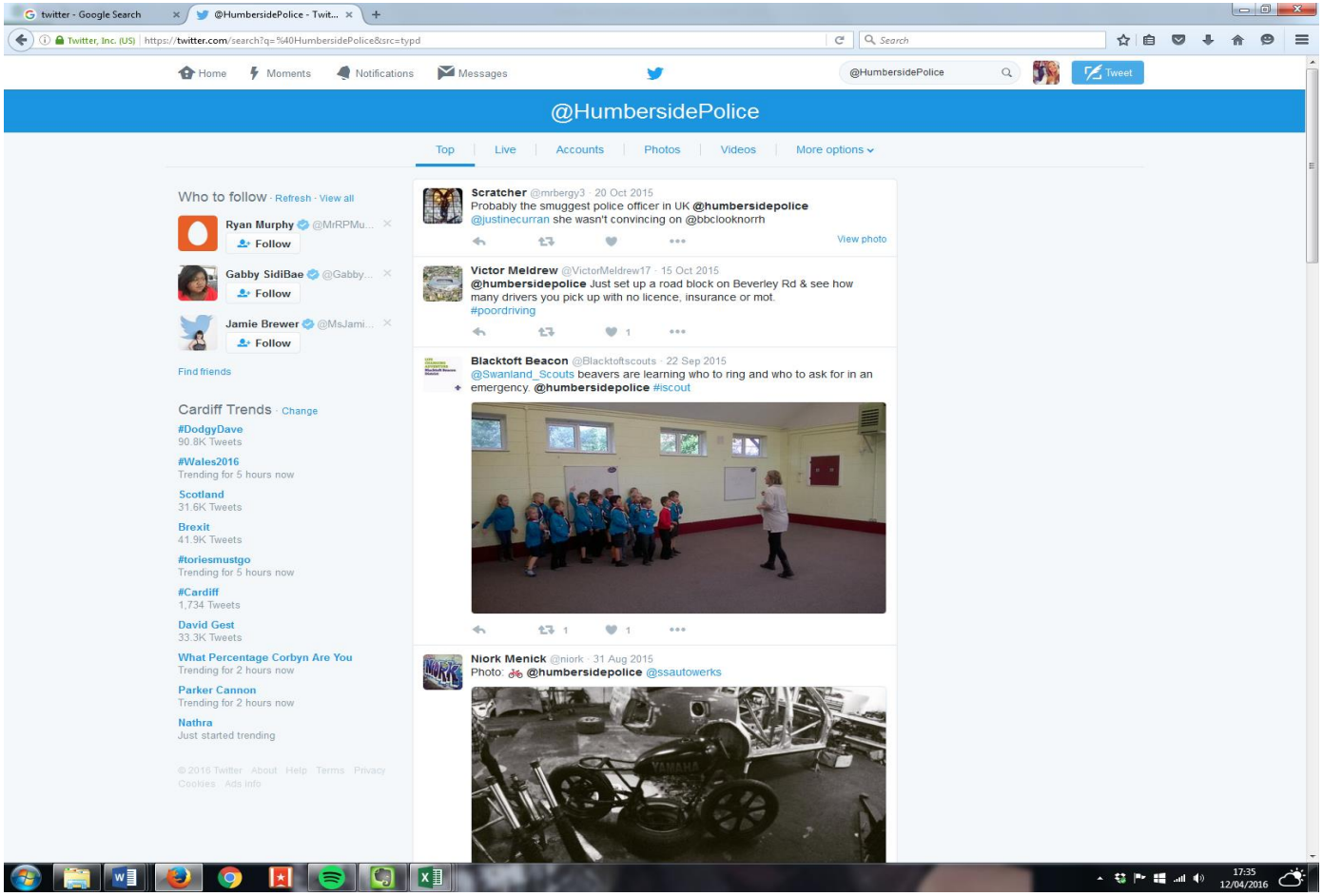
sara cox @sarajcox
Follow
Vernon Kay @vernonkay
Follow
Ryan Murphy @MrRPMu...
Follow
Find friends
Cardiff Trends · Change
#DodgyDave
90.8K Tweets
#Wales2016
Trending for 5 hours now
Scotland
31.6K Tweets
Brexit
41.9K Tweets
#toriesmustgo
Trending for 5 hours now
#Cardiff
1,734 Tweets
David Gest
33.3K Tweets
What Percentage Corbyn Are You
Trending for 2 hours now
Parker Cannon
Trending for 2 hours now
Nathra
Just started trending
PC Darren Kirkwood @PCDKirkwood · 55m
#HumbersidePolice Appeal for Info following a #Robbery on 11 year old boy in underpass near Wawne Rd, Hull bit.ly/1qG9CSc #Call101
Michael McIntyre follows
Sgt James Main @SgtJamesMain · 24h
Tips & advice from #HumbersidePolice for our rural communities especially farmers to keep property safe
don't let them in
FARMS AND OUTBUILDINGS
Farm buildings are used to store valuable equipment, tools and farm supplies and, when left insecure, are inviting to thieves.
Check valuable equipment is stored in a secure building behind a strong locked door, or use a metal cage and keep it locked when unattended.
Check locks comply with the British Standards, good quality locking bars and high security padlocks.
Windows can be an open invitation to thieves – check they are protected with locks, metal bars or grilles.
Make sure doors are kept locked when owners on premises.
Shutting the gate on
Sgt James Main @SgtJamesMain · Apr 11
#HumbersidePolice issue advice to ensure vehicles are secure after 15 Land Rover Discoveries stolen in last 6 mths humberside.police.uk/news/land-rove...
PC Darren Kirkwood @PCDKirkwood · Apr 10
Jeremiah St Phorose (27) who escaped from H M P & Y O I Hatfield, Doncaster arrested in Hull bit.ly/1VK3wvC #HumbersidePolice
17:34
12/04/2016


twitter - Google Search
@HumbersidePolice - Twit...
Twitter, Inc. (US) https://twitter.com/search?q=%40HumbersidePolice&src=typd
Search
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@HumbersidePolice
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@HumbersidePolice
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Follow
Gabby SidiBae @Gabby...
Follow
Jamie Brewer @MsJami...
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Cardiff Trends · Change
#DodgyDave
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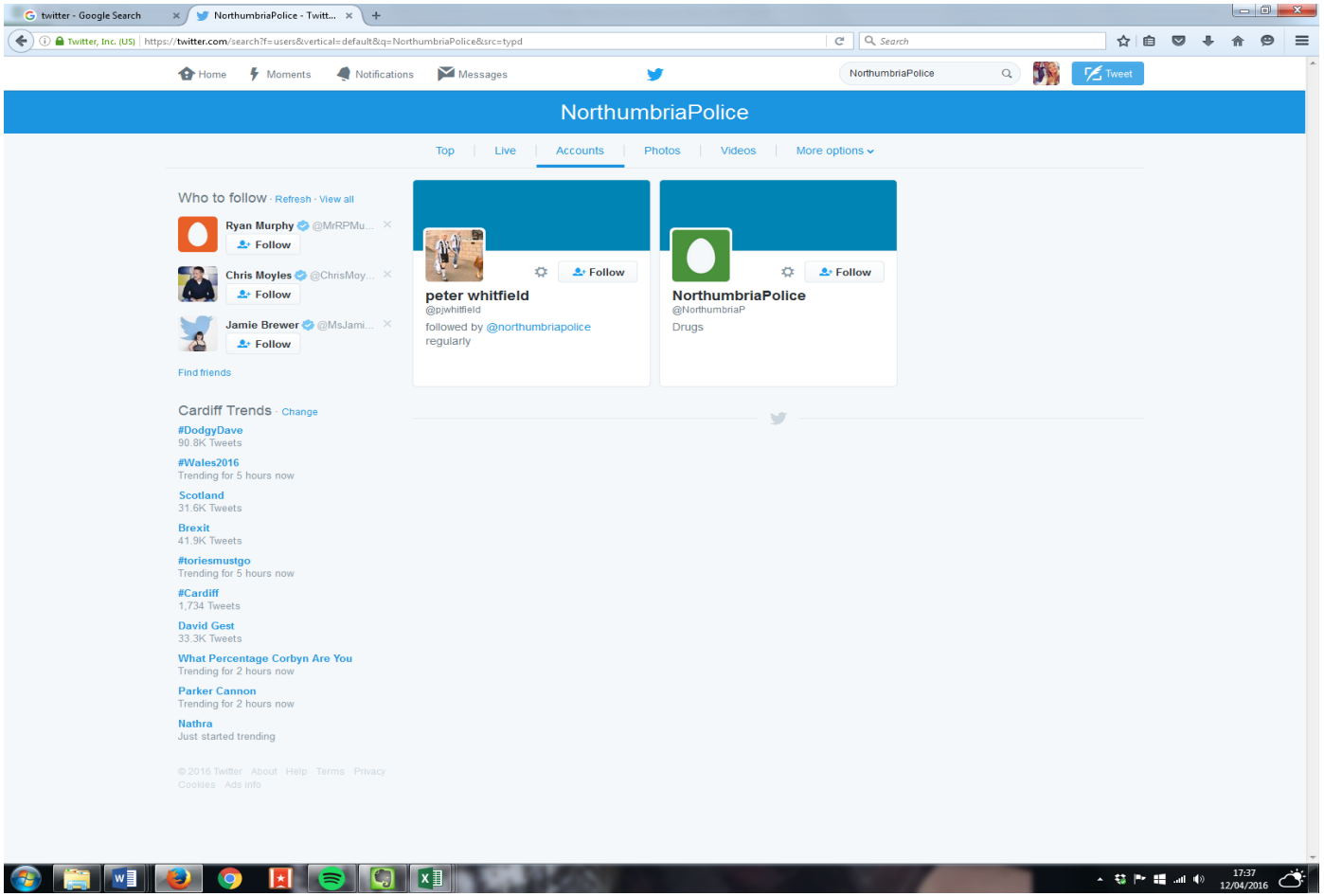
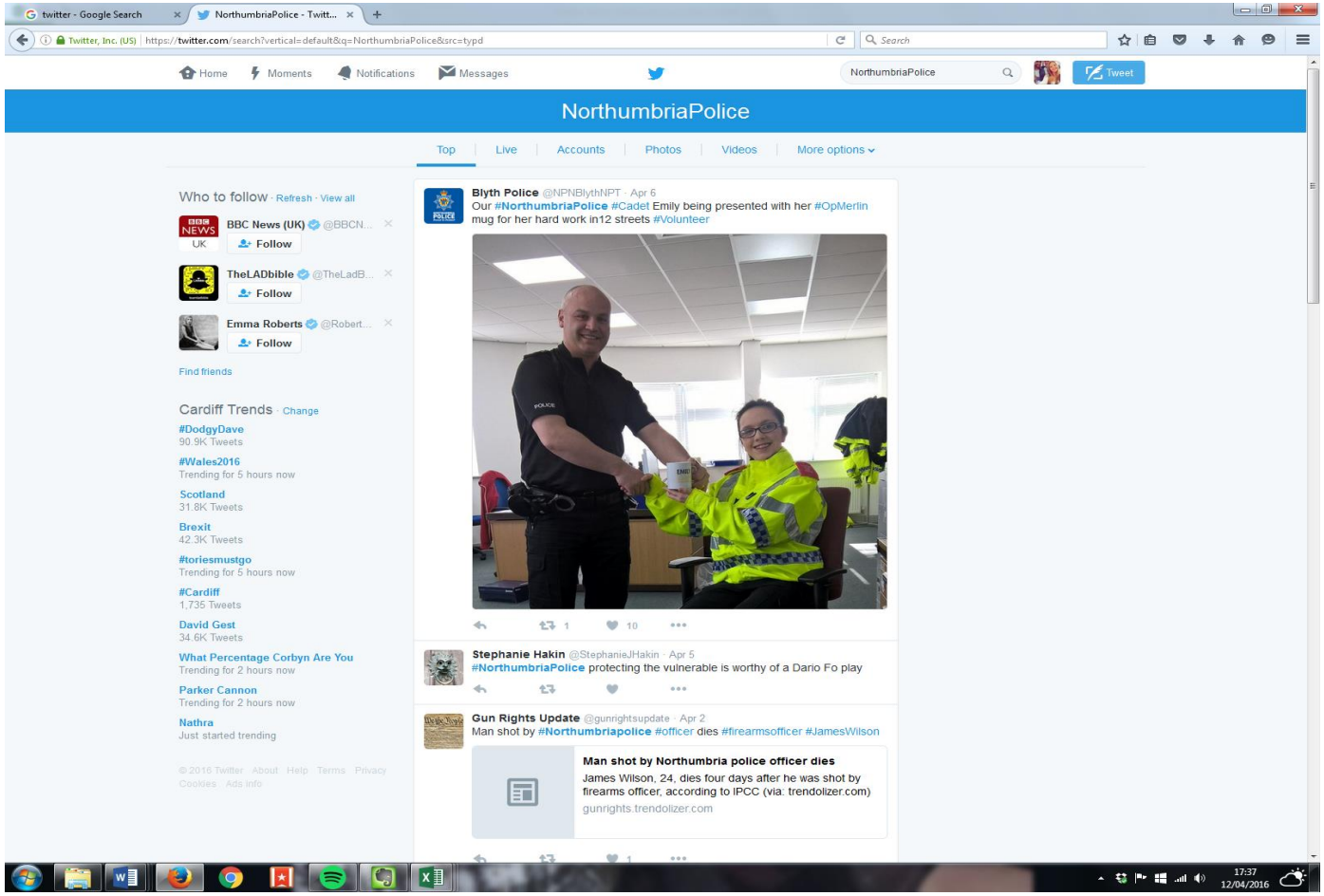
1,734 Tweets
David Gest
33.3K Tweets
What Percentage Corbyn Are You
Trending for 2 hours now
Parker Cannon
Trending for 2 hours now
Nathra
Just started trending
© 2016 Twitter About Help Terms Privacy Cookies Ads info
Scratcher @mrbergy3 · 20 Oct 2015
Probably the smuggest police officer in UK @humbersidepolice @justinecurran she wasn't convincing on @bbclooknorth
View photo
Victor Meldrew @VictorMeldrew17 · 15 Oct 2015
@humbersidepolice Just set up a road block on Beverley Rd & see how many drivers you pick up with no licence, insurance or mot. #poordriving
Blacktoft Beacon @Blacktoftscouts · 22 Sep 2015
@Swanland_Scouts beavers are learning who to ring and who to ask for in an emergency. @humbersidepolice #iscout
Niork Menick @niork · 31 Aug 2015
Photo: @humbersidepolice @ssautowerks
17:35
12/04/2016

NorthumbriaPol

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NorthumbriaPolice - Twitt...
https://twitter.com/search?vertical=default&q=NorthumbriaPolice&src=typd
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NorthumbriaPolice
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More options
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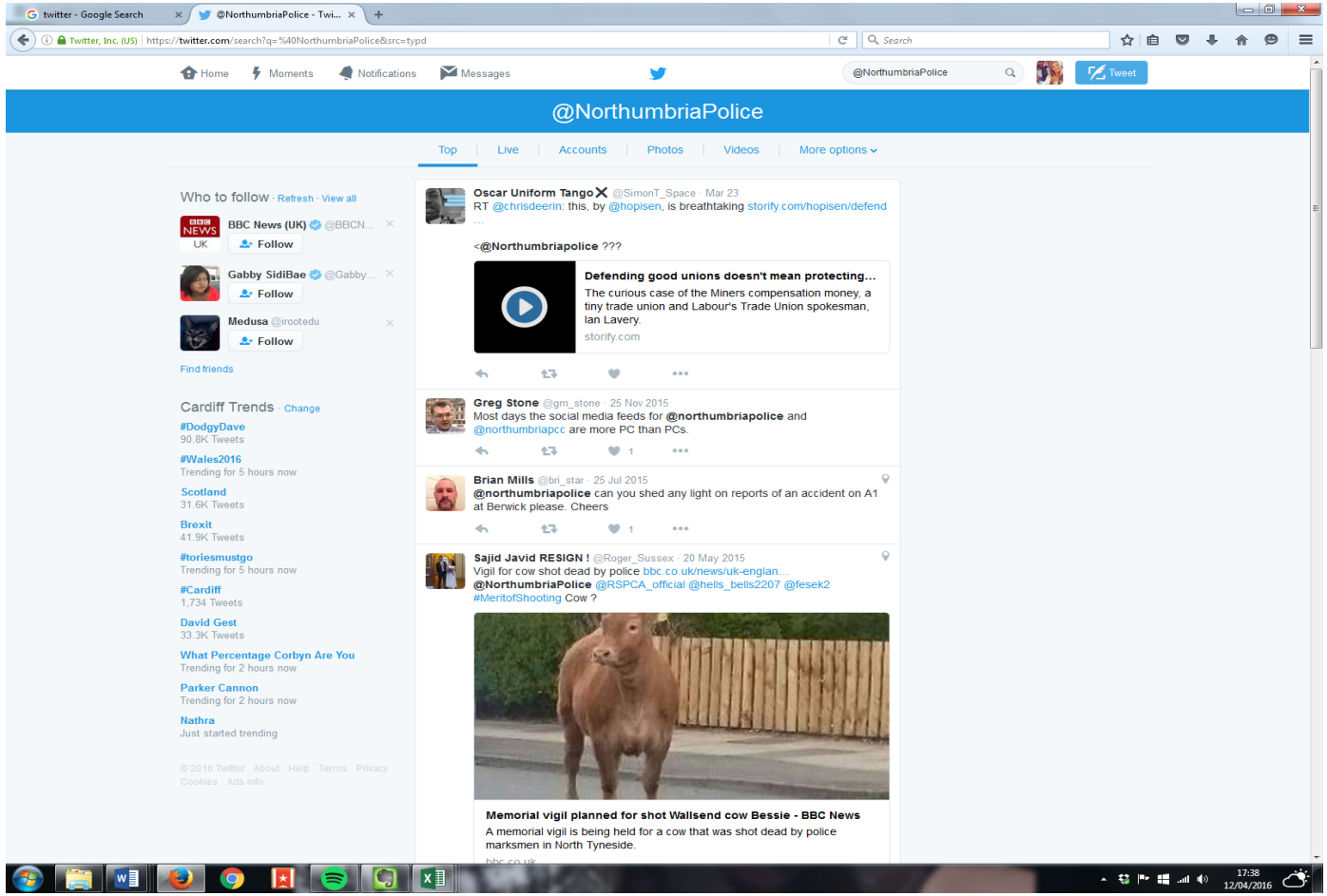
BBC News (UK) @BBCN...
Follow
TheLADbible @TheLadB...
Follow
Emma Roberts @Robert...
Follow
Find friends
Cardiff Trends · Change
#DodgyDave
90.9K Tweets
#Wales2016
Trending for 5 hours now
Scotland
31.8K Tweets
Brexit
42.3K Tweets
#toriesmustgo
Trending for 5 hours now
#Cardiff
1,735 Tweets
David Gest
34.6K Tweets
What Percentage Corbyn Are You
Trending for 2 hours now
Parker Cannon
Trending for 2 hours now
Nathra
Just started trending
Blyth Police @NPNBlythNPT · Apr 6
Our #NorthumbriaPolice #Cadet Emily being presented with her #OpMerlin mug for her hard work in12 streets #Volunteer
Stephanie Hakin @StephanieJHakin · Apr 5
#NorthumbriaPolice protecting the vulnerable is worthy of a Dario Fo play
Gun Rights Update @gunrightsupdate · Apr 2
Man shot by #Northumbriapolice #officer dies #firearmsofficer #JamesWilson
Man shot by Northumbria police officer dies
James Wilson, 24, dies four days after he was shot by firearms officer, according to IPCC (via: trendolizer.com)
gunrights.trendolizer.com
17:37
12/04/2016


twitter - Google Search
@NorthumbriaPolice - Twi...
https://twitter.com/search?q=%40NorthumbriaPolice&src=typd
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@NorthumbriaPolice
Tweet
@NorthumbriaPolice
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Oscar Uniform Tango @SimonT_Space · Mar 23
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<@Northumbriapolice ???
Defending good unions doesn't mean protecting...
The curious case of the Miners compensation money, a tiny trade union and Labour's Trade Union spokesman, Ian Lavery.
storify.com
Greg Stone @gm_stone · 25 Nov 2015
Most days the social media feeds for @northumbriapolice and @northumbriapcc are more PC than PCs.
Brian Mills @bri_star · 25 Jul 2015
@northumbriapolice can you shed any light on reports of an accident on A1 at Berwick please. Cheers
Sajid Javid RESIGN ! @Roger_Sussex · 20 May 2015
Vigil for cow shot dead by police bbc.co.uk/news/uk-englan...
@NorthumbriaPolice @RSPCA_official @hells_belis2207 @fesek2
#MeritofShooting Cow ?
Memorial vigil planned for shot Wallsend cow Bessie - BBC News
A memorial vigil is being held for a cow that was shot dead by police marksmen in North Tyneside.
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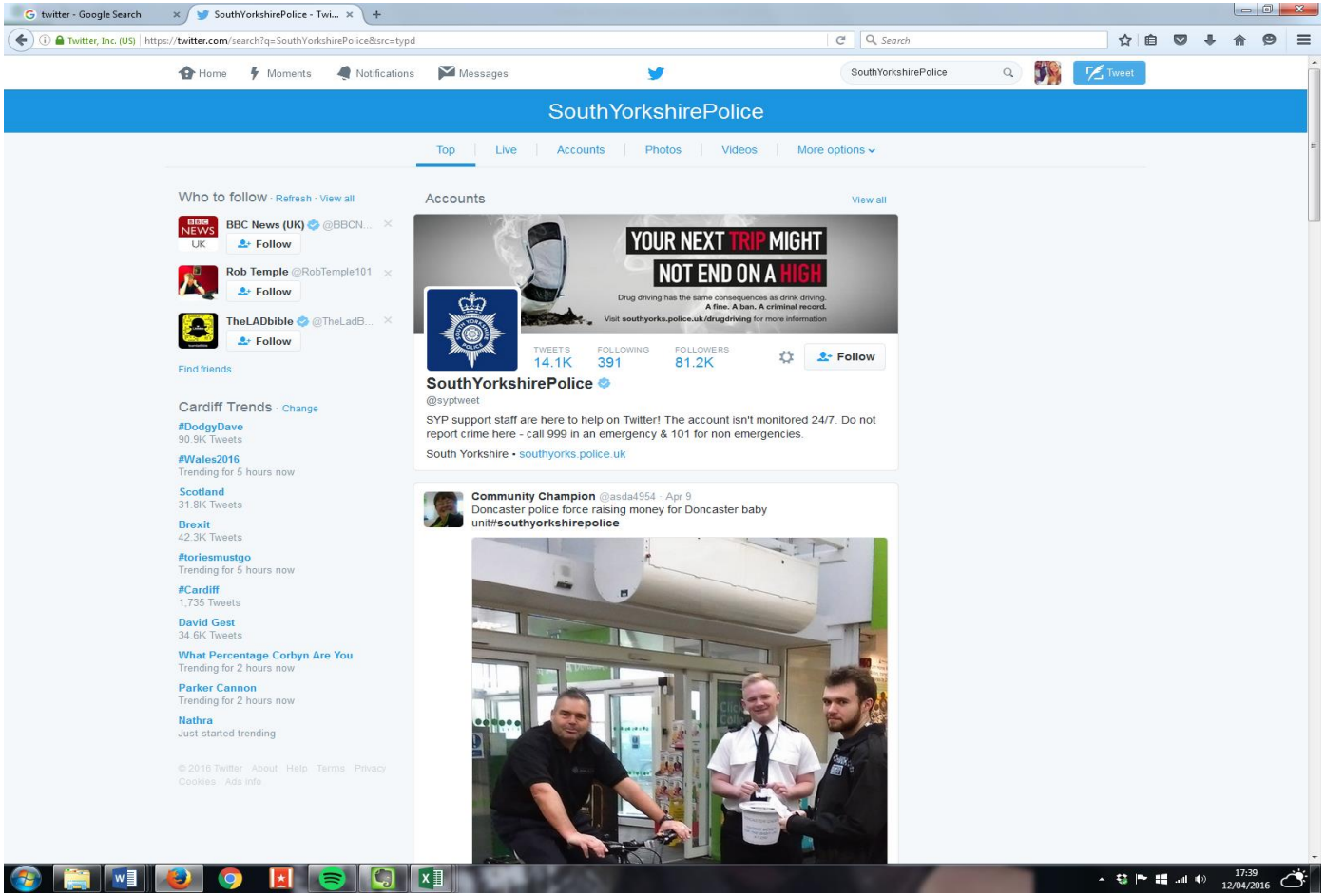

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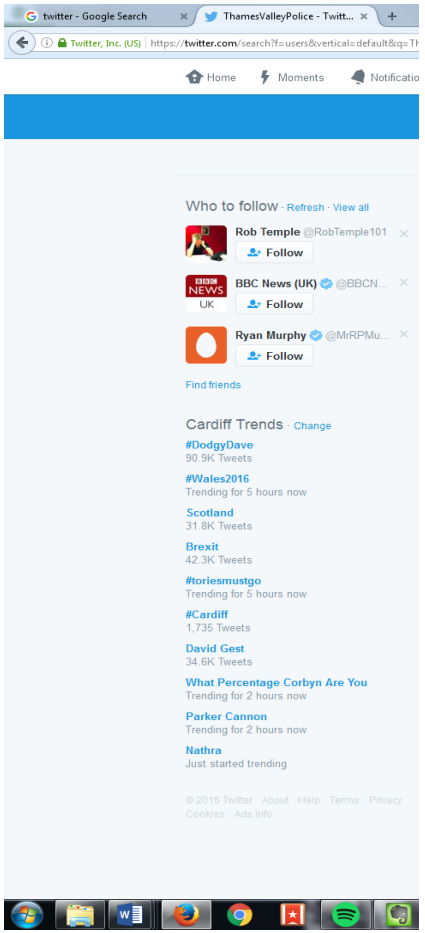

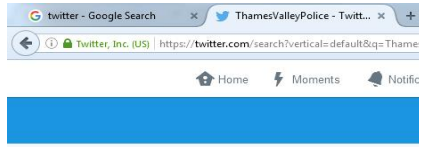

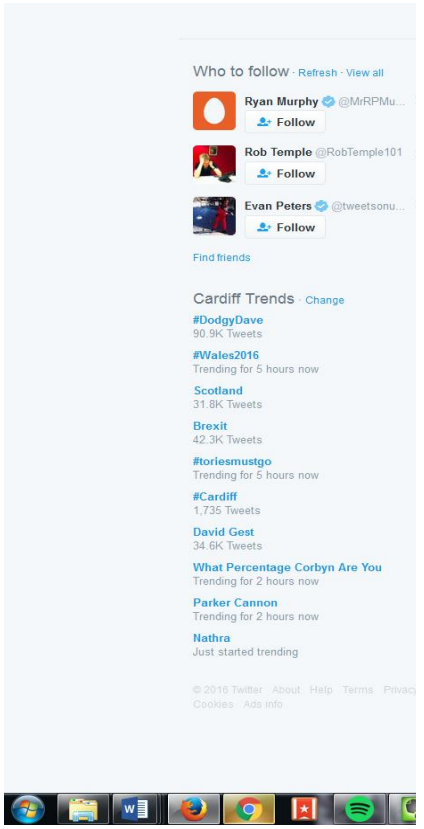
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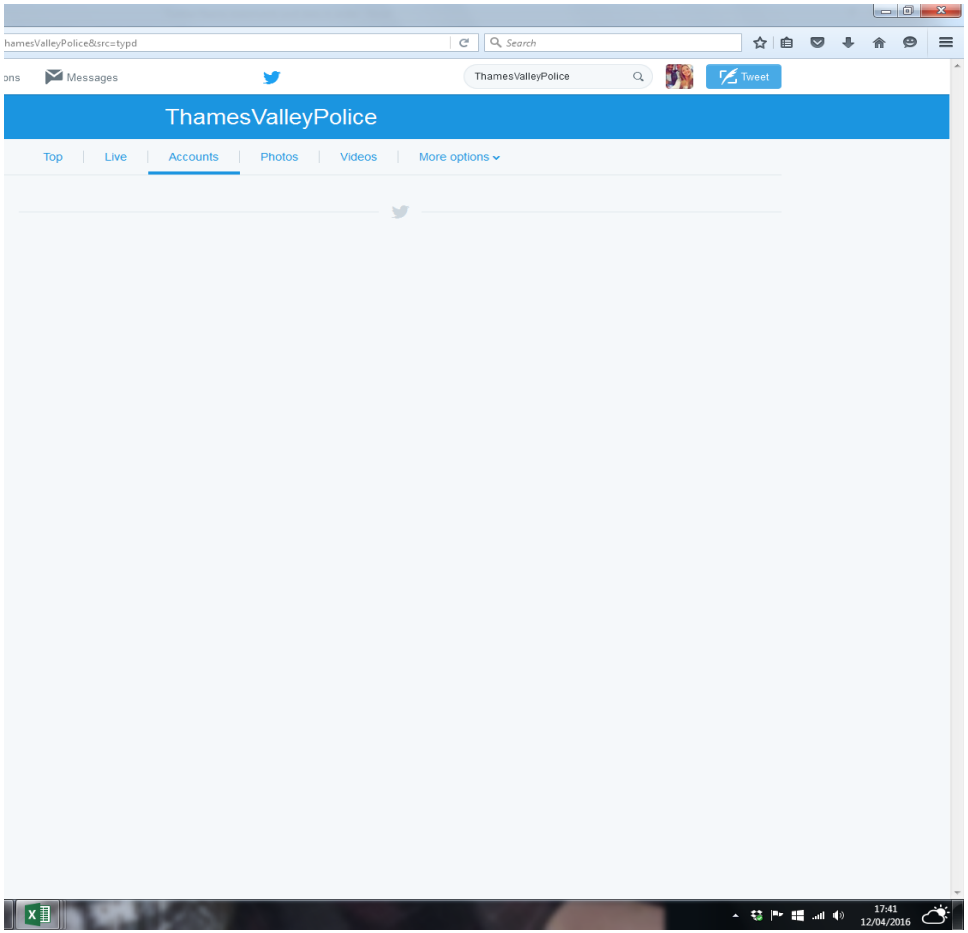
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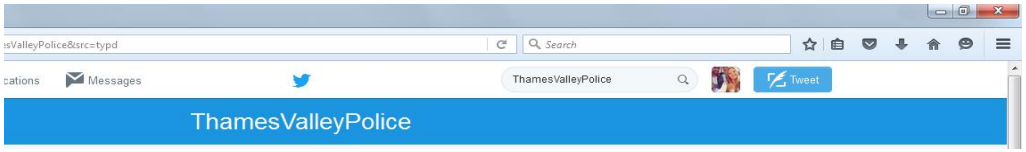
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SouthWaves Radio Man @SouthWavesMan · 19h
This is Ex-PD Eric who is enjoying retirement after working with #SussexPolice #ThamesValleyPolice #NationalPetDay

3 9

Paul Burnham @partridgebirdie · Apr 9
Police barricade in Wycombe today. Police exaggerated EDL numbers 300% to scare people away from antiracist mobilisation **@thamesvalleypolice**

1

tiniskwerl @tiniskwerl · Apr 9
#Oxford #Historian #AdrianGreenwood StabbedToDeath #ThamesValleyPolice arrest 26yo #Witness? 5Apr6pm #Kidlington

> **Sky News** @SkyNews
> Oxford historian found stabbed to death in what police say was "vicious & sustained attack" trib.al/LjgyHF7

17:41
12/04/2016