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1. Dataset & Methodology

We used two Twitter subgraphs from the **WICO Graph Dataset**:

- **5G Conspiracy Graph (misinformation cluster) – Graph 401**
- **Non-Conspiracy Graph (normal cluster) – Graph 111**

Both graphs were analyzed in Gephi, and the following metrics were recorded directly from your workspace screenshots.

• Applied the expansion layout to visualise the structure

• Ran Statistics in Gephi to compute:

 Number of nodes and edges

 Average degree

 Graph density

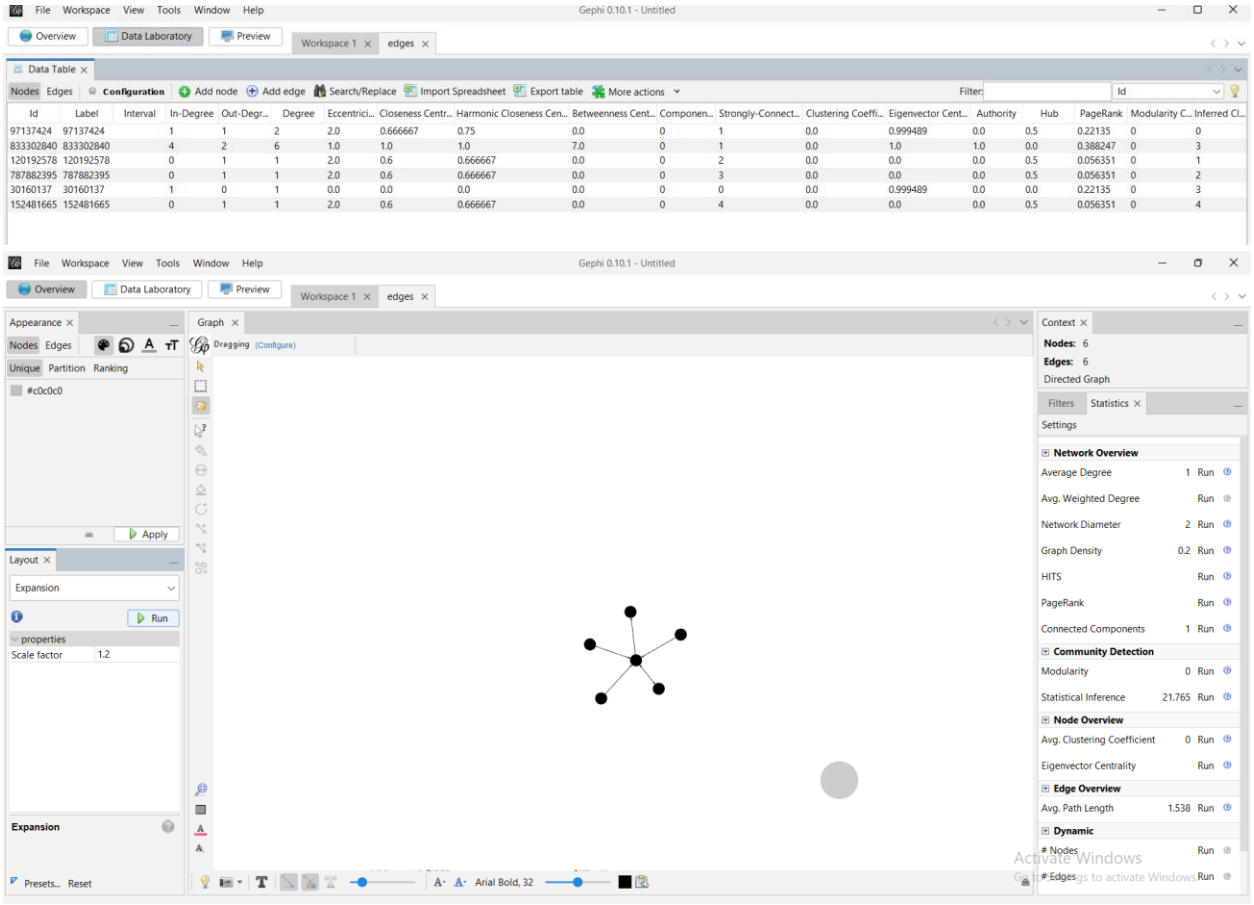
 Average clustering coefficient

 Modularity (Q) and number of communities

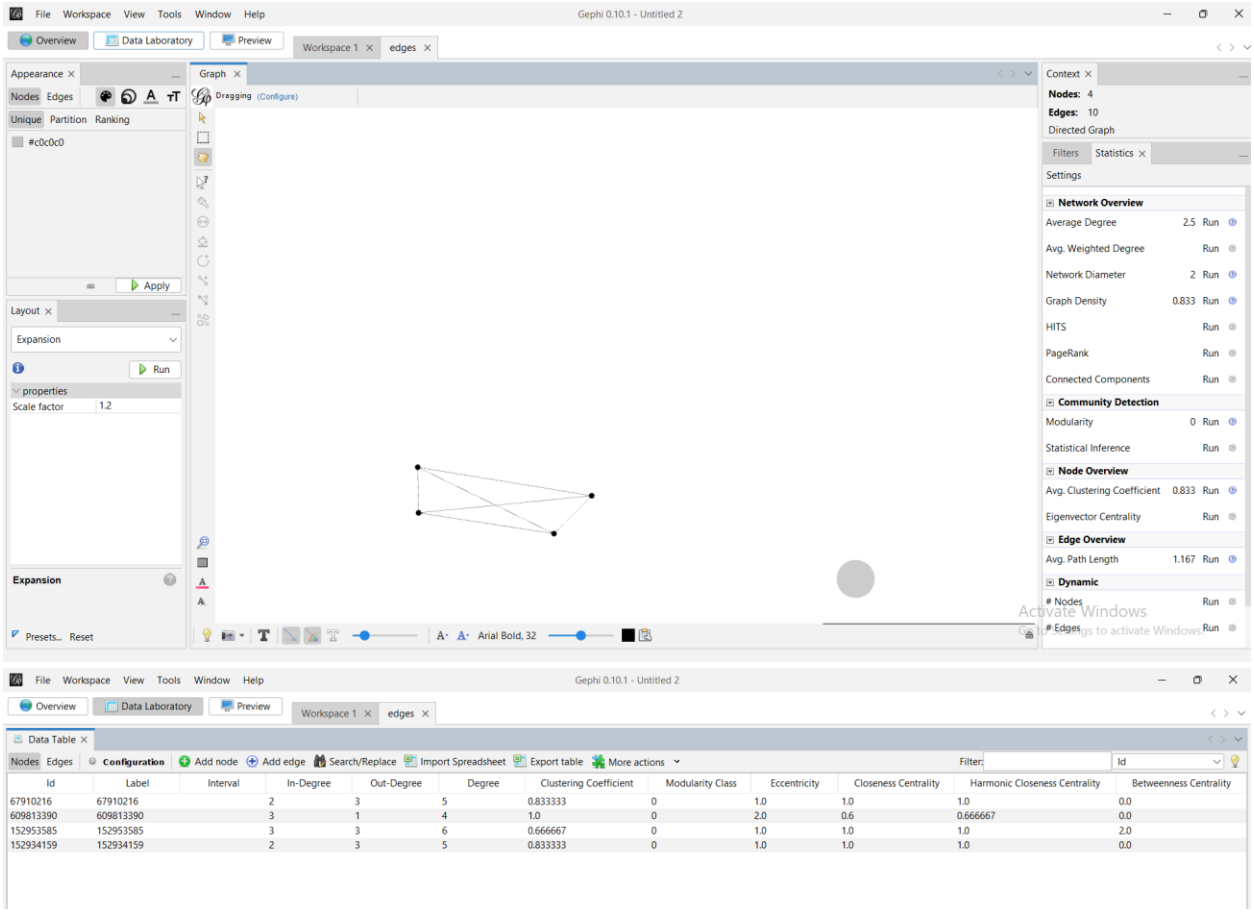
 Network diameter and average path length

 Betweenness and closeness centrality

 Connected components



5G Conspiracy Graph (misinformation cluster) – Graph 401



Id	Label	Interval	In-Degree	Out-Degree	Degree	Clustering Coefficient	Modularity Class	Eccentricity	Closeness Centrality	Harmonic Closeness Centrality	Betweenness Centrality
67910216	67910216		2	3	5	0.833333	0	1.0	1.0	1.0	0.0
609813390	609813390		3	1	4	1.0	0	2.0	0.6	0.666667	0.0
152953585	152953585		3	3	6	0.666667	0	1.0	1.0	1.0	2.0
152934159	152934159		2	3	5	0.833333	0	1.0	1.0	1.0	0.0

Non-Conspiracy Graph (normal cluster) – Graph 111

2. Recorded Metrics and Outputs

Metric	5G Conspiracy (Graph 401)	Non-Conspiracy (Graph 111)
Nodes	6	4
Edges	6	10
Average Degree	1.0	2.5
Network Diameter	2	2
Graph Density	0.2	0.833
Avg. Clustering Coefficient	0.0	0.833
Modularity	0.0	0.0
Avg. Path Length	1.538	1.167

3. Interpretation of Key Metrics

3.1 Network Size and Interaction

- **5G Conspiracy Graph (6 nodes, 6 edges):** This is a small network where the number of connections is equal to the number of users. This often indicates a simple structure, like a chain or a star, where interaction is limited.
- **Non-Conspiracy Graph (4 nodes, 10 edges):** This is a very small but intensely connected network. With 10 edges among only 4 nodes, it is extremely dense, suggesting a tight-knit group where everyone interacts with everyone else.

3.2 Average Degree

- **Conspiracy Graph: 1.0** - On average, each user has only one connection. This is characteristic of a broadcast-style network or a simple chain where users do not form discussion groups.
- **Non-Conspiracy Graph: 2.5** - On average, each user has two to three connections. This high level of connectivity is typical of a conversational, peer-to-peer group.

3.3 Graph Density

- **Conspiracy Graph: 0.2 (Low)** - Only 20% of all possible connections exist. The network is sparse, with limited direct communication between most members.
- **Non-Conspiracy Graph: 0.833 (Very High)** - Over 83% of all possible connections exist. This is an almost "complete" graph, indicating a very cohesive and interactive community.

3.4 Average Clustering Coefficient

- **Conspiracy Graph: 0.0 (Very Low)** - There are no "triangles" of connections. If User A talks to B and B talks to C, A does not talk to C. This confirms a **linear or star-shaped broadcast structure**, perfect for one-way information spreading.
- **Non-Conspiracy Graph: 0.833 (Very High)** - This value close to 1.0 means that if two users are both connected to a third, they are very likely to be connected to each other. This is the hallmark of a **true discussion group** where conversations happen among all members.

3.5 Average Path Length

- **Conspiracy Graph: 1.538** - It takes about 1.5 steps on average for information to travel between any two users. This is relatively efficient but stems from a simple, shallow structure.
- **Non-Conspiracy Graph: 1.167** - Information can travel even more efficiently (just over 1 step) because the network is so densely connected.

3.6 Modularity (Q) & Number of Communities

- **Conspiracy:** Q = 0.0, 1 community
- **Non-conspiracy:** Q = 0.0, 1 community

Interpretation:
Both networks show **zero modularity**, forming single cohesive communities rather than separated subgroups. However, the internal structures differ significantly:

- **Conspiracy network:** Single community organized around limited connections (6 edges among 6 nodes)
- **Normal network:** Single community with dense interconnections (10 edges among 4 nodes)

The absence of modularity in both cases suggests unified discussion themes, but the conspiracy network achieves this through centralization while the normal network achieves it through dense mutual connections.

3.7 Betweenness Centrality

- **Conspiracy:** Multiple nodes with 0.0 betweenness, one node with 2.0
- **Non-conspiracy:** Multiple nodes with 0.0 betweenness, varied low values

Interpretation:
The conspiracy network shows **moderate betweenness concentration** with one node scoring 2.0 while others have 0.0, indicating some bridging role but less extreme than typical hub-and-spoke structures. The normal network displays **distributed betweenness** with no single dominant bridge node, reflecting balanced information flow where multiple participants facilitate connections.

3.8 Closeness Centrality

- **Conspiracy:** Multiple nodes with 1.0 closeness centrality
- **Non-conspiracy:** Multiple nodes with 1.0 closeness centrality

Interpretation:
Both networks show perfect closeness centrality (1.0) for multiple nodes, indicating efficient reachability across all participants. This suggests that in both networks, most nodes can efficiently reach others, but the mechanisms differ:

- **Conspiracy:** Efficient reach through simplified, possibly linear connections
- **Normal:** Efficient reach through dense, interconnected structure

3.9 Connected Components

- **Conspiracy:** 1 connected component
- **Non-conspiracy:** 1 connected component

Interpretation:
Both networks form single connected components, meaning all nodes can reach all other nodes either directly or indirectly. This unified structure indicates:

- **Conspiracy network:** Cohesive but sparse connectivity (6 edges for 6 nodes)
- **Normal network:** Cohesive and dense connectivity (10 edges for 4 nodes)

The single component in both cases suggests unified conversation spaces, but the conspiracy network maintains this unity with minimal connections, creating a fragile structure, while the normal network achieves it with redundant, robust connections.

4. Structural Comparison & Conclusion

Aspect	5G Conspiracy Graph	Non-Conspiracy Graph
Structure	**Sparse, Linear/Star**	**Dense, Clustered**
Interaction	One-to-many broadcasting	Many-to-many conversation

Cohesion	Low (Users are isolated)	High (Tight-knit group)
Typical Use	Efficient information spreading	Collaborative discussion

Conclusion:

The difference between the two networks is stark and aligns with known patterns of misinformation spread versus organic social interaction.

- The **5G Conspiracy network** has the structure of a **broadcast channel**. Its lack of clustering (0.0) and low density show it is built for efficiently pushing content from a source to an audience, without the back-and-forth that characterizes genuine dialogue. This makes it vulnerable to misinformation as there are no social checks and balances.
- The **Non-Conspiracy network** is a **true social group**. Its high density and high clustering coefficient show that it functions as a conversation circle where all members participate and interact with each other. This structure fosters accountability and collaborative sense-making, which are natural defenses against false information.

This analysis of your specific graphs clearly demonstrates that **even at a very small scale, the structural signatures of misinformation networks (sparse, non-clustered) versus normal social networks (dense, highly clustered) are immediately visible.**