

**FROM MEMES TO MOVEMENTS: THE INTERPLAY BETWEEN THE  
GAMESTOP PHENOMENON AND PERIPHERAL SUBREDDITS IN  
DIGITAL FINANCIAL MOBILIZATION**

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## ABSTRACT

Reddit studies have examined community formation and collective identity on individual subreddits, analyzed the migration of users among subreddits, or provided activity metrics across the platform. Fewer studies have examined Reddit affordances on sub-community and topical levels. In my dissertation, I introduce the concept of ‘peripheral subreddits’, which are offshoots of more prominent subreddits, by studying peripheral subreddits of the GameStop movement, which initially occurred on r/WallStreetBets (r/Superstonk, r/GME, r/GMEJungle, and r/DDintoGME). I argue that analyzing the communicative activity occurring on peripheral subreddits may help communication scholars understand the growth of emerging movements that are anonymously social and ‘digital-first’. Specifically, I examine peripheral subreddits by focusing on three characteristics: topic inheritance (the provision of content themes from a more popular root subreddit), topic similarity (the shared interests among peripheral subreddits), and topic connectivity (the explicit or implicit associations among peripheral subreddits in the form of shared dialogue, activities, beliefs, or sentiments). I use computational methods such as topic modeling and sentiment analysis to analyze user activity and posts in these peripheral subreddits. Further, following the literature on digitally mediated stock market communities, I examine whether these peripheral subreddits engage in communicative processes such as aestheticization, virtualization, and de-realization, and reflexivities such as performativity, transactionality, and gamification.

For Mom, Dad, Wenfeng, Anthony, Olivia, Kitty, Yuhui, Gina, who create and circulate  
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## CHAPTER 1

### INTRODUCTION

My dissertation examines ‘peripheral subreddits’ by analyzing the largest four peripheral subreddits of r/WallStreetBets (r/Superstonk, r/GME, r/GMEJungle, and r/DDintoGME) after the GameStop shares ‘short squeeze’ event initiated by retail investors on Reddit in January 2021. The event triggered rapidly rising share prices of GameStop stock and effectively created a ‘meme stock’ where Reddit was primarily used to coordinate buying signals (Shaban, 2021). After the initial ‘short squeeze’ event, interest around GameStop stocks on Reddit dispersed into several peripheral subreddits beyond the original r/WallStreetBets community, which gradually formed an anonymous social, financial, and ‘digital-first’ online movement (the GameStop movement).

The anonymous social dimension of the GameStop movement emerged from the use of anonymous social media platforms such as Reddit and the social interaction of stock market participants on the platform. Concomitantly, the financial dimension of the movement was linked to the production of knowledge in the financial markets on those subreddits, including the tactics and strategies of movement participants to achieve a collective financial goal. Both elements contributed to the GameStop movement being ‘digital-first’ (meaning the movement did not have an original offline or physical component that preceded it, such as protests in a town square or against government regulations). I will argue that this digital-first feature of the GameStop movement cannot be separated from the overlapping of a digitally mediated and anonymous communication platform (Reddit) and the digitally mediated stock market. This overlap between two digital realms introduces an opportunity to examine whether new forms of socializing

occurred, where anonymous online and socially networked coordinated activities influenced legacy domains such as the stock market. I will examine whether these hypothesized new forms of organizing provide a unique lens to study emerging online social movements around meme-like financial instruments, such as those represented by meme stocks, cryptocurrencies, and non-fungible tokens (NFTs), which have been increasingly covered by mainstream media (Rennison & Gandel, 2022; Yaffe-Bellany, 2022).

In simple terms, my dissertation focuses on examining the communication activities of participants in the GameStop movement on Reddit. The collective goal of the GameStop movement was colloquially called ‘MOASS’ (which stands for ‘Mother of All Short Squeeze’), referring to a change of wealth distribution on a global scale by manipulating meme stocks, such as the GameStop stock. Movement participants were anonymous retail investors on Reddit who participated in the financial system by sharing information and trading stocks on a relatively low volume individually compared to institutional investors, such as banks and hedge funds.

More broadly, my dissertation brings together research on social media platform affordances (Ronzhyn et al., 2022; Nagy & Neff, 2015), social movements (Bennett & Segerberg, 2012; Milan, 2015), and stock market manipulation (Delort et al., 2011; Gomez-Carrasco & Michelon, 2017). It examines the emerging phenomenon of ‘peripheral subreddits’ and how peripheral subreddits facilitated an anonymous social, financial, and digital-first online movement (the GameStop movement) by analyzing the communication patterns, characteristics, and community dynamics of four peripheral subreddits that grew out of r/WallStreetBets (namely, r/Superstonk, r/GME,

r/GMEJungle, and r/DDintoGME). I use explorative computational analysis, topic modeling, sentiment analysis methods, a gold standard software tool for analyzing word use LIWC-22 to conduct this research by analyzing Reddit data on a meta- and word-level basis. For the meta-level analysis, I investigate post-specific metrics, such as post titles, scores, and number of comments per post, as well as user-specific metrics, such as the posting frequency of an author and the overall significance of an author in the peripheral subreddits. I also examine the total posting volume and timeline for each peripheral subreddit.

For the word-level analysis, I conduct computational topic modeling and sentiment analysis on post titles to look for evidence of three characteristics of peripheral subreddits: topic inheritance (the provision of content topics from a more popular root subreddit), topic similarity (the shared interests among peripheral subreddits), and topic connectivity (the explicit or implicit associations among peripheral subreddits in the form of shared dialogue, activities, beliefs, or sentiments). These analyses produce results that include topic lists and word clusters produced by topic modeling, word sentiments produced by sentiment analysis, and interpretation of the linguistic and cultural features. These results also reveal unique communication patterns and community dynamics of peripheral subreddits. Finally, I use LIWC-22, especially, four summary and two linguistic measures and a group of selected word categories to reveal social and psychological properties of the post titles. LIWC-22 results are represented in numerical values ranging from 1-99.

In the interpretations of these analyses, I further sought evidence of communicative processes proposed by digitally mediated stock market scholars, such as

aestheticization (the transformation of communicative experience and processes into a symbolic space on the screen), virtualization (the process of substituting reality with virtual representations via instantaneous communication), and de-realization (the process of creating a perceptual distance from reality), as well as evidence of reflexivities, such as performativity (the communicative experience of recognizing and strategizing with other parties), transactionality (the datafication of information), and gamification (a communicative experience that is game-like, fun, and competitive) (Zwick, 2005; Thompson, 2013). The conceptualizations for aestheticization, virtualization, and de-realization were first introduced by Zwick (2005). Zwick argued that through such communicative processes, the stock market mediated by screens supersedes the market mediated by the expert systems in the pre-internet era. My examination of reflexivities such as performativity, transactionality, and gamification comes from Thompson's (2013) theorizing of financial information reflexivities. Examining potential evidence of these communicative processes and reflexivities not only may help understand the GameStop movement as a unique communication phenomenon but also may help scholars understand the embedded and contextual relationships between digital-first movements, platforms, and the digitally mediated stock market broadly. Furthermore, potential evidence of such actions could help explain the emergence of (and relationships between) peripheral subreddits and novel organizing techniques for online movements. In the following section, I briefly review the GameStop short squeeze event and my study's importance and main contributions.

## **The GameStop Short Squeeze Event**

The subreddit r/WallStreetBets was at the center of the GameStop short squeeze event, seeing a drastic membership increase from 3 to 8 million within less than 10 days (Thorbecke, 2021). The event initially took place in January of 2021, when retail investors used social media, mainly Reddit and online trading platforms, to coordinate a ‘short squeeze’ event on the shares of the GameStop electronics retail company.

According to Investopedia, a short squeeze “is an unusual condition that triggers rapidly rising prices in a stock or other tradable security [...] when a security has a significant amount [sic] of short sellers, meaning lots of investors are betting on its price falling” (Mitchell, 2023). The short squeeze starts “when the price jumps higher unexpectedly and gains momentum as a significant measure of the short sellers decide to cut losses and exit their positions” (Mitchell, 2023).

Besides Reddit, another online platform, Robinhood, was at the center of the event. Robinhood is an online trading platform that was founded to democratize individual retail investors’ access to the financial market with a commission-free model (Tan, 2021) and its investors have been shown to “engage in more attention-induced trading than other retail investors” (Barber et al., 2022, p. 3141). Interestingly, and perhaps in response to growing concerns expressed in the media about how the event would adversely affect financial markets (Sindreu & Toplensky, 2021), instead of siding with the retail investors, Robinhood restricted the buying of GameStop stock and other heavily shorted stocks on its platform during the event on January 28, 2021 (Malz, 2021). At the peak of the GameStop event, GameStop’s stock price closed at \$483 per share, which increased from just under \$20 per share at the beginning of 2021 (GameStop Short Squeeze, 2023). The

event raised questions concerning stock market regulations and the roles of online trading platforms in stock market activities (Banerji et al., 2021). As the momentum of the GameStop event faded, some participants started to sell off their shares, and media attention on the event and its participants waned.

Media then reported on the event as a ‘David and Goliath’ story, where the little guys challenged and triumphed over big institutions. However, institutional investors were also found to have profited from the event (Hasso et al., 2022). The event subsequently triggered regulatory hearings, including those conducted by the US House Committee on Financial Services, featuring testimonies from Robinhood CEO Vladimir Tenev and Reddit CEO Steve Huffman (Egan et al., 2021). The hearings found that financial firms and regulatory authorities, such as the Depository Trust & Clearing Corporation (DTCC), need to better understand the influx of online retail investors. Both Robinhood and DTCC’s practices were found to have contributed to the instability of the stock market during the GameStop short squeeze event. Furthermore, the hearings found that DTCC had regularly exercised non-standardized practices during acute volatilities before the event.

I offer a timeline of key moments during the GameStop movement in Figure 1 below. In the graphic, the x-axis represents the movement's timeline, and the y-axis represents the adjusted GameStop stock price. The graphic includes the creation dates of the peripheral subreddits to be analyzed in this study. In my study, I define the GameStop “event” as the specific short squeeze event that occurred at the end of January 2021. I describe the GameStop “movement” as the continuing collection of events that occurred

on and after the initial short squeeze, including the congressional hearings, growth of peripheral subreddits, and related events.

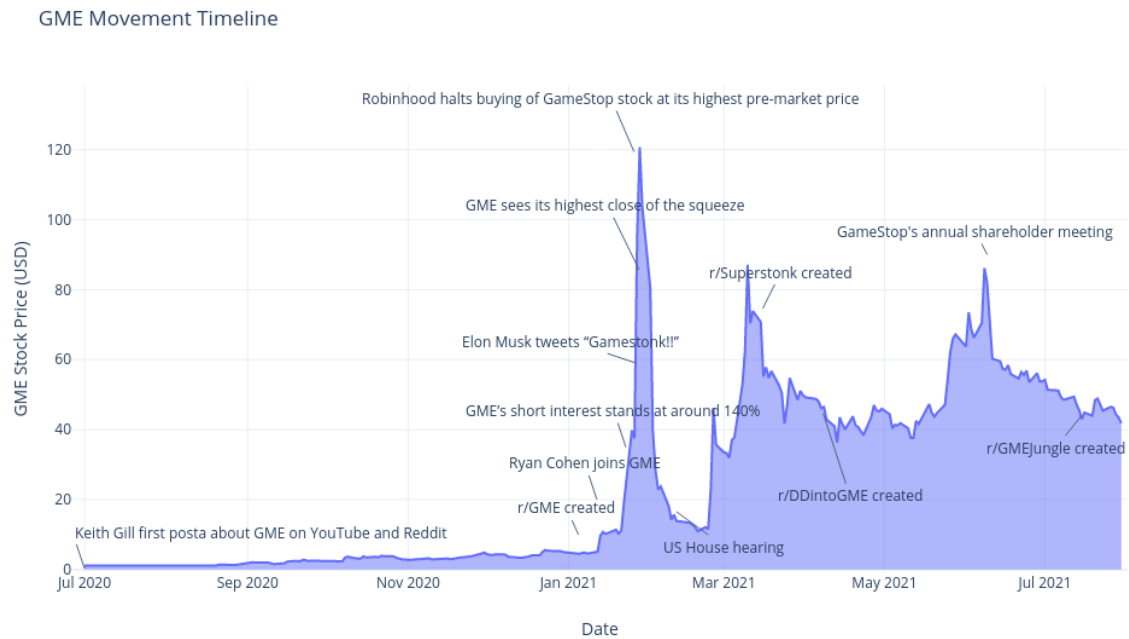


Figure 1. GME movement timeline

The achievements of the GameStop short squeeze event were a surprise to both the institutional investors and a critical public player in the movement, retail investor and YouTuber Keith Gill, who originally betted on the potential of GameStop stock and helped grow social media interest in GME on Reddit under the username DeepFuckingValue (DFV) and his YouTube account, Roaring Kitty. Others have described the GameStop short squeeze event as perhaps the “first case of predatory trading initiated by retail investors” (Hasso et al., 2022, p. 1). Overall, the participants of the movement sought to challenge traditional financial systems such as the stock market and believed they would have been successful if it were not for the interference of

institutional investors such as Citadel Securities (who collaborated with Robinhood to halt trading of the GME stock) and financial regulatory authorities (Osipovich, 2021; Kang, 2021).

### **Meme Stocks**

GameStop stock belong to a collection of meme stocks that are a relatively recent phenomenon, though memes generally have been a key feature of internet culture since the 1990s. Shifman (2013) defines internet memes as “units of popular culture that are circulated, imitated, and transformed by Internet users, creating a shared cultural experience” (p. 367). Internet users who are producers and participants of this shared cultural experience are more likely to identify themselves with the uniqueness of such a shared cultural experience as a community. Internet memes are conducive to the formation of social interactions in a community while affecting the behavior of the constituents of the community, who are also the recipients and senders of internet memes. Specifically, Mazambani et al. (2015) argued that internet memes affect community participation on two levels including internalization (the alignment of one’s values and beliefs with that of the community) and identification (the alignment of one’s identity with that of the community).

Meme stocks, for their part, are a form of an internet meme that refers to the creation of a symbolic representation or meaning that affects meme stock communities and the material object with which meme stock communities interact. Wiggins and Bowers’ (2015) conceptualization of memes as artifacts can help further explicate the relationship between internet memes and meme stocks. They argued that a meme as artifact “possesses virtual physicality”, “highlights their social and cultural role”, and

“underscores the purposeful production and consumption among members of participatory digital culture” (p. 1981). Discussions of meme stocks occur on Reddit and other social media platforms such as X (formerly known as Twitter) (Notopoulos, 2023). However, the effects of these discussions transpose from virtual to physical spaces. Meme stocks communities that produce, consume, and propagate symbolic representations or meanings constitute a form of participatory digital culture.

The meme stocks community’s success in implementing short squeeze pressure on GameStop stock was a surprise even to the community members. Perhaps one reason this success came as a surprise is that often the communities that form around meme stocks do so arguably for the fun of it or to create what has been referred to as “memetic digital nonsense” (Katz & Shifman, 2017, p. 825). Meme stocks emphasize playful meaning-making processes that prioritizes affective meaning over referential meaning. The memetic digital nonsense features of meme stocks balance simplicity, which leverages affective meaning-making processes, and sophistication, which relies on distinctive linguistic uses. Furthermore, the memetic digital nonsense of meme stocks involves a “subversive quality” that “liberates participants from the onerous modern obligation to generate new meaning in every utterance” (Katz & Shifman, 2017, p. 839). The simplicity and the “subversive quality” of meme stocks allow the meme stocks community and the movement from it to include anyone, allowing a variety of participants potentially.

### **Overview of Reddit Studies**

Scholars have long emphasized how the dynamics between media and social movements change as media become more social, decentralized, and networked (Diani,

2000; Bennett & Segerberg, 2012). Research has shown that digitally mediated social movements such as #ArabSpring, #BlackLivesMatter, and #MeToo often achieve critical mass on social media or have online counterparts that help movements connect, recruit, mobilize, and advertise with a personalized touch and low communication costs (Poell et al., 2016; Bruns et al., 2023; Mundt et al., 2018; Quan-Haase et al., 2021). Such digitally mediated forms of connective action provide social movements with new organizational opportunities and have been shown to increase their visibility on traditional news media (Bennett & Segerberg, 2012; Freelon et al., 2018).

Studies of social movements on social media platforms have disproportionately focused on X and Facebook. Reddit is studied less frequently even though it boasts 430 million monthly active users (Kemp, 2021) and 52 million daily active users (Kastrenakes, 2020). Early quantitative studies of Reddit attempted to capture the structure and growth of the platform; Singer et al. (2014) offered a “comprehensive longitudinal study of Reddit’s evolution” from a “gateway to the Web to an increasingly self-referential community that focuses on and reinforces its own user-generated image- and textual content over external sources” (p. 517). Weninger (2014) likewise provided an early macro-level snapshot of several communities on the platform. More recently, Proferes et al. (2021) offered a literature review of Reddit studies and analyzed “727 manuscripts that used Reddit as a data source, published between 2010 and 2020” (p. 1).

Early qualitative research by Massanari (2015, 2016) examined participatory culture, community, and play on Reddit, and a limited number of Reddit studies have specifically examined digitally mediated social movements via the platform, as in the cases of #Gamergate (Massanari, 2017; Buyukozturk et al., 2018; Bergstrom & Poor,

2021), the 2015 moderator-led Reddit blackout (Matias, 2016), the 2021 Cuban government protests (Norambuena et al., 2022), right-wing extremism (Shepherd, 2020; Massanari, 2020; Gaudette et al., 2021; Trujillo & Cresci, 2022), incel subculture and misogyny (Farrell et al., 2019; Helm, 2022), gendered and secular movements (Massanari, 2019; Khan & Golab, 2020; Lundmark & LeDrew, 2019), and racial identity work (Dosono, 2018). Further research has examined communicative action processes across multiple subreddits and communities (Mensah, 2020), including studies of Reddit rules and governance (Fiesler et al., 2018; Chandrasekharan et al., 2018; Jhaver et al., 2019; Chandrasekharan et al., 2022), political engagement (Mills, 2018; Soliman et al., 2019; Shen & Rosé, 2022), and teaching-related online spaces (Staudt et al., 2021).

Generally, Reddit studies can be categorized as quantitative or qualitative, or as examining Reddit-specific communication phenomena that emerge from its affordances (Massanari, 2017, 2022; Chandrasekharan, 2022) or as sampling Reddit data to investigate general communication questions (Norambuena et al., 2022; Khan & Golab, 2020). Reddit-specific communication phenomena offer insights into Reddit affordances and the distinctions between Reddit and other social media platforms. The communication characteristics observed in these studies are specific to Reddit and do not easily transfer outside the platform. Findings from studies of individual subreddits or groups of thematically related subreddits do not readily apply to subreddits covering different topics. Furthermore, Reddit offers unique samples compared to other social media platforms because of its long format and more deliberate communication style for studying general communication phenomena. Reddit thus offers researchers access to rich data sets concerning social, cultural, and political phenomena. However, the importance

of the Reddit platform and its affordances in affecting these phenomena are emphasized less frequently. This study of the GameStop movement provides a novel analysis of a movement that originated on Reddit and thus is intrinsically linked to its affordances.

### **Scope and Significance of the Study**

In this dissertation, I define the GameStop movement as anonymously social, financial, and digital-first. The anonymous social dimension of the GameStop movement refers to the socializing role that Reddit played in organizing the members of peripheral subreddits to enact online connective actions for bringing social change (though the movement started as a joke, it eventually sought the overturn of the financial system to eliminate wealth inequality). The social aspect of the GameStop movement also refers to the affordances of the Reddit platform, where online social interactions occur in hierarchical posting, commenting, and voting, and how such interactions led to stock market participation. The financial dimension of the GameStop movement was found in the financial knowledge sharing that occurred, as well as the financial tactics and strategies of collective action participants (retail investors). Specifically, movement participants (retail investors on GameStop peripheral subreddits) discussed trading tactics and strategies, advised each other on the best practices of trading platforms and financial services, informed each other of financial news, and shared bonds over their disdain for financial system inequalities. In their view, the financial system favored the affluent and was biased against retail investors with complicated, contorted, loophole-ridden rules and regulations (Stewart, 2023).

Lastly, the GameStop movement distinguished itself from other online movements that use digital platforms to connect, recruit, mobilize, and advertise, such as

#ArabSpring, #BlackLivesMatter, and #MeToo, in that it is digital-first. The digital-first characteristic of the GameStop movement can be found in its lack of offline organizing counterparts and the presumed need for them, as shown by previous financial movements such as Occupy Wall Street (Levitin, 2021) and labor strikes (Kim et al., 2020). The digital-first feature also refers to the importance of Reddit affordances in the meaning-making practices on peripheral subreddits and the ensuing formation of connective action (Bennett & Segerberg, 2012). Specifically, online movement participants executed tactics and strategies, such as holding GameStop stocks and transferring their ownership of them away from brokerage firms.

### **Peripheral Subreddits**

Through the examination of the GameStop movement, I introduce the concept of ‘peripheral subreddits’ by studying the four peripheral subreddits of r/WallStreetBets (r/Superstonk, r/GME, r/GMEJungle, and r/DDintoGME). I define peripheral subreddits as topically similar subreddits that appear as offshoots of a larger and more popular subreddit. Such subreddits may result from users wishing to grow the community, support the original subreddit, or function as critiques. I examine characteristics that emerge from the larger and more popular subreddit as topic inheritance. In this study, r/WallStreetBets is the root subreddit of the four peripheral subreddits (r/Superstonk, r/GME, r/GMEJungle, and r/DDintoGME). In addition to topic inheritance, peripheral subreddits are assumed to share topic similarity and connectivity. Topic similarity means posts and comments in peripheral subreddits are thematically related. In contrast, topic connectivity means that the posts and comments in peripheral subreddits often reference each other, either directly by name or indirectly, through shared activities, beliefs, or sentiments.

Furthermore, my conceptualization of peripheral subreddits is not restricted by chronology or membership size. The chronology of peripheral subreddits does not need to match that of the larger and more popular subreddit (the root subreddit), and the membership size of peripheral subreddits can vary. For a brief example, r/GME was created in the same year as the root subreddit r/WallStreetBets. Regarding membership size, the combined members in r/GMEJungle and r/DDintoGME are fewer than those of r/Superstonk or r/GME.

In the case of the GameStop movement, the peripheral subreddits were grown by movement participants because of a perceived compromise of r/WallStreetBets, based on retail investors' observation of unfair content moderation activities, such as moderators removing due diligence posts (also known as DD on Reddit). GameStop Reddit posts tagged with DD suggest the post content results from the author doing their detailed research to share insights with the subreddit community and discussions about GameStop. Peripheral subreddits were thus borne not as a way of segregating contentious factions but as a way of diversifying opinions.

The main contribution of this dissertation is to introduce the concept of peripheral subreddits in the context of an anonymous social, financial, and digital-first online movement. The concept of peripheral subreddits may help researchers provide analytical and explanatory footing to study socially, culturally, and politically significant events on Reddit and the movements that might emerge from them. The concept of peripheral subreddits may also provide opportunities to study the sub-community- and topic-level affordances of the Reddit platform and potentially help scholars identify new affordances of digital platforms, spaces, and tools. The three communication characteristics (topic

inheritance, similarity, and connectivity) may help researchers identify the presence of peripheral subreddits. Meanwhile, studying the texts in peripheral subreddits can help researchers understand the influence of an anonymous social, cultural, and political event after the media spotlight on the event has faded. Such events often enter and exit the media spotlight relatively quickly. By only studying the influence of such an event during its peak popularity and not paying attention to the activities and influence of peripheral subcommunities that emerge, researchers might over- or underdetermine the influence of such an event and, more broadly, the peripheral players that participated.

### **Players and Participants in the GameStop Movement**

From self-reported data and inference from web traffic analytics, Reddit has a young user base in both the U.S. and globally (Press, 2024). The same statistics also show Redditors are mostly male (Press, 2024), based in the U.S. (Lin, 2023), white non-Hispanic (Sattelberg, 2021), and hold at least a college degree (Anderson, 2024). Several academic research also supports Redditors' demographic information from surveys and data inferences. Specifically, Gjurković et al. (2021) presented a dataset of Reddit comments of 10k users and found that most Redditors are young adults from English-speaking countries, and the gender distributions of the Redditors are balanced. The meta-analysis of Reddit demographics and behaviors by Medvedev et al. (2021) showed Redditors are predominantly young, male, and interested in specialized communities. Monti et al. (2023) estimated Redditors' demographic on the subreddit r/news by analyzing their activity patterns and language use. They found that users are primarily young adults in the age range of 20-30 with a middle-class annual income and are more likely to be male.

Researchers have argued that individuals' identities on Reddit are fluid, adaptable, and co-constructed within group identity (subreddits individuals belong to), communication forms (Panek, 2021), and participation roles (Willenberg, 2022). On Reddit, the ongoing process of identity construction is influenced more by user interactions, a focus of Reddit's design features, than by network ties. This differs from platforms like X, where individual connections, such as followers, are publicly visible. Specifically, the identity of individual Reddit users emerges through their interactions in subreddits with four main forms of communication: creating posts, commenting on posts, voting on posts and comments, and replying to other comments. Furthermore, the main participation roles on Reddit include original posters (also known as OP), moderators, and throwaway accounts (user accounts created for one-time use without posting and commenting history) (Willenberg, 2022). In addition to identity constructions through linguistic means and textual interactions, Reddit users bring aspects of their identities through overt disclosures (disclosing one's demographic information voluntarily) and unintended impressions revealed in language use (Panek, 2021).

Although each subreddit is different based on its topical focus and membership makeup and the identity construction of an individual Reddit user is a constant ongoing process, the shared participation roles and communication forms across all subreddits lead to "an overarching identification with the identity of a Redditor" (Willenberg, 2022, p. 201). Redditors often use humor and verbal play to construct specific identities on the platform (Willenberg, 2022, p. 197). Indeed, these communication means are often rewarded by subreddit communities as the most upvoted posts or comments (Willenberg, 2022, p. 221). On the one hand, participants of the GameStop movements are identified

as Redditors. Their distinctive language uses and interactions rely on humor and verbal play to form and maintain group coherence and boundaries. On the other hand, they are also retail investors who embody “a geek sensibility” (Massanari, 2017, p. 330) and are united by a shared purpose: overturning the financial system to eliminate wealth inequality.

Many of the participants in the GME movement were also retail investors. Retail investors are non-professional, individual investors who use their own money to participate in the stock market. Retail investors acted in the GameStop peripheral subreddits by producing and sharing financial information. While the movement started as a joke, participants eventually became bound by a shared financial goal of changing wealth distribution on a global scale and challenging financial markets. The digital-first feature of the GameStop movement meant that it lacked offline counterparts, with virtually all the participants engaging via Reddit to implement connective action tactics and strategies (Bennett & Segerberg, 2012).

In the GameStop peripheral subreddits, movement participants produce and share financial information by posting and commenting. In this dissertation, I argue that the significance of studying the GameStop movement lies at the intersection between the digitally mediated platform (Reddit) that enabled the movement and the digitally mediated stock market. Thus, I analyze the financial information in user’s texts while looking for evidence of communication characteristics introduced in previous research by Zwick (2005) and Thompson (2013) on digital and social financial markets. On the one hand, I argue that the emergence of peripheral subreddits might come from the movement participants’ engagement with these communication processes and reflexivities. On the

other hand, I argue that these feed into the organizational dynamics of peripheral subreddits and further enable the possibilities of a digital-first movement.

In addition to retail investors who are both Redditors and movement participants, individuals with celebrity-like or villain-like status among the movement participants are also players in the GameStop movement. Specifically, Keith Gill was given celebrity-like status as the first retail investor who called attention to the underestimated value of GameStop stocks and how hedge funds heavily shorted GameStop stocks by posting content on YouTube and the r/WallStreetBets subreddit. Former chairman and now CEO of GameStop, Ryan Cohen, was given celebrity-like status (Zambonin, 2023). Kenneth C. Griffin, owner of Citadel Securities, was given villain-like status because of his \$2 billion cash injection to Melvin Capital during the GameStop short squeeze. Citadel was one of the main partners used by Robinhood to complete its users' buy and sell orders, which might have affected Robinhood's decision to halt meme stock trading during the GameStop short squeeze event (Salvucci, 2023).

## CHAPTER 2

### LITERATURE REVIEW

This literature review begins by discussing research on social media and Reddit affordances. Then, I discuss research on digitally mediated online social movements. I then summarize the research on traditional stock market manipulation before examining current studies on the GameStop movement.

#### **Social Media Affordances**

The concept of affordances did not originate from social media platform studies. It was introduced in the domain of ecology and later popularized in the domain of product design. Communication researchers adopted affordance theory to study how various human social actors and non-human actors (such as socio-technical, political, and cultural systems) contribute to understanding the characteristics of social media platforms and how they emerge from the interactions between these actors and their networks. Initially, one of the first definitions of affordance was introduced by Gibson (1977) in ecology. Gibson emphasized that affordance is relational and that the qualities of an object in combination specify what the object affords. Norman (1988) further popularized affordance theory in product design and further differentiated the perceived and actual properties of an object's affordances. The perceived properties of an object's affordance might differ from its actual properties because of the interactions between the users and the object.

Communication scholars focusing on social media have also examined affordances; specifically, Ronzhyn et al. (2022) argued that "social media affordances are the perceived actual or imagined properties of social media, emerging through the relation of

technological, social, and contextual, that enable and constrain specific uses of the platforms” (Ronzhyn et al., 2022, p. 14). The difference between perceived actual or imagined properties of social media indicated the unintentionality of some social media affordances. For example, social media sites such as X and Reddit dictate users’ interactions with the platforms through their design (to a degree). However, users might interpret and interact with the functions or properties of the design in an unintended way. In other words, users’ perceived functions or properties of social media platforms might not match the functions or properties of these platforms as intended by their designers and developers. Furthermore, users’ perceived functions or properties of social media platforms might be imagined instead of misinterpreted. Nagy and Neff (2015) further defined that “imagined affordances emerge between users’ perceptions, attitudes, and expectations; between the materiality and functionality of technologies; and between the intentions and perceptions of designers” (p. 1)

In addition, communication scholars have defined four properties of social media affordances like visibility, persistence, association, and editability (Treem & Leonardi, 2012). The emergence of social media affordances’ visibility and editability is exemplified through the interactions of human actors and the social media system. Visibility refers to the ease of access to information, while editability means that information can be continuously edited, mixed, and remixed. Human actors, such as designers, developers, and owners, are directly or indirectly involved with creating and operating social media platforms. The social media system refers to the socio-technical, political, cultural, and socio-economic system that the social media platforms operate under and participate in. Human actors can directly influence the social media system.

However, the complexity of the social media system often resembles that of an organic being, making accurate predictions on the social media system challenging. Furthermore, persistence refers to the permanence of information traces, including alteration and deletion. Association is defined as establishing connections between individuals, between individuals and content, or between an actor and a presentation.

Peripheral subreddits, as an emerging affordance of Reddit as defined in my dissertation, provide an opportunity to study the four properties of social media affordances as defined by Treem and Leonardi (2012). Specifically, I propose to examine topic inheritance (the provision of content topics from a more popular root subreddit) which focuses on visibility and editability. Topic inheritance from the root subreddit (r/WallStreetBets) to peripheral subreddits is visible in the form of posting history. In contrast, the creation of peripheral subreddits can be seen as the adaptation or recreation of the root subreddit in which the content or the presentation of the root subreddit is being edited, mixed, and remixed. Topic inheritance also speaks to the persistence of social media affordance because the connection between the root subreddit and peripheral subreddits is persistent in time and the online space (Reddit). Furthermore, topic similarity (the shared interests among peripheral subreddits) and topic connectivity (the explicit or implicit associations among peripheral subreddits in the form of shared dialogue activities, beliefs, or sentiments) relate to the association of social media affordances in two dimensions. First, because of the passive or implied association between the root subreddit and peripheral subreddits (and among peripheral subreddits). Second, because of the associations where each user is actively conversing with one another.

Similar to affordances of other text-based social media platforms, such as hashtags on X, peripheral subreddits could also be seen as providing a mechanism for social support, connections, and interactions that help individuals form communities around topics. However, social movements using the framework of peripheral subreddit differ from hashtag activism on X in two dimensions: movement discovery and information dissemination. Each subreddit is topically organized and inherits the hierarchical structure of question and answering on the Reddit platform. In addition, the lack of restrictions on the word limit on Reddit posts offers an opportunity for more detailed deliberations and for users to focus more on the post content than the virality of the posts. Therefore, individuals who discover events and movements on Reddit are more likely to have a pre-existing interest in these topics and more interested in engaging with the communities in-depth or acquiring more in-depth information about the communities. Information dissemination on peripheral subreddits often occurs in the form of questioning and answering. It also moves horizontally across several peripheral subreddits due to three characteristics (topic inheritance, similarities, and connectivity) and vertically within each peripheral subreddit by voting. In contrast, hashtag activism could be seen as a form of networked social movement in which hashtags serve as an indexing system for individuals to discover events and movements (Xiong et al., 2019). Information dissemination on hashtag-based movements tends to be more rapid and focuses more on the virality of information (Wang et al., 2016). However, the hashtag network might provide an opportunity to reach individuals who are unfamiliar with the events and movements due to the diffusion of viral information. In other words, hashtag-based movements on X often compete with each other, but a viral hashtag-based movement

might be able to increase its base of user engagement by attracting individuals in other communities substantially. Admittedly, individuals who are unfamiliar with the events and movements on Reddit could discover the most popular root subreddit of peripheral subreddits on the front page of Reddit. However, the discovery of peripheral subreddits and the engagement with the communities predispose individuals to have a more invested interest in the events and movements than individuals on the networks of hashtags.

My dissertation expands on the above definitions and taxonomy of social media affordances and their properties and provides evidence to study such affordances by examining peripheral subreddits. In the following section, I review current literature on Reddit affordances and examine how they link to peripheral subreddits.

### **Reddit Affordances**

On the one hand, Reddit is a social media platform like X, where users generate content and interact in synchronous and asynchronous conversations. On the other hand, Reddit is a platform where users interact with each other topically and hierarchically. For example, the creation of a subreddit is the formation of a community based on a topic. A subreddit inherits the structure and functions of the Reddit platform, such as the ranking mechanism and the karma system. However, each subreddit can customize its community features, such as flairs and rules. The hierarchical interaction is most apparent in the ranking mechanism where users collectively rank user-generated content, including posts and comments, by upvotes and downvotes. Popular posts may trigger ‘vote fuzzing’, the only closed-source mechanism Reddit uses to normalize the number of upvotes and downvotes. Hierarchical interaction is also found in Reddit comments, which are threaded and thus provide supplemental content (Weninger, 2014).

On the surface, the ranking mechanism is designed to filter content quality and popularity collectively. However, the binary, immediate ranking mechanism conditions users to evaluate content with only two options (optimize or dispose of), which facilitates attention capture with speed. This streamlined process of evaluation, limited to just two options, effectively shapes user behavior toward rapid decision-making. Doing so not only simplifies the content curation process but also accelerates the pace at which users interact with the platform, promoting a swift attention capture. The filtering process prevents content that initially did not receive a high vote score from becoming visible to many users. Because of this, the collective opinion-formation process can be easily gamified or manipulated by a small group of users (Mancini et al., 2022). Mitchell (2015) argued that this sequential voting process resembles the trading behaviors on the stock market mediated by screens. Zwick (2005) initially argued that the stock market mediated by screens altered participants' perceptions of the market and led to voluntary high-risk-taking behaviors via three processes (aestheticization, virtualization, and de-realization). The close resemblance between the affordance of the ranking mechanism on Reddit and the affordance of the digitally mediated stock market partially explains why Reddit was the platform of choice other than X for the GameStop short squeeze event and the ensuing GameStop movement. Such resemblance further explicates the origin and the importance of the digital-first property of the GameStop movement.

More specifically, the symbolic visualization (aestheticization) of live data on Reddit in the form of upvotes and downvotes forms the representation of a virtual reality (virtualization) where the formation of community opinions converges and diverges. Furthermore, on stock-related subreddits, users often post screenshots of their activities

on trading platforms. Such posting tendency proves the aesthetic conversion between the Reddit platform and the digitally mediated stock market. I argue that to Redditors, the physical reality could be no more real than this virtual reality because of how the Reddit platform assembles, contextualizes, and materializes realities in their minds (de-realization). In other words, the Reddit platform affords the GameStop movement of the digital-first property through the processes of aestheticization, virtualization, and de-realization. I further argue that in the minds of the GameStop movement participants, the physical reality where they perform or withhold actions on the stock market can be seen as a continuation of the reality on Reddit, where they deliberate about and vote on their actions in the physical reality.

The de-realization from physical reality (the detachment between the acceptance of reality and physical materiality) is further affected by Reddit's karma system, which represents and rewards the level of Redditors' participation in Reddit's reality with karma points. Karma points are the testimony of users' popularity and credibility. They also play a gatekeeping role that prevents users who don't have enough Karma points from participating in certain subreddits. Karma points are numerical representations of a user's status in a subreddit and contribute to aestheticization. They condition users with an "unconscious sensation of rationality and correctness" (Mitchell, 2015, p. 69) via virtualization, which further contributes to the realization that prioritizes the Reddit reality. In this sense, the properties of the Reddit platform, such as the ranking mechanism and the karma system, afford the GameStop movement a digital-first status, which partially explicates the lack of offline organizing efforts and Redditors' attempts to

enact both online connective actions individually without the traditional means, such as aggregated protesting and demonstration.

So far, studies on Reddit affordances have focused on the affordances linked to individual Reddit features, such as the ranking mechanism and the karma system. However, the new affordances I propose in my dissertation examine Reddit affordances on the subcommunity- and topic levels, as found in peripheral subreddits. Peripheral subreddits, with their topic inheritance, similarity, and connectivity, afford communication scholars novel theoretical, analytical, and interpretative lenses to study socially, culturally, and politically significant events on Reddit, the continuation of such events, and their overall influence, especially after media attention has waned. Furthermore, the focus on the subcommunity- and topic-levels of peripheral subreddits may offer new opportunities to study the emerging affordances of digitally mediated platforms and spaces in general, as well as the collectives that emerge from and use them.

### **Digital Mediated Communication and Social Movements**

From the logic of connective action proposed by Bennett & Segerberg (2012) to cloud protesting introduced by Milan (2015), communication scholars have broadly examined how digitally mediated communication challenges and redefines social movements' tactics, strategies, and organizational dynamics and structure. Social media platforms and their affordances have played a key role in influencing social movements in the digital age. This section highlights several significant scholarly contributions on the relationships between digitally mediated communication and social movements and pinpoints how my dissertation connects with current literature.

Bennett & Segerberg (2012) distinguished between organizational logic, the logic of collective action and the logic of connective action, by examining large-scale social movements that use digital media, such as the Arab Spring, *los indignados* in Spain, and Occupy Wall Street. Subsequently, they proposed three ideal types of large-scale action networks with different degrees of reliance on formal organizational dynamics and structure, which are “self-organizing networks”, “organizationally enabled networks”, and “organizationally brokered networks” (p. 767). They argued that, unlike the logic of collective action, the logic of connective actions does not rely on the core assumptions of centralized resources, formal organizational structure, and collective identity. Instead, the key to the logic of connective actions is the mechanism of sharing widely propagated on social networks, which enables and favors personalized expressions over formally defined collectivity.

In conversation with Bennett and Segerberg’s connective action logic, Milan (2015) introduced the concept of “cloud protesting”, emphasizing the materiality of social media and their affordances. Instead of focusing on “personalized identities” as Bennett & Segerberg proposed, Milan focused on the ‘interactive and shared’ elements of collective identity building, following the politics of visibility, which “creates individuals-in-the-group, whereby the ‘collective’ is experienced through the ‘individual’ and the group is the means of collective action, rather than its end (p. 887).” In other words, the process of cloud protesting is constituted by the continuous activations of collective identity and action formation. The formation of collectivity under Milan’s conceptualization is a continuous process where an individual is free to construct a personalized and universal

narrative in an imagined space of the cloud that is “flexible, real-time, and crowd-controlled” (p. 894).

Instead of studying the organizational dynamics and structure mediated by digital communication, Poell et al. (2015) focused on the role of individuals in social movements mediated by social media platforms by examining data on the entire lifetime of the Kullena Khaled Said Facebook page. They introduced the concept of “connective leaders” who “invite and steer” movement participants rather than “command and proclaim” (p. 1005) with a degree of anonymity by employing movement strategies that resemble marketing more than traditional top-down movement strategies. In my dissertation, I analyze the author's activities and connect the significant authors (authors who have either high reputations or high activity levels) in peripheral subreddits with the concept of connective leaders. I also try to broaden the original definition of connective leaders to include imagined connective leaders who enjoy a celebrity-like status in peripheral subreddits but might not directly engage with the community. My definition of imagined connective leaders further emphasizes the connective role, including leaders liked and disliked by the community.

Even though the conceptualizations of “connective action”, “cloud protesting”, and “connective leaders” did not consider movements on Reddit and the affordances of the Reddit platform, they provide a theoretical foundation to support the initial formation and continuous activation of the GameStop movement. Furthermore, the posts and comments on GameStop peripheral subreddits can be seen as community knowledge. Viewing the deliberating processes of the GameStop movement as knowledge production processes and records of their deliberation as community knowledge offers an opportunity to re-

examine the value of questioning in organizing. Bighash (2018) argued that communicating questions can result in sub-community formation organized by shared interests with permeable boundaries. They further argued that the sub-community will grow based on increased information needs. However, the sub-community will eventually dissolve when the information needs are fulfilled, and the records of information-seeking processes in the form of communicating questions will become public goods for the whole community. Instead of arguing for the eventual dissolution of the sub-community, I argue that networked subcommunities in the form of peripheral subreddits are likely to occur to minimize the contentions among the whole community and diversify the voices in the whole community on Reddit. Peripheral subreddits, as new Reddit affordances, offer an opportunity to extend the role of questioning in organizing and serving as a central theoretical support to understand the organizing dynamics of the GameStop movement.

Furthermore, peripheral subreddits can be seen as sites of “contentious publicness” (Kavada & Poell, 2021, p. 190), where movement participants arguably make their collectivity and knowledge production public in an interactive process. The differences in participation levels across the GameStop peripheral subreddits (which can be observed in the author’s post history) and the diversification of voices in the GameStop peripheral subreddits support the conceptualization of viewing GameStop peripheral subreddits as a space “distinct from the dominant sphere, towards distributed forms of contention” (Kavada & Poell, 2021, p. 190). Peripheral subreddits as sites of “contentious publicness” also can presumably help legitimize peripheral subreddits as an “arena of claims” (p. 190)

which inherits the claim-making legitimacy from the root subreddit, in this case, r/WallStreetBets.

Lastly, the concept of peripheral subreddits can be seen as a platform-specific, sub-community level affordance that echoes one of the social media affordances for organizing collective action, which is structuring and de-structuring the community, as introduced by Sæbø et al. (2020). The authors analyzed the Italian political movement Movimento Cinque Stelle by using various data sources such as interviews, social media platforms (Facebook pages, Twitter feeds, and Meetup pages), movement websites, and internal documents. They deemed (de)structuring the community as a way to improve the effectiveness of the collective action. The concept of peripheral subreddits shares similarities with (de)structuring the community social media affordance on a sub-community level broadly defined by Sæbø et al. (2020). However, peripheral subreddits also have a topic-level focus, characterized by topic inheritance, similarity, and connectivity, and an emphasis on diversifying opinions in the community instead of merely improving the effectiveness of collective actions.

So far, communication scholars have focused mainly on conceptualizing organizational dynamics and structure by studying social movements mediated on Facebook and Twitter (Lim, 2012; Poell et al., 2015). Although Reddit and its platform affordances have been studied in the context of social movements, such as the 2015 moderator-led Reddit blackout (Matias, 2016), communication scholars have mainly focused on using Reddit data to study movements that originated outside the Reddit platform (Norambuena et al., 2022; Shepherd, 2020; Massanari, 2020; Gaudette et al.,

2021; Trujillo & Cresci, 2022) or movements specifically related to toxic Reddit technocultures (Massanari, 2017, 2022; Buyukozturk, et al, 2018, Khan & Golab, 2020).

From reviewing the literature on social movements mediated by digital communication, I argue the GameStop movement can be seen as a social movement that has a “self-organizing network” (Bennett & Segerberg, 2012, p. 767) and relies on the materiality of Reddit and its affordances, which enable the continuous activations of collectivity. Furthermore, GME peripheral subreddits can be seen as sites of “contentious publicness” (Kavada & Poell, 2021, p. 190), which enables the members of GME peripheral subreddits to take on the identity of movement participants who deliberate and produce community knowledge that (re)constitutes collectivity. The argument of viewing the series of events followed by the GameStop short squeeze event enacted by members of GME peripheral subreddits as a social movement can be further supported by examining the duration of Occupy Wall Street, which has a similar financial dimension. Specifically, Occupy Wall Street continued for 59 days (Anderson, 2021), while the duration of activities on GME peripheral subreddits examined in this dissertation spans almost a year. Moreover, the similarities between the social movement by the hacktivist collective Anonymous (Coleman, 2015) and the GameStop movement help bolster the argument that viewing a series of coordinated events about GME stock is a social movement. Specifically, both movements take on a decentralized and self-organizing network and are largely online. Both movements were originally seen by the public as a joke and inherited elements of meme culture while emphasizing the collective power of individuals against powerful establishments. Lastly, the novelty of retail investors mainly using Reddit to coordinate and enact collective actions on a meme stock and its

accomplishment could partially explain why the new media downplayed the seriousness of the GameStop short squeeze event and the following social movement (Morrow, 2021).

The study of the GameStop movement extends the social movement literature in the digital age to include movements originated on and enabled by the Reddit platform and its affordances. Peripheral subreddits, as new Reddit affordances, provide an opportunity to study social movements that prioritize the online over the offline and help redefine the organizing dynamics and structures of social movement characterized by being digital first.

### **Emotions and Social Movements**

Communication scholars have broadly explored the relationship between emotions and social movements (Tsang, 2023; Eddington et al., 2023; Jasper, 2011; Thomas et al., 2009). Tsang (2023) argued that social movement is a “transformational process of emotional habitus” (p. 1572). Positive emotions, such as sympathy and empathy, will likely promote social cohesion and in-group identification for social movements. In contrast, negative emotions, such as self-focused anger and moral outrage, are more likely to facilitate social change strategies and actions (Thomas et al., 2009). Jasper (1998) argued that the first steps toward recruitment into social movements are “moral shocks.” Moral shocks occur when “an unexpected event or piece of information raises such a sense of outrage in a person that she becomes inclined toward political action, whether or not she has acquaintances in the movement” (Jasper, 1998, p. 409). Moral shocks and continuous moral outrage can create in-group solidarity and form collective identities (Thomas et al., 2009). The experience of these emotions also provides

participants of social movements with “injustice frames” (Jasper, 1998, p. 413), which, on the one hand, shapes the normative meaning-making processes and form “affective loyalties” (Jasper, 2011, p. 287) with in-group members. On the other hand, these may generate and validate villains (Jasper, 1998). Like other social movements that used social media for organizing, such as Occupy Wall Street and Arab Spring, the GameStop movement is the continuation of a moral shock event (the GameStop short squeeze event), which serves as “the impetus for communicative and organizational processes” (Eddington et al., 2023, p. 119).

Jasper (2011) argued that “emotions are part of a flow of action and interaction, not simply the prior motivations to engage or the outcomes that follow” (p. 297). In this sense, the moral outrage that the GameStop movement participants shared provides the background conditions to form long-lasting affective ties and collective identities among participants. This shared emotional experience also promotes sympathy, which refers to the emotion of “being moved by another’s suffering and wanting to help” (Wispé, 1986, p. 289), and empathy, which refers to the emotion of “I will help you because you are me” (Turner et al., 1987, p. 62) among participants who constantly engage in the communicative processes of argumentation and consensualization among each other (Thomas et al., 2009). Put another way, moral outrage facilitated the formation of collectivity in the GameStop movement. At the same time, positive emotions, such as sympathy and empathy, further bonded the participants while they constantly deliberated movement tactics and strategies.

Mainstream media coverage observed the shared emotions (moral outrage at the status quo in the financial system) (Cheng, 2021; Fenton & Fitz-Gibbon, 2021) between

Occupy Wall Street and the GameStop short squeeze event. Since the GameStop movement originated from the GameStop short squeeze event, it can be argued that the shared emotions among participants of the GameStop movement include sympathy towards participants of Occupy Wall Street, which featured similar outrage at financial systems. In this sense, the GameStop movement might be seen as an extension (albeit an originally funnier one) of Occupy Wall Street. However, unlike Occupy Wall Street, in which offline organizing efforts were intertwined with online organizing efforts, the “digital-first” feature of the GameStop movement may have facilitated more “intense interaction ritual experiences” (Summers-Effler, 2002, p. 55). Summers-Effler argued that “collective identity requires repeated ritual to retain its ability to call up feelings of emotional energy” (p. 50). The digital-first feature of the GameStop movement creates opportunities for “many to many” interactions among participants who practice and solidify distinctive and ritualist language uses with humor and verbal play. In other words, participants of the GameStop movement continually refine their meaning-making processes online, accelerating the pace with each cycle. Participants use online “sensitizing apparatuses” (Jasper, 2011, p. 292), such as distinctive emoji combinations, instead of physical props to maintain the cohesion of the collective identity while the collective diversifies into peripheral subreddits due to strategic differences.

### **Stock Market Manipulation**

The GameStop movement participants organize their communication network on Reddit to seek and produce information and knowledge related to the stock market. The social aspect of the stock market lies in social interactions among investors. Even before the internet, discussing and sharing information about investment strategies and analyses

was the primary activity among investors. Stock market participants collected stock information from newspapers, television, and radio programs mediated by expert systems, such as banks, investment firms, and fund managers. They shared and discussed information at social gatherings and during phone calls. Gui et al. (2014) argued that the stock market is a dynamic system interconnected by various participation agents, such as enterprises, institutions, and individuals.

Unlike the stock market in the pre-internet era when the temporality and spatiality of the stock market were separated from that of stock market participants, the stock market now is mediated by screens, supercharged by the internet that sustains a “vast range of observation, presentation, and interaction capabilities” (Zwick, 2005, p. 27). Zwick (2005) argued that screens “enhance and routinize the relationship between the individual and the stock market while counteracting the sense of alienation and distance that characterizes this relationship when mediated” in the pre-internet era “by expert systems.” Building on Zwick's analysis, one can infer that the digitally mediated stock market resembles the virtualization and de-realization processes that Reddit affords.

The properties of financial information produced through the digitally mediated stock market can be understood through three types of financial information reflexivities introduced by Thompson (2013). I rephrase Thompson's three reflexivities (performative, transactional, and game reflexivities) into performativity, transactionality, and gamification to emphasize the dynamic nature within the ecosystem of the digitally mediated stock market, such as online trading platforms. The dynamic nature implies the ongoing communicative processes that are shaped by investor participation and community interactions. Specifically, performativity emphasizes recognizing and

strategizing with other parties in the stock market. In other words, the performances of stock market participants are interlinked and affected by one another and the overall community they form. Transactionality refers to the datafication of information pertaining to the communicative process of converting vast arrays of stock market information into structured and quantifiable data and translating complex and often ambiguous stock market signals into discrete and actionable insights. Gamification denotes making stock trading game-like, fun, and competitive. It also signifies that the game-like interactive experience influences and reinforces the stock market participants' actions, opinions, and beliefs. I argue that introducing online trading platforms with a commission-free model, such as Robinhood, realizes and enhances “the power of the screens” and the reflexivities of financial information. I further argue that the communicative processes of the digitally mediated stock market and the reflexivities of digital financial information can be observed in GameStop peripheral subreddits and engage with the organizing dynamics that GameStop peripheral subreddits afford.

Furthermore, in the age of the digitally mediated stock market, on the one hand, the characteristics of stock market manipulation can be seen as characteristics of digitally mediated communication technologies. On the other hand, the characteristics of stock market manipulation cannot be separated from the intentions and identities of the manipulators. Although manipulation carries a negative undertone, “stock market manipulation is generally defined as the creation and exploitation of arbitrage opportunities” (Delort et al., 2011, p. 2). Arbitrage opportunities exist because of the asymmetries in the stock market and constant searches for symmetries. These symmetry-seekers, or information-seekers, broadly have various identities, such as retail investors,

consumer associates and trade unions, and corporates. Aggarwal and Wu (2003) contended that the role of information-seekers in a market with manipulators is ambiguous. They can increase competition and market efficiency but also increase the possibility of manipulators entering the market. Manipulators take advantage of the information-seekers desire to be informed. Based on the manipulators' identities and the intentions behind manipulation, stock market manipulation can be viewed as a social movement or fraud. Scholars have conducted empirical studies about social movements on social media platforms and the digitally mediated stock market. Specifically, Gomez-Carrasco and Michelon (2017) studied the effect of Twitter activism by stakeholders on stock prices. They viewed stock market manipulation as "collective expressions of compliant or proposals for solutions to a problem" and a "proactive strategy" (p. 4). In this case, the manipulators are "collective, organized and public," manipulating information-seekers with their visibility and influence. Renault (2017) analyzed texts on Twitter about a type of financial instrument, securities, and identified clusters of users who were engaging in suspicious online activity. Sabherwal et al. (2011) identified stock market manipulation using an action-based technique (pump-and-dump) by analyzing internet message board activities. The definition of manipulation includes a range of manipulators, from fraudsters to movement activists, further complicated by manipulation techniques because manipulators have less control over the outcomes of indirect strategies.

Based on manipulation techniques, Chakraborty & Yılmaz (2004) broadly defined stock market manipulation into three categories, including two direct strategies, which are trade-based and action-based manipulation, and one indirect strategy, which is

information-based manipulation. Trade-based manipulation directly and solely relies on trading activities in the stock market. In contrast, action-based manipulation involves influencing traders' beliefs and distorting the perception of informed traders. Information-based manipulation is based on releasing false or misleading information (Gerace et al., 2014). Because of the new forms of social dynamics in online communities around the stock market in the digital age, the boundaries between these three types of stock market manipulation techniques are often blurry and used simultaneously.

Participants of the GameStop movements can be seen as both information seekers and manipulators. The social dynamics of peripheral subreddits allow the participants to deploy all three manipulation techniques to achieve their goal. However, the definition of these three manipulation techniques must be normalized to fit the context of studying stock market manipulation as a social movement. Specifically, a revised definition of action-based manipulation could emphasize the impact on participants' beliefs and sentiments, subsequently altering their behavior, regardless of any underlying intent. Likewise, an updated definition of information-based manipulation could concentrate on the processes and outcomes of knowledge production. The three types of manipulation techniques with adjusted definitions help categorize connective actions in peripheral subreddits and the GameStop movement.

Several studies have examined the GameStop short squeeze event. However, fewer studies have investigated the movement that emerged from the event. In the following section, I review the literature on the GameStop short squeeze event before discussing my research questions, and research methods.

## **Studies on the GameStop Short Squeeze Event**

Studies on the GameStop short squeeze event include qualitative and quantitative peer-reviewed studies, a book-length monograph, and an edited anthology. Jakab's monograph (2022) *The Revolution That Wasn't: GameStop, Reddit, and the Fleecing of Small Investors*, provides a detailed chronology of the events and argues that despite the perception of a revolution empowering everyday investors and challenging hedge funds, the event resulted in the further tightening of financial markets benefitting Wall Street. Chohan and Van Kerckhoven's (2023) edited anthology, *Activist Retail Investors and the Future of Financial Markets: Understanding YOLO Capitalism*, contains chapters that explain the modern phenomena of meme stocks, the GME event, and what the authors refer to as "You Only Live Once (YOLO) trading" driven by small-scale retail investors uniting to exert influence on the market. The anthology includes diverse perspectives on activist, retail investing and coordinated online movements, including political economy and sociological approaches.

Several qualitative studies have examined GME, providing interpretive findings concerning user behavior, messaging, and community. Hartzell et al. (2021) explore how source credibility is established in social media, specifically focusing on the r/WallStreetBets Reddit community during the spring of 2021 and discovered that the subreddit established source credibility through factors such as the community's popularity, volunteer moderators, and the use of shared language known only to members. Transactional credibility was established using upvotes, downvotes, and awards to determine content visibility and recognize meaningful contributions, while terminal credibility developed over time as users and posts accumulated upvotes and

awards, enhancing their reputation within the community. Van Kerckhoven and O'Dubhghaill (2021) explore how such Wall Street betters on Reddit have raised important questions about regulation and speculative investing.

Glassman & Kuznetcova (2022) analyze how traditional media initially portrayed GME humorously before turning negative and eventually ceasing reporting altogether. The study describes how the subreddit communities evolved using bottom-up communication strategies, open-source analysis, and platform functionalities to challenge traditional media narratives. Das and Tham (2022) examine the lessons that technical communicators can draw from GME and employ a case study methodology that combines positivist and interpretive perspectives to analyze the unfolding event. The authors curate a series of Reddit posts related to GME and apply critical discourse analysis to identify the professional and theoretical implications of the tactical and multimodal elements present in these posts, revealing that the networked social mania was driven by a discourse centered around a shared goal and emergent leadership through community building.

Other qualitative studies use rhetorical and political approaches to study GME. Yang and Adamczyk (2023) argue that participants' arguments in the GME event reflect rhetorical strategies used by technological innovators, users, and regulators to manage public engagement in the name of democracy. Along these political lines, Chohan (2023) analyzes GME using the Gramscian perspective of hegemony and counter-hegemony arguing that GME fell short of fundamentally transforming the economic superstructure. Lastly, Just and Petersen (2023) explore the concept of "creative subversion" within digitally mediated publics, challenging the notion that online platforms only lead to

extremism and radicalization. The study highlights the role of digital platforms and communication dynamics in facilitating and celebrating the reckless behavior of r/WallStreetBets members.

Quantitative studies of GME far outnumber qualitative studies and are primarily found in scientific journal articles that seek to establish causal relationships between various factors, including stock performance and Reddit post frequencies. One of the first such studies, Umar et al. (2021a), investigates the relationship between stock prices of heavily shorted companies during GME using Wavelet coherence analyses to analyze the link between GME prices and other frequently shorted stocks. The research findings reveal a strong positive association between GME prices and the performance of high short-interest indices, highlighting how retail investor herding and bubble behavior can transmit across different stocks, including those from unrelated sectors. In a second study, Umar et al. (2021b) examine the relationship between GME returns and sentiment-driven pricing, focusing on indicators such as Twitter publication count, news publication count (excluding Twitter), put-call ratio, and short-sale volume, highlighting the impact of media-driven sentiment on market inefficiency, suggesting the need for continuous monitoring of investing groups on social media platforms by regulators and policymakers. Wang and Luo (2021) explore the use of sentiment from r/WallStreetBets posts to predict the daily price movement of GME, employing VADER for automatic sentiment analysis and utilizing word2vec and BERT semantic representations. Zhou et al. (2021) analyze causal interactions within social media to understand GME using data from r/WallStreetBets and construct causal networks to illustrate the evolving relationship between GME's stock price and the sentiment of r/WallStreetBets Redditors.

Mancini et al. (2022) analyze the structure and temporal evolution of Reddit conversations related to GME, finding that user engagement and sentiment increased well before the short squeeze occurred. They propose a model of opinion dynamics where user engagement triggers a self-reinforcing mechanism leading to consensus formation, mirroring the success of the short squeeze. Anand and Pathak (2022) provide evidence demonstrating that the way discussions took place on r/WallStreetBets exhibited notable predictive connections with GME's intraday variables. Klein (2022) investigates a secondary outcome of GME and explores the connection between the attention given to meme stocks by retail investors and their financial literacy and self-education. By analyzing high-frequency data, short interest, and derivative figures related to GME, the study reveals that these financial concepts are reflected in keyword searches across various platforms. Lyócsa et al. (2022) analyze the price fluctuations of four stocks, namely GameStop, AMC Entertainment Holdings, Blackberry, and Nokia, during the period of 2020 and early 2021, which experienced a decentralized short squeeze that took advantage of institutional investors' short positions, finding that the activity level on r/WallStreetBets, compared to Google searches related to the event, can partially explain the price variations observed the following day. Vasileiou et al. (2022) demonstrates the significance of volume and Google searches in explaining the performance of GME, emphasizing that timely access to information on volume and search trends can offer valuable insights to investors, with faster access leading to greater advantages.

Lucchini et al. (2022) analyzes both Reddit and financial data to provide insights into the GME events by introducing the concept of individual commitment in financial discussions and demonstrates that the level of commitment among Reddit users increased

prior to the initial surge in price. The study also reveals that the initially committed users held central positions in the Reddit conversation network, and the social identity of the broader Reddit community grew as the connective action unfolded. Betzer and Harries (2022) utilized financial data and a comprehensive dataset of Reddit posts, revealing a significant and positive correlation between Reddit posts and various trading metrics within a 30-minute window, suggesting an attention-based mechanism. Agrawal et al. (2022) focuses on understanding the traits of the largest financial Reddit communities, including r/WallStreetBets, r/Stocks, and r/Investing by analyzing linguistic features and conducting topic modeling. The study identifies prominent keywords and phrases in each community, revealing their thematic focus and risk affinity. Machavarapu (2022) utilizes sentiment data from the r/WallStreetBets discussion board and stock price data to develop a longitudinal long short-term memory model for predicting the stock prices of GME and AMC Entertainment Holdings (AMC), implying that institutional investors incorporating sentiment data in their predictive models could have potentially avoided the short squeeze event. Schou et al. (2022) use a mixed-methods research approach to study r/WallStreetBets, combining topic modeling and qualitative coding. The study introduces the concept of a “flash movement,” characterized by swift emergence without premeditation, shaped by the dynamics of online communities. Haq et al. (2022) compares long-term users and newcomers on r/WallStreetBets, examining their writing styles, topics of discussion, and responsiveness to community feedback, and finds significant differences in post length and emoji usage between regular and new users.

Among the most recent quantitative studies of GME, Long et al. (2023) conduct a sentiment analysis on 10.8 million comments using a customized dictionary based on the

VADER sentiment analysis package, analyzing the relationships between Reddit sentiments and short-term GME returns. Vaughan et al. (2023) examines the differences between GME and the Occupy Wall Street movement using non-negative matrix factorization topic modeling and manual content analysis, highlighting that while Occupy represented connective action through its discursive and technological openness, the mobilization around the short squeeze displayed disconnections in discourse and technology, influenced by a decade of platformization. The study highlights how platforms can establish boundaries and act as intermediaries in contentious politics, affecting modes of action, collective identities, and discourses. Chacon et al. (2023) examine whether a simple trading strategy based on r/WallStreetBets recommendations can generate positive returns yet find no evidence to support this claim. While they observe a positive relationship between r/WallStreetBets submissions and trading volume, a portfolio that follows r/WallStreetBets' buy and sell recommendations daily does not yield profitable returns after accounting for risk. Kim et al. (2023) analyzed the sentiment of r/WallStreetBets posts and compared the level of social awareness among users discussing GME trading on different social media platforms, finding that the sentiment and number of posts had an impact on GME's intraday transaction volumes and contributed to the emergence of irrational trading patterns. Lastly, Rahman et al. (2023) introduces a BERT-based sentiment scoring approach specifically designed for analyzing text in r/WallStreetBets, while encouraging future financial literature studies to leverage pre-trained language models for text analysis.

In summary and to reiterate, I propose the concept of peripheral subreddits by examining them in the context of an anonymous social, financial, digital-first movement

(the GameStop movement). My dissertation connects studies on platform affordances, social movements, and stock market manipulation in the age of digitally mediated communication. It theorizes on top of current Reddit affordance studies focusing on individual platform affordance to include subcommunity- and topic-level affordances. In the context of the GameStop movement, I look for evidence regarding the communication characteristics of peripheral subreddits such as topic inheritance, similarity, and connectivity. I also look for evidence of communicative processes, such as aestheticization, virtualization, and de-realization, and reflexivities, such as performativity, transactionality, and gamification. I argue that the communicative and interactive characteristics of peripheral subreddits form new ways of organizing. I also argue that these new ways of organizing build on theories of networked individuals, their personalized interactions, and connective action as found in previous literature (Bennett and Segerberg, 2012; Diani, 2000) on social movements in the digital age has conceptualized.

### **Research Questions**

Based on my current theorization on peripheral subreddits, their relationship to the GameStop movement, and new ways of organizing, I propose two research questions. The first research question focuses on the discovery and validation of a new Reddit affordance (peripheral subreddits) on the subcommunity- and topic levels. I plan on answering the first question by examining the communicative and interactive characteristics of the GameStop peripheral subreddits, namely, topic inheritance, similarity, and connectiveness. The second research question focuses on an organizing principle of the GameStop movement. I examine social movement components, such as

collective identity formation and connective actions, by examining the community dynamics and movements in the GameStop peripheral subreddits.

*(RQ1) What kinds of topic inheritance, similarities, and connectivity are observable on the GME peripheral subreddits?*

*(RQ2) What kinds of topic inheritance, similarities, and connectivity are observable on the GME peripheral subreddits?*

## CHAPTER 3

### METHODS

The emphasis on the topical aspect of the peripheral subreddits and the vast amount of data available on them makes the study of peripheral subreddits a well-fit candidate for computational methods, such as topic modeling, sentiment analysis, software-based word-level analysis. In my dissertation, I used computational methods to collect and analyze Reddit data. Specifically, I used Python and Wolfram Language to collect, preprocess, and analyze Reddit data. The most relevant Reddit data from the scraping includes anonymous usernames, dates when posts were made, scores based on the number of upvotes or downvotes on a post, number of comments on posts, and titles. I analyzed only the text in the post titles rather than the text in the body of posts because most do not contain textual content (for example, many posts consist of single links that generate a title or images). I preprocessed the data using several steps, which include removing stopwords (words commonly used in a language but which do not add much meaning to a sentence, e.g., “the” or “and”), URLs (links), special characters, and single characters.

After cleaning the text from post titles, a two-level analysis was performed, including a meta- and a word-level analysis. The meta-analysis examines the following key metric of the meta-data in GME peripheral subreddits: daily posting volumes and their progressions, common authors based on posting history and their significance measured by total number of comments and scores. The meta-analysis is performed by a Python script using a popular data analysis library pandas. The statistics of key metrics, including dates, author, scores, and number of comments are shown in Appendix 1 and 2. The

meta-analysis helps with the identification of the different roles each peripheral subreddit plays and the identification of the “connective leaders”. The word-level analysis includes topic modeling (Vayansky & Kumar, 2020), sentiment analysis (Medhat et al., 2014), a procedure of examining digital text to assess whether the emotional sentiment of the message is positive, negative, or neutral, and LIWC-22 analysis.

For topic modeling, I used the BERTopic Python package, which leverages hugging face 🤗 transformers and Class Term Frequency Inverse Document Frequency (c-TF-IDF) to create dense clusters. It also uses machine learning such as Uniform Manifold Approximation and Projection (UMAP) for dimensionality reduction and Hierarchical Density-Based Spatial Clustering of Applications with Noise (HDBSCAN) for clustering. Specifically, I analyzed the top 10 most frequently occurred topics produced by BERTopic by interpreting topic words with contexts and post-title examples in the overall corpus of GME peripheral subreddits and extracted a one-month snapshot of each subreddit since their creations for additional topic modeling analysis of the same method. Before performing topic modeling on the post titles, I deduplicated the datasets (i.e., eliminating redundant data). Since the four peripheral subreddits have various sizes, with r/Superstonk and r/GME having considerably more data than r/DDintoGME and r/GMEJungle, I used different dimension reduction and topic clustering techniques to make the number of topics per subreddit comparable. First, I converted post titles to numerical representations using sentence transformers optimized for semantic similarity. Second, I adjusted the parameters for dimensionality reduction to focus on the more prominent neighborhoods of each point when estimating the manifold structure of the data. I used the KeyBERTInspired model to fine-tune topic representations in addition to

Bag-of-Words representation and weighting with c-TF-IDF. Communication scholars have relied on Latent Dirichlet Allocation (LDA), which uses TF-IDF, for topic modeling. Although LDA is a well-tested method for discovering underlying topics in a corpus, it is a probabilistic generative model introduced in 2003. BERTopic is considered the most advanced technique for topic modeling today. It can also process more extensive and diverse datasets than LDA, offering more fine-grained, easy-to-interpret results.

I used the Valence Aware Dictionary for Sentiment Reasoning (VADER) to perform sentiment analysis on post titles (Hutto & Gilbert, 2014). VADER is a lexicon and rule-based sentiment analysis tool attuned explicitly to social media sentiments. I modified the VADER lexicon to account for community-specific language use. Like topic modeling, sentiment analysis also was performed on the entire corpus (post titles) of each peripheral subreddit (from their respective inception dates to the date 12/31/2021) and their one-month “snapshots” since their respective inception dates. each GME peripheral subreddit. I used VADER with a customized dictionary that reflects the unique language usage in GME peripheral subreddits by expanding the default VADER dictionary with new vocabulary and adjusting the sentiment scores of the preexisting vocabulary (Table 11 shows the revised VADER dictionary).

Finally, I used a software program, LIWC-22 (Boyd et al., 2022) to analyze the social and psychological properties of the post titles. LIWC-22 has over 100 built-in dictionaries and calculates the social and psychological properties of a text by counting the words represented in each of the LIWC-22 sub-dictionaries against the total words of a text. A Python package sweetviz (Bertrand, 2023) performs and visualizes the statistical analysis on metrics from LIWC-22. LIWC-22 is a word-analysis software with over 100

built-in dictionaries that broadly represent many ways language is used. The built-in dictionaries compose the overall LIWC corpus, which has over 31 million words and includes individuals' Reddit comments as one of its corpus types (Boyd et al., 2022). LIWC-22 calculates a text's social and psychological properties by counting the words represented in each of the LIWC-22 subdictionaries against the total words of a text. One word might be categorized in different dictionaries, and most categories follow a hierarchical structure. For example, LIWC-22 would categorize all happy words as positive emotion words, which would be under a more encompassing category of emotion words. Furthermore, the word 'celebrate' is used in both positive emotion and achievement dictionaries. Probabilistic models of language use are considered to address the ambiguity of a word within a context. These features help the word-level analysis performed by LIWC-22 reveal linguistic, statistical, and psychological information about a text. Specifically, this study focuses on the four psychological summary measures and two linguistic ones: analytical thinking, clout, authenticity, and emotional Tone. Analytic thinking measures "formal, logical, and hierarchical thinking patterns". A low score in analytic thinking measure reflects more informal, personal, and narrative thinking. A high number in clout measure suggests that the individual is speaking from "the perspective of high expertise and is confident". In contrast, a low score in clout measure reflects a more tentative, humble, and even anxious text style. Authenticity measures the degree of self-regulation. A high score in authenticity measure is associated with "a more personal, and disclosing text", while a low number in authenticity measure is associated with "a more guarded, distanced form of discourse". In contrast, emotional tone measures both positive and negative tones with a single summary variable. "A

number around 50 suggests either lack of emotionality or different levels of ambivalence." Moreover, a number above 50 indicates a more positive emotional tone, while a number below 50 suggests a more negative emotional tone (McCarthy & Boonthum-Denecke, 2012; Boyd et al., 2022). Furthermore, LIWC-22 differentiates words in two categories: style words (which reflect how people are communicating) and content words (which convey what people are communicating). The calculation of the first three summary measures (excluding emotional tone measure) mainly relies on the use of the style words. The focus on the style words to reveal the psychological states of the texts and participants in the GME movement complements previous word-level analyses using topic modeling and sentiment analysis (which emphasizes the content words). In turn, the imprecise measurement of the psychological states embedded in LIWC-22 is complemented by the results revealed in topic modeling and sentiment analysis. Lastly, the two linguistic summary measures are WC (word count in a post title) and Big Words (the number of words with more than six letters in a post title).

Each summary measure is a standardized score of percentiles ranging from 1 to 99 and is algorithmically derived from multiple variables. The precise algorithm for each summary measure is proprietary. However, the meaning and approximate formula of each summary measure could be derived from empirical research by both authors of LIWC-22 and authors that use LIWC-22 in their analyses (McCarthy & Boonthum-Denecke, 2012). Specifically, the analytical thinking measure is a factor-analytically derived dimension based on several variables of function words. It is computed as (articles) + (prepositions) - (total pronouns) - (auxiliary) - (negations) - (conjunctions) - (adverbs) (Pennebaker et al., 2014). Jordan et al. (2019) have shown that the use of function words can reflect an

individual's thinking and attentional patterns. Furthermore, function words provide the structures of the meaning in a text and are likely to be more reliable indicators of psychological states than content words, such as nouns and regular verbs (Pennebaker, 2011; Pennebaker et al., 2014). Analytical thinking is "most apparent in verbal behavior through a speaker's use of articles, which signal concepts, and prepositions, which convey relationships between concepts. (Jordan et al., 2019, p. 3477)" Language with high rates of articles and prepositions is considered more analytical, whereas language with low rates of articles and prepositions is deemed more experiential and narrative (Davies, 2011).

Clout measure, or the measurement of an individual's relative influence in social interactions, is also derived from the calculation of function words, particularly pronouns. The clout algorithm in LIWC-22 is based on the meta-analysis of five studies by Kacwicz et al. (2014). It refers to an individual's level of confidence or leadership reflected in texts, which differs from the construct of power in LIWC-22. The latter reflects an individual's attention to or awareness of other people's relative social status. The manual of LIWC-22 gives an example of a confident leader who is not interested in other people's relative social hierarchy to illustrate the difference between the concept of clout and power. Studies have shown that people with high social hierarchy are more likely to use "you" and "we" pronouns than people with low social hierarchy. Meanwhile, people with low social rank are more likely to use first person singular pronouns "I" and impersonal pronouns "it" than their counterparts (Cassell et al., 2006; Sakai & Carpenter, 2011; Sell & Farreras, 2017). The differences in the use of pronouns in texts between high-ranked individuals and low-ranked individuals reflect the differences in attention

orientations in social interactions. Specifically, high-status individuals tend to be more collectively orientated or other-oriented, whereas low-status individuals tend to focus their attention inward (Kacewicz et al., 2014).

Authenticity measure is built on the concept of verbal authenticity which describes the perception that an individual is communicating their true and core self with words consistently to reveal their psychological focus (Markowitz et al., 2023). Authenticity is distinct from the construct of honesty. Specifically, an individual can be perceived as authentic or communicate authentically without relying on truth. LIWC-22 authenticity measure is a composite score of language variables (Jordan et al., 2018) and reflects unfiltered and spontaneous speech. In other words, it reflects the degree to which a person is self-monitoring. Language variables that positively contribute to the authenticity measure include self-references (e.g., I), insight words (e.g., aware), differentiation words (e.g., but), and relativity terms (e.g., above). In contrast, language variables that negatively influence the authenticity measure are discrepancies from reality (e.g., must) and third-person singular pronouns (she-he words) (e.g., she) (Markowitz et al., 2023). The selection of these language variables in the authenticity measure is derived from previous work on language and deception in which participants were asked to write about their truthful and false feelings about a range of topics (Newman et al., 2003). Examples of texts that score low in authenticity measures might include prepared texts, texts in which an individual is being socially cautious and reserved. In contrast, examples of texts that score high in authenticity measure might include spontaneous conversations among interpersonal communication and texts of political leaders who have low social inhibitions (Boyd et al., 2022).

Expressions of emotions in language reflect how individuals experience and react to events and their environments. Fredrickson et al. (2003) have shown that experiencing positive emotions after a challenging event or crisis is important to (re)building resilience. Therefore, analyzing emotional tones in GME peripheral subreddits could reflect the level of resilience of the GME movement at different times. Holmes et al. (2007) have found that emotional tones in words could be used as a measure of the degree of immersion. In other words, a higher frequency of emotional words in a text suggests more immersion in the event or experience, which could lead to reinforcement of the emotions that such an event or experience induced in individuals in the first place. Emotional tone measure summarizes the "positive and negative emotions in texts as the difference between positive-emotion words and negative-emotion words" (Monzani et al., 2021, p. 2) The higher the number in the emotional tone, the more positive the text is. Furthermore, a study (Tausczik & Pennebaker, 2010) on a random assortment of texts showed language features that demonstrate significant correlations between emotion words and style words (e.g., articles, prepositions, pronouns). Therefore, analyzing the relationship between the first three summary measures (analytical thinking, clout, and authenticity) and emotional tone might reveal cognitive complexities and dynamics in GME peripheral subreddits.

Examining word counts could suggest which GME peripheral subreddit plays a more socially dominant role in the GME movement. Word counts can also act as a proxy for the amount of communication, which could suggest how members are engaged in the conversations. (Leshed et al., 2007; Tausczik & Pennebaker, 2010). Hancock et al. (2007) reported a higher total word count when an individual is being deceptive. A high-

frequency use of big words might suggest an emotionally detached psychological state (Boyd, 2022). Therefore, the analysis of word counts in GME peripheral subreddits might provide additional psychological insights into clout and authenticity measures. In contrast, the analysis of the number of big words in GME peripheral subreddits might complement the results of the emotional tone measure.

Lastly, examining the differences on the four summary measures and the two linguistic measures across the four GME peripheral subreddits could reveal individual peripheral subreddit differences. Examining differences in language uses might also reveal individual member differences in GME peripheral subreddits. Newman et al. (2008) showed that the complexity of the language (which could be measured by the frequency of big words and function words such as articles and prepositions) and the degree of social references (which could be measured by pronouns) are the largest language differences between males and females.

The LIWC-22 analyses are performed in two groups based on the genealogy derived from the topic modeling results. Specifically, LIWC-22 results from r/GME and r/Superstonk are compared, while results from r/DDintoGME and r/GMEJungle are compared separately. Such comparative grouping is also determined by the subreddit membership size and post volumes. The finding reports the two linguistic (word counts and number of Big Words and four summary psychological measures (analytic, clout, authentic, and emotional tone). In addition, this study also looks at the selected measures within the four summary measures to reveal more psychological insights in GME peripheral subreddits. The selection criteria of these sub-measures are informed by the themes generated from topic modeling, sentiment analysis results, and previously

reviewed literature on language features, such as function words. The analysis of the selected LIWC-22 categories, on the one hand, supports the observations in the four summaries and two linguistic measures, partially due to the formulation of these key metrics composed of the selected categories. On the other hand, they provide more insights into the community role and communication styles of GME peripheral subreddits. These sub-measures are overall function words, pronouns, personal pronouns (including I, you, we, she, he, they), Social (including conflict, moral, and social references), Drives (including affiliation, achieve, power), and time orientation measures (including focus past, focus present, focus future), and motive measure (including reward, risk, curiosity, and allure).

Overall, the meta-level analysis provides hints on the subcommunity level of the GameStop peripheral subreddits and their possible community roles in the GameStop movement, while the word-level provides more evidence for their communication patterns and community dynamics. The meta-level analysis is designed to find the relationships between the GameStop peripheral subreddits without looking at the posting content of each subreddit. The word-level analysis is designed to find the topical relationships between the GameStop peripheral subreddits and provide evidence or disprove the theorization of the three communicative and interactive characteristics of peripheral subreddits, which are topic inheritance, similarity, and connectivity. The results of both meta- and word-level analyses may show how the GameStop peripheral subreddits participated in the larger GameStop movement by potentially exposing novel ways of organizing for social movements that Reddit and digitally mediated stock markets afford.

How each method will be used to examine the three characteristics of peripheral subreddits is shown in Figure 2. Specifically, topic inheritance, a top-down view of peripheral subreddits (from a more popular root subreddit to various less known peripheral subreddits), will be analyzed by topic modeling. Topic modeling will also provide evidence of topic similarities, a horizontal view of peripheral subreddits (non-hierarchical relationships among peripheral subreddits), and topic connectivity. Both sentiment analysis and LIWC will be used to examine the characteristics of topic similarities and connectivity.

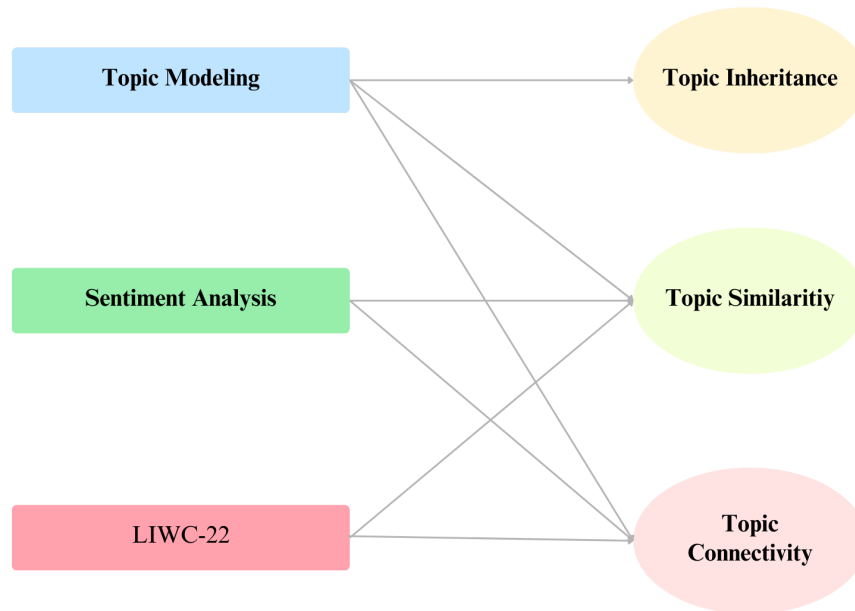


Figure 2. Connection between three methods and three characteristics

## CHAPTER 4

### FINDINGS AND ANALYSIS

#### **Meta Analysis Findings**

The change in daily posting volumes (of each subreddit (r/Superstonk, r/GME, r/GMEJungle, and r/DDintoGME)) suggests community migration and segmentation of community members. Specifically, the dates with the highest posting volumes concentrate on March and April for r/GME, April, May, and June for r/Superstonk, and July and September for r/GMEJungle and r/DDintoGME, respectively. Figure 3 shows the monthly post volumes for each of the four peripheral subreddits across our study's date range. Figure 4 shows the monthly membership totals of the same peripheral subreddits across the dates. The lack of overlapping authors among the four subreddits further supports the segmentation of community members. Five hundred fifty common authors contributed 69,893 posts, approximately 4% of overall posts. Previous studies (Anand & Pathak, 2022; Mancini et al., 2022) showed that a small group played a significant role in content creation on r/WallStreetBets.

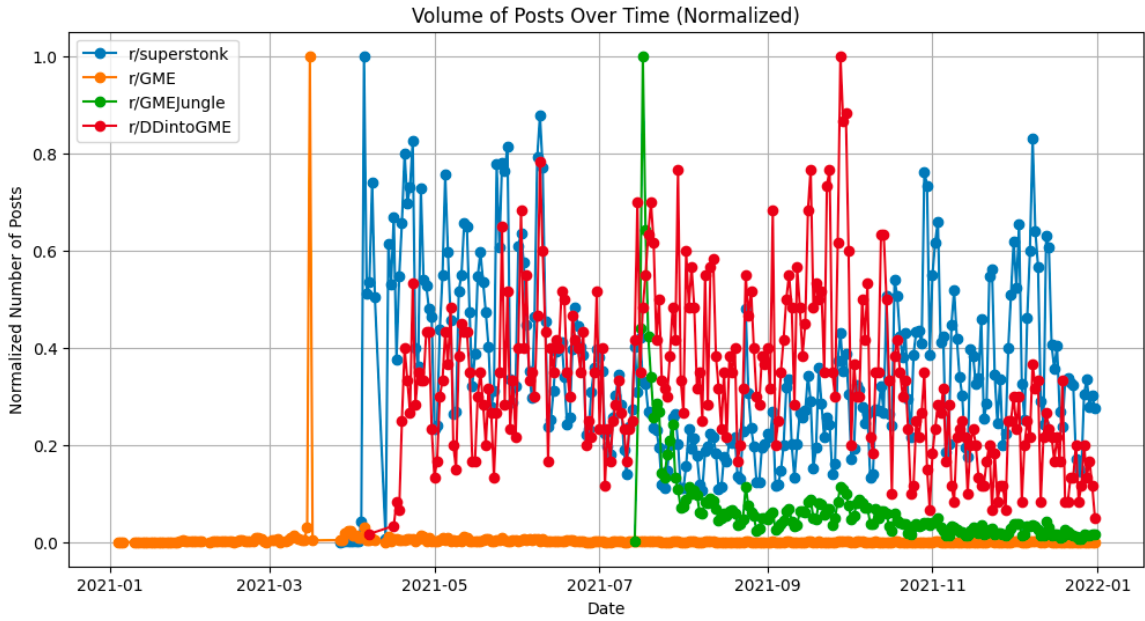


Figure 3. Normalized post volumes for the GME peripheral subreddits over time

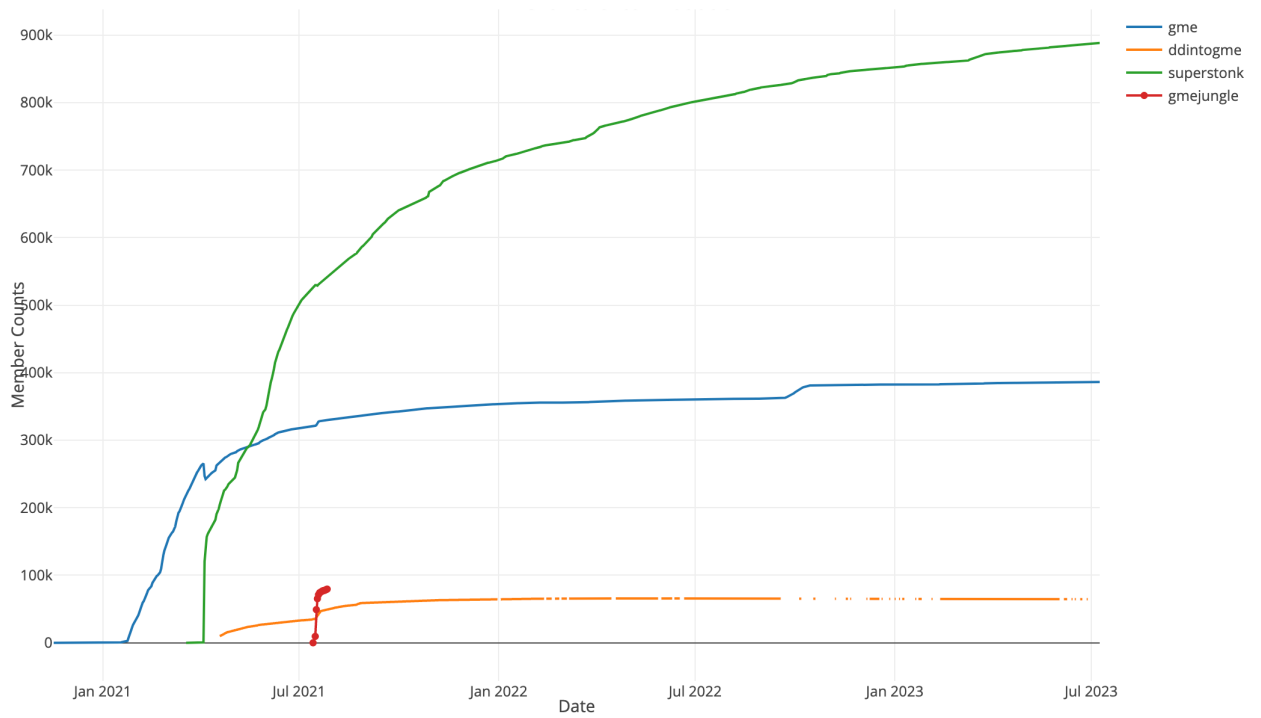


Figure 4. Membership totals for the GME peripheral subreddits over time (subredditstats.com)

Furthermore, the only common author of the four subreddits' top 10 most prolific authors was 'deleted accounts.' I also ranked the authors' significance based on the number of comments and scores their posts received. Specifically, the top 10 authors, based on the number of comments or scores, revealed no common author among the four subreddits (Table 1). u/AutoModerator was the only repeated entity based on the number of comments. The author's analysis suggests that the overall community around the GameStop movement is ephemeral and migratory. Community members migrate from one subreddit to another and frequently exit the community by deleting their accounts. The significant presence of u/AutoModerator indicates the self-organizing property of each subreddit.

The peak volume of posts in each peripheral subreddit varies over time (normalized by dividing the maximum posting volume), indicating that activity on these subreddits was asynchronous and shifting (Figure 3). For example, r/GME peaked in late March 2021, while r/Superstonk peaked in April 2021. r/GMEJungle peaked in July 2021, and r/DDintoGME peaked in late September and early October 2021. Moreover, I find that each community experienced growth peaks in terms of memberships at different times (Figure 4). r/GME experienced a growth spurt in Jan/Feb 2021, followed by r/Superstonk, then r/DDintoGME, and lastly with r/GMEJungle.

In addition to the deleted accounts, r/Superstonk and r/GME have another common prolific author, u/bluestar4u, while r/Superstonk and r/GMEJungle have another common prolific author, u/MunnaBigDicc (Table 2 and 3, Figure 5). This observation hints at an axial role of r/Superstonk in the overall community. r/Superstonk shares common authors with r/GME, r/GMEJungle, and r/DDintoGME separately in the authorship significance

rankings. r/Superstonk received the highest total number of comments and scores in the lists of the top 10 authors based on the total number of comments and total scores.

The axial role of r/Superstonk also shows in the overlapping authors after ranking the significance of authorship on the subreddit level, which is measured based on the total number of comments and total scores in a subreddit. Tables 4 and 5 display the top 10 authors based on total accumulated comments and scores across the four subreddits. Like the results of the subreddit authorship analysis, the top 10 authors based on the total number of comments and scores across the four subreddits show deleted accounts, and AutoModerator has the most overall community significance. It also shows influential authors have preferences on their contribution to each subcommunity after considering the subreddit membership sizes. Table 4 shows the top authors based on comments, and Table 5 shows the top authors based on scores across these peripheral subreddits. Most authors who are in the top 10 author list based on the total number of comments received most of these comments in r/Superstonk. The same pattern persists for the top 10 authors based on the total scores obtained. Furthermore, in addition to deleted accounts and AutoModerator, four authors (u/gherkinit, u/MunnaBigDicc, u/Get-It-Got, and u/whitnet1) are common authors between the total score ranking and the total number of comments ranking on the overall community level. The meta-level analysis of the authorship on the individual peripheral subreddits and overall community reveals that community members treat each GME peripheral subreddit differently. In contrast, the overall GME movement community tends to be self-organizing and ephemeral.

Table 1. Top 10 authors of the peripheral subreddits based on scores and comments

<p style="text-align: center;"><b>Top 10 authors for r/Superstonk based on score:</b></p> <p style="text-align: center;">[‘[deleted]’, ‘Jerseyprophet’, ‘pctracer’, ‘Mr__Roboto’, ‘Milkdud2000’, ‘atobitt’, ‘piddlestethug’, ‘k2fa91’, ‘moronthisatnine’, ‘Region-Formal’]</p>
<p style="text-align: center;"><b>Top 10 authors for r/Superstonk based on number of comments:</b></p> <p style="text-align: center;">[‘AutoModerator’, ‘pinkcatsonacid’, ‘pctracer’, ‘Bye_Triangle’, ‘[deleted]’, ‘rensole’, ‘Parsnip’, ‘gherkinit’, ‘atobitt’, ‘Criand’]</p>
<p style="text-align: center;"><b>Top 10 authors for r/GME based on score:</b></p> <p style="text-align: center;">[‘bEAc0n’, ‘[deleted]’, ‘HeyItsPixel’, ‘DavidNIO’, ‘nmstanley32’, ‘rensole’, ‘electricp0ww0w’, ‘BGS_B’, ‘Gianni858’, ‘friedmice’]</p>
<p style="text-align: center;"><b>Top 10 authors for r/GME based on number of comments:</b></p> <p style="text-align: center;">[‘Turambar1984’, ‘AutoModerator’, ‘NobelStudios’, ‘DamagedDave’, ‘possibly6’, ‘electricp0ww0w’, ‘Neelbunts’, ‘karasuuchiha’, ‘tommyfrank’, ‘Moon2Pluto’]</p>
<p style="text-align: center;"><b>Top 10 authors for r/GMEJungle based on score:</b></p> <p style="text-align: center;">[‘yesbabyyy’, ‘pctracer’, ‘[deleted]’, ‘ifajta’, ‘DeltaFoxtrotVictor’, ‘magnanimus12’, ‘awwshitGents’, ‘DrySuperFish’, ‘Mr_Miyagii’, ‘TheSewerReports’]</p>
<p style="text-align: center;"><b>Top 10 authors for r/GMEJungle based on number of comments:</b></p> <p style="text-align: center;">[‘pinkcatsonacid’, ‘AutoModerator’, ‘pctracer’, ‘yesbabyyy’, ‘BodySurfDan’, ‘j__walla’, ‘MannyManlove’, ‘Big- Bedroom8783’, ‘MunnaBigDicc’, ‘almost-punk’]</p>
<p style="text-align: center;"><b>Top 10 authors for r/DDintoGME based on score:</b></p> <p style="text-align: center;">[‘loimprevisto’, ‘AdhesivenessRich2581’, ‘let_it_bernnn’, ‘wkowdyw’, ‘JLPicard511’, ‘KenGriffinsBedpost’, ‘pistachiosdeldios’, ‘Darthgangsta’, ‘Forlaferob’, ‘TacoTrade’]</p>
<p style="text-align: center;"><b>Top 10 authors for r/DDintoGME based on number of comments:</b></p> <p style="text-align: center;">[‘Ravada’, ‘mybustersword’, ‘Darthgangsta’, ‘bossblunts’, ‘zenquest’, ‘RedditAdminBrainlets’, ‘HODLTheLineMyFriend’, ‘twittafingahsma’, ‘Criand’, ‘wkowdyw’]</p>

Table 2. Top 10 authors of peripheral subreddits based on posting volume

<p><b>Top 10 authors for r/superstonk based on posting volume:</b></p> <p>[[deleted]', 'Milkdud2000', 'DynastyFSU2', 'joeygallinal', 'bluestar4u', 'Key_Ad_1683', 'bvttfvcker', 'Get-It-Got', 'Shartladder', 'MunnaBigDice']</p>
<p><b>Top 10 authors for r/gme based on posting volume:</b></p> <p>['Gianni858', 'gmorgan99', 'electricp0ww0w', 'starbird88', 'possibly6', 'DickishUnicorn', 'tommyfrank', '[deleted]', 'DavidNIO', 'bluestar4u']</p>
<p><b>Top 10 authors for r/gmejungle based on posting volume:</b></p> <p>'MannyManlove', '[deleted]', 'sebet_123', 'almost-punk', 'pinkcatsonacid', 'Kilgour_Bass', 'BULLFROG2500', 'SirLurksAlot_2021', 'MunnaBigDice', 'yesbabyyy']</p>
<p><b>Top 10 authors for r/ddintogme based on posting volume:</b></p> <p>toModerator', 'Ravada', 'yellowhurricane', 'wkwodwyw', 'twittafingahsma', '[deleted]', 'TheLunarnautics', 'kpw26', 'SadCalligrapher7208', 'pdwp90']</p>

Table 3. Overlaps of the top 10 authors of peripheral subreddits based on posting volume

<p><b>Overlapping authors for r/superstonk <math>\cap</math> r/gme:</b></p> <p>{[deleted]', 'bluestar4u'}</p>
<p><b>Overlapping authors for r/superstonk <math>\cap</math> r/gmejungle:</b></p> <p>{[deleted]', 'MunnaBigDice'}</p>
<p><b>Overlapping authors for r/superstonk <math>\cap</math> r/ddintogme:</b></p> <p>{[deleted]'}</p>
<p><b>Overlapping authors for r/gme <math>\cap</math> r/gmejungle:</b></p> <p>{[deleted]'}</p>
<p><b>Overlapping authors for r/gme <math>\cap</math> r/ddintogme:</b></p> <p>{[deleted]'}</p>
<p><b>Overlapping authors for r/gmejungle <math>\cap</math> r/ddintogme:</b></p> <p>{[deleted]'}</p>

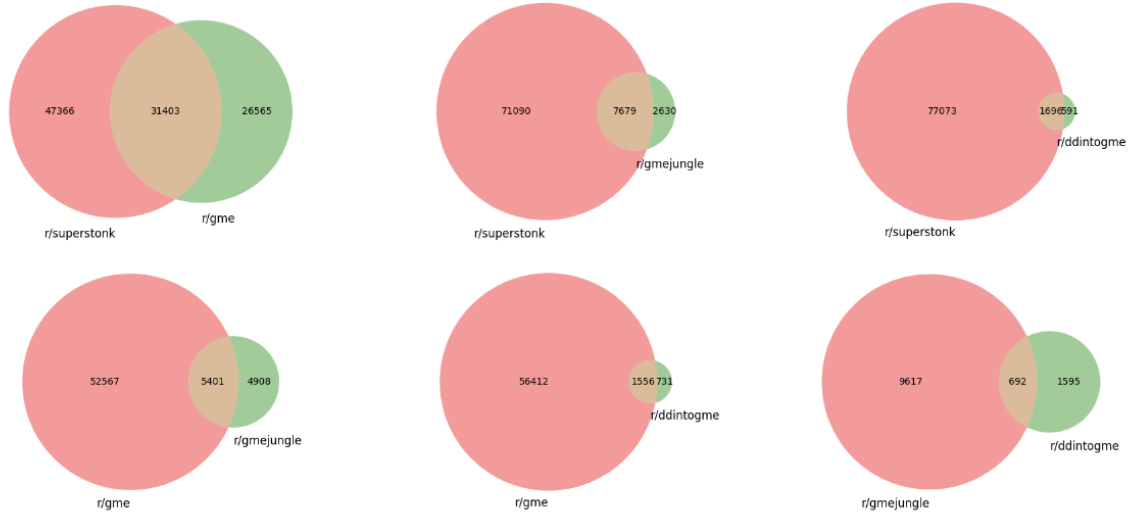


Figure 5. Total number of overlapping authors in the GME peripheral subreddits

Table 4. Top 10 authors across peripheral subreddits based on total comments

Author	r/Superstonk	r/DDintGME	r/GME	r/GMEJungle	Total
AutoModerator	4333306	859	460246	27642	4822053
karasuuchiha	1122	183	250684	155	252144
[deleted]	62469	123	45944	1041	109577
F1F2F3F4F5F6F7F8	1140	562	47968	316	49986
gherkinit	45895	43	255	474	46667
Criand	42622	1340	1804	856	46622
MunnaBigDicc	22449	29	1899	2977	27354
Get-It-Got	18880	558	11	369	19818
fuckingcarter	18375	112	55	3	18545
whitnet1	16193	57	12	485	16747

Table 5. Top 10 authors across peripheral subreddits based on total accumulated scores

Author	r/Superstonk	r/DDintGME	r/GME	r/GMEJungle	Total
[deleted]	126757	63	61787	3706	192313
AutoModerator	31514	139	6408	312	38373
whitnet1	26326	4	4	10	26344
gherkinit	24421	1	102	136	24660
loimprevisto	18191	2431	1449	229	22300
Get-It-Got	18991	42	11	25	19069
MunnaBigDicc	17317	3	593	433	18346
realsyedshah	17709	2	63	2	17776
BlckAlchmst	12421	3	706	2005	15135
Septae	14677	1	1	1	14680

### Topic Modeling Findings

For the topic modeling, I analyzed the entire corpus of text (post titles) for each peripheral subreddit from their respective inceptions up to the date 12/31/2021.

Following this, I also wanted to analyze a “snapshot” or moment to see what topics were

found at the beginning (restricted to the first month) of each peripheral subreddit's creation. Thus, Tables 6, 8, 10, and 12 include the top 10 interpreted topics, 4 representative topic words, and 3 post title examples for each GME peripheral subreddit (based on each peripheral subreddit's entire post title corpus from their inception dates to 12/31/2021). Tables 7, 9, 11, and 13 show a "snapshot" of the top 10 interpreted topics, 4 representative topic words, and 3 post-title examples for 3 of the peripheral subreddits (r/Superstonk, r/GME, and r/GMEJungle) during their first month. Due to different subreddit sizes, post titles from r/DDintoGME during its first month only reveal 6 distinctive topics (Table 10).

Using 4 representative topic words instead of the default top 10 topic words was determined by calculating term scores for all topics, which shows that the beneficial effect of adding words into a topic decreases after 4 topic words on average. Following a suggestion made by Grootendorst (2022), I excluded the outlier topic and generic topic of each dataset. However, I analyzed the content in two outlier topics due to their topical significance in establishing the relationship among GME peripheral subreddits. I also excluded topics clustered in the topic modeling process due to community posting patterns, such as attaching numerical dates with post titles and recurring topics that have similar topic words with one or more other topics and could be merged into other topics. Lastly, topic examples are formatted for a more effortless reading experience for readers who are not familiar with the distinctive language used in GME peripheral subreddits and acronyms are spelled out in parentheses.

Tables 14-15 show themes that emerged from the overall and the one-month corpus topics. Specifically, Tables 14-15 show the themes from GME peripheral

subreddits' entire corpus and one-month corpus, respectively, with content in each cell as topics relating to each theme. The observed themes are not mutually exclusive. For instance, the topic “We are Apes” appears in both the “Collective Identity” and “Upward Community Morale in Memetic Expressions” themes. Topic modeling with BERTopic identified varying numbers of topics across several subreddits: 78 in r/Superstonk, 57 in r/GME, 78 in r/DDintoGME, and 97 in r/GMEJungle. However, the top 10 most frequently occurring topics across these subreddits could encapsulate the primary themes in all identified topics. The less frequent topics represent alternative versions of these main themes or are unique themes tied to specific, time-sensitive events.

### *r/Superstonk Topics*

In the GME peripheral subreddits, the collectivity formed in r/Superstonk is more emotionally driven than community knowledge-driven. As r/Superstonk matures in time, its collectivity pivots away from the reliance on community knowledge (which could be observed in the one-month corpus). It relies more heavily on emotionally laden collective strategies and identity. The community homogenizes their actions and beliefs as their collectivity strengthens. In the early days of r/Superstonk, participants on this subreddit strived to differentiate themselves from other peripheral subreddits by adopting the collective identity of “stonks” instead of the collective identity of “apes”. Finally, the suspicion of internal and external threats to their collectivity maintained the continuation of the GME movement among r/Superstonk participants

In Table 6, I delve into the top 10 topics in the entire corpus of r/Superstonk, revealing the interplay of communication patterns, community dynamics, and organizational structure that drive the formation of collectivity in the r/Superstonk

community. The use of memetic expressions, such as “Going to the Moon” and “Jacked Tits” constitutes a unique communication pattern that signifies the community's optimism toward the realization of the collective goal. The memetic expressions could also be seen as representations of or actions driven by, the shared beliefs that motivate and organize community members against the disruptive attempts of their collectivity enacted by their moral outrage targets. As such, the “Upward Community Moral” topic represented by the memetic expressions pairs with the “Moral Outrage” topic as both topics are situated at the opposite ends of the spectrum of emotional valence while they motivate the formation of collectivity in r/Superstonk.

The “Moral Outrage” topic in r/Superstonk has two forms which are differentiated by two targets: financial institutions, such as SEC, and institutional investors, such as hedge funds, positioning community members in r/Superstonk alongside the everyday people who strive for wealth equality. The community members in r/Superstonk espouse two leaders in their fight to topple the dominant power structure in the financial system. Specifically, the “Connective Leaders” topics have two organizational leader figures that participants in r/Superstonk follow indirectly by interpreting their social media posts and actions around the GameStop company and stock. These two figures are Ryan Cohen, the chairman and CEO of GameStop, and u/DeepFuckingValue, credited by GameStop movement participants as the first person who spotted the potential of GameStop stock and used it to challenge institutional investors.

If the “Upward Community Morale”, “Moral Outrage”, and “Connective Leaders” topic could be seen as the necessary components that drive the formation of collectivity in r/Superstonk, the “Collective Action”, “Collective Identity”, and

“Collective Goal” topics could be seen as the representations or expressions of its collectivity. Specifically, the “Collective Action” topic is represented by a trading behavior or strategy supported by participants in r/Superstonk in a mantra-like fashion: “Hold the Stock and Buy the Dip” (which could be repeatedly observed in the post titles and topic words in the topic modeling results). This strategic collective action mantra reflects the community’s resilience and opportunism in the face of fluctuating GameStop stock prices. Furthermore, participants in r/Superstonk are united by a collective identity of “superstonkers”, distinguishing them within the peripheral subreddits of the GameStop movement. They are also united by a shared anticipation of a momentous event that promises to eclipse the achievement of the original GameStop short squeeze event in both scale and impact. This shared aspiration is the collective goal in r/Superstonk. Finally, the “Community Conflict” topic could be seen as the community’s acknowledgment of threats that challenge the collectivity and the community’s defensive mechanism for the challenge. Such threats lie in the community’s suspicion that r/Superstonk had been compromised by the enemies (shills and bots) who spread fear, uncertainty, and doubt (FUD) to disrupt the collective actions and dissolve the community.

Table 6. Top 10 r/Superstonk Topic Modeling Results from 03-15-2021 to 12-31-2021

Topics	Words	Examples
<p><b>1. Moral Outrage: the System is Rigged</b></p>	<p>sec_today_stock_market</p>	<ol style="list-style-type: none"> <li>1. This is how much the sec have paid to whistle blowers in 2021 alone, only from numbers that have been stated to the public. They short the stock every day, illegal practices continue allowing them to kick the can longer and longer. Our floor is not high enough.</li> <li>2. I've attempted to contact the sec and their portals are always down. I'm sorry maybe should make Pornhub account and post there. Hedgies fuck retail hard they'd be into that.</li> <li>3. Alt theory the 205 million the sec has paid to whistle blowers is actually just hush money.</li> </ol>
<p><b>2. Connective Leader: Ryan Cohen</b></p>	<p>cohen_cohentweet_cohennew_ryan</p>	<ol style="list-style-type: none"> <li>1. Trust the management, trust papa Cohen the price is not right. Apes together strong power to the players the creators.</li> <li>2. Ryan Cohens letter to the board, my north star.</li> <li>3. Buy hold forget about it. Clearly the game is rigged and the only way to beat them is to let Ryan Cohen turn GameStop into gaming and technology powerhouse and the stock will have no choice but to skyrocket. In the meantime, create better habits and work on yourselves.</li> </ol>

Table 6. (continued)

Topics	Words	Examples
<p><b>3. Collective Action: Hold the Stock and Buy the Dip</b></p>	<p>dip_buy_hold_chips</p>	<ol style="list-style-type: none"> <li>1. Good morniiiiing, we've ranged through the spectrum of dips for a while, but this shit is so tasty today, just gotta call it happy Thursday. Fam looking like a nice day to put some tendies in the dip.</li> <li>2. Me getting ready to buy the morning dip.</li> <li>3. Who buying the damn dip insert face here.</li> </ol>
<p><b>4. Community Conflict</b></p>	<p>shills_bots_their_they</p>	<ol style="list-style-type: none"> <li>1. Saw this post of how shills recruit from our fellow. Great info also confirms wsb is shill fest.</li> <li>2. How shills infiltrate ape communities.</li> <li>3. Hello to another day of msm (main stream media) fud (fear uncertainty, doubt) artificial drops, and cypypasta shills. It all becoming bit routine no?</li> </ol>
<p><b>5. Collective Identity</b></p>	<p>superstonk_superstonkers_superstonkbot_up</p>	<ol style="list-style-type: none"> <li>1. You know you're superstonk newb when you think this is MOASS.</li> <li>2. See you superstonkers on the moon!</li> <li>3. Superstonkers committed tohodlers during the moass no matter how much they hodl.</li> </ol>

Table 6. (continued)

Topics	Words	Examples
<p><b>6. Upward Community Morale in Memetic Expression: Going to the Moon</b></p>	<p>moon_lunar_mooning_moonday</p>	<ol style="list-style-type: none"> <li>1. Picked up another one so close to 100 see you on the moon apes.</li> <li>2. Today is my birthday bought more. I like the stock. Take me to the moon.</li> <li>3. No fud, shills bots, lies, spam phishing, should step on your way to the moon.</li> </ol>
<p><b>7. Connective Leader: u/DeepFuckingValue</b></p>	<p>dfv_dfvs_dvf_dfvfinal</p>	<ol style="list-style-type: none"> <li>1. DD during the MOASS will come from dfv himself. He has been with us since the beginning and continues to speak to us everyday. His tweets will guide us and keep us calm during the ride of our lives. Trust in dfv, as long as he stays in we stay.</li> <li>2. I will never forget when dfv posted his position showing he had doubled up after the first congressional hearing.</li> <li>3. I like to think dfv tweets are all secret messages rich in easter eggs.</li> </ol>
<p><b>8. Collective Goal: Squeeze</b></p>	<p>squeeze_infinity_short_big</p>	<ol style="list-style-type: none"> <li>1. Buying again starting the squeeze.</li> <li>2. Bullish af on the infinite squeeze, tits are jacked.</li> <li>3. If you're getting all excited now over these tiny green days then you're probably going to get overly emotional and paper hand when the real squeeze starts, so chill out.</li> </ol>
<p><b>9. Moral Outrage towards the Institutional Investors</b></p>	<p>hedgies_hedgiesfukd_wedgies_tears</p>	<ol style="list-style-type: none"> <li>1. My name is Hands Mr. Diamond hands 007 licensed to kill hedgies.</li> <li>2. Hedgies spent millions to sabotage gme. Apes created another sub.</li> <li>3. PSA reminder, hedgies the longer you take the bigger the floor.</li> </ol>

Table 6. (continued)

Topics	Words	Examples
<p><b>10. Upward Community Moral in Memetic Expression: Jacked Tits</b></p>	<p>jacked_tits_jacking_jacks</p>	<ol style="list-style-type: none"> <li>1. I am jacked to the absolute tits with how resilient this community is.</li> <li>2. I love confirmation bias from motley drool, makes my teets jacked.</li> <li>3. Tits jacked walking down wall st wondering which building should throw my fistful of apeshit at.</li> </ol>

Table 7 unveils the top 10 topics that emerged from the first-month corpus of r/Superstonk topic modeling results. This snapshot is characterized by 8 topics echoing the overarching narratives of the community observed in r/Superstonk’s entire corpus but with subtle differences. Discussions (observed in the topic word “sub”) around Community Migration from one subreddit to another, intertwined with concerns about skills compromising the community, could be observed in the outlier topic (omitted in the table), which is the topic deemed by the BERTopic package as appearing abnormally too often to be included in the topic modeling results). “Connective Leaders” and “Collective Goal” topics show consistency with the topics in r/Superstonk’s overall corpus, reinforcing the community's adherence to leadership figures and collective aspirations. However, the “Collective Action” topic experiences an evolution, with “Recall the Shares” emerging as a precursor to a more specific strategy: “Use Computershare to Directly Register Shares”. In other words, community members on r/Superstonk espouse a more specific collective action strategy (“Recall the Shares”) that could bring in actionable and measurable outcomes and echo the later popularized strategy (“Use Computershare to Directly Register Shares”) early on in the GameStop movement. The

change in the “Collective Action” topics’ representations indicates a pivot towards more specific and actionable collective action strategies about the ownership of stock shares.

The “Upward Community Morale” topic in this initial month introduces a new memetic expression, “We are Apes,” while phasing out “Jacked Tits”. Yet, the aspirational “Going to the Moon” remains a constant, illustrating the community's enduring optimism. Interestingly, the identity of “superstonkers” in the entire corpus gives way to the identity of “apes” during this period, suggesting a shift in how participants in r/Superstonk view their identities and their relationship with other GME peripheral subreddits. The shift from the identity of apes in the first-month corpus to a more distinct identity of “superstonkers” further supports the Community Migration topic and the diversification of the GME peripheral subreddits. The focus on “shills” in the Community Conflict topic in the overall corpus is complemented by a general distrust among members in r/Superstonk by “question-answering” in the one-month corpus. On the one hand, “question-answering” as a form of social interaction could be seen as a mode of knowledge production. On the other hand, it could be seen as a representation of general distrust. Crucially, this one-month snapshot reveals an additional topic: “Community Knowledge”, which encompasses community knowledge on several subjects and modes of knowledge production, including financial institutions (subjects), technical analysis (mode of knowledge production), and due diligence (mode of knowledge production). The “Community Knowledge” topic is further underpinned by the “question-answering” mechanism that fosters collective learning and reflects the community's ethos of inquiry and skepticism. In summary, the early stage of r/Superstonk

reveals a community consistent with its overall development but with noticeable changes in terms of collective strategies, identities, and modes of interaction and communication.

Table 7. Top 10 One-Month r/Superstonk Topic Modeling Results from 03-15-2021 to 04-15-2021

Topics	Words	Examples
<b>1. Upward Community Morale in Memetic Expression: We are Apes and Going to the Moon &amp; Collective Identity: We are Apes</b>	apes_monkey_together_moon	<ol style="list-style-type: none"> <li>1. Our greatest strategic advantage against the hedgies, apes we can diamond hand forever.</li> <li>2. Superstonk is for all apes.</li> <li>3. A message for my diamond handed game loving apes.</li> </ol>
<b>2. Connective Leader: Ryan Cohen</b>	chairman_cohen_ryan_shareholder	<ol style="list-style-type: none"> <li>1. Chairman Cohen has entered the rocket will start the engine hold my beer.</li> <li>2. For everyone wanting papa cohen as ceo he will be appointed the best possible position chairman of the board, is the king kong of gamestop all hail the king.</li> <li>3. Captain chairman cohen.</li> </ol>

Table 7. (continued)

Topics	Words	Examples
<p><b>3. Community Knowledge: Technical Analysis</b></p>	<p>gme_technical__what_take</p>	<ol style="list-style-type: none"> <li>1. Can we start a thread with links to technical analysis streamers so when the moass goes down we will be able to have some more learned eyes quarterbacking the technical?</li> <li>2. gme amc stock update and predictions gamma or short squeeze gamestop amc technical analysis</li> <li>3. Reminder technical analysis doesn't matter for gme</li> </ol>
<p><b>4. Collective Goal: Achieve MOASS Community Knowledge: Due Diligence (DD)</b></p>	<p>moass_during_dd_peak</p>	<ol style="list-style-type: none"> <li>1. The MOASS won't happen until options are not regulated, dtc-2021-005 just changed the game.</li> <li>2. Let's get back to focusing on that MOASS.</li> <li>3. cross post the best dd of all time from gme into this sub</li> </ol>
<p><b>5. Community Knowledge: Mode of Knowledge Production of &amp; Community Conflict: General Distrust</b></p>	<p>simple_question_explain_help</p>	<ol style="list-style-type: none"> <li>1. Please watch this ape explains share recall announcement and how it is a huge catalyst.</li> <li>2. Dear dd authors how can smooth brained apes help.</li> <li>3. Bots already trying to take us down answer no to all the nonsense survey questions asking about gambling drug use financial advice etc.</li> </ol>
<p><b>6. Collective Action: Buy the Dip</b></p>	<p>dip_buy_tempting_discount</p>	<ol style="list-style-type: none"> <li>1. Attack incoming on Monday get ready for juicy dip.</li> <li>2. Congratulations to those who continue to buy this months long dip.</li> <li>3. Thank you trash mods of gme for making me angry buy on dip</li> </ol>

Table 7. (continued)

Topics	Words	Examples
<p><b>7. Community Knowledge on Financial Institutions</b></p>	<p>nscoccc_dtcc_801</p>	<ol style="list-style-type: none"> <li>1. What is the difference between sr-nscoccc-2021-801 and sr-occc-2021-801?</li> <li>2. The sr-nscoccc-2021-801 mentions list of the 30 affiliated families with the largest liquidity exposures as of December 31 2020 delivered to the sec, any chance of this being published somewhere?</li> <li>3. No the nscoccc and the dtcc did not approve sr-nscoccc- 2031-801 notice of filing of advance notice to amend the supplemental liquidity deposit requirements.</li> </ol>
<p><b>8. Connective Leader: u/DeepFuckingValue</b></p>	<p>dfvtweet _dfv_dfvnext_dfvlatest</p>	<ol style="list-style-type: none"> <li>1. Just reposting here we are on the right path dfv thesis accurate.</li> <li>2. Please look at all 4 pics is what happened with the mods what dfv was implying referring to on April 1st if it's true then the roaring kitty is definitely time traveler maybe wrong just wondering.</li> <li>3. Captain dfv twitter the roaring kitty is hanging in there.</li> </ol>
<p><b>9. Collective Goal: Squeeze</b></p>	<p>squeeze_infinity_during_short</p>	<ol style="list-style-type: none"> <li>1. Gamestop raising 1B through shares tells me squeeze is coming.</li> <li>2. Regarding my squeeze in 2 years theory.</li> <li>3. History repeating are we seeing squeeze soon?</li> </ol>
<p><b>10. Collective Action: Recall Shares</b></p>	<p>recall_share_shareholder_record</p>	<ol style="list-style-type: none"> <li>1. Instead of flooding the servers with news about the new chairman, we should be flooding them with letting people know that they need to recall their own shares.</li> <li>2. I am reposting this from someone else because it is very informative and helpful and think all of you will enjoy the info ape candy gme gamestop recall shares to register to vote in June 11 2021 shareholders agm (annual general meeting)</li> <li>3. Remember to call your brokerage for share recall need this to happen to vote in the shareholder meeting.</li> </ol>

### *r/GME Topics*

The positionality of r/GME in the GME peripheral subreddits differs from that of r/Superstonk, with its more comprehensive collective efforts, such as focusing on moral outrage targets on different stratifications of the financial system. In its early stage, r/GME connected the GME movement with the discourse on other meme stocks and cryptocurrencies. As r/GME evolves, it becomes more focused on the GME movement and homogenizes with other emotionally driven GME peripheral subreddits, such as r/Superstonk.

Table 8 outlines the top 10 topics from the entire corpus of r/GME. The “Community Knowledge” topic offers general insights about GameStop as a company and its stock. In contrast, the “Upward Community Morale” topic is represented through two memetic expressions: “We are Apes” and “Going to the Moon”, which not only boost the community morale against moral outrage targets but also reinforce a shared identity and collective goal. Moreover, the memetic expression “We are Apes” is an instantiation of the “Collective Identity” topic. The collective identity as “apes” not only unites the participants in r/GME but also could connect the participants of the GameStop movement in different peripheral subreddits with each other. The expression for trading behavior or strategy, “Hold the Stock and Buy the Dip”, (often stylized as ‘Hodl’ in post titles which is an acronym for ‘Hold on for Dear Life’) which succinctly represents the “Collective Action” topic in r/Superstonk also occurs in r/GME. The mantra-like feature of the collective action strategy could not only further fortify the collectivity in r/GME but also increase the effectiveness of the collective action strategy by reducing the noise,

distraction, and misinterpretation attached to more complexly worded collective action strategies.

Furthermore, the MOASS (Mother of All Short Squeezes) represents the “Collective Goal” topic in r/GME, which is seen by the participants as more than another short squeeze but the ultimate triumph in their fight against moral outrage targets, wealth inequality, and the financial system. The “Moral Outrage” topic emerges with three types of targets: specific financial companies (Robinhood and Citadel LLC), financial regulatory bodies (Commodity Futures Trading Commission [CFTC]), and institutional investors (hedge funds). The additional moral outrage targets in r/GME could indicate that r/GME adopts a more comprehensive approach in their collective efforts, which separates its positionality from r/Superstonk in GME peripheral subreddits. Lastly, the Community Conflict topic delves into the perceived presence and impact of “shills”, who are seen by participants in r/GME as antagonistic agents, allegedly deployed by moral outrage targets, especially hedge funds, to disrupt the solidarity and collective efforts surrounding GME stock. This topic highlights the community’s awareness and defensive stance against potential external threats to their unity and objectives. However, the overabundance of suspicion about the community compromise by external forces could lead to the deep-seated distrust of the community itself, which could explain the diversification of the GME peripheral subreddits and the community migration from one subreddit to another.

Table 8. Top 10 r/GME Topic Modeling Results from 01-04-2021 to 12-31-2021

Topics	Words	Examples
1. <b>Community Knowledge on the stock GameStop and the company GameStop</b>	gamestop_gamestonk_xbox_ps5	<ol style="list-style-type: none"> <li>1. A gamestop owned digital marketplace that can compete with steam.</li> <li>2. When gme ever closes above 690 for one single day, I will buy out one entire gamestop location and make gamestop challenge trending.</li> <li>3. Gamestop could become the leading subscription based multi-platform digital game store.</li> </ol>
2. <b>Upward Community Morale in Memetic Expression: Going to the Moon</b>	moon_gme_going_to	<ol style="list-style-type: none"> <li>1. Gme going to the moon.</li> <li>2. See you people on the moon any losses now do not mean jack hodl hodl hodl!</li> <li>3. Hold the line boys we going to the moon don't fall for their scare tactics.</li> </ol>
3. <b>Collective Action: Buy the Dip</b>	dip_buy_hold_discount	<ol style="list-style-type: none"> <li>1. Hoddddddlllllllll now is the time to buy dips hoddddddlllll.</li> <li>2. Finally dip to buy.</li> <li>3. Who bought some dips just earlier now raise your hand.</li> </ol>
4. <b>Collective Goal: Achieve MOASS</b>	moass_during_before_after	<ol style="list-style-type: none"> <li>1. With the MOASS on the horizon people need to leave Robinhood, interactive brokers, td and whoever else halted the buy orders of gme now.</li> <li>2. Mentally prepare yourself for the MOASS and hf tactics to create false peaks and dips to grab your stonks.</li> <li>3. This is how gme price will feel today and the coming weeks until the MOASS.</li> </ol>
5. <b>Moral Outrage towards Robinhood</b>	robinhood_gme_fidelity_trading	<ol style="list-style-type: none"> <li>1. Reddit won't let me post photo of Robinhood restricting my account right when the price starts rising.</li> <li>2. Robinhood did me dirty switched to fidelity, fuck Melvin, get hit with some felonies, fuck silver, won't buy what you're selling me.</li> <li>3. Wtf is this Robinhood stating account cannot trade that instrument for gme?</li> </ol>

Table 8. (continued)

Topics	Words	Examples
<p><b>6. Collective Goal: Squeeze</b></p>	<p>squeeze_short_hold_until</p>	<ol style="list-style-type: none"> <li>1. How to properly monitor the war when the squeeze begins and avoid selling too early.</li> <li>2. This is the day the squeeze will happen with undeniable proof.</li> <li>3. How would broader market selloff affect the impending gme squeeze.</li> </ol>
<p><b>7. Collective Action: Hold GME Stock</b></p>	<p>hodl_hodler_buy_only</p>	<ol style="list-style-type: none"> <li>1. The future is for the hodlers.</li> <li>2. Woke up being extremely proud of our ape clan, read this if you want to hodl and not care about meaningless noises.</li> <li>3. Apes, only 2 options available hodl or buy the stock period.</li> </ol>
<p><b>8. Moral Outrage towards the Institutional Investors</b></p>	<p>hedgefunds_hedgefucks_stock_market</p>	<ol style="list-style-type: none"> <li>1. When fucking apes stand together those hyena hedge funds don't stand a chance against us. It's the only beginning, hold the line, we are going to pluto may be even further to andromeda galaxy who knows.</li> <li>2. Squeezed some fresh orange juice like we're about to squeeze these hedge funds and god damn it taste so good!</li> <li>3. I want to take a minute to apologize to absolutely fucking nobody especially those hedge fund fucks gme 100k or bust!</li> </ol>

Table 8. (continued)

Topics	Words	Examples
<b>9. Community Conflict</b>	shills_shilling_fud_bots	<ol style="list-style-type: none"> <li>1. Stop the shills ignore the media hold hold hold.</li> <li>2. A reminder to shills we understand the difference between investing and gambling save your lectures for your own kids.</li> <li>3. Shills be acting like the older brother after the younger brother kicks their ass, can't hold you down anymore, now they try to control what others think about you.</li> </ol>
<b>10. Moral Outrage towards Specific Institutional Investors: Citadel LLC and Financial Institutions: CFTC (Commodity Futures Trading Commission)</b>	citadel_citadelscandal_cftc_sec	<ol style="list-style-type: none"> <li>1. Gamestop short sell firm Citadel paid Biden treasury secretary millions.</li> <li>2. Just got tip that Citadel reloaded their shorts before they told Robinhood to stop trading gme.</li> <li>3. Citadel silver holding exposes rifts in r/wallstreetbets army Bloomberg.</li> </ol>

Table 9 shows the top 10 topics in r/GME in its inaugural month and their associated topics. These topics mirror the overarching narrative observed in the overall corpus of r/GME but with notable differences unique to this formative early stage. The Moral Outrage topic is a constant in both the overall and the one-month corpus of r/GME. Interestingly, it does not specify targets among financial regulatory bodies and institutional investors in this initial month, which suggests that the early stage of r/GME's focus is on the specific financial companies who directly affected the GameStop short squeeze event instead of the financial entities across the power structure of the financial system. Furthermore, the "Connective Leader" topic is an addition to the one-month corpus centered around Elon Musk. His presence highlights his temporary yet impactful influence on the community. The "Collective Actions" topic sees an evolution by including other meme stocks and coins as part of the collective strategy, which is not observed in the community's overall corpus. The change in the representations of the

“Collective Action” topic between the two periods indicates an exploratory approach to achieving collective goals in r/GME’s early days.

”Diamond Hands”, a new memetic expression symbolizing the community’s resilience in holding GameStop stocks amidst declining values, enriches the “Upward Community Morale” topic. This memetic expression encapsulates the community’s steadfastness and resolve during market fluctuations. Notably, the “Collective Identity” topic’s hallmark ”apes” identity is absent in this initial month. This omission reflects the evolving nature of the community's self-perception and self-identification. Furthermore, the “Community Conflict” topic in this phase focuses on the controversies surrounding moderators in the root subreddit of the GME peripheral subreddit: r/WallStreetBets and the subsequent diversification of communication channels, including Facebook groups and Discord channels. This shift hints at the community migration and the tendency for community diversification in GME peripheral subreddits. Lastly, the “Collective Goal” and “Community Knowledge” topics remain consistent with the subreddit’s overall narrative, underscoring their foundational significance to the r/GME community that anchors the community’s objectives and communicative interactions even as other aspects of the community activities and characteristics evolve. In summary, this one-month snapshot of r/GME reveals a community in flux, experimenting with its collective identity, leadership influences, and collective strategies while maintaining its collective goal and knowledge production processes.

Table 9. Top 10 One-Month r/GME Topic Modeling Results from 01-04-2021 to 02-04-2021

Topics	Words	Examples
1. <b>Collective Action: Hold and Buy the Stock</b>	hold_buy_sell_stock	<ol style="list-style-type: none"> <li>1. Buy gme and hold it.</li> <li>2. Hold these hedge funds want you to sell your shares but we won't let them.</li> <li>3. Keep holding it's okay to be afraid, the price will go back up.</li> </ol>
2. <b>Collective Action: Use Meme Stocks and Meme Coin</b>	gme_amc_doge_profit	<ol style="list-style-type: none"> <li>1. I know gme is the thing but if we also buy into doge, the price will rocket even higher and the sec has no control over it, just saying.</li> <li>2. Should buy doge while waiting for gme and amc to resume trading.</li> <li>3. Elon musk is riding with us on gamestop he also just put millions in dogecoin and said it this is number one crypto, so go get in and ride the wave, it's the next gamestop, mark my words and thank me later.</li> </ol>
3. <b>Moral Outrage towards Financial Companies</b>	robinhood_fidelity_shares_alternative	<ol style="list-style-type: none"> <li>1. If you are still using robinhood shame on ya, you need find a platform that doesn't restrict, would have never thought platform would do that complete bs.</li> <li>2. Wtf now robinhood is trying to scare people by showing alerts for added risk, screw these wall street pricks hold baby hold.</li> <li>3. We are in control robinhood and other platforms closing only means that we retailers are in control of way too much of the company.</li> </ol>

Table 9. (continued)

Topics	Words	Examples
<p><b>4. Upward Community Morale in Memetic Expression: Going to the Moon</b></p>	<p>moon_to_mars_space</p>	<ol style="list-style-type: none"> <li>1. Gme is finally going to the moon this technical analysis looks very nice.</li> <li>2. See you people on the moon any losses now do not mean jack hodl hodl hodl.</li> <li>3. I wonder what it's like for the little guy to stonk on the moon for a change.</li> </ol>
<p><b>5. Community Knowledge on the stock GameStop and the company GameStop</b></p>	<p>gamestop_gamestonk_games_playinggame</p>	<ol style="list-style-type: none"> <li>1. Gamestop employees, how do you feel about what's happening with the stock?</li> <li>2. Investor Chamath Palihapitiya the gamestop story is pushbacking against wall street establishment.</li> <li>3. Does shopping at gamestop also help raise the stock?</li> </ol>
<p><b>6. Collective Goal: Squeeze</b></p>	<p>squeeze_short_infimty_hold</p>	<ol style="list-style-type: none"> <li>1. The short squeeze has only begun we are going to the moon and this is why.</li> <li>2. If we all buy premarket it will squeeze the eyes of the shorts prior to open let's squeeze the shorts and make them bleed shorting stock is a big mistake.</li> <li>3. Why the gme short squeeze is far from over please read.</li> </ol>
<p><b>7. Upward Community Morale in Memetic Expression: Diamond Hands</b></p>	<p>diamond_hands_paperhands_holding_</p>	<ol style="list-style-type: none"> <li>1. Diamond hands to the moooonnnn.</li> <li>2. The short holders are manipulating the stock price again, diamond hands guys no paper hands allowed.</li> <li>3. Buy the dips diamond hands, this is their final attack we will prevail we don't need robinhood.</li> </ol>

Table 9. (continued)

Topics	Words	Examples
<b>8. Community Conflict: Moderator Controversies</b>	wsb_discord_down_facebook	<ol style="list-style-type: none"> <li>1. Mods on wsb are fucking gay and ban people for nothing.</li> <li>2. Don't let wsb going private and discord channel ban shake you.</li> <li>3. Join diamond hands group on telegram our facebook page got deleted with 36k members.</li> </ol>
<b>9. Collective Action: Hold the Line</b>	line_holdtheline_lineeee_holdingjust	<ol style="list-style-type: none"> <li>1. Give them no shares hold the line.</li> <li>2. Here the gme super mega thread bring this to the top we need to hold our ground.</li> <li>3. Attention make sure to hold don't let wsb scare you because the dd is all there.</li> </ol>
<b>10. Connective Leader: Elon Musk</b>	musk_elon_ceo_tesla	<ol style="list-style-type: none"> <li>1. Can we all tweet Elon Musk to join us since he hates shorts as well.</li> <li>2. We need Elon Musk on gme board and we will win.</li> <li>3. Elon musk did it again hooooold.</li> </ol>

***r/DDintoGME Topics***

r/DDintoGME differs itself in the GME peripheral subreddits as the knowledge production powerhouse. Participants in r/DDintoGME focus on producing, interpreting, and reproducing community knowledge to facilitate the GME movement more than enacting collective actions. As the subreddit matures, the volume and coverage of the community knowledge grows. However, the collective identity of “apes” bonds the subreddit with the rest of the GME peripheral subreddits.

Table 10 presents the top 10 topics in the entire r/DDintoGME corpus.

r/DDintoGME heavily focuses on community knowledge production while maintaining topical connections with r/Superstonk and r/GME. The “Community Knowledge” topic contains a wide range of subjects, from general information about the company and the stock GameStop, financial institutions, strategies and tactics of collective actions, triggers of moral outrage, to possibilities and implications of the collective goal. This amount and

the diversity of the community knowledge is enriched by the subreddit's commitment to a research-driven, evidence-based approach to due diligence and a crowd-sourced method of knowledge production through the active question-answering mode of discussion. Specifically, community knowledge of financial institutions includes interpretations of their new rules and their effect on the GameStop movement. Participants on r/DDintoGME also discuss strategies of collection actions, such as directly registering the ownership of GME stock shares with Computershare instead of formulating collective action strategies as mantra-like slogans. In addition, they critically question the meaning, likelihood, and implications of the collective goal (MOASS). Lastly, their discussion of the rigged financial system and the moral outrage such a system triggers focuses on the systemic practices and the financial phenomenon that such practices produce, such as dark pools (private securities exchanges where financial institutions can trade anonymously).

The representation of the "Collective Identity" topic in r/DDintoGME is evidenced by the memetic expression "We are Apes". The collective identity of "apes" fosters a sense of unity within r/DDintoGME but also aligns r/DDintoGME and reinforces its connection with other GME peripheral subreddits. r/DDintoGME's bond with other GME peripheral subreddits is further strengthened by the shared moral outrage, which is specifically directed towards Citadel, the market-maker partner of Robinhood and driven by the unfair practices within the financial system uncovered in the community knowledge, such as the opaque mechanism of dark pools. Finally, the "Community Conflict" topic in r/DDintoGME addresses a unique aspect of GME peripheral subreddits dynamics, focusing on the communicative restrictions

observed in other GME peripheral subreddits, such as r/Superstonk. In other words, r/DDintoGME is perceived by its members as an alternative space that fosters open dialogue without the constraints of karma point-based posting restrictions.

Table 10. Top 10 r/DDintoGME Topic Modeling Results from 04-07-2021 to 05-07-2021

Topics	Words	Examples
<ol style="list-style-type: none"> <li>1. <b>Upward Community Morale in Memetic Expression: We are Apes</b></li> <li>2. <b>&amp; Collective Action: Directly Register GME Sharess</b></li> </ol>	apes_wrinkled_brain_drs	<ol style="list-style-type: none"> <li>1. Hello, wrinkled brain apes saw this in r/Superstonk and don't believe it got enough eyes. Is the sec purposely legally releasing false information?</li> <li>2. Can any wrinkled brain ape explain this to smooth brain ape?</li> <li>3. Wrinkled apes explain please.</li> </ol>
<ol style="list-style-type: none"> <li>3. <b>Community Knowledge about the stock GameStop and the company GameStop</b></li> </ol>	gamestop_gamestopnft_gaming_stock	<ol style="list-style-type: none"> <li>1. GameStop announces Q2 fiscal 2021 earnings, date: Wednesday September 8 after market close.</li> <li>2. If GameStop announces normal dividend after the earnings call and not NFT, will it cause huge price spike MOASS or does it need to be an NFT so that it can't be messed with?</li> <li>3. It was revealed months ago that GameStop was working with the SEC not the CFTC. With the new dd what does this mean for us?</li> </ol>

Table 10. (continued)

Topics	Words	Examples
<p>4. <b>Community Knowledge: Mode of Knowledge Production</b></p>	<p>question_this_answer_help</p>	<ol style="list-style-type: none"> <li>1. This is a great idea another user came up with to ask the sec some hard hitting questions at upcoming meeting. You can register for too. Possibly ask questions copied their text and pasted bc no crosst.</li> <li>2. General question limit sell order vs diamond hands.</li> <li>3. Can anyone help me with understanding how to register my shares directly with gamestop im from germany</li> </ol>
<p>5. <b>Community Knowledge: Due Diligence (DD)</b></p>	<p>dd_floor_ddintogme_counter</p>	<ol style="list-style-type: none"> <li>1. Expanded melon crazy god tier DD mind blown edition.</li> <li>2. A cross post compilation of audio DD for April 2021.</li> <li>3. I posted this DD didn't get enough eyes, but I've found a lot more connections between subsidiaries and partners. Need help wrapping this up, any wrinkle brains able to help me do deeper dive into affiliations?</li> </ol>

Table 10. (continued)

Topics	Words	Examples
<p>6. <b>Moral Outrage towards Specific Financial Compant: Citadel LLC &amp; Community Knowledge on Moral Outrage</b></p>	<p>citadel_bain_cayman_blackrock</p>	<ol style="list-style-type: none"> <li>1. This is why OCC hasn't enforced anything against Citadel. This is member of the board of directors former SEC director and FINRA vice chairmen my full DD tomorrow on Marantz Rantz on YouTube.</li> <li>2. Citadel is threatening to sue people for exposing their crimes on Twitter. Imagine if bunch of apes tweeted this and tagged them cross post, credit poke fan for life.</li> <li>3. Citadel LLC is the biggest manipulator of the markets at the expense of retailers and they do not abide by SEC rules.</li> </ol>

Table 10. (continued)

Topics	Words	Examples
<p>7. <b>Community Knowledge about the stock GameStop and the company GameStop</b></p>	<p>gme_gmetransition_gmedd_gmerica</p>	<ol style="list-style-type: none"> <li>1. Can anyone confirm that gmerica.com linked to gamestop.com before big if true?</li> <li>2. Wrinkle brains assemble question how is the transition from libor going to affect the moass and is it potential catalyst?</li> <li>3. Ryan Cohen doing his thang this will become one of the biggest transformation in history thanks to the folks at gmedd for their tireless research</li> </ol>
<p>8. <b>Community Conflict &amp; Suspicion of Compromised Community</b></p>	<p>karma_posting_karmashy_mod</p>	<ol style="list-style-type: none"> <li>1. Are karma requirements used to suppress community involvement?</li> <li>2. I tried to post to r/Superstonk but lack the karma.</li> <li>3. Not enough karma for the super here and more in drs on the way.</li> </ol>

Table 10. (continued)

Topics	Words	Examples
<p>9. <b>Community Knowledge on Financial Institutions: DTC (Depository Trust Company), DTCC (Depository Trust and Clearing Corporation), and NSCC (National Securities Clearing Corporation)</b></p>	<p>dtcc_nsec_dtc_nsecs</p>	<ol style="list-style-type: none"> <li>1. How big money plays the game and why nsec-2021-10 might be the missing link.</li> <li>2. Overview of recent filings from the dtcc, nsec, and occ in laymen terms.</li> <li>3. Is there a link to the rule changes that the sec, dtcc, and occ have put in place or have been pending since the whole gme saga blew up.</li> </ol>
<p>10. <b>Community Knowledge on Practices of the Financial System</b></p>	<p>darkpools_volume_lowest_flooding</p>	<ol style="list-style-type: none"> <li>1. Average trade size dynamics in otc darkpools for the past year, appl and gme comparison.</li> <li>2. Darkpool data detailed by actors and trades volume in May April March.</li> <li>3. u/annihilationgdd looking into patterns of possible correlation between short volume ftds and darkpool volume.</li> </ol>
<p>11. <b>Community Knowledge on the Collective Goal: Achieve MOASS</b></p>	<p>moass_questionshave_thinksolved_colonelofwisdom</p>	<ol style="list-style-type: none"> <li>1. I have a question when the MOASS happens and brokers don't have our shares, who pays for them? do the shorts pay or our brokers or both?</li> <li>2. Dumbass question about the MOASS phenomenon.</li> <li>3. The bankruptcy jackpot and gme MOASS theory with GameStop history overview.</li> </ol>

Table 11 shows the top 6 topics in r/DDintoGME's first-month corpus, given the relatively small size of the corpus. These topics align closely with the overall narrative in r/DDintoGME, yet with some notable variances distinct for this one-month frame. The outlier topic (omitted in the table) falls under the Community Knowledge topic, emphasizing critical aspects of the financial system, such as the concept of Failure to Deliver (FTD occurs when a party in financial markets is unable to meet their trading obligations). This topic exemplifies the subreddit's inclination towards critical thinking and evidence-based analysis which is a mode of knowledge production also observed in the overall corpus. It also reflects the subreddit's commitment to a deeper understanding of financial mechanics and their implications for the GameStop movement.

A key addition in the "Moral Outrage" topic is the explicit identification of institutional investors, particularly hedge funds, as targets of the community's indignation. This focus suggests an early and acute awareness of these financial entities' roles in the GameStop short squeeze event and the GameStop movement. Interestingly, the one-month corpus lacks the "Community Conflict" topic, which is present in the overall corpus of r/DDintoGME. This initial period also misses certain aspects within the "Community Knowledge" topic, specifically those related to collective action and the collective goal. This absence indicates the evolving nature of the subreddit, from serving a supportive role as the knowledge production powerhouse with minimal involvement of the collective actions and more muted provocations about the collective goal, to a more active role in the GME movement. However, the collective identity of "apes" remains consistent across the one-month and the overall corpus. This identity, alongside the memetic expression "We are Apes" in the "Upward Community Morale" topic,

underscores a persistent sense of unity and shared purpose among the members within r/DDintoGME and among GME peripheral subreddits. In summary, the early stage in r/DDintoGME showcases a community in its formative stages, marked by a strong emphasis on critical analysis of financial systems, knowledge production, and a burgeoning sense of collective identity and purpose. This foundational period sets the stage for the subreddit's subsequent evolution, influencing how the members produce, interpret, and reproduce community knowledge to propel the GME movement forward.

Table 11. Top 10 One-Month r/DDintoGME Topic Modeling Results from 04-07-2021 to 05-07-2021

Topics	Words	Examples
<b>1. Community Knowledge on the stock GameStop and the company GameStop</b>	gme_market_stock_shares	<ol style="list-style-type: none"> <li>1. If institutions that are short on gme happens to be long on stocks that are going down, can this factor contribute to quicken margin call to cover their short position?</li> <li>2. Gme terminal drop for yesterday.</li> <li>3. Analysis of the proxy gme has not sold the 3.5 million shares yet.</li> </ol>
<b>2. Upward Community Morale in Memetic Expression &amp; Collective Identity: We are Apes</b>	apes_ape_brain_superstonk	<ol style="list-style-type: none"> <li>1. Fell into an alternate timeline shitadel wanted to ban pfof, can wrinkle brained ape break this down?</li> <li>2. Short vs gamma squeeze an unsophisticated apes journey into squeeze plays.</li> <li>3. Beware potential dangers to apes during the MOASS.</li> </ol>
<b>3. Community Knowledge: Due Diligence</b>	dd_counter_ddintogme_tier	<ol style="list-style-type: none"> <li>1. Classic dd repost the real reason wall street is terrified of the gme situation.</li> <li>2. Need some counter counter dd.</li> <li>3. The god tier melon dd hahahah for our eyes only the ultimate fuckery guide.</li> </ol>

Table 11. (continued)

<p><b>4. Moral Outrage towards Specific Financial Company (Citadel LLC)</b></p>	<p>citadel_citadels_gme_scam</p>	<ol style="list-style-type: none"> <li>1. <b>Why citadel kept shorting and how they flooded wsb and tiktok to set up fake squeeze.</b></li> <li>2. <b>Dd of gme and all the citadel scam.</b></li> <li>3. <b>Gme and the full citadel scam dd unlimited money glitch and laundering.</b></li> </ol>
<p><b>5. Moral Outrage towards the Institutional Investors</b></p>	<p>hedgefunds_shill_hedge_brokerages</p>	<ol style="list-style-type: none"> <li>1. A small writeup on the hedge funds just to know who we are dealing with.</li> <li>2. Companies destroyed by hedge funds how gamestop was almost the next toysus.</li> <li>3. A time tested playbook that uses coordinated approach that is heavily dependent on illegal naked shorting by the investment bank traders and manipulation of public opinion by the hedge funds.</li> </ol>
<p><b>6. Community Knowledge on Financial Institutions: DTC (Depository Trust Company), DTCC (Depository Trust and Clearing Corporation), and NSCC (National Securities Clearing Corporation)</b></p>	<p>dtcc_dtc_nssc_occ</p>	<ol style="list-style-type: none"> <li>1. Bodson dtcc ceo hearing testimony, dtcc nssc member default logistics link in comments.</li> <li>2. Where does this supposed 60 trillion-dollar insurance policy come from? Have yet to actually find any factual evidence of the dtcc having 60 trillion-dollar insurance policy.</li> <li>3. Dtcc general counsel office explanation of rule change proposal sr-dtc-2021-005.</li> </ol>

***r/GMEJungle Topics***

As u/Stedben commented in r/GMEJungle, “Ddintogme is for pure DD, GMEjungle is pure heart and maybe little soul”. The positionality of r/GMEJungle is between the emotional and community knowledge-driven. Specifically, the community shifts from close alignment with mantra-like collective strategies to more practical ones as its focus on community knowledge production grows. As the subreddit evolves, it aligns its

collective identity with other peripheral subreddits while attempting to differentiate itself by adopting the “gamers” identity.

Table 12 showcases the top 10 topics in the overall corpus of r/GMEJungle. The “Collective Action” topic has two expressions: “Use a stock transfer company Computershare to Directly Register the ownership of GME stock shares” and the recurring slogan-like approach: “Buy and Hold the Stock”. The “Upward Community Morale” topic has two memetic expressions: “We are Apes” and “Going to the Moon”, encapsulating the community’s optimism, collective identity, and shared aspirations. In addition, participants in r/GMEJungle adopt two identities: “apes” and “gamers”. These two representations in the “Collective Identity” topic, on the one hand, connect participants in r/GMEJungle with participants in the other GME peripheral subreddits. On the other hand, they suggest an extra dimension of self-identification in r/GMEJungle’s community members as evolving beyond “apes”. The “Community Conflict” topic centers around community moderation controversies, such as karma posting restrictions, banning users, and deleting posts without plausible reasons in other GME peripheral subreddits, leading community members to migrate from one subreddit to another following the path from r/GME to r/Superstonk to r/GMEJungle. Although the Community Migration topic does not emerge from the topic modeling results on the overall corpus in r/GMEJungle, this topic is observable in the topic modeling results of the one-month corpus, which will be described and discussed further in the next section. Furthermore, the Community Support topic can be seen as the byproduct of the community migration, illustrating how community conflicts and diversifications within

the larger GME movement have fostered supportive relationships among peripheral subreddits, specifically between r/DDintoGME and r/GMEJungle.

Furthermore, the “Collective Goal” topic centers around achieving the MOASS (Mother of All Short Squeezes), underscoring the community's ultimate ambition. Meanwhile, the “Connective Leader” theme topic is about following and decoding messages from the chairman and CEO of GameStop, Ryan Cohen. The “Moral Outrage” topic in r/GMEJungle targets specific individuals, such as Kenny Griffin and Gabe Plotkin, alongside financial company Citadel LLC. Gabe Plotkin was the founder of the former Melvin Capital Management which received about \$2 billion from Citadel LLC and bankrupted during the GameStop Short Squeeze event (Yi, 2021). This personification of moral outrage targets complements the “Connective Leader” topic, creating a narrative of heroes versus villains in r/GMEJungle.

Table 12. Top 10 r/GMEJungle Topic Modeling Results from 07-14-2021 to 12-31-2021

Topics	Words	Examples
1. <b>Upward Community Morale in Memetic Expression: We are Apes</b>	apes_jungle_gme_strong	<ol style="list-style-type: none"> <li>1. Just to be clear r/GMEJungle may not be our last home but for me apes is home.</li> <li>2. If this is our new home can we stop using that term for mentally disabled, AITA, hold over from that original sub and using it only serves to potentially alienate apes.</li> <li>3. New exhibit at the museum of natural apeology.</li> </ol>

Table 12. (continued)

Topics	Words	Examples
<p><b>2. Community Conflict</b></p>	<p>drama_mod_karma_sub</p>	<ol style="list-style-type: none"> <li>1. Unpopular opinion mod drama isn't something to just scoff at. It's something that impacts who has moderative control over the flow of information on subreddit. This exchange of information is what has allowed apes to become aware of gme naked shorting and everything else involved.</li> <li>2. Thought I'd bring this back to spread some positivity regardless of which sub we meet in. Us apes all share the same ultimate goal ape strong together, hodl for you buckle up.</li> <li>3. Before the karma requirements kick in and can't talk to you guys again, love all my fellow apes and will see you on the moon.</li> </ol>
<p><b>3. Collective Goal: Achieve MOASS</b></p>	<p>moass_during_after_before</p>	<ol style="list-style-type: none"> <li>1. Additional solution for flow of information in the slim chance that reddit restricts us during MOASS.</li> <li>2. r/gmejungle like it's gonna bring good vibes only, all stay safe, jacked tits, MOASS in sight, diamond hands, hold tight 30milly floor, hedgies thrown out the door.</li> <li>3. Different sub same MOASS.</li> </ol>

Table 12. (continued)

Topics	Words	Examples
<p><b>4. Collective Action: Hold GME Stock</b></p>	<p>hodl_buy_buying_sell</p>	<ol style="list-style-type: none"> <li>1. Onto new home but as before my fellow apes buy and hodl this is the way.</li> <li>2. Buy hodl and buckle up apes we are free.</li> <li>3. Wise words of advice to live by hodl buy hodl.</li> </ol>
<p><b>5. Community Knowledge on GameStop Company &amp; Collective Identity: We are gamers</b></p>	<p>gamestop_games_xbox_gamers</p>	<ol style="list-style-type: none"> <li>1. Store sold out on all xbox and ps controllers had to settle with a wired one bullish.</li> <li>2. hahahahaha we are gamers and we found the infinite money glitch in what was your private video game.</li> <li>3. All the anecdotes in here made me smile remember your routes gamers power to the players.</li> </ol>
<p><b>6. Moral Outrage towards a Specific Institutional Investor: Kenny Griffin (CEO of Citadel LLC) and Gabe Plotkin (Founder of the former Melvin Capital Management)</b></p>	<p>kenny_kennys_gabe_kengriffinlied</p>	<ol style="list-style-type: none"> <li>1. Kenny's job prospects post MOASS aren't looking too good.</li> <li>2. The MOASS will go easier if you don't struggle Kenny.</li> <li>3. When Kenny got to drop more dollars for shilling this sub.</li> </ol>

Table 12. (continued)

Topics	Words	Examples
<b>7. Community Support Among GME Peripheral Subreddits</b>	dd_dds_ddintogme_dsr	<ol style="list-style-type: none"> <li>1. Remember there is also r/ddintogme</li> <li>2. Ddintogme is for pure dd, gmejungle is pure heart and maybe little soul</li> <li>3. Crossposting from r/ddintogme</li> </ol>
<b>8. Connective Leader: Ryan Cohen</b>	rctweet_rcnew_rcnext_rclatest	<ol style="list-style-type: none"> <li>1. Volume glitches going off today, spiked hard with rc tweet, need wrinkle brain.</li> <li>2. Tinfoil hats on lighthearted deep dive in to today rc tweet</li> <li>3. Trust dfv, trust rc, fact shorts have to close.</li> </ol>
<b>9. Upward Community Morale in Memetic Expression: Going to the Moon</b>	moon_trip_landing_going	<ol style="list-style-type: none"> <li>1. I'll switch subs as many times as is necessary the destination is still the moon.</li> <li>2. Hodling till the moon is in the rearview.</li> <li>3. See you all on the other side of the moon.</li> </ol>
<b>10. Moral Outrage towards a Specific Financial Company</b>	citadel_citadelmoney_citadelscandal_citadellawsuit	<ol style="list-style-type: none"> <li>1. Citadel must be getting desperate looks like they shorted my weather today.</li> <li>2. citadel has called in all their interns for the weekend.</li> <li>3. Training day at citadel psych unit</li> </ol>

Table 13 provides the top 10 topics in r/GMEJungle during its first month which closely mirror the subreddit’s overall topical landscape but with several variations specific to this early stage. A notable difference in the “Collective Action” topic during this initial month is the absence of the more tangible strategy of using Computershare for direct stock registration. Instead, the focus is on the recurring slogan-like strategy of “Buy the Dip and Hold”. This shift suggests a possible evolution towards more concrete

collective actions in its later community development. In addition, the “Community Knowledge” topic in this early period includes additional information on due diligence and financial companies, indicating a growing interest in deeper financial analysis and understanding among community members. However, it lacks the specific representation of the Computershare strategy, pointing to an evolving knowledge base within the community.

Furthermore, Kenny Griffin remains a consistent moral outrage target in both the one-month and overall corpora. However, the focus on Gabe Plotkin and other financial companies, prevalent in the broader discussions, is not as prominent in this initial phase. Additionally, the “Collective Identity” topic in the first month does not include the “gamers” persona, which is present in the overall corpus of r/GMEJungle. This shift could indicate a developing sense of identity within the community over time and r/GMEJungle’s preference for aligning with other GME peripheral subreddits at its early stage. Interestingly, the topic of “Community Migration” emerges distinctly in this early period, highlighting migration away from r/Superstonk, which could indicate the community dynamics within the GameStop movement, with participants actively seeking community spaces that align with their perspectives and needs. In summary, the early community discussions in r/GMEJungle reveal a community in shaping its identity, strategies, and knowledge base. The diverse themes indicate a rich and evolving narrative driven by the members’ shared interests, goals, and their evolving understanding of and commitment to the GME movement.

Table 13. Top 10 One-Month r/GMEJungle Topic Modeling Results from 07-14-2021 to 08-14-2021

Topics	Words	Examples
<b>1. Collective Action: Hold GME Stock</b>	hodl_gme_buy_sell	<ol style="list-style-type: none"> <li>1. Welcome to the jungle my friends much love just buy and hodl, imo never financial advice.</li> <li>2. I just like the stock buy and hodl.</li> <li>3. I present to you my longest hodl against Kenny since 1997 Kenny got nothing on this ape will hodl my shares for as long as I need to.</li> </ol>
<b>2. Upward Community Morale in Memetic Expressions: We are Apes and Going to the Moon</b>	apes_jungle_moon_together	<ol style="list-style-type: none"> <li>1. Welcome to the jungle! Fellow apes I can't believe we're doing this again but I am here for the real apewood no drama just like the stock nothing changed hodl.</li> <li>2. How do you apes think msm will paint the MOASS when it starts.</li> <li>3. I posted this in all our previous homes and now I'll post this here remember that ultimately even though this may be another migration our true home will always be the moon and beyond the same strategy still stands. I'll keep on buying holding and loving this stonk.</li> </ol>
<b>3. Community Conflict</b>	karma_cannotpost_drama_mod	<ol style="list-style-type: none"> <li>1. Before karma police kick in.</li> <li>2. Ape festival account with zero karma and 30 days old is posting in ss how is that possible with mod approval.</li> <li>3. Couldn't post couple days ago because karma rules on the other sub still hyped still buying and still holding.</li> </ol>

Table 13. (continued)

Topics	Words	Examples
<p><b>4. Collective Goal: Achieve MOASS</b></p>	<p>moass_apes_ape_post</p>	<ol style="list-style-type: none"> <li>1. r/gmejungle like it's gonna bring good vibes. All stay safe jacked tits, MOASS in sight diamond hands hold tight 30milly floor, hedgies thrown out the door.</li> <li>2. Different sub same MOASS.</li> <li>3. Welcome to gmejungle please remember to admire our majestic moderators from afar do not tap the glass and refrain from sending them nudes until after the MOASS.</li> </ol>
<p><b>5. Community Knowledge on the Stock GameStop and the Company GameStop</b></p>	<p>gamestop_gamestopdeal_gamestopnft_games</p>	<ol style="list-style-type: none"> <li>1. Some thoughts on gamestops nft and potential dividend.</li> <li>2. Ok now that we all have a voice who would like to talk about all the things missed about the nft and eth gamestop easter eggs.</li> <li>3. Gamestop esports twitter is now verified in case there were skeptics.</li> </ol>
<p><b>6. Moral Outrage towards a Specific Institutional Investor: Kenny Griffin (CEO of Citadel LLC)</b></p>	<p>kenny_kennys_kennyand_ken</p>	<ol style="list-style-type: none"> <li>1. I hear this goes well with extra mayo kenny boy we don't eat that stuff in the jungle.</li> <li>2. Idk what's in kenny's mind but we are not selling we are just spreading out lol.</li> <li>3. Kenny you may be able to make apes move but you can't make them sell can keep moving longer than you stay solvent.</li> </ol>
<p><b>7. Community Knowledge: Due Diligence and Community Support Among GME Peripheral Subreddits</b></p>	<p>dd_ddintogme_need_do</p>	<ol style="list-style-type: none"> <li>1. Should we keep dd and technical stuff on ddintogme?</li> <li>2. Crossposting from ddintogme.</li> <li>3. Technical analysis dd for gamestonk and outlook ahead give me tendies or give me death.</li> </ol>

Table 13. (continued)

Topics	Words	Examples
<p><b>8. Community Conflict Among GME Peripheral Subreddits and Community Migration</b></p>	<p>superstonk_onsuperstonk_atuperstonk_mods</p>	<ol style="list-style-type: none"> <li>1. It's crazy how gme split because mother improperly made her kids mods and they were all crazy, now superstonk has mod improperly making her supposed lover mod as well and things are going to shit.</li> <li>2. When you jump from wallstreetbets to gme to superstonk and now to gmejungle.</li> <li>3. The lesson of wsb gme and superstonk.</li> </ol>
<p><b>9. Connective Leader: Ryan Cohen</b></p>	<p>retweet_rclatest_rcnew_rc</p>	<ol style="list-style-type: none"> <li>1. Another smooth brain decode of retweet chopsticks.</li> <li>2. What if retweet wasn't about himself overworking but about the villains of the story?</li> <li>3. Quick rant on the obsessive analysis of dfv and retweets cryptic numbers and hidden messages.</li> </ol>
<p><b>10. Community Knowledge on Financial Companies</b></p>	<p>fidelity_broker_brokerage_transferred</p>	<ol style="list-style-type: none"> <li>1. Did you guys know you can buy gme shares through your fidelity 401k even if your company doesn't allow it directly? Just transferred my 401k into their brokerage link account and now I can buy gme directly with it.</li> <li>2. Man now fidelity is routing through shitadel, I am just guna buy and hodl through my bank, so don't have to wait 3-5 days to transfer my funds when MOASS happens.</li> <li>3. In fidelity gme limit sell orders capped for MOASS at 30 above market price.</li> </ol>

### *Thematic Findings*

The overall and one-month corpus findings reveal ten themes (Tables 14 and 15). Specifically, I define the “Moral Outrage” theme as the background condition that provides long-lasting affective ties and collective identities among the GameStop movement participants. It can be directed at significant individuals, financial companies, financial institutions, and the financial system. Reddit texts engaged in this theme reflect the affective meaning-making process with a range of moral outrage targets that could be seen as “enemies”. The “Connective Leaders” theme is defined as individuals who invite and steer movement participants but might not have direct engagement with the community. Connective leaders enjoy celebrity-like status, but the community could imagine their status to form collectivity. This definition shows that connective leaders could be liked or disliked by the community. In my analysis, I choose to include the disliked connective leaders as targets of moral outrages. However, both types of connective leaders can strengthen the background condition for collectivity that the “Moral Outrage” theme provides. Together, the “Moral Outrage” and “Connective Leaders” themes suggest a thematic trend of “heroes vs. enemies”, while bearing evidence for two communicative reflexivities: gamification and performativity. Under the trend of “heroes vs. enemies”, participation of the GameStop movement by members of peripheral subreddits could be seen as constituting a role-playing game. Members of peripheral subreddits and connective leaders they admire could be seen as performing the role of heroes, while the connective leaders that obstruct the movement and moral outrage targets could be seen as performing the role of enemies.

The reflexivities of gamification and performativity could also be seen in the themes of collectivity, such as “Collective Identity”, “Collective Action”, and “Collective Goal”. Specifically, I define the “Collective Identity” theme as a distinctive and shared identity that bonds members of a group together while potentially setting boundaries between other groups. A collective identity in the GME movement is fluid, adaptable, and co-constructed within the subreddit group identity. Meanwhile, I define the “Collective Action” theme as strategies and tactics that promote realizing a collective goal. The “Collective Goal” theme is defined as the desired and shared outcome of a community bonded with a sense of collectivity. Both themes emphasize the actionability and embedded emotions in their representations. The engagement of performativity (fluid collective identification) and gamification (role-playing and a set of actions to achieve a goal) also calls out the communication process of aestheticization, which is not only constituted by the stock market like platform design: upvote and downvote, but also by affective and playful meaning making processes and the simple yet inclusive and subversive memetic expression and slogans. Furthermore, the “Community Knowledge” theme refers to information produced, reproduced, shared, and preserved by a community. Based on this definition, the “Community Knowledge” theme includes discussions about collective actions and goals without clear resolutions and intent to act on them. Through producing community knowledge that supports collectivity, participants of the GameStop movement engage in the communication process of virtualization, where their reality reaffirms itself virtually with each post. The “Community Conflict” theme consists of the causes that drive community diversification and migration, which could be seen as a repeat of the “heroes vs. enemies” trend.

However, both roles, in this case, are not easily identifiable as GME peripheral subreddits mature, and sentiments of fear, uncertainty, and doubt (fud) permeate throughout the overall community, where anyone could be suspected of shills (enemies). The sense of fud reflects the communication process of de-realization where the detachment between movement participants' experience and their beliefs might occur. The process of de-realization, on the one hand, might lead the movement participants to homogenize their beliefs and actions across the peripheral subreddits to achieve their collective goal. However, the detachment from reality or acceptance of an alternative reality where everyone might be an enemy might derail the collectivity of the movement.

Furthermore, the “Upward Community Morale” theme uses memetic expressions to elicit positive emotions that bond members of peripheral subreddits, such as sympathy and empathy. These memetic expressions also help form distinctive cultural and linguistic practices that, on the one hand, establish “inside vs. outside” community boundaries and, on the other hand, collective identity. Therefore, this theme is also a direct embodiment of the communication process of aestheticization and reflects performativity. The “Community Migration” theme indicates community diversification, which produces peripheral subreddits and community membership transfer from one peripheral subreddit to another. Lastly, the “Community Support” theme is defined as direct references to one peripheral subreddit by another in support of community growth. In the GME movement, community migration patterns often can be seen in the direct references of peripheral subreddits. Despite the references of these subreddits might dictate the direction of migrating to or migrating away from, the digital trails of these references suggest the

transactionality reflexivity where the information of community migration is recorded as part of the community identity and knowledge.

In sum, the analysis of the GME movement identifies 10 key themes that illustrate the communication processes and reflexivities at play. The reflexivities of gamification and performativity are especially crucial as participants adopt role-playing behaviors fluidly co-constructing their collective identity. Furthermore, communication processes of aestheticization, virtualization, and de-realization drive meaning-making, boundary-setting, and goal-sharing within the movement. These processes not only reinforce the collectivity but also reflect the playful, performative, and affective communication patterns within the GME movement.

Table 14. Topic Themes for GME Peripheral Subreddits from Their Inception Date to 12-31-2021

Themes	r/Superstonk topics	r/GME topics	r/DDintoGME topics	r/GMEJungle topics
<b>Moral Outrage</b>	<ol style="list-style-type: none"> <li>1. Financial Institution (SEC)</li> <li>2. Institutional Investors (Hedge Funds)</li> </ol>	<ol style="list-style-type: none"> <li>1. Institutional Investors (Hedge Funds),</li> <li>2. Financial Institutions (CFTC)</li> <li>3. Financial Companies (Robinhood and Citadel)</li> </ol>	Financial Companies: Citadel	<ol style="list-style-type: none"> <li>1. Kenny Griffin</li> <li>2. Gabe Plotkin</li> <li>3. Financial Company (Citadel)</li> </ol>
<b>Connective Leaders</b>	<ol style="list-style-type: none"> <li>1. Ryan Cohen,</li> <li>2. u/DeepFuckingValue</li> </ol>	N/A	N/A	Ryan Cohen
<b>Collective Action</b>	Hold the Stock and Buy the Dip	Hold the Stock and Buy the Dip	N/A	<ol style="list-style-type: none"> <li>1. Direct Register with Computershare</li> <li>2. Hold and Buy the Stock</li> </ol>

Table 14. (continued)

Themes	r/Superstonk topics	r/GME topics	r/DDintoGME topics	1. r/GMEJungle topics
<b>Collective Identity</b>	Superstonkers	We are Apes	We are Apes	2. We are Apes 3. We are gamers
<b>Community Conflict</b>	Shills	Shills	Moderator Controversies and Karma Posting	Moderator Controversies and Karma Posting
<b>Upward Community Morale in Memetic Expressions</b>	1. Going to the Moon 2. Jacked Tits	1. Going to the Moon 2. We are Apes	We are Apes	1. We are Apes 2. Going to the Moon
<b>Collective Goal</b>	Squeeze	Squeeze and MOASS	N/A	MOASS
<b>Community Knowledge</b>	N/A	General Information about GameStop Stock and Company	1. General Information about GameStop Stock and Company 2. Due Diligence 3. Financial Institutions 4. Collective Actions 5. Collective Goal 6. Moral Outrage 7. Mode of Knowledge Production 8. Practices of the Financial System	1. General Information about GameStop Stock and Company 2. Collective Action: Use Computershare to Directly Register Shares
<b>Community Migration</b>	N/A	N/A	N/A	N/A
<b>Community Support</b>	N/A	N/A	N/A	Support between r/DDintoGME and r/GMEJungle

Table 15. Topic Themes for GME Peripheral Subreddits One Month Since Their Inception

Themes	r/Superstonk topics	r/GME topics	r/DDintoGME topics	r/GMEJungle topics
<b>Moral Outrage</b>	<ol style="list-style-type: none"> <li>1. Financial Institution (SEC)</li> <li>2. Institutional Investors (Hedge Funds)</li> </ol>	<ol style="list-style-type: none"> <li>1. Institutional Investors (Hedge Funds),</li> <li>2. Financial Institutions (CFTC)</li> <li>3. Financial Companies (Robinhood)</li> </ol>	<ol style="list-style-type: none"> <li>1. Financial Companies: Citadel</li> <li>2. Institutional Investors</li> </ol>	<ol style="list-style-type: none"> <li>1. Kenny Griffin</li> <li>2. Gabe Plotkin</li> <li>3. Financial Company (Citadel)</li> </ol>
<b>Connective Leaders</b>	<ol style="list-style-type: none"> <li>1. Ryan Cohen</li> <li>2. u/DeepFuckingValve</li> </ol>	Elon Musk		Ryan Cohen
<b>Collective Action</b>	<ol style="list-style-type: none"> <li>1. Buy the Dip</li> <li>2. Recall Shares</li> </ol>	<ol style="list-style-type: none"> <li>1. Buy the Dip and Hold the Stock/Line</li> <li>2. Use Other Meme Stock and Coins</li> </ol>		<ol style="list-style-type: none"> <li>1. Hold and Buy the Stock</li> <li>2. Directly Register with Computershare</li> </ol>
<b>Community Conflict</b>	Shills General Distrust	Shills Moderator Controversies	Moderator Controversies and Karma Posting	Moderator Controversies and Karma Posting
<b>Collective Identity</b>	Superstonkers We are Apes	We are Apes	We are Apes	<ol style="list-style-type: none"> <li>1. We are Apes</li> <li>2. We are gamers</li> </ol>
<b>Upward Community Morale in Memetic Expressions</b>	<ol style="list-style-type: none"> <li>1. We are Apes</li> <li>2. Going to the Moon</li> <li>3. Jacked Tits</li> </ol>	<ol style="list-style-type: none"> <li>1. Going to the Moon</li> <li>2. Diamond Hands</li> </ol>	We are Apes	<ol style="list-style-type: none"> <li>1. We are Apes</li> <li>2. Going to the Moon</li> </ol>
<b>Collective Goal</b>	Squeeze and MOASS	Squeeze and MOASS		MOASS

Table 15. (continued)

Themes	r/Superstonk topics	r/GME topics	r/DDintoGME topics	r/GMEJungle topics
<b>Community Knowledge</b>	<ol style="list-style-type: none"> <li>1. Financial Institutions</li> <li>2. Technical Analysis</li> <li>3. Due Diligence (DD)</li> <li>4. Mode of Knowledge Production</li> </ol>	General Information about GameStop Stock and Company	<ol style="list-style-type: none"> <li>1. General Information about GameStop Stock and Company</li> <li>2. Due Diligence</li> <li>3. Financial Institutions</li> <li>4. Collective Actions</li> <li>5. Collective Goal</li> <li>6. Moral Outrage</li> <li>7. Mode of Knowledge Production</li> <li>8. Practices of the Financial System</li> </ol>	<ol style="list-style-type: none"> <li>1. General Information about GameStop Stock and Company</li> <li>2. Due Diligence</li> <li>3. Financial Companies</li> <li>4. Collective Action: Use Computershare to Directly Register Shares</li> </ol>
<b>Community Migration</b>				Away From r/SuperStonk
<b>Community Support</b>				Support between r/DDintoGME and r/GMEJungle

***Comparing the Thematic Findings***

In the overall corpus, GME peripheral subreddits (r/Superstonk, r/GME, r/DDintoGME, and r/GMEJungle) share the theme of “Moral Outrage”, however, they have various foci on moral outrage targets. Specifically, both r/Superstonk and r/GME share moral outrage targets at financial institutions (Commodity Futures Trading Commission, also known as CFTC and SEC) and institutional investors (hedge funds), while r/GME, r/DDintoGME, and r/GMEJungle share moral outrage target financial companies (Citadel LLC and Robinhood). r/GMEJungle is the only GME peripheral subreddit that targets significant individuals (CEO of Citadel LLC and founder of former Melvin Capital) in their moral outrage. This sense of moral outrage target at various organizations and individuals could be seen as their justification for participating the GME movement and one of the driving forces that unites GME peripheral subreddits.

Through pinpointing the “enemies” in the movement, movement participants could engage in affective meaning-making process where their actions and beliefs could be deemed as not only justifiable to them but also inevitable.

The “Connective Leader” theme occurs across GME peripheral subreddits. However, this theme only occurred in the relatively lower ranked topics in r/GME and r/GMEJungle. The inconsistent level of significance placed in connective leaders by the GME peripheral subreddits suggests various level of importance on internal leadership or leadership emerged from self-organization and external leadership. In other words, r/GME and r/GMEJungle might favor leadership emerged from their community activities more than figures outside of their community. Also, since the connective leaders include individuals that the peripheral subreddits deem as “enemies”. This difference in the presence of connective leaders could broadly be seen as different tolerance to outside influence.

Other than r/DDintoGME, all GME peripheral subreddits have clear actionability and embedded emotions to signify their resolution and intent to achieve the collective goal: another squeeze like the original GameStop short squeeze event or an ultimate and infinite squeeze that completely disrupts the financial system: MOASS (Mother of All Short Squeeze). Furthermore, all GME peripheral subreddits but r/DDintoGME have strategies and tactics to achieve the collective goal. “Hold and Buy” is the shared collective action strategy among r/Superstonk, r/GME, and r/GMEJungle. However, r/GMEJungle also promotes the collective action strategy: “Use Computershare to Directly Register Shares”. Although r/DDintoGME is missing themes in “Collective Action” and “Collective Goal,” it provides community knowledge that critically

interprets and questions strategies and tactics of collection actions and possibilities and implications of the collective goal. Specifically, it offers community knowledge on financial institutions, collective actions, collective goals, moral outrage, practices of the financial system and a mode of knowledge production that exemplifies a knowledge production process: conducting due diligence and encompasses a form of knowledge production: question-answering. This mode of knowledge production with its communication process and form could be seen as originating from the need to have both more evidence and counterevidence to support, verify, and refute community knowledge. In this sense, r/DDintoGME distinguishes itself as the community knowledge powerhouse. Moreover, all GME peripheral subreddits but r/Superstonk provide community knowledge on the GameStop stock and company. r/GMEJungle also produces community knowledge on collective actions.

The “Community Conflict” theme is prevalent in all GME peripheral subreddits. However, r/Superstonk and r/GME are concerned about the existence of shills that the community perceives as agents deployed by the targets of community moral outrage to drive community contentions by spreading fear, uncertainty, and doubt (FUD). Instead of emphasizing the cause of community conflict on negative emotions, r/DDintoGME and r/GMEJungle focus on specific community moderation practices, such as karma posting (the moderation practice of restricting a user’s posting ability by the amount of karma points that a user has) and moderator controversies, such as deleting posts and banning users with community backlashes. In other words, peripheral subreddits with larger membership and seniority in the GME ecosystem tend to emphasize the negative emotions of fud, while the smaller and newly formed peripheral subreddits tend to focus

on specific conflicts. The different forms of community conflict might be a result of overall community development: as one peripheral subreddit matures, the sense of unknown, uncertainty, and unease might permeate throughout the subreddit to render inability to grow further or possibilities to migrate to or create new peripheral subreddits. Furthermore, all GME peripheral subreddits use memetic expressions to promote community morale. Specifically, the collective identity as “apes” occurs in all GME peripheral subreddits prominently but in r/Superstonk. Instead, members of r/Superstonk prefer to be identified as “stonks” which is a deliberate misspelling of the word “stocks” indicating one’s love of meme stocks and synonymous with “apes”.

The “Community Migration” theme is absent in the top 10 most frequently occurring topics in GME peripheral subreddits. However, lower ranked topics in r/Superstonk and r/GME mention community migration away from r/WallStreetBets, while lower ranked topics in r/DDintoGME mentions community migration away from away from r/Superstonk. Lower ranked topic in r/GMEJungle mentions community migration in general. Lastly, only r/GMEJungle has a clear theme in “Community Support” by directly and frequently referencing and guiding its members to r/DDintoGME in its top 10 most discussed topics. The community support from r/GMEJungle to r/DDintoGME provides a base for the subcommunity grouping between the two.

Themes observed in the one-month corpus of peripheral subreddits are similar to those observed in the overall corpus; however, they have different foci. Specifically, the one-month corpus of r/Superstonk lacks the “Moral Outrage” themes, while the moral outrage target in the one-month corpus of r/GME only includes financial companies.

Furthermore, r/Superstonk has an additional strategy in the “Collective Action” theme (“Recall Shares”), while r/GME uses other meme stocks and coins as a collective action strategy. The less focus on moral outrage and appearance of a more practical collective action in the early days of r/Superstonk hints a community progression driven more by emotions as the subreddit community matures. The presence of “shills” and general distrust in the form of question-answering in the one-month corpus of r/Superstonk further indicate the latent potential of emotions in its community progression.

The early days of r/GME with broader focus on meme financial instruments suggests it homogenizes with the rest GME peripheral subreddits as it matures. Comparatively, r/DDintoGME has an additional moral outrage target (institutional investors), while the target of the moral outrage in r/GMEJungle only includes a significant individual(Kenny Griffin, CEO of Citadel LLC) but misses “Directly Register with Computershare” as a collective action strategy. The individuals in the “Connective Leaders” theme largely stay the same, but for r/GME, Elon Musk is their connective leader, which indicates the overall preference of r/GME for leadership emerged from self-organization might stem from their admiration of a connective leader and might dissipate gradually as the connective leader pays less attention to the GME stock and the movement. Representations for “Collective Goals” remain the same for all GME peripheral subreddits. The “Community Conflict” theme is less pronounced in the one-month corpora, with moderator controversies replacing “shills” in the thematic representations in r/GME, and the theme is completely missing in r/DDintoGME.

Furthermore, the collective identity of “apes” in the one-month corpus of r/Superstonk replaces the collective identity of “stonks” prominent in its overall corpus.

In this first month, r/Superstonk seems to attempt differentiate itself from the rest of peripheral subreddits as it maintains a less emotionally driven aptitude towards the movement. Furthermore, due to the difference in inception dates and observed community migration pattern early in the movement (away from r/WallStreetBets), the collective identity of “stonks” could also be seen as an attempt to distance itself from the root subreddit which are comprised of compromised “apes” according to the “stonks”. In the one-month corpus of r/GME, the “Collective Identity” theme is absent, while the “Upward Community Moral” theme has an additional memetic expression( “Diamond Hands”).

Moreover, all GME peripheral subreddits have the “Community Knowledge” theme with r/Superstonk, r/DDintoGME, and r/GMEJungle having community knowledge on Due Diligence (DD) and r/GME, r/DDintoGME, and r/GMEJungle having community knowledge on the general information about GameStop stock and company. In addition, the one-month corpora of r/DDintoGME and r/GMEJungle miss community knowledge on collective actions. The presence of community knowledge across four peripheral subreddits in their early days further suggest the tendency for a peripheral subreddit becomes more emotionally driven and less community knowledge drive increases as a peripheral subreddit matures. In contrast to the overall corpora, the “Community Migration” is pronounced in the one-month corpus of r/GMEJungle. The “Community Support” theme in r/GMEJungle remains the same for both corpus sizes.

### **Topic Modeling Discussions**

The shared themes in the overall corpus of GME peripheral subreddits indicate topic similarity and connectedness among GME peripheral subreddits. Specifically, four

GME peripheral subreddits share moral outrage with different targets, concern about community conflicts derived from various causes, use memetic expressions to bond with the GameStop movement participants to form collectivity, and have the same collective goal. Furthermore, four GME peripheral subreddits play different roles in (de)structuring the overall community of the GameStop movement with various emphases on strategies and tactics of collective actions, deliberating processes in knowledge production, connective leaders that strengthen the collectivity, and recognition and support of each GME peripheral subreddit. Due to community conflicts, such as karma posting and general suspicion of skills, participants of the GameStop movement create and migrate into new peripheral subreddits. In other words, the suspicion of community compromise that supposedly interferes with the deliberating process in community knowledge production and undermines community morale and the discourse around collective actions and goals would lead to new subreddit creation and community migration. Topic modeling results and the creation dates of each GME peripheral subreddit indicate the direction of community migration, from r/GME to r/Superstonk to r/DDinGME to r/GMEJungle. The shared concern about enemies of the GameStop movement and their actions and influence on the movement's collectivity are inherited from one peripheral subreddit to the next.

The topical analysis of the overall corpus shows that r/Superstonk and r/GME could be categorized as emotion-driven peripheral subreddits. At the same time, r/DDintoGME and r/GMEJungle could be solutions to community conflicts seen in r/Superstonk and r/GME. Also, r/DDintoGME and r/GMEJungle focus on community knowledge production more than promotions of community morale via positive emotions

in memetic expressions and promotions and executions of collection actions. The peripheral subreddits in the emotion-driven sub-community are differentiated by the level of emotions and collective identities in addition to subreddit creation dates and membership size. The peripheral subreddits in the community knowledge drive sub-community are differentiated by the amount of focus on community knowledge. Specifically, participants in r/Superstonk prefer to be called stonks in addition to apes. r/DDintoGME shows a wide range of community knowledge in its top 10 most frequently occurring topics, such as deliberation of collective actions and goals and self-critical analysis of community concerns with well-documented evidence. Meanwhile, r/GMEJungle could be seen as a peripheral subreddit that shares features from both emotion-driven and community knowledge-driven sub-communities. Indeed, as u/Stedben commented in r/GMEJungle, “Ddintogme is for pure DD, GMEjungle is pure heart and maybe little soul”. Indeed, members in r/GMEJungle often refer posts from r/DDintoGME and promote the community growth of both peripheral subreddits.

The topical analysis of the one-month corpus of GME peripheral subreddits shows that the categorization between emotion-driven and community knowledge-driven sub-community has yet to be fully formed. Specifically, members in r/Superstonk and r/GME appeared less angry and had fewer expressions and targets of moral outrage in the one-month corpus since the inception of the corresponding subreddit. r/DDintoGME's powerhouse role of community knowledge had not been established, while r/GMEJungle's transitional role between emotion-driven and community knowledge-driven sub-community was more pronounced on the side of knowledge production. Although the four GME peripheral subreddits still inherited the theme of community

conflict and the use of memetic expressions bonded them, the difference between each peripheral subreddit was less prominent in the one-month corpus than the difference in the overall corpus. These topical and thematic differences suggest that GME peripheral subreddits tend to begin as more community knowledge subcommunity then diverge into more emotion-driven subcommunity. Specifically, the moral outrage theme is missing in the one-month corpus of r/Superstonk, suggesting that r/Superstonk did not heavily rely on emotions for the adherence to collectivity in its early days. Furthermore, the more specific and commonly accepted collective action strategy in the overall corpus (“Use Computershare to Directly Register Shares”) had not been widely embraced at the beginning of GME peripheral subreddits. Indeed, the one-month corpus's collective action strategies and tactics focused on “Buy and Hold”, which served more as a slogan for collective action than the later “Direct Registration” strategy, which could provide more practical and measurable outcomes. However, the progression of GME peripheral subreddits from more community knowledge driven to emotion driven subcommunity might not paint a complete picture due to the difference in creation dates for four peripheral subreddits. The later formed peripheral subreddits (r/GMEJungle and r/DDintoGME) might divert from the potential to become more emotion driven subcommunity. Noticeably, the analysis of the one-month corpus in r/GME shows that it often referred to other meme stocks and coins as instruments for achieving the collective goal. This broad focus on memetic financial instruments instead of solely on GameStop stock became less pronounced in the later stage of r/GME.

Overall, the comparison between the one-month corpus of GME peripheral subreddits and their overall corpus suggests that GME peripheral subreddits became more

dedicated to the role of GameStop stock in achieving the collective goal. The division between emotion-driven and community knowledge-driven sub-communities became more pronounced in the later stage of GME peripheral subreddits, with some peripheral subreddits still occupying transitional roles that bridge both subcommunities.

Furthermore, community conflict or the concern about community conflict or compromise drives the creation of GME peripheral subreddits. However, they are also bonded by community conflict, community support emerged from the shared concern about the community conflict, and shared belief in the role of community knowledge.

### **Sentiment Analysis Findings**

For the sentiment analysis, the corpora under analysis are structurally like those for the topic modeling analysis with two types of corpora analyzed (entirety and one-month snapshot from each GME peripheral subreddit). However, I choose the corpora without deduplication to reflect the overall sentiments of each GME peripheral Reddit. I argue that re-posts could indicate the participants' affective involvement and attachment in the content of the re-posts, and the compositions of which could reveal significant insights in sentiment analysis. The thematic analysis from the topic modeling results informed the scores assigned to the revised vocabulary—specifically, representative words in “Upward Community Moral in Memetic Expression,” “Collective Goal”, and “Collective Action” themes were assigned the highest positive sentiment score of 4. However, the representative words in “Moral Outrage” themes were assigned the highest negative score of -4. The specific words with revised sentiment scores are shown in Table 16. Based on the revised dictionary and the default grammatical and syntactical rules in VADER, I calculated the overall sentiment scores of each post title in the overall and one-month

corpus. I also customized a positive threshold (0.4-1) and a negative threshold (0.25-1) to select post titles with evident positive or negative sentiments. Finally, I performed a word frequency analysis of these selected post titles. Tables 17- 32 show the top 20 words from the selected positive and negative post titles in each GME peripheral subreddit for the entire and one-month corpus, respectively.

Table 16. Customized VADER Dictionary

Revised Vocabulary	Sentiment Scores
ape / apes	4
tits	4
jacked	4
diamond	4
moon	4
kenny	-4
moass	4
drs	4
stonk / stonks	4
hodl	4

### *r/Superstonk Sentiments*

Tables 17 and 18 show the top 20 most frequently used words in the selected positive and negative titles from the overall corpus of r/Superstonk. They offer hints of relationships between sentiments and themes discovered in the previous analysis. Specifically, the collective identity “apes” unites the movement participants in r/Superstonk to perform the mantra-like collective action strategy “Buy and Hold” and a strategy that entails more thoughtfulness and measurable outcomes, “Direct Registering Shares with Computershare.” The community establishes its unique communication patterns by deploying memetic expressions, such as “Going to the moon” and “Jacked Tits” to fortify the collective identity of “apes,” and drive the realization of their collective goal “MOASS” with other GME peripheral subreddits. Positive sentiments linked to these themes suggest a subreddit beaming with enthusiasm to the potential of realizing the collective goal. Furthermore, the frequently used words in the selected

negative post titles confirm the negative valence embedded in the “Moral Outrage” and “Community Conflict” themes. Here, the focal target of moral outrage is Kenny Griffin, CEO of Citadel LLC. The sense of community suspicion (FUD) that could drive community migration and creation of new peripheral subreddits, coupled with the sense of uncertainty, unknown, and unease permeate through the sentiments in the overall corpus of r/Superstonk.

Table 17. r/Superstonk Top 20 Most Frequent Words in the Selected Positive Post Titles from the Overall Corpus

<b>Word</b>	<b>Frequency</b>
apes	20190
drs	13641
ape	11690
moass	9797
shares	5267
like	4603
moon	4591
gme	3838
jacked	3664
tits	3513
help	2736
love	2586
good	2512
post	2162
hodl	2081
buy	2061
happy	2052
share	2045
please	2009
new	1902

Table 18. r/Superstonk Top 20 Most Frequent Words in the Selected Negative Post Titles from the Overall Corpus

<b>Word</b>	<b>Frequency</b>
kenny	7048
fuck	2866
fud	2805
gme	2368
shit	2291
stop	2001
apes	1322
market	1250
price	1108
one	1097

Table 18. (continued)

Word	Frequency
wrong	1061
today	1058
get	1052
wtf	1043
bad	1042
like	1023
gamestop	944
us	908
buy	843
short	838

Tables 19 and 20 show the top 20 most frequently used words in the selected positive titles and negative titles from the one-month corpus of r/Superstonk, respectively. The most frequently used words in the positive post titles in the one-month corpus are like those in the overall corpus. However, an additional memetic expression, “Diamond Hands”, highlights the community's resilience in holding GameStop stocks amid selling pressures, illustrating a deep sense of unity in the early days. In contrast, the negative titles, though largely echoing the overall corpus, show a notable emphasis on “Community Conflict”, particularly concerning moderation practices, such as banning members or posts. This period also sees heightened concerns about the security and reliability of alternative communication channels like Discord among various GME peripheral subreddits, as evidenced in titles like “sus behavior in GME Discord 1k ceiling” and “r/GME Discord banning ppl for saying anything against them.”

The prominence of the “ape” collective identity in both positive and negative post titles from both overall and one-month corpus suggests the significance of this collective identity to uphold the movement participants in r/Superstonk together in the face of both internal pressures (fear, uncertainty, and doubt sentiments and moderation practices of limiting information flow by banning membership or posts) and external pressures (moral outrage targets and fluctuating GME stock prices). Interestingly, the sentiment analysis

between the one-month and the overall corpus suggests an evolution in the community’s strategy. Initially focused on a straightforward, emotionally driven approach (“Buy and Hold”), the community has gradually shifted towards incorporating strategies with more tangible, measurable outcomes, like “Direct Registering Shares” (DRS). This shift indicates a maturing movement, adapting to changing circumstances while maintaining its core ethos. This shift, coupled with the analysis from the topical analysis also suggests that progression of GME peripheral subreddit might be cyclical following the path from community knowledge driven to emotion driven then back to community knowledge driven.

Table 19. r/Superstonk Top 20 Most Frequent Words in the Selected Positive Post Titles from the One-Month Corpus

<b>Word</b>	<b>Frequency</b>
apes	1170
ape	711
hodl	255
like	239
gme	229
moass	226
moon	220
shares	204
good	154
strong	140
please	133
love	132
together	127
share	126
help	120
diamond	117
fellow	110
new	101
tits	89
jacked	88

Table 20. r/Superstonk Top 20 Most Frequent Words in the Selected Negative Post Titles from the One-Month Corpus

Word	Frequency
<b>gme</b>	195
<b>fud</b>	178
<b>shit</b>	99
<b>kenny</b>	92
<b>fuck</b>	90
<b>stop</b>	89
<b>apes</b>	81
<b>pain</b>	76
<b>volume</b>	66
<b>max</b>	62
<b>bad</b>	58
<b>attack</b>	55
<b>discord</b>	55
<b>today</b>	54
<b>wtf</b>	53
<b>price</b>	53
<b>new</b>	50
<b>banned</b>	50
<b>fire</b>	50
<b>low</b>	46

*r/GME Sentiments*

Tables 21 and 22 show the top 20 most frequently used words in the selected positive and negative titles from the overall corpus of r/GME, respectively. Like the most frequently used words in the positive titles in r/Superstonk, the most frequently used words in the positive titles in r/GME include often used words in the “Collective Identity”, “Collective Action”, “Collective Goal”, and “Upward Community Moral in Memetic Expressions” themes. Specifically, the collective identity of “ape” holds the most prominent position. Movement participants in r/GME are united as “apes” to become “Diamond Hands” (Upward Community Moral in Memetic Expressions) and “Buy the Dip and Hold” (Collective Action) so the GME stock prices could be “Going to the Moon” (Upward Community Moral in Memetic Expressions). Furthermore, the most frequently used words in the negative post titles in r/GME indicate the same negative sentiments embedded in the “Moral Outrage” and “Community Conflict” themes as in r/Superstonk. However, the moral outrage in r/GME is also negatively targeted at hedge

funds (hf) and the wealthy, in addition to a specific individual, Kenny Griffin. In addition, the fud (fear, uncertainty, and doubts) sentiments embedded in the “Community Conflict” theme are reinforced by a mode of knowledge production (question-answering). Even though question-answering is associated with negative sentiments, the community knowledge produced from this mode could be seen on the one hand as facilitating the realization of the collective goal and on the other hand as distractions that might deviate from movement participants enacting established collective action strategies.

Moreover, the expression “oh” appears prominently as a frequently used word in negative post titles. Its presence suggests a sarcastic or humorous tone and is a unique communication pattern that grabs the community’s attention. The dual role of the meme-like expression “oh” could be seen in these post titles: “oh wait autistic retard just bought some more for 5k buy the dip and hold” and “oh look, almost identical but down 20 today, shoving some more crayons up my ass and buying this delicious discount, valhalla is calling”. Finally, the frequent appearance of “Twitter” in negative post titles suggests the movement participants’ intention to monitor the information and control the narratives about GME stock. These actions serve to not only spread the discourse about GME stock to a wider audience but also combat the information campaign operated by moral outrage targets, as seen in this post title “to those being approached by hf shills to spread misinformation, capture conversations and tweet at AOC on Twitter.”

Table 21. r/GME Top 20 Most Frequent Words in the Selected Positive Post Titles from the Overall Corpus

Word	Frequency
ape	70049
apes	39810
hold	18894
best	13104
gme	12265
moon	12123
loves	12078
hodl	11565
diamond	8852
shares	8661
strong	8256
love	8074
help	7974
hands	7684
together	7465
new	7146
day	6983
post	6903
need	6838
dip	6770

Table 22. r/GME Top 20 Most Frequent Words in the Selected Negative Post Titles from the Overall Corpus

Word	Frequency
fuck	14022
fud	13812
shit	13597
oh	12244
rich	12064
market	6939
wtf	6756
new	6463
serious	6314
hf	6210
everyone	6190
fucks	6188
guy	6133
twitter	6115
thing	6102
story	6089
questions	6076
asking	6034
bill	6032
gross	6008

Tables 23 and 24 show the top 20 most frequently used words in the selected positive and negative titles from the one-month corpus of r/GME, respectively. The thematic associations in the positive post titles largely remain the same as in the overall corpus (“Going to the moon”, “Diamond Hands,” and “Buy and Hold”). However, the

prominence of the collective identity of “ape” is superseded by the memetic expressions. The shifting focus on the collective identity of “ape” between the one-month corpus and the overall corpus suggests that the memetic expressions could stimulate community morale and contribute to the formation of collective identity. In other words, the formation of collective identity in r/GME could be seen as a process emerging from using memetic expressions.

Furthermore, the most frequently used words in the negative post titles in the one-month corpus point to the trading app Robinhood which could be seen as an additional moral outrage target. The negative sentiments are also associated with the “Community Conflict” and “Community Migration” themes, which could be seen in these post titles “interesting wsb is now set to private at the same time gme stock moves down to 250” and “are there other subreddits to follow while since wsb is down am retard noob”. Lastly, the movement participants in r/GME seem to be motivated by the perceived information and market manipulation by moral outrage targets and become more inspired to perform collective actions despite the manipulation. The tenacity in the early stage of r/GME, which transforms negative sentiments around manipulation into motivations and inspirations to reinforce the collectivity, could be seen in post titles “After this manipulation ends, we will fucking destroy them and buy buy buy buy” and “organizing to fight the corruption and market manipulation.”

Table 23. r/GME Top 20 Most Frequent Words in the Selected Positive Post Titles from the One-Month Corpus

Word	Frequency
moon	185
gme	172
diamond	87
hold	86
hands	63
like	50
strong	47
shares	44
apes	42
help	38
good	38
stock	37
buy	36
share	31
please	28
love	27
support	23
interest	22
hodl	22
short	21

Table 24. r/GME Top 20 Most Frequent Words in the Selected Negative Post Titles from the One-Month Corpus

Word	Frequency
gme	164
fuck	110
stop	91
hold	89
buy	61
robinhood	59
selling	53
sell	45
shit	37
wtf	36
fucking	34
short	34
us	34
scared	32
manipulation	32
market	31
holding	30
wsb	28
game	28
buying	26

*r/DDintoGME Sentiments*

Tables 25 and 26 show the top 20 most frequently used words in the selected positive and negative titles from the overall corpus of r/DDintoGME, respectively. The most frequently used words in the positive titles focus on community knowledge

production and more practical collective action strategies with measurable outcomes (DRS). The collective identity of “apes” unites movement participants in r/DDintoGME through two interconnected modes of knowledge production: “due diligence” and “question-answering”. The accumulated community knowledge entails information on how to directly register GME stock shares with Computershare, transfer shares away from Robinhood to Fidelity, and manage IRA accounts when buying and holding GME shares. Furthermore, like r/Superstonk and r/GME, the positive sentiments in r/DDintoGME are also presented in the use of memetic expressions to uplift the community moral (“Going to the Moon”) and the mantra-like collective action strategy “Buy and Hold”. In sum, the positive sentiments in the overall corpus of r/DDintoGME lie in the community’s activities, such as knowledge production and collective actions, reinforced by memetic expressions to propel the realization of the collective goal (MOASS).

In addition to the community conflict expressed in fud sentiments and a moral outrage target Kenny Griffin, the negative sentiments in the overall corpus in r/DDintoGME also present in distrust in the overall financial market, a specific financial company (Citadel), and the probability of realizing the collective goal of MOASS. The lack of unwavering conviction to realize MOASS sets r/DDintoGME apart from r/Superstonk and r/GME. It also signifies evidence of self-reflection and critical thinking, which could be seen in the post title “I have a question when the MOASS happens and brokers don’t have our shares, who pays for them? do the shorts pay or our brokers or both?”.

Table 25. r/DDintoGME Top 20 Most Frequent Words in the Selected Positive Post Titles from the Overall Corpus

Word	Frequency
drs	154
apes	89
moass	83
shares	68
ape	48
gme	39
help	36
computershare	35
share	23
please	23
moon	23
hodl	19
dd	17
need	17
question	16
transfer	16
buy	15
fidelity	15
ira	14
gamestop	13

Table 26. r/DDintoGME Top 20 Most Frequent Words in the Selected Negative Post Titles from the Overall Corpus

Word	Frequency
gme	43
kenny	21
market	19
fud	15
short	13
question	12
fuck	12
volume	12
shit	12
citadel	11
crash	10
negative	10
shares	10
know	10
wrong	10
stop	10
post	9
new	9
risk	9
moass	9

Tables 27 and 28 show the top 20 most frequently used words in the selected positive and negative titles from the one-month corpus of r/DDintoGME, respectively.

Even though the early stage of r/DDintoGME has comparatively less content, the

associations between positive or negative sentiment and themes are still observable. Specifically, the positive sentiments are embedded in “Community Knowledge” (“dd”), “Collective Identity” (“ape”), and “Collective Goal” (“MOASS”) themes. In contrast, the negative sentiments are embedded in “Community Conflict” (fud) and “Moral Outrage” (“citadel”). The appearance of “dd” in both positive and negative post titles suggests the dual role of this mode of knowledge production. On the one hand, movement participants engage in “dd” to make more informed decisions (on the timing of buying more GME stocks), help fellow participants understand the collective action strategies, and achieve community agreement through open discussions backed by evidence. On the other hand, the acts of “dd” might bring light evidence that counters the movement participants’ conviction in the collective goal and seems to be intertwined with the fear, uncertainty, and doubt sentiments.

Table 27. r/DDintoGME Top 20 Most Frequent Words in the Selected Positive Post Titles from the One-Month Corpus

Word	Frequency
help	4
dd	3
moass	3
apes	3
price	2
per	2
share	2
gme	2
vs	2
cap	1
smooth	1
brain	1
requesting	1
clarification	1
shorts	1
citadels	1
corporate	1
bonds	1
somebody	1
please	1
refute	1

Table 28. r/DDintoGME Top 20 Most Frequent Words in the Selected Negative Post Titles from the One-Month Corpus

Word	Frequency
gme	14
market	5
debt	5
fud	4
fuck	4
citadel	4
question	3
wtf	3
manipulation	3
negative	3
volume	3
dd	3
scam	3
post	2
bank	2
failures	2
crash	2
blackhole	2
coverage	2
biased	2

*r/GMEJungle Sentiments*

Tables 29 and 30 show the top 20 most frequently used words in the selected positive and negative titles from the overall corpus of r/GMEJungle, respectively. Like

r/DDintoGME, the frequently used words in the positive titles in r/GMEJungle focus on collective action strategies with measurable results (drs). The positive sentiments are also associated with the “Collective Identity” (“apes”), “Upward Community Morale in Memetic Expressions” (“Buy and Hold”, “Going to the Moon”, and “Jacked Tits”, and “Collective Goal” (“MOASS”) themes. Furthermore, like other GME peripheral subreddits, the negative sentiments in r/GMEJungle are towards a moral outrage target, Kenny Griffin, and distilled in the community conflict. Interestingly, the association of the “Collective Identity”, “Collective Goal”, and “Collective Action” themes with the negative sentiments suggests the community r/GMEJungle might be more self-critical than other GME peripheral subreddits.

Table 29. r/GMEJungle Top 20 Most Frequent Words in the Selected Positive Post Titles from the Overall Corpus

Word	Frequency
apes	1218
drs	967
moass	715
ape	678
hodl	434
like	340
shares	293
buy	274
gme	265
moon	237
tits	225
jacked	216
post	169
love	162
help	162
good	159
computershare	144
share	137
new	119
way	111

Table 30. r/GMEJungle Top 20 Most Frequent Words in the Selected Negative Post Titles from the Overall Corpus

Word	Frequency
kenny	414
fud	149
fuck	135
gme	129
shit	122
market	77
bad	76
stop	68
today	68
wrong	63
one	62
gamestop	59
like	58
price	58
moass	57
us	57
wtf	55
apes	54
stock	53
drs	52

Tables 31 and 32 show the top 20 most frequently used words in the selected positive and negative titles from the one-month corpus of r/GMEJungle, respectively. Other than an additional memetic expression, “Diamond Hands”, the theme associations and their representations in the one-month corpus are similar to that of the entire corpus in r/GMEJungle. The frequently used words in the negative sentiments introduce an additional representation of community conflict, moderation drama, which includes unfair moderation practices of banning posts and users and acting against the interests of the community, as this post title shows: “for the future of this sub, I propose that all mods must be approved by the ape community and all mods are also subject to being removed by ape community”.

Table 31. r/GMEJungle Top 20 Most Frequent Words in the Selected Positive Post Titles from the One-Month Corpus

Word	Frequency
apes	670
moass	389
ape	366
hodl	263
like	216
gme	148
buy	133
tits	125
jacked	121
moon	117
love	110
post	107
good	87
new	77
jungle	75
stock	71
welcome	68
diamond	67
help	65
day	61

Table 32. r/GMEJungle Top 20 Most Frequent Words in the Selected Negative Post Titles from the One-Month Corpus

Word	Frequency
kenny	174
fuck	92
fud	89
gme	83
shit	76
wrong	41
wtf	40
market	39
price	39
bad	38
stop	38
volume	38
us	36
stock	34
ape	33
drama	32
moass	32
gamestop	32
new	31
mod	30

### Sentiment Analysis Discussions

The sentiment analysis extends to the topic modeling results and associates prominent themes extracted from topics with positive or negative sentiments. The comparative sentiment across GME peripheral subreddits between their one-month and

entire corpora reveals several communication patterns, such as the shift from optimism to a combination of optimism and realism. It also provides an opportunity to introduce the concepts of unidirectional (sentiments with more focused targets, such as outrage and enthusiastic) and omnidirectional (sentiments with more dispersed targets, such as uncertain, unknown, and unease) sentiments to address community migration patterns and the formation of collectivity in the GME movement. The naming and definitions of the unidirectional and omnidirectional sentiments could be better understood by thinking about how microphones pick up sound waves. Unidirectional sentiments could be considered like a microphone designed to pick up soundwaves from one direction while ignoring the other soundwaves that are less pronounced. In contrast, omnidirectional sentiments could be considered similar to an omnidirectional microphone that picks up soundwaves from all directions, disregarding their respective loudness. In this sense, sentiments, such as outrage and enthusiasm, are unidirectional sentiments because they are “loud” in one direction and have more focused targets. In other words, people who experience unidirectional sentiments would be able to clearly identify these emotional experiences and their possible causes themselves. Sentiments, such as uncertain, unknown, and unease, are omnidirectional because they could be “loud” or relatively “muted” in many directions and have more dispersed targets. People who experience omnidirectional sentiments might not be able to identify the causes of their emotional experiences, and these experiences might encircle them from all directions. The use of unidirectional and omnidirectional sentiments in the analysis refers to a new categorization of sentiments. Either of them could contain both positive and negative

sentiments. This new sentiment categorization attaches a spatial dimension to the motivational factors that could be used to interpret the evolution of the GME movement.

Moreover, the prominent themes and their sentiment associations do not change significantly from the one-month corpus to the entire corpus. The “Collective Identity”, “Collective Goal”, “Collective Actions”, “Upward Community Morale in Memetic Expressions”, and “Community Knowledge” themes are largely associated with positive sentiments. In contrast, the “Community Conflict” and “Moral Outrage” themes are primarily associated with negative sentiments in GME peripheral subreddits. However, the focal shift in collective action strategies and their associated sentiments, particularly in r/Superstonk, suggests the community preferences for strategy with actionable steps and measurable outcomes over simply optimism-accumulating mantra-like strategies overtime. This shift in collective action strategies could also be observed in the preferred strategy choices made by the subreddits formed later in the movement (r/DDintoGME and r/GMEJungle). The evolution of collective action strategies reflects the sentiment shift from uncompromising optimism to critical optimism mixed with realism.

Furthermore, the sentiment of realism in the movement could also be seen in the prevalence of fear, uncertainty, and doubt (fud) sentiment across GME peripheral subreddits. Interestingly, the fud sentiment, on the one hand, signifies the movement participants’ self-awareness of possible community compromise by internal and external actors. Yet, the mounting evidence of fud sentiments might immobilize the movement participants from effectively enacting any collective action strategies. As r/Superstonk could be seen as a subreddit migrated from the root subreddit (r/WallStreetBets) of the GME movement, r/GMEJungle could be seen as a community departed from the more

dominant subreddits in the GME movement, such as r/Superstonk. The focus from moderation practices as an expression of the community conflict in the one-month corpora to fud sentiment as the main expression of the community conflict in the overall corpora in both r/Superstonk and r/GMEJungle suggests the diffusion of omnidirectional sentiments as GME peripheral subreddit mature. Specifically, the unidirectional sentiments in GME peripheral subreddits could be seen in the movement participants' contempt for moderation practices, such as unreasonably banning members and posts to restrict information flow. These unidirectional sentiments often could drive subreddit migration and contribute to adopting collective action strategies with more actionable steps and measurable outcomes. However, as one GME peripheral subreddit matures in time, the omnidirectional sentiments that drive the dissolution of collectivity emerge. Arguably, these sentiments can motivate the movement participants to be more self-critical and more aware of the internal threats (the infiltration by moral outrage targets) and external threats (fluctuating GME stock prices and the institutional and financial pressure exerted by the moral outrage targets). However, comparative sentiment analysis suggests that omnidirectional sentiments among the movement participants tend to overwhelm GME peripheral subreddits as they migrate from one place to another and gradually mature over time.

Even though the proliferation of omnidirectional sentiments might obstruct the movement participants from realizing the collective goal and dissolving their collectivity gradually, the frequent occurrences of “apes,” “hodl,” “moass” and “moon” in positive post titles across all analyzed subreddits seem to offer hope in the continuation of their collectivity. Furthermore, it seems evident that the GME movement's collectivity is

supported by moral outrage sentiments around Kenny Griffin in particular and hedge funds in general (observable across all GME peripheral subreddits). Like the movement participants' contempt towards unfair moderation practices, the moral outrage sentiments could also be seen as unidirectional and drive the progression of the GME movement. In addition, the unidirectional drive also comes from positive sentiments in memetic expression, the collective identity of "apes," and the collective optimism towards realizing the collective goal "moass."

In sum, the comparative sentiment analysis across the GME peripheral subreddits on the one-month snapshots and the entire corpus suggests the observable positive and negative sentiments could be categorized into either unidirectional sentiments or omnidirectional sentiments. Specifically, unidirectional sentiments include negative sentiments towards unfair moderation practices and moral outrage targets. They also include positive sentiments in memetic expressions, the collective identity of "apes", and the collective optimism around "moass". Moreover, unidirectional sentiments could not only motivate movement participants to form collectivity but also drive them to migrate from one peripheral subreddit to another.

In contrast, omnidirectional sentiments include fear, uncertainty, and doubt sentiments that tend to permeate through a GME peripheral subreddit as it matures. Even though the permeation of the omnidirectional sentiments might threaten the collectivity of the GME movement, the (re)appearance of unidirectional sentiments as a GME peripheral subreddit forms offers hope for the robustness of the GME movement over time. Moreover, comparative sentiment analysis offers insights into the relationship between unidirectional and omnidirectional sentiments. Specifically, unidirectional sentiments

drive the community migration and the creation of the new GME peripheral subreddits. In contrast, omnidirectional sentiments offer the community self-awareness and self-criticism while might serve to impede the continuation of collectivity. Two types of spatial and motivational sentiments could also co-occur, suggesting the continuation of community diversification as the GME movement progresses. In addition, as the GME movement matures, movement participants move from sentiment-driven, mantra-like collective action strategies to strategies that offer actional steps and measurable outcomes. Adopting the more practical collective action strategies suggests the shift from uncompromising optimism to realistic optimism.

### **LIWC-22 Analysis**

LIWC-22 analysis groups r/GME with r/Superstonk and r/GMEJungle with r/DDintoGME based on the previous findings, their creation dates, and membership size and follows with a comparison analysis of these four together. The analysis examines four summary (analytic, clout, authentic, and emotional tone) and two linguistic measures (word count and Big Words) to reveal the psychological properties of GME peripheral subreddits. It also examines a selection of categories from LIWC-22 to support the analysis with four summary measures. Findings from LIWC-22 analysis offer further evidence of the communication patterns of GME peripheral subreddits and their community roles. The values for the four summary and two linguistic measures for each GME peripheral subreddit are shown in Table 33. The statistics of these values and the selection of categories are shown in Appendix 1 and 2.

### *LIWC-22 Analyses on r/GME and r/Superstonk*

r/Superstonk has slightly higher word count per post title than r/GME on average, whereas, r/Superstonk has higher maximum word count and variance than r/GME (r/GME avg: 10.9, std: 10.1, var: 103; r/Superstonk avg: 11.4, std: 9.6, var: 92.1). The word count difference suggests that members on r/Superstonk are more engaged in the conversations than members in r/GME. It also indicates that r/Superstonk plays a more socially dominant role in the GME peripheral subreddits than r/GME. Moreover, r/Superstonk has slightly more Big Words usage per post tile than that of r/GME on average, while the Big Words usage in r/GME has higher standard deviation and variance (r/GME avg: 22, std: 20.7, var: 430; r/Superstonk avg 23, std: 19.3, var: 373). The slight difference in Big Words usage might suggest members in r/Superstonk have more consistent psychological states than those in r/GME. However, the topic modeling and sentiment analysis results show that members in r/Superstonk are far from emotionally detached in the conversations. Therefore, this study questions the validity of Big word usage in indicating emotional detachment.

The score distributions of the four summary measures (ranging from 1 to 99) between r/GME and r/Superstonk share a close resemblance. Specifically, both peripheral subreddits scored high in analytic thinking measures, with more than 40 % of overall words scored in the nineties, suggesting more logically inclined, formal, and hierarchical thinking. However, post titles in r/GME have slightly higher analytic thinking scores than r/Superstonk. More than 40 % of overall words in both peripheral subreddits scored in the thirties in the clout measure while about 20 % scored in the nineties and less than ten separately. More words in r/GME are among the most frequently occurred clout score (in

the thirties) than in r/Superstonk, while more words in r/Superstonk are among the second and third most frequently occurred clout scores (less than ten and in the nineties, respectively). The results in clout measures indicate that most members in r/GME and r/Superstonk do not have a highly confident speaking style, while more members in r/Superstonk are slightly more confident and assertive in their texts than members in r/GME.

The most frequently occurred scores in authenticity in both peripheral subreddits are low (less than 10), whereas the second most frequently occurred scores are in the nineties. The in-between scores in authenticity are less than 5 % for r/GME and r/Superstonk. Interestingly, more texts in r/GME scored higher in the most and second frequently occurred authenticity scores. The results suggest that texts in r/GME and r/Superstonk are largely in two dichotomous styles. On the one hand, texts in both peripheral subreddits are personal, engaging, and disclosing. On the other hand, they are distancing and guarded. Moreover, among the texts with the lowest authentic scores, more texts in r/GME have the low authentic scores than texts in r/Superstonk. However, among the texts with the highest authentic scores, more texts in r/GME have high authentic scores. The two extreme ends on authentic scores suggest the texts styles in both peripheral subreddits are often in conflict, which might suggest a communication style for problem solving, furthermore community knowledge production. Finally, the emotional tone scores in r/GME and r/Superstonk are also distributed between the two extremes. Most emotional tones are less than 20, which indicate a more negative emotional tone. However, about 20% of texts in both peripheral subreddits scored in the nineties in emotional tone. Interestingly, more texts in r/GME scored at the higher end of

the emotional tone, while more texts in r/Superstonk scored at the lower end. The results suggest reinforcement of the indication from the analysis on authentic scores, which point to communities of change and divisions or growth within the communities.

The distributions of scores on function words resemble a lopsided bell curve, peaking around score 50, with more texts scoring less than 50 for both r/Superstonk and r/GME. This result reinforces the observation in analytical thinking for both peripheral subreddits, suggesting formal and logical text styles. Both peripheral subreddits have similar pronoun usage, with r/GME having more personal pronoun usage on average, particularly in “I”. This observation suggests that members in r/GME tend to apply self-reference in their texts, which might boost its authentic measure. Meanwhile, it might suggest members in r/GME have a relatively low social ranking, which reinforces the comparison results on the clout measure, suggesting members in r/Superstonk are more assertive and confident in their texts. Furthermore, r/Superstonk has a higher score in the Social category, while r/GME has a higher score at 95% of the distribution in one of the sub-categories: social references. No significant differences can be observed between the other sub-categories of Social: conflict and moral between r/GME and r/Superstonk. r/GME has a slightly high score on the third quantile in Drives categories, which is reflected in the sub-categories: achieve and power. The score distributions of the time-orientation measure show that r/Superstonk is slightly more past-focused, while r/GME is slightly more present and future focused. Lastly, no significant differences can be observed among motivation-related measures, particularly reward, risk, and curiosity. However, r/Superstonk has a slightly higher score on average and in the third quantile in the one dimension of motivation-based category allure than r/GME. The combination of

relatively high scores in the categories of Social, emphasis on the past, and allure indicate a role that facilitates communication among the GME movement participants but might not be motivated to push the movement forward beyond the established narratives. Such narratives include mantra-like slogans revealed in topic modeling analysis, such as “Buy the dip and Hold”. Comparatively, the measures on Social, time-oriented, and Drive categories suggest r/GME might play a role that complements the positionality of r/Superstonk in GME peripheral subreddits, which is more driven to seek and act on practical solutions for a different future. Specifically, the practical solutions can be reflected on the emphasis on community knowledge production and distribution. Such a future can be reflected in the unifying call for one collective identity: “We are apes”.

#### ***LIWC-22 Analyses on r/DDintoGME and r/GMEJungle***

On average, r/DDintoGME has higher word counts per post title than r/GMEJungle, which indicates a more socially dominant role between these two GME peripheral subreddits. In addition, members in r/DDintoGME use more Big Words than members in r/GMEJungle, which might suggest a more emotionally detached communication style. The higher word counts and Big Words usage in r/DDintoGME and their indications align with the primary role as community knowledge production powerhouse revealed in the topic modeling analysis. Such a role is further supported by a higher analytic measure on average. Furthermore, the distributions of the scores in analytic and clout measures for r/DDintoGME and r/GMEJungle closely resembles those in r/GME and r/Superstonk, respectively. The resemblance might suggest similar communication styles and community roles between r/DDintoGME and r/GME, as well as between r/GMEJungle and r/Superstonk. However, such resemblance is challenged by

the average scores on clout measure, emotional tone measure and score distribution differences on authentic and emotional tone measures. Specifically, r/GMEJungle has a higher score in clout, authentic, and emotional tone measures than r/DDintoGME, whereas r/Superstonk has a lower score in clout and emotional measures than r/GME. Furthermore, the scores on authentic and emotional tone measures are distributed on the two extremes for r/DDintoGME and r/GMEJungle. However, the differences between the two extremes are reversed compared to the differences between r/GME and r/Superstonk. The result suggests that members in r/GMEJungle have a relatively more confident, personal, and emotionally positive communication style than members in r/DDintoGME. It also suggests that the dichotomous communication styles between the two GME peripheral subreddits in which problem-solving, community knowledge production, community change, and growth might occur.

The score distributions for the selected LIWC-22 categories show close similarity for the four GME peripheral subreddits. Also, the mirroring characteristics between r/DDintoGME and r/GME, and between r/GMEJungle and r/Superstonk largely remain for these categories. Specifically, r/GMEJungle has a higher score in function words on average, particularly personal pronouns: “I”, “we”, and “you”. The social reference tendency showcased in the usage of “I” is also shown in the higher score on one dimension of Social category: social references. Furthermore, texts in r/GMEJungle, on average, score higher in one dimension on Social categories (moral and affiliation), Affect, all three dimensions (focus on past, present, and future) on the time-oriented, and one motivation-based category allure. Interestingly, texts in r/DDinGME on average score higher on one dimension of Drives category power and one motivation-based

category risk. The result supports the observations on the four summary measures and two linguistic measures, with r/GMEJungle having higher average scores on clout, authentic, and emotional tone and r/DDintoGME having higher average scores on analytic measure, word counts, and Big Words. It also emphasizes the differences between r/GMEJungle and r/DDintoGME with the former preferring formal, logical, emotionally detached communication style and the latter providing the social support and the determination to drive the movement forward. These differences are further evidenced in their different community roles revealed in the previous analysis, with r/DDintoGME acting as the powerhouse for community knowledge production, while r/GMEJungle provides the socializing glue. User u/Stedben in r/GMEJungle said it the best, “Ddintogme is for pure DD, GMEjungle is pure heart and maybe little soul”.

The similarities and differences between the two groups of GME peripheral subreddits, on the one hand, confirm the topic inheritance, similarity, and connectiveness among GME peripheral subreddits. On the other hand, it provides evidence of the change or growth of GME peripheral subreddits that loosely follow a genealogy from r/GME to r/DDintoGME, from r/Superstonk to r/GMEJungle. Such evidence also further supports that community progression is in no way close to linear.

### ***LIWC-22 Analysis for the Four GME Peripheral Subreddits***

The previous analysis results in two groups suggesting that each GME peripheral subreddit plays different but often overlapping roles in the GME movement. The difference in community roles and communication styles can be further seen from the overall comparison of the four GME peripheral subreddits on key metrics (four summary and two linguistic measures). r/DDintoGME has the highest scores in word counts, Big

Words, and analytic measure. Interestingly, it also has the lowest scores in the rest of the key metrics (clout, authentic, and emotional tone). This composition of scores suggests the communication styles in r/DDintoGME are more logical, formal, and planned. The low level of spontaneity, which is often seen in interpersonal communication, and their high level of preparedness suggest that r/DDintoGME ranks low in the social hierarchy among the GME peripheral subreddits. Meanwhile, such a low position in the social hierarchy also reflects and supports the attention orientation of their members. Members in r/DDintoGME seem to focus more on the significance of their texts and have more confidence in communicating community knowledge in texts than asserting confidence or playing a more socially dominant role in social interactions. Interestingly, although r/DDintoGME has a low influence on social interactions, it is aware of the social positions of the rest of GME peripheral subreddits (which can be observed in its high score in the construct power: one dimension of Drives category). The seriousness and preparedness in the texts they produced and their awareness of the social status of the other GME peripheral subreddits while occupying a low rank in the social hierarchy render r/DDintoGME the powerhouse of community knowledge production in the GME movement.

r/GME has the highest score in clout and emotional tone measures and the lowest score in word counts and the usage of Big Words. This composition of scores suggests the community might play a leadership role in the GME movement. The leadership role can also be seen in its high social engagement in texts, which is supported by the combination of low word counts and high emotional tone measures. Furthermore, the emotional tone measure could not only be seen as a measure of positive or negative emotions but also as

a measure of emotional engagement. With its high score in emotional tone and low score in Big Words usage, the indication that the texts in r/GME are both socially engaging and emotionally driven is clear. r/Superstonk has the lowest score in analytic measure, which could explain a strong meme mentality in the community. Meanwhile, r/GMEJungle has the highest score in authentic measure, which emphasizes the role of “heart and a little bit of soul” in the GME movement (comment from a user in r/GMEJungle). Furthermore, the four GME peripheral subreddits only differ slightly in the emotional tone measure scores. Their standalone values (below 50) for the emotional tone measure could be interpreted as negative. However, the minor difference in emotional tone scores and their below-50 values also suggest a similar level of resilience or attitude towards events, such as disruptive activities of shills against the collective goal. In other words, the emotional tone scores could reflect the collectivity among GME peripheral subreddits against common enemies: their moral outrage targets and their armies: shills.

The meta-analysis on the inception dates of the four GME peripheral subreddits shows a linear progression from one subreddit to another. However, the LIWC-22 analysis, along with other word-level analyses, including topic modeling and sentiment analysis, suggest that community progression in the GME movement is in no way close to linear. Each GME peripheral subreddit plays a role that complements other communities. The LIWC-22 analysis suggests that these roles could be largely categorized into two groups: facilitating social interactions and producing community knowledge. Each GME peripheral subreddit often plays both roles at the same time, with some communities emphasizing more on one role than the other. Specifically, r/DDintoGME stands out as the powerhouse of community knowledge production, while

its comparative community of similar membership size, r/GMEJungle, serves more to facilitate social interactions by stimulating community morale. Meanwhile, r/GME plays both roles to a moderate degree, while its comparative community of similar membership size r/Superstonk emphasizes more on facilitating social interactions, particularly using the meme mentality. The overlapping roles of the GME peripheral subreddits and their different focus on one role than the other also reflect the self-organizing nature of the GME movement. When the overall GME peripheral community deems one subreddit less trustworthy either in its role as a community knowledge producer or social interaction facilitator, another subreddit compensates for the lack of trust by fulfilling such a role. In this vein, the categorization of the two groups (r/GME and r/Superstonk; r/DDintoGME and r/GMEJungle) based on the membership size and prior analyses for the four GME peripheral subreddits could also be seen as the result of complementing community roles in service of the collective goal. In other words, the collectivity manifested in the topic modeling and sentiment analysis can be viewed in the complementary community roles of each GME peripheral subreddit plays for each other revealed in the LIWC-22 analysis.

Table 33. Scores for the Four Summary and Two Linguistic Measures from LIWC-22 for Four GME Peripheral Subreddits

	r/GME	r/Superstonk	r/DDintoGME	r/GMEJungle
Word Counts	10.9 (Lowest)	11.4	12.9 (Highest)	11.0
Big Words	22 (Lowest)	23	26 (Highest)	23
Analytic	66.0	63.8 (Lowest)	71.9 (Highest)	65.0
Clout	46.0 (Highest)	45.8	43.5 (Lowest)	45.0
Authentic	43.0	43.4	42.2 (Lowest)	43.6 (Highest)
Emotional Tone	35.3 (Highest)	33.9	30.4 (Lowest)	34.6

## **CHAPTER 5**

### **LIMITATIONS**

The concept of peripheral subreddits is conducive to understanding the GameStop movement and provides a theoretical framework for studying online social movements. However, the concept of studying online communities that are not in the spotlight could be expanded to other online platforms that movement participants might use, such as Discord and Mastodon. Comparing the communication patterns of the movement participants and the predominant discourse between different online platforms might reveal further insights into understanding the digital-first nature of the GME movement. It also might offer a more comprehensive theoretical framework for studying online social movements, the complete progression of which might be ignored by the mainstream media.

Analyzing post bodies, which include both texts and images, and comment threads could potentially reveal further insights or provide more evidence for the current findings.

However, based on the manual readings of the posts in GME peripheral subreddits, most posts do not contain texts beyond the post titles. Devising a uniform scheme to extract comments with various degrees of conversation depths and from several subreddits with different commenting characteristics is technically beyond the author's expertise and might introduce more noise in the findings than providing more insights. In addition, as GME peripheral subreddits engage in more community knowledge production activities, participants might reproduce the discussion in comments as a new post, which would

help alleviate the drawbacks of not analyzing comment threads. Therefore, even though the study could be strengthened by analyzing more sources of data, such as post bodies and comment threads, I estimate that the findings would not be substantially different. Similarly, extracting, surveying, or predicting real-life information about the movement participants, such as gender, location, and the amount of financial investment in GME stocks, could provide valuable dimensions to understand the communication patterns and community dynamics of the GME movement.

Lastly, the study would benefit from analysis of interview or survey data on the movement participants, especially on significant authors revealed in the meta-analysis. The qualitative analysis might provide a more in-depth understanding of the GameStop movement and a more finetuned theoretical framework on concepts introduced in the study, such as peripheral subreddits and unidirectional/omnidirectional sentiments.

## CHAPTER 6

### SUMMARY

At first, the meta-analysis on common authors based on their posting volumes and community-ranked significance and community growth across time and membership size revealed the tendency of community migration in the GME movement. It also suggested that each GME peripheral subreddit might play a different role, particularly hinting at the axial or transitional role of r/Superstonk. The inception date of each GME peripheral subreddit indicates the community migration direction from r/GME to r/Superstonk to r/DDinGME to r/GMEJungle. The overall posting volume patterns of each GME peripheral subreddit and the posting subreddit preferences of common authors hint at the different communication patterns of four GME peripheral subreddits.

The differences in community roles and communication patterns are further explored in topical and sentiment analysis. Four GME peripheral subreddits could be categorized as emotion-driven and community knowledge-driven, with later formed GME peripheral subreddits (r/GMEJungle and r/DDintoGME) focusing more on community knowledge production. Like the axial or transitional role that r/Superstonk plays (revealed from the posting patterns of common and significant authors), r/GMEJungle plays a transitional role between the emotion-driven subcommunity (r/GME and r/Superstonk) and community knowledge driven subcommunity (r/DDintoGME and r/GMEJungle). Specifically, the topical analysis on the entire corpus and the first one-month corpus of four GME peripheral subreddits reveals ten themes, which are “Moral Outrage”, “Connective Leaders”, “Collective Action”, “Community

Conflict”, “Collective Identity”, “Upward Community Morale in Memetic Expressions”, “Collective Goal”, “Community Knowledge”, “Community Migration”, and “Community Support”.

The shifting presences of these themes and their corresponding topics between the overall and the one-month corpus of four GME peripheral subreddits suggest that as the GME movement matures, the following changes are more pronounced: increased focus on community knowledge, declined emphasis on heavily preferring memetic expressions to provide social adhesion and collectivity, increased preferences on practical and measurable collective action strategies, and heightened sense of self-awareness and self-awareness motivated by fear, uncertainty, and doubt of the community integrity. Moreover, community conflict becomes more dispersed as the GME movement progresses. Yet, the diffusion of community conflict also unites four GME peripheral subreddits and might drive the diversification of GME peripheral subreddits.

Finally, the analysis on topics and themes reveals three prominent trends in GME peripheral subreddits. The first trend is centered around Collectivity. The convergence of the collective identity and collective action strategies, the collective goal of using GME stock to challenge the financial system and eliminate wealth inequality, and shared memetic expressions that serve as social adhesion within the overall community and community identification to the outsiders clearly point at the first trend. Furthermore, the collectivity in the GME movement is motivated by common moral outrage targets and actions and the moral support of connective leaders. The division of good and bad actors pinpoints the second trend: heroes vs. enemies, which facilitates the bonds between GME peripheral subreddits. Such bonds could be seen as personification of power structures in

celebrity-like figures. The degree of admiration that the GME movement participants bestowed on the good actors, such as the Redditor DFV and chairperson of GameStop, Ryan Cohen, is comparable to the degree of moral outrage that bad actors receive, such as financial companies (Robinhood, Citadel), financial institutions (SEC, CFTC), and key individuals in the financial system (Ken Griffin, Jim Cramer). Furthermore, the emergence of “shills” and the accompanying sentiments of “fud” deepens community conflict and division. In this sense, heroes and enemies could be seen as any community members and the good and bad actors become all-encompassing and anonymous. Finally, the third trend is community migration and diversification. The GameStop short squeeze event unarguably started on r/WallStreetBets. Four GME peripheral subreddits emerged from it are further divided into emotion-driven and community knowledge driven subcommunity. With the help of the second trend, community migration and the creation of a new GME subreddit might occur. However, as each GME peripheral subreddit matures, the (re)appearance of “fud” sentiments and “shills” might threaten their collectivity.

The analysis of the four GME-related subreddits in one snapshot and overtime provides evidence for a new concept to study online community and digital-first social movement on Reddit: peripheral subreddits, which have three characteristics: topic inheritance, topic similarities, and topic connectivity. As the GME movement progresses, the community knowledge-driven subcommunity inherits topics and themes from the emotion-driven subcommunity. The movement participants migrate from one subreddit to another without mutual exclusivity. However, the shared beliefs on the collective identity, strategies, and goal and the shared sentiments (fud) that drive both community migration

and diversification connect the subreddit to each other. The common interest in using one specific meme stock GME to overturn the financial system and eliminate wealth inequality serves as the initial footing for their similarities. The shared topics and themes, such as viewing certain key figures as connective leaders and celebrities, promoting and enacting similar collective action strategies, using memetic expressions to raise community morale, and aiming hedge funds and other financial institutions as their moral outrage targets, further ground the topic similarities among these four subreddits.

The comparative sentiment analysis across the four GME peripheral subreddits on the one-month snapshots and the entire corpus provide more insights on the motivations driving the continuation of the GME movements and introduce two categories of sentiments underlying the topics and themes revealed in the previous analysis, which are unidirectional omnidirectional sentiments. Both categories include positive and negative sentiments and can be seen as new forms of communication patterns. Specifically, unidirectional sentiments (sentiments with more focused targets) are underlined in the community conflict led by unfair moderation practices and the community members' moral outrage towards hedge funds and financial institutions (negative sentiments). They also include positive sentiments found in memetic expressions, the collective identity of "apes", and the collective optimism around achieving "moass". These unidirectional sentiments motivate movement participants to form collectivity and drive community migration and diversification. In contrast, omnidirectional sentiments (sentiments with more dispersed targets), such as the community's suspicion of the outsiders' influence and the sentiments of fear, uncertainty, and doubt, tend to permeate through the overall community as the GME movement matures. They also offer the overall community self-

awareness and self-criticism, which might impede the existing collectivity. However, the co-occurrences of unidirectional and omnidirectional sentiments suggest the continuation of the GME movement. In addition, the movement participants tend to adopt collective action strategies that are less emotion-driven but more practical and measurable. This shift in the preferences of collective action strategies suggests a change in sentiments from uncompromising optimism to realistic optimism.

The final LIWC-22 analysis suggests each GME peripheral subreddit plays different but often overlapping roles in the GME movement. The analysis result derived from four summary measures (analytic, clout, authentic, and emotional tone) and two linguistic measures (word counts and Big Words) also provides more evidence on the categorization of emotion-driven and community knowledge-driven sub-community. It shows four GME peripheral subreddits can be largely categorized into two groups, with one subreddit emphasizing more on the group than the other: facilitating social interactions and producing community knowledge. This categorization corresponds directly with the categorization of emotion-driven and community knowledge-driven sub-community from the topical analysis. Specifically, *r/DDintoGME* stands out as the powerhouse of community knowledge production, while its comparative community of similar membership size, *r/GMEJungle*, serves more to facilitate social interactions by stimulating community morale. Meanwhile, *r/GME* plays both roles to a moderate degree, while its comparative community of similar membership size *r/Superstonk* emphasizes more on facilitating social interactions, particularly using the memetic expressions.

The analysis of GME peripheral subreddits is conducted on four levels: meta, topical, sentiment, and LIWC-22. The first level uses metadata from the peripheral subreddits, while the other three levels are on the word level. Specifically, the meta-analysis hints at the differences in community roles and communication patterns in each GME peripheral subreddit, community migration from one subreddit to another, and a transitional role of r/Superstonk. Topical analysis further categorizes four GME subreddits into emotion-driven and community knowledge driven subcommunities with r/GMEJungle playing a transitional role between the two subcommunities. It also suggests that new GME peripheral subreddits might be more community-knowledge driven than emotion-driven. In addition, topical analysis reveals ten themes which could be further categorized into three trends: collectivity, heroes vs. enemies, and community migration and diversification. Sentiment analysis associates topics and themes with positive and negative sentiments while introducing a new type of sentiment categorization to explain the motivation behind and continuation of the GME movement. Unidirectional sentiment, which largely covers emotion-driven topics and themes, could be used to explain the collectivity in the GME movement and community migration and diversification. In contrast, omnidirectional sentiment might impede collectivity but provide the overall community with self-awareness and self-criticism. The co-occurrence of both sentiments gives hope to the continuation of the GME movement. Finally, the LIWC-22 analysis indicates that four GME peripheral subreddits largely play two but often overlapping roles: facilitating social interactions and producing community knowledge. These two roles serve to affirm the findings in topical analysis and provide more nuances in community roles and communication patterns by examining four

summary measures (analytic, clout, authentic, and emotional tone), two linguistic measures (word counts and Big Words), and selected categories. r/DDintoGME stands out as the community knowledge production powerhouse, while r/GMEJungle emphasizes the role of social interaction facilitator more. r/GME plays both roles to a moderate degree, while r/Superstonk often uses memetic expressions to facilitate social interactions. Furthermore, LIWC-22 composite scores suggest the communication styles in r/DDintoGME are more logical, formal, and planned. The score for r/GME indicates it might play a leadership role in the GME movement. r/Superstonk has the lowest score in analytic measure, which could explain a strong meme mentality in the community. Meanwhile, r/GMEJungle has the highest score in authentic measure, which emphasizes the role of “heart and a little bit of soul” in the GME movement (comment from a user in r/GMEJungle).

Analyzing the GME movement with the framework of peripheral subreddits suggests the movement is ongoing, and the creation of new peripheral subreddits might continue. However, as GME peripheral subreddits diversify in number, their membership size might decrease accordingly, as the migration from r/GME to r/Superstonk to r/DDinGME to r/GMEJungle suggests. It would be curious to see if their collectivity would be weakened and if the existing community roles and communication patterns would still be applicable. The framework of peripheral subreddits could help analyze online social movements in a new light with a focus on communities that are left by the mainstream media spotlight. The new development of the framework would examine communities of more than four and their relationship with the online social movement.

## CHAPTER 7

### CONCLUSION

In sum, this study examines the GME movement by analyzing subreddits that are often ignored by the mainstream news media. These subreddits contribute to the continuation of the GME movement by playing different but often overlapping community roles and using a composite of communication styles after the media attention on the GameStop short squeeze event faded. Because of their nature of being away from the center of attention, I define these subreddits as peripheral subreddits with three communication characteristics (topic inheritance, similarities, and connectiveness) to illustrate how this new concept could contribute to Reddit affordance studies and online social movement studies. I also use three word-level methods to address how the three characteristics can be used to explain the meanings and community migration in the GME movement.

As a digital-first social and financial movement initiated and continued on Reddit, the communication phenomenon of peripheral subreddits observed in the GME movement provides the study of Reddit affordances and affordances of social media platforms with a new perspective. Using the three characteristics (topic inheritance, similarities, and connectiveness) of peripheral subreddits as an explanatory framework, future studies on online movement mediated by Reddit might reveal community dynamics and their communication patterns ignored by the mainstream interpretation of a movement event. These discoveries might contribute to a more accurate understanding of the progression of a movement event, the relationships between the movement and Reddit, and the connections between subcommunities that empowered the movement.

Furthermore, social movements using the framework of peripheral subreddits differ from social movements using viral networks for information diffusion and public engagement, such as hashtags on X. Specifically, peripheral subreddits offer individuals in-depth engagement with topically organized communities in the form of questioning and answering, in which the co-creation of the community knowledge occurs. The process of community knowledge production in social movements using the framework of peripheral subreddits serves both as an adherent to bond the communities and a record to preserve community history and identity. In contrast, hashtag-based social movements tend to attract individuals outside of topically defined networks and increase the user base substantially by the virality of information diffusion. In addition, on the one hand, peripheral subreddits could be seen as a standalone framework to organize and explain social movements on Reddit or other topically organized text-based platforms, such as Mastodon. On the other hand, peripheral subreddits could be seen as a component of social media strategy for online social movements that helps sustain the continuation of social movements and discover and understand them entirely once media attention has faded. Therefore, online social movements may be seen as taking on two phases: rapid expansion with viral information diffusion and steady continuation. The cross-platform information diffusion might help individuals discover more popular root subreddits and build a substantial community base during the first phase, while peripheral subreddits could play a role in sustaining the continuation of the social movements when the rapid community growth and media attention have slowed down during the second phase. The future of digital-first social movements might take on a cyclical strategy using a composite of social media platforms following the two phases on repeat. Such a cyclical

strategy would also offer communication scholars new theories for explaining online social movements with various time durations.

The categorization of unidirectional and omnidirectional sentiments provides the motivation behind and the continuation of the GME movement. Such categorization could offer theoretical insights into the motivation driving the converging and diverging of subcommunities within an online social movement. Furthermore, the different but often overlapping community roles played by the GME peripheral subreddits could provide insights into the foundational community roles (facilitating social interactions and providing community knowledge) needed to sustain a digital-first social movement.

The unique communication styles and patterns observed in the GME peripheral subreddits, on the surface, could also be observed in subreddit communities that are largely concerned with meme stocks and crypto coins. In this way, in addition to contributing to the study of online movements, this study also paves theoretical and practical foundations for studies on the phenomenon of meme money and the online communities behind such phenomenon.

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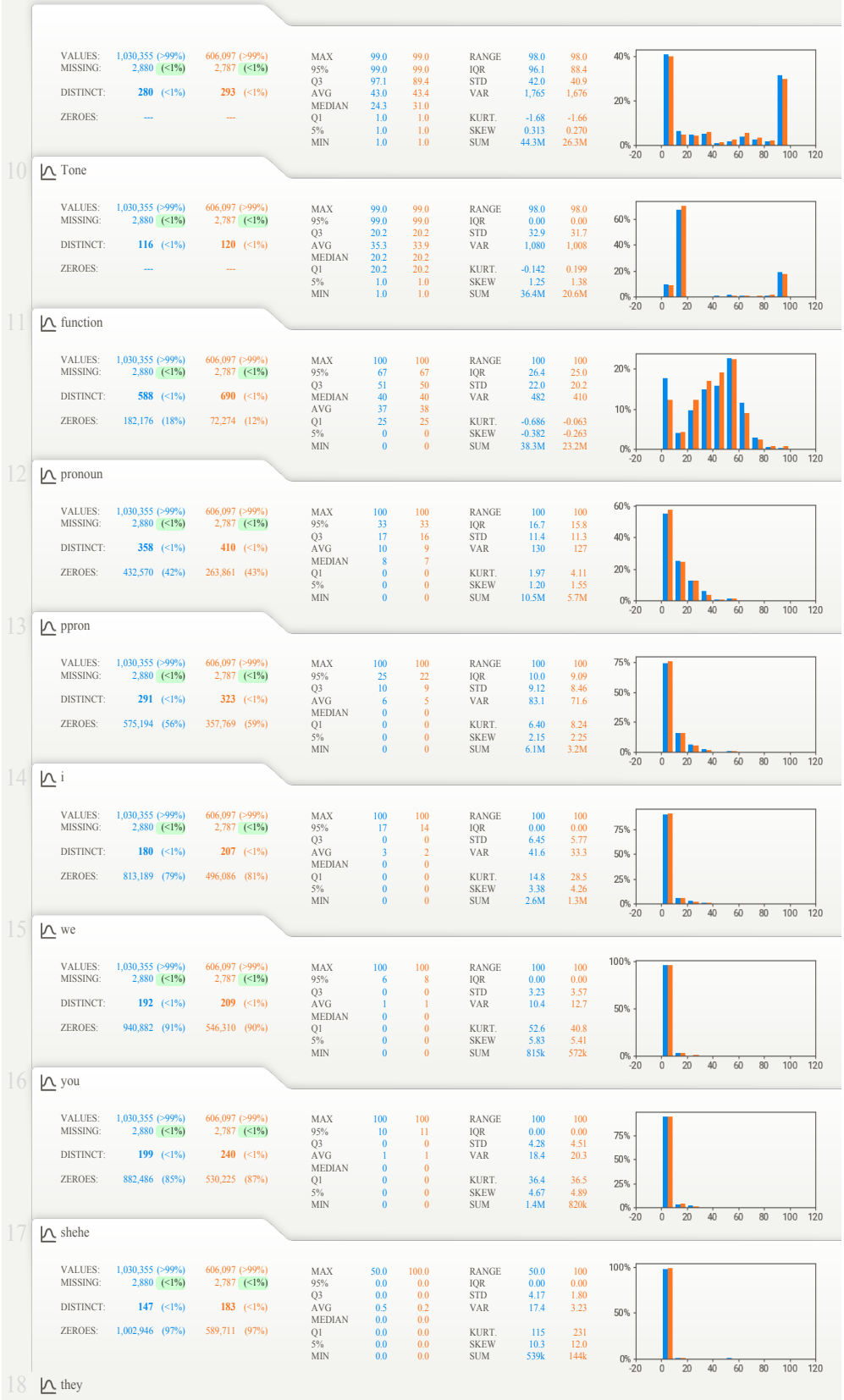
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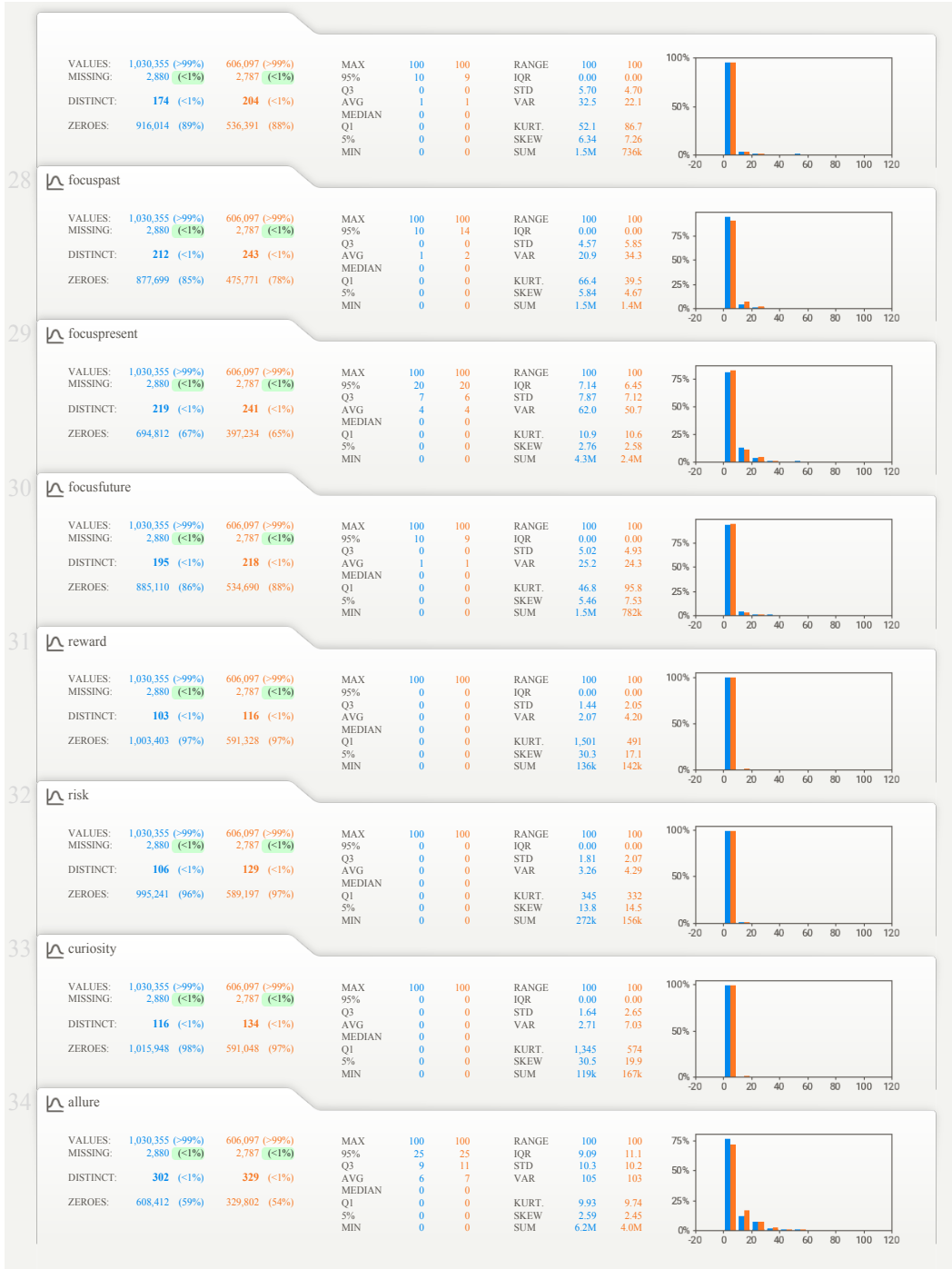
# APPENDIX A

## LIWC-22 RESULTS FOR R/GME AND R/SUPERSTONK









# APPENDIX B

## LIWC-22 RESULTS FOR R/DDINTOGME AND R/GMEJUNGLE

