MACQUARIE University
SYDNEY·AUSTRALIA

BUSA3020 ADVANCED ANALYTICS TECHNIQUES

ASSIGNMENT #1: SOCIAL NETWORK ANALYSIS

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TOPIC: #GUNCONTROL

DUE DATE: FRIDAY, 13 MARCH 2020, 11:55PM

1. DATA COLLECTION PROCESS

1.1 Netlytic

Data for the social network analysis was obtained using *Netlytic* – a platform that extracts the most recent Twitter posts associated with **#GunControl.**

This report shows the graphs and metrics used for statistical analysis and visualised the network connections and characteristics using *Gephi*.

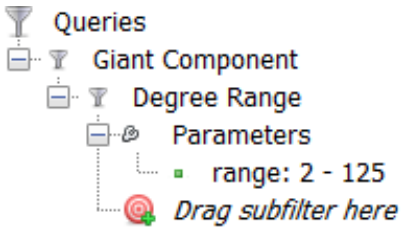
2. GEPHI VISUALISATION PROCESS

2.1 Giant Component

The first step was to remove all outliers by using *Giant Component*. This filtered out the nodes that had no connection to the main cluster as they are irrelevant to the analysis.

2.2 Degree Range

Next, the *Degree Range* was used as a sub-filter to remove nodes with a single edge, resulting in a network of 137 nodes (18%) and 244 edges (30%).

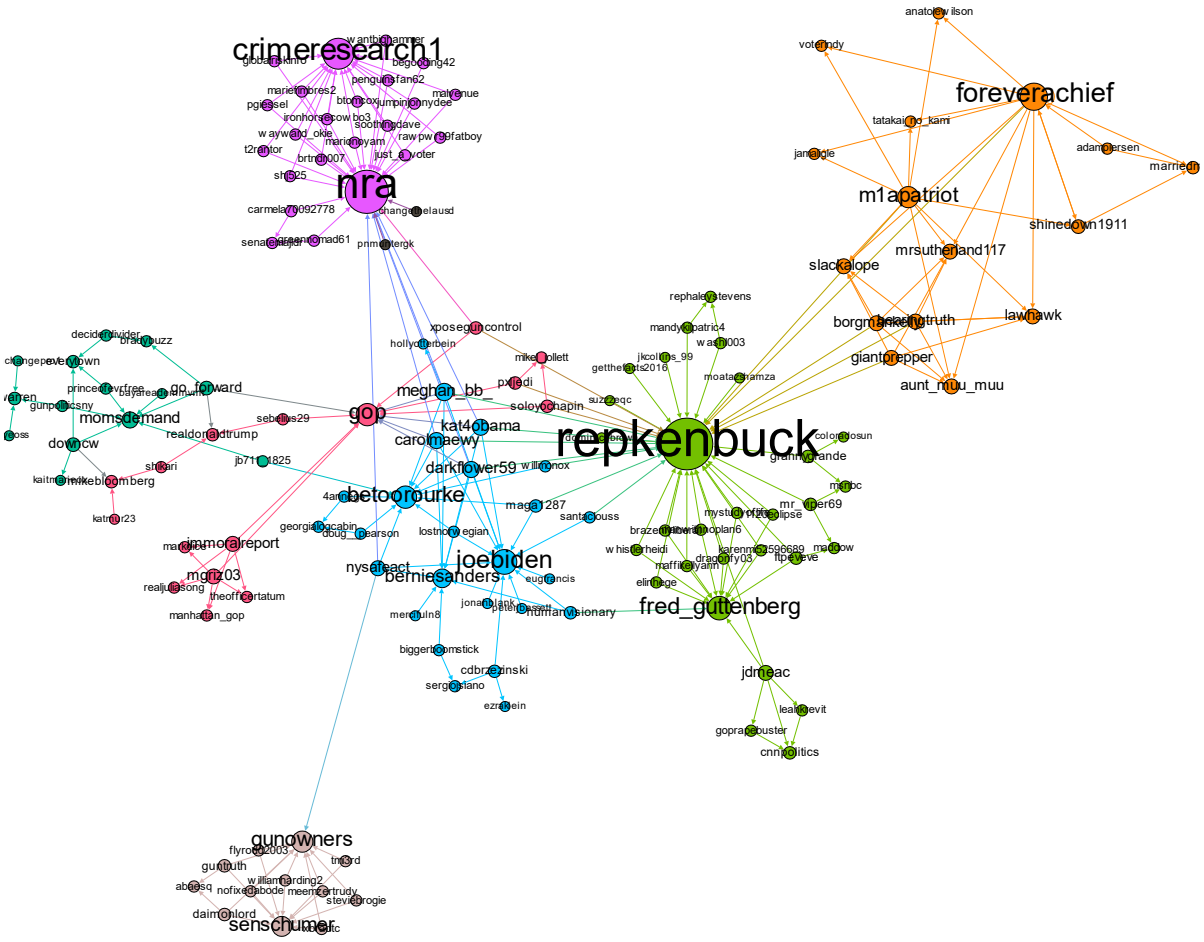


2.3 Modularity

A cluster analysis method was then used by running *Modularity*, which produced 7 communities. A partition on *Modularity Class* was colorized to distinguish the sub-communities.

3. ANALYSIS OF DATA

3.1 Size Ranked by Degree & Colour Partitioned by Modularity Class



The above graph shows how the nodes' sizes are ranked by *Degree* – number of connections a node has (i.e. a bigger node indicates having more connections). The names that stand out from the purple cluster are **@nra** (National Rifle Association) – leading gun rights associations, and **@CrimeResearch1** – organizations that conduct quality research on laws regulating the ownership of guns. Other names include American Politicians – **@repkenbuck** (Ken Buck) from the green cluster, **@senschumer** (Chuck Schumer) from the brown cluster and **@joebiden** (Joe Biden) from the blue cluster – all of whom are activists against gun violence.

The nodes mentioned above are considered as users engaged most in conversations and their stand on **#GunControl**. The brown cluster at the bottom are mostly against it, with **@gunowners** having the strongest influence.

Figures below indicate the detailed breakdown of the 7 clusters.

Fig 1. Cluster 1

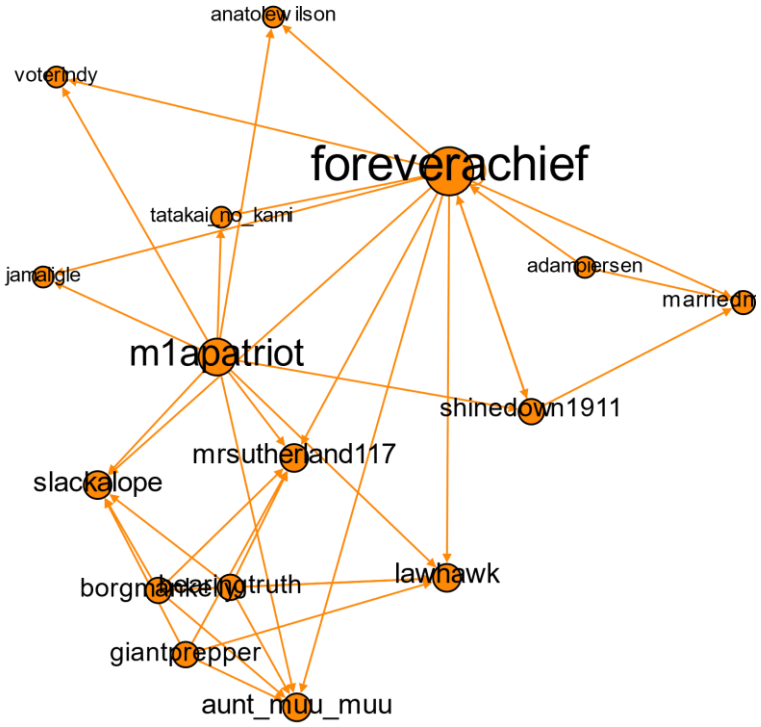


Fig 2. Clusters 2 – 4

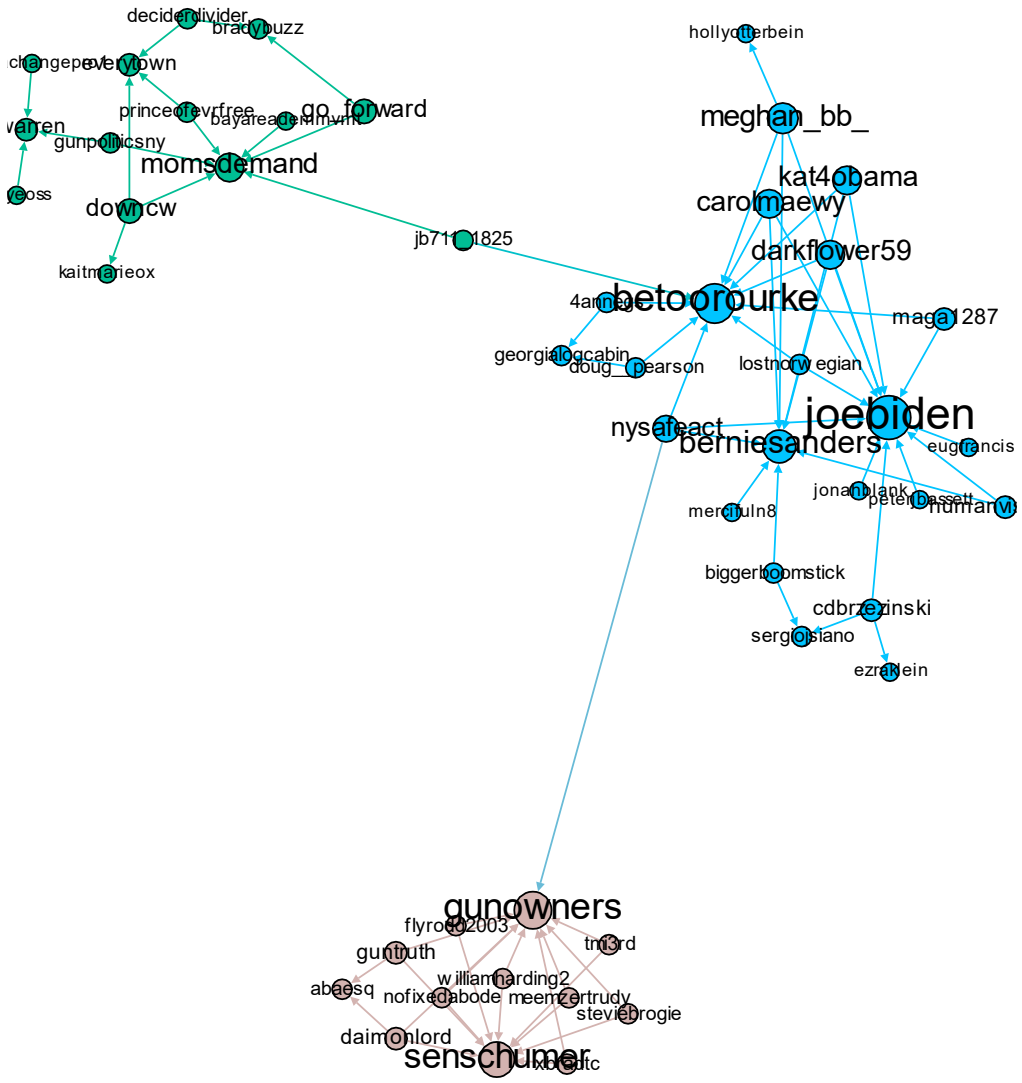
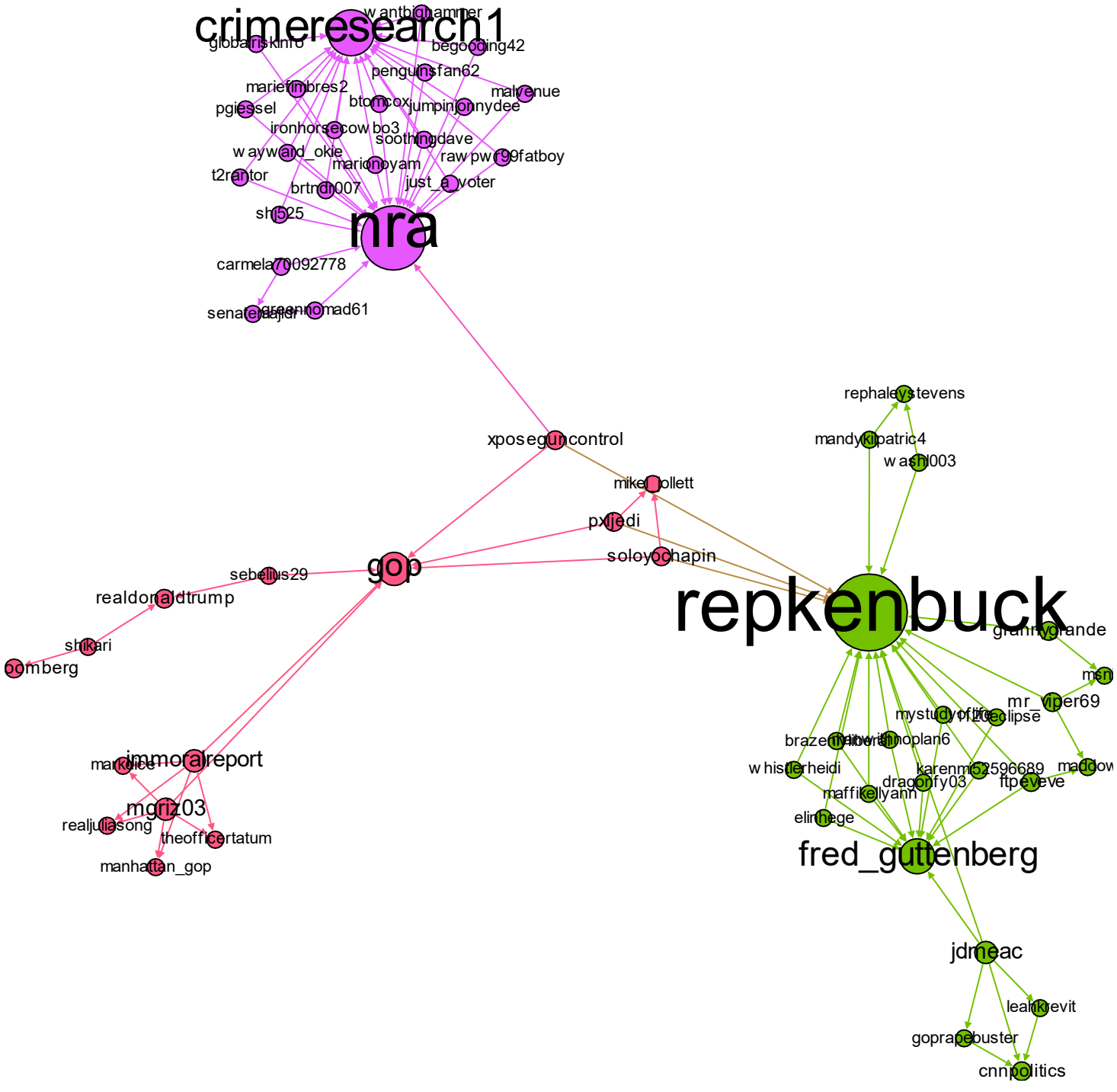
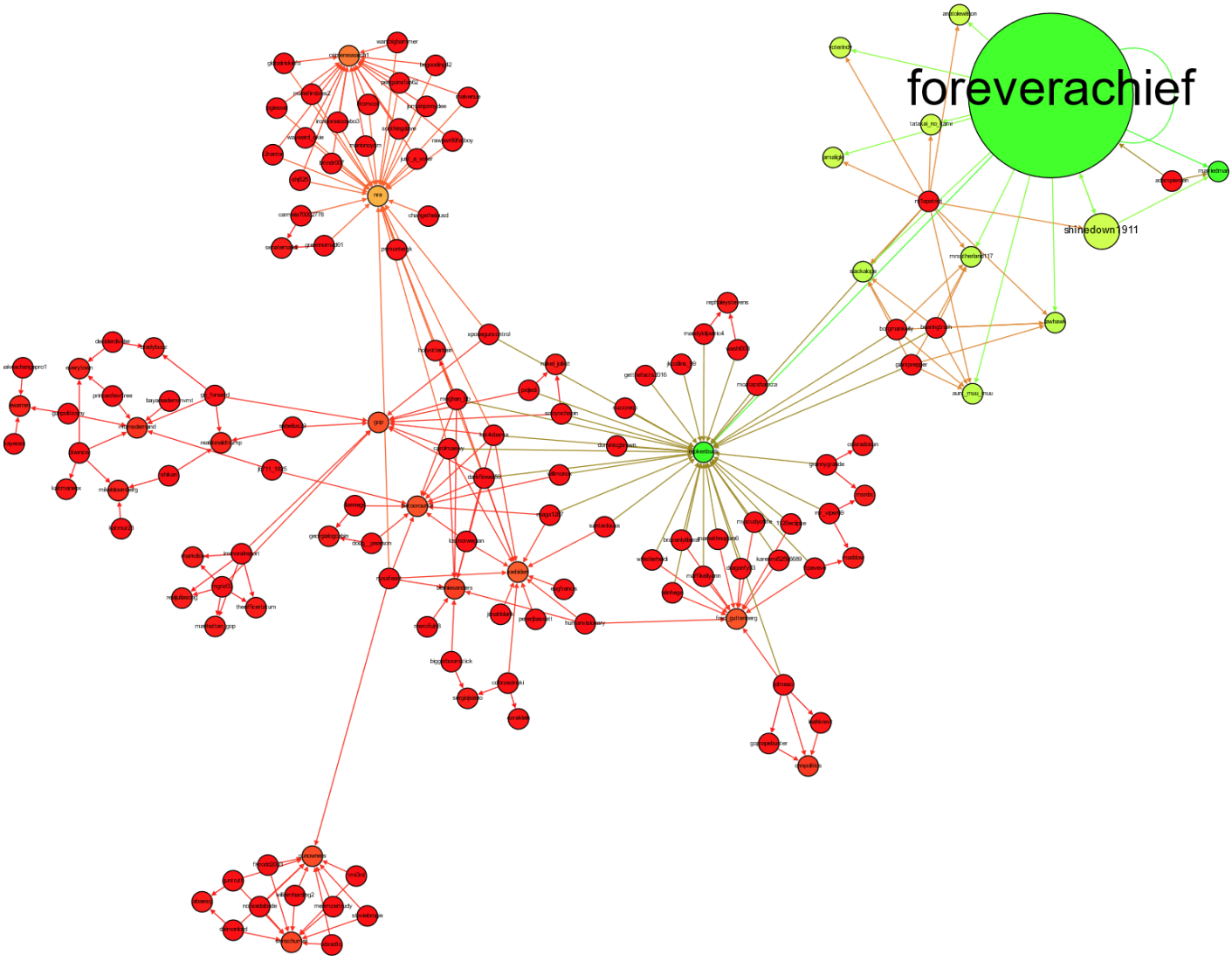


Fig 3. Clusters 5 – 7



3.2 Size Ranked by Bridging Centrality & Colour by Eigenvector Centrality



Bridging Centrality demonstrates how much nodes act like bridges to all others (i.e. a bigger node means that it links different groups together) while *Eigenvector Centrality* measures the importance of nodes in a network (i.e. green being the most important while red is portrayed as the least).

The graph above shows that the green nodes are clustered on the right with **@foreverachief** – a member of Gun Owners of America (GOA) – being the largest. Based on this person's tweets, he has an influential presence regarding his passion for gun rights with strong connections to other nodes in the network.

4. CONCLUSION

Section 3.1 highlights users who intensely interact with Ken Buck's official Twitter account while section 3.2 show supporters of gun rights groups – **@foreverachief** – lobbying against the **#GunControl** legislations by politicians.