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UNIVERSITY OF CALIFORNIA,
IRVINE

Consumer Ties in Social Media Networks

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Management

by

Duygu Akdevelioğlu

Dissertation Committee:
Professor Alladi Venkatesh, Co-Chair
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2018

DEDICATION

To

The best mother in the world, my mother, Sitare Kalaycı

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ABSTRACT OF THE DISSERTATION

Consumer Ties in Social Media Networks

By

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Doctor of Philosophy in Business Administration

University of California, Irvine, 2018

Professor Alladi Venkatesh, Co-chair
Associate Professor Loraine Lau-Gesk, Co-chair

Digital technologies of social media networks provide opportunities for individuals who are becoming key players in the socially constituted offline world. In three essays, this research explores the relationships between consumers defined as consumer ties in social media networks by specifically examining the meanings behind their everyday practices and patterns in their relationships through social media networks. The empirical analysis focuses on identifying the underlying structures of consumer ties. Through an ethnographic examination, three categories have emerged; motivating empowerment, friendly rivalry and train, trust, share. Additionally, an in-depth analysis of social networks revealed the effects of triads and a negative gender homophily on network formation. Hence, this dissertation provides a unique framework to explain the underlying mechanisms of consumer ties in social media.

INTRODUCTION

Social media have emerged as a new paradigm in the cultural landscape with the promise of facilitating platforms for online interactions. Digital technologies of social media networks provide opportunities for individuals who are becoming key consumers in the socially constituted offline world. This research explores the relationships between consumers in social media networks. In three essays, this dissertation concentrates on examining consumer as a digital avatar in social media, explaining effects of social media on consumer communities and exploring of consumer ties in social media through social network analysis and ethnography (see Figure 1).

In Essay 1, I provide an analysis on the role of the social character of consumers and their digital persona. This essay examines the interplay among social media users, platforms, companies, and regulatory parties create the medium of communication. Moreover, I investigate how social media enable the consumer to become *a participant and an active agent* who connects with friends, colleagues, as well as acquaintances and strangers in an effort to engage as a *social persona or digital avatar* in this emerging global world.

In Essay 2, I postulate that consumer ties in social media are different from consumer ties in traditional offline consumer communities. Understanding social media networks' novel characteristics is essential also because social media networks have different assumptions of the existing theory built on traditional offline social and cultural networks. In exploring the nature of social networks in social media, the findings explain the importance of

structural positions of actors in social media networks (e.g., central and peripheral actors), strength of ties among actors in social media networks (e.g., strong and weak ties), and the novel capabilities of social media in network structures. Specifically, this research provides a framework to identify the changing dynamics of *strong* and *weak ties* in social media with implications to the consumer culture theory.

In Essay 3, I utilize a social networks approach together with an ethnographic approach to reach a thorough understanding of how consumer ties evolve in social media networks. In the first part, I focus on i) understanding cultural underpinnings of consumer ties in social media communities; ii) social network formation and consumer ties in social media consumer communities—analysis of social network formation: reciprocity, triads and gender homophily. By utilizing an ethnographic analysis on social media, I develop a model that explains underlying foundations of consumer ties in social media communities. Specifically, three important themes are identified: motivating empowerment, friendly rivalry, and trust and share. Additionally, by using social network analysis, I disentangle the effects of triadic structures, homophily and reciprocity on network formation. My findings contribute to the growing literature on the effects of social networks and social media on consumer communities by demonstrating the increasing importance of triadic structures and gender homophily.

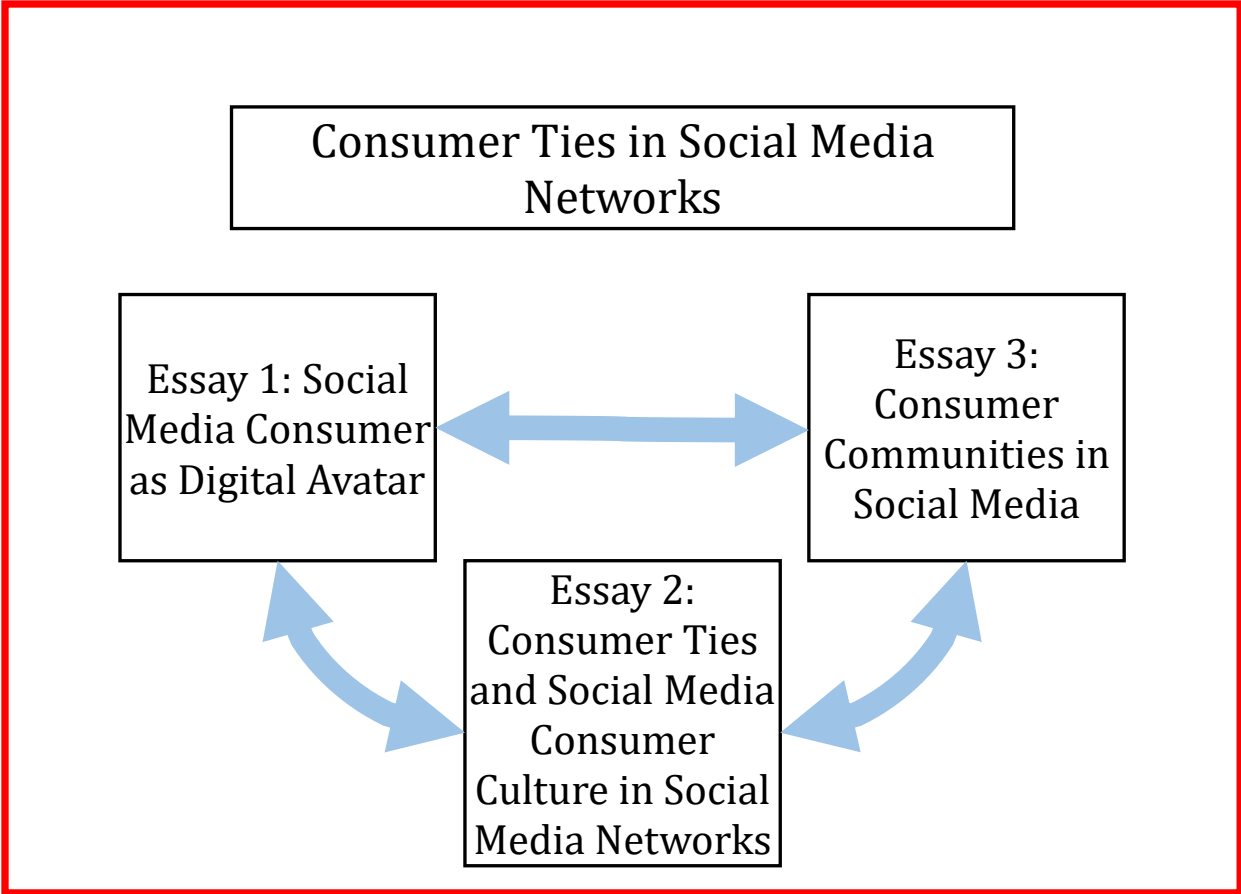


Figure 1: Conceptual framework

ESSAY 1: SOCIAL MEDIA CONSUMER AS DIGITAL AVATAR

“We live in a world which is an accumulation of spectacles. There is no greater spectacle than the media world. Images are detached from life... The spectacle appears incessantly and constantly. Spectacle is not merely a collection of images, it is a social relationship between people mediated by images” (Debord 2000, 42).

What Is “Social Media”?

A simple definition offered by Hoffman, Novak, and Stein (2013, 29) is as follows: “a set of web-based mobile and applications that allow people to create (consume) content that can be consumed (created) by others and which enables and facilitates connection . . . tools that support social interaction between users.” In a similar fashion, boyd and Ellison (2007) regard social media as social networking sites that allow individuals to: a) maintain a public or semi-public profile within a bounded system, b) articulate a list of other users with whom they share opinions and ideas, and c) view the list of connections made by them and those made by the others in the system. It is the third item that allows users to make their social networks visible (Wasserman and Faust 1994), thus facilitating new connections that render the social networking sites unique and socially compelling. According to boyd and Ellison (2007) the sites are used for social networking activities (e.g., Facebook and LinkedIn), or for sharing videos and photos (YouTube, Pinterest) and thoughts, opinions, and other content through microblogging (Twitter, Tumblr). They all represent transformational network systems that include friends, family members, professional associates, and even

strangers as well as local and distant communities (van Dijck 2013). In addition to user-generated activities, social media platforms permit public and private organizations to post information about their products and services and communicate or promote their activities. Thus, social media is practically the first instance in the history of human communication that both organizations and their constituencies are able to share equally and communicate with each other in the same interaction space.

Research on social media shows that scholars and critics are pursuing a wide range of topics regarding social media users and their activities. In the broader context of social media culture, some developments include the rise of *convergence* culture (Jenkins 2006) social media and youth perspectives (boyd 2014), linguistic patterns and semiotic modes, social media intelligence (Moe and Schweidel 2012) the culture of connectivity (van Dijck 2013), comparative social media usage patterns (Gottfried and Shearer 2016), and structures of user participation in social media (Hansen, Shneiderman, and Smith 2011).

Specifically, in terms of social media consumer culture, some noteworthy issues are digital self and virtual consumption (Belk 2013), virtual/digital goods (Denegri-Knott and Molesworth 2010), social commerce (Hoffman and Novak 2012), netnography and networked narratives (Kozinets 2015), the role of branding (Gensler et al. 2013; Labrecque 2014; Singh and Sonnenburg 2012; Smith, Fischer, and Yongjian 2012), consumer self-expression and identity representation (Berger and Buechel 2015), consumer socialization and collaboration (Löwgren and Reimer 2013), the selfie generation and the rise of selfie

culture (boyd 2014; Murray 2015), and social media and consumer privacy (Venkatesh 2016a).

The chapter will proceed as follows. We will first provide a preliminary analysis of the social media culture and social media users. This will be followed by a more focused discussion of consumer issues. We will conclude with some final thoughts on social media consumption.

Social Media Culture – User Participation Issues

According to Statista (2016) there are currently 2.22 billion social network users worldwide, and the number of users is likely to grow to 2.39, 2.72, and 3.0 billion in 2017, 2018, and 2019, respectively. Similarly, Social Media Examiner (2016) has reported 90% of the marketers consider social media as indispensable to their businesses. Regarding social media trends, according to PEW Research report (Gottfried and Shearer 2016), “nearly two-thirds of American adults (65%) use social networking sites, up from 7% when Pew Research Center began systematically tracking social media usage in 2005.” Thus, there is no doubt that social media usage is a global phenomenon and is growing rapidly.

In spite of the growing popularity of social media, there seem to be some holdouts as reported recently by Wayne (2016). He notes that there is a “stubbornly resistant minority” even among the younger age groups that seem uninterested and also quite concerned about privacy erosion on social media sites. The concern expressed by some refers to lurkers who can invade “your avatar in a way that feels invasive.” Such concerns give rise to the privacy issues on social media discussed recently by Venkatesh (2016a).

At a rather macro level, Jenkins (2006) raises some fundamental concerns regarding (social) media convergence, participatory culture, and collective intelligence. By *convergence*, he means the flow of content across media platforms and media participants, the cooperation between media players and constituencies, and the sharing of their experiences. By *participatory culture*, he means that it is not the traditional media spectatorship where media producers and consumers are separated; the reference is to all individuals who are social media users who interact with each other and produce and share content. Since these individuals share ideas with each other, what emerges is voluntary consumer collaboration (Löwgren and Reimer 2013).

danah boyd (2014) examines issues concerning how teenagers communicate with each other on Facebook, Twitter, and Instagram. The main question she addresses is: Do social media affect the quality of teens' lives and, if so, how? She explores tropes about identity, privacy, safety, danger, and bullying. Ultimately, boyd argues that society bears heavy responsibility in shaping the lives of teens and making sure they are better informed and thoughtful, and become engaged citizens through their online activities. Based on her analysis, she draws conclusions regarding the impact of emerging technologies on society, culture, and commerce. She concludes on a reassuring note regarding the future of teens in this technologically complex world, finding that they often develop a sense of identity and social purpose. For consumer researchers, teen behaviors constitute a major area of research and inquiry.

Zappavigna (2011) argues that social media platforms give rise to new linguistic patterns and semiotic modes (e.g., online/real-time chat) not encountered before. She proposes that these emerging forms of conversation are not only different from face-to-face encounters (i.e., due to lack of physicality) but give rise to new linguistic patterns of content production and management.

Certainly, social media users not only post their comments but are able to upload pictures of themselves and friends and family members and other items of interest. This has given rise to what is known as selfie culture (boyd 2014; Murray 2015). For example, Murray (2015) has shown that social media users post pictures of themselves, often times in a personally daring fashion. Thus, social media is emerging as an uninhibited digital/visual culture.

What is the nature of social media interactions? Moe and Schweidel (2014) liken them to “water-cooler conversations” except, of course, the social media exchanges are more-permanent records that are now digitally available for further examination and scrutiny. At a more serious level, they call it “social media intelligence gathering” or “social media monitoring,” which permits the researcher to perform computational linguistic analysis and extract underlying themes.

In her work on social media connectivity, van Dijck (2013, 23) has shown how users play different roles on social media that include consumers, producers, recipients, friends,

critics, citizens and professionals. In these different roles, users voluntarily devote their time and effort to develop and sustain social media content. As a result, user-generated content “creates value for the ecosystem of social media as a whole”.

Social Media Network and Communication Issues

In social media networks, consumers interact with each other, build communities, and share opinions. This network notion of communication is somewhat different from offline human interaction. The connected media with its numerous new cultural forms such as tweets and posts enable individuals to access various sources simultaneously, which was not possible in the pre-Internet era. Because of this, social media culture emerges with new behavioral codes and values.

The notion of friendship is also slightly different in social media networks when compared to traditional offline networks. To begin with, social media platforms act as bridges between online and offline connectivity (Hampton 2007). In the context of social media, the terms *friends* and *friending* express the strength of the relationship between individuals. Thus, both a person with a close relationship and high intimacy as well as a total stranger can be included under the term *friend*. Also, the term *followers* has a connotation that includes both members from neutral groups as well as devotees and believers. In other words, in the context of social media, meanings change to include people who simply follow one’s Twitter stream. That is, although most of the contacts in social media networks are *weak* ties in the traditional sense, they are nevertheless significant (Trusov, Bodapati, and Bucklin 2010).

We are now able to examine social media user participation in terms of some related criteria in the context of networks: asynchronous threaded conversation, synchronous conversation, World Wide Web (WWW) and hyperlinks, collaborative authoring, blogs and podcasts, and social sharing. Here is a brief description of each of these participation categories (extracted from Hansen et al. (2011)).

Asynchronous Threaded Communication

Asynchronous communication typically starts with a user-communicator and is followed by another user, and this may go back and forth. Typical categories in this sequence are: (i) email and (ii) forums/groups. These sources serve as an excellent platform to curate people's sentiments, relationships, and social influence.

Synchronous Conversations

Synchronous conversations, on the other hand, allow for communications to take place at the same time or simultaneously. Examples include such categories as: (i) Chat, instant messaging, texting (Yahoo!, Messenger, Facebook, Google Talk, etc.) and (ii) audio and video conferencing.

World Wide Web Traditional Websites, Homepages, and Documents

The World Wide Web is the largest public web content platform where the contents are connected through hyperlinks. Network analysis plays a significant role in various activities performed on this platform. Homepages, as well as social media tools such as Facebook, Twitter, Pinterest, and Instagram, are good examples.

Collaborative Authoring

Wikipedia and shared documents provide useful sources for collaborative authoring over social media. In Wiki, people not only contribute their own articles but can also fine-tune others'. These signify content relationship and social roles; individuals with expertise in certain areas contribute to relevant contents in those areas.

Blogs and Podcasts

Blogs (e.g., Twitter) are very attractive platforms for content presentation and for making comments. Some of them can also be embedded within larger websites. Typically, web crawlers capture these connections, and thus blogs can be mined to develop various social and political insights.

Social Sharing

Social sharing sites are content centric. They include video, TV, photos, art, music, bookmarks, news, and books. They help the users save time while searching for any particular topic. Such media aid researchers in analyzing people with shared interests, identifying new information, finding a historical trace, and fostering collaboration in community formation.

Some other social media participation examples would include social networking services, online markets and production, idea generation, virtual world, and mobile-based services (Thompson 2003). Social networking services such as dating, professional, and niche networks are becoming an integral part of contemporary society and, needless to say, people

are choosing these networks to find a friend or like-minded community, look for a job, pursue sales leads, and so on. Financial transactions, user-generated products, and review sites are flourishing in online market and production platforms. Consumers depend increasingly not only on reviews by others (i.e., friends/acquaintances/strangers), but also on the recommendations provided by specific websites to decide on their next set of purchases.

Consumer Participation in Social Media and the Digital World

While Jenkins's (2006) notion of convergent culture describes the macro environment, at a micro level, we refer to Belk's (2013) work on extended self in the digital world. In his seminal paper, Belk discusses the notion of digital self, which is a virtual reincarnation of the "extended self" he proposed in his earlier work (Belk 1989). He identified five characteristics that describe the consumer in the digital environment. They are:

- Dematerialization – Attachment to virtual possessions
- Re-embodiment – The emergence of digital avatar
- Sharing – Referring to virtual space as a shared space
- Co-construction of self – Extended self in the virtual environment
- Distributed memory – Consumer narratives in the virtual world

Thus, Belk argues that the technological environment has altered consumer discourses, but the basic concept of "extended self" is still intact. In other words, consumer fundamentals have not changed. One question that arises in this regard is: What kind of objects are

consumers dealing with in the social media environment? Denegri-Knott and Molesworth (2013) call them aptly “digital virtual goods.”

Members of online communities are active Internet contributors who expend time and creative effort outside their professional routines and produce what Kozinets (2015) calls “network narratives.” Their roles are varied and diverse. For example, they are information initiators and recipients, consumers, producers, critics, and participants within the social media culture. In other words, users voluntarily devote time and effort to developing and sustaining social media content and their presence. Users contribute to the content because of the need to communicate, gather information, and express their ideas. As a result, *user-generated content*, a key phrase in social media vocabulary, creates value for the ecosystem of social media as a whole (van Dijck 2009). Social media platforms (Facebook, Twitter, etc.) reinforce the interaction between users through different forms of user-generated cultural content (e.g., text, photos, and videos) that have become key drivers of people’s opinion formation and value judgments. Socially speaking, ties between individuals are also generated through such content production and sharing.

Hoffman, Novak, and Stein (2013) aptly conceptualize social media in terms of four Cs: connect, consume, create, and control. Thus, social media represent a significant development in a short time, giving rise to several possibilities and scenarios that involve socializing, information sharing, buying and selling, and interacting with others in significant ways. This also means that consumers are producing and sharing a lot of data about themselves and others.

Consumers are social media users of different platforms that are continuously being modified and updated through user demands and initiatives “via microblogs, pictures, videos and/or private messages to which other users in their network can respond” (Berger and Buechel 2015, 3). What makes this particularly striking is users’ ability to create and consume social media content at the same time. These dynamics remind us of the transition of consumers to “prosumers” – a combination of producers and consumers (Kotler 1986; Ritzer and Jurgenson 2010).

Along with the emergence of social media come questions about data security and privacy. There is some concern that privacy protections over social media are easy to circumvent. Consumer data is not really protected well enough and can be accessed with sophisticated tools and software. Thus, the social media environment raises some critical questions of privacy, security, and net neutrality that are emerging as key issues (Venkatesh 2016a).

The privacy of the user or the consumer is a major concern in social media given the semi-public nature of the medium. Basically, one expects that the data or information about an individual remains secure, and their right to protection regarding information or data about themselves is guaranteed. So the main concerns relate to: a) secure data, b) imperatives regarding the need to keep data private, c) the need for individuals to have control over data, d) transparency in terms of how data is stored, accessed, and secured, and e) enforcement of compliance in practices regarding data management. To this end, Venkatesh argues for security design and operations, infrastructure protection, network and data protection, transparency, customer control, and third-party compliance.

Conceptualizing the Consumer in the Social Media World

Typically, in the field of consumer research, the general tendency is to study the consumer from different theoretical perspectives – as a psychological being with socio-cognitive and emotional characteristics; from a socio-cultural point of view with an emphasis on cultural values, group affiliations, and social background; or from an economic standpoint with a focus on utility maximization and tradeoffs. We believe there is another but related perspective that is appropriate for our study. That is, the participant in *social* media is a social person engaged in social communicative interactions with friends and associates as well as strangers – all in their capacity as social beings. Thus, there is an opportunity for us to explore how the individual is constituted within the socio-historical context. To pursue this point of view, I refer to some pertinent literature and begin with relevant work from consumer research, social psychology, and media studies that include: identity theory of planned behavior (Ajzen 1985), Marshall McLuhan's (1964) and McLuhan and Powers' (1989) work on media imagery, and the notion of digital avatar (Damer et al. 1997).

A Social Psychological Perspective

Ajzen (1985) proposed that intentions to perform behaviors of different kinds can be predicted with a high degree of accuracy from attitudes towards that behavior under conditions of prevailing subjective norms. Ajzen also proposed a theory of planned behavior, which offers the notion that human behavior is not capricious and that there is a conscious formulation of such behavior. For our purposes, we might say that social media users are

very cognizant of the social media environment's benefits and drawbacks and participate in them with due deliberation and not capriciously.

Ajzen's theory is preceded by a well-known theory of reasoned action with a similar logic (Fishbein and Ajzen 1975). For our purposes, the implication here is that if social media users have positive attitudes towards social media sites and feel a need for involvement, they will have positive dispositions toward social media. Identity theory and social identity theory (Hogg, Terry, and White 1995; Stets and Burke 2000) explain how the socially constructed self-mediate between the individual and the social environment. Both theories address the social nature of the self as constituted by the environment instead of self as a purely independent construct. This may help explain consumer participation in social media; it contributes to consumers' sense of identity and self-worth or serves as a way to accumulate some level of social capital. Lin (2002) proposes a more sociologically oriented notion of social capital formation. In some early work, Pierre Bourdieu (1984), the French social theorist, popularized the notion of capital formation in the social world by integrating the three forms of capital – social, cultural, and economic. He argued that some elite members of society assume the role of arbiters of social taste, and socially orchestrate the three forms of capital that are combined to form "human capital," which in turn confers "social distinction" on them. The other members become followers of this elite group. Lin (2002) takes this notion further and identifies the dynamics of social capital formation, which include a number of sociological concepts such as social interaction, social cohesion, social norms, and values. Relating social capital to the notion of human capital, Lin (2002) argues that social

capital is the outcome of a collective effort built around social networks, trust, and socially oriented contexts. For our purposes, one can make an argument that participation in social media is a way to build social capital. In this context, social capital refers to investment in the social community with some expected returns – economic, social, and cultural (friends, community formation, information exchange, etc.).

A Media-Centric Perspective: Individual in the Media Age – Marshall McLuhan

Marshall McLuhan (1964) is very pertinent to our discussion on social media because he was preoccupied with the role of media in contemporary society. His media work had and continues to have a wider appeal globally along with his other well-known joint work on the global village (McLuhan and Powers 1989). McLuhan was interested in cultural transformation due to media influence/expansion. He proposed the view that cultural change was driven by technological forces and, in particular, by the characteristics of media technologies. He was, of course, referring primarily to television. According to McLuhan, new media are not just novel manifestations of communication technology but are instruments of change in the social structure and formation of social character. Although the Internet and social media (and even email) did not exist in McLuhan's time, his famous thesis regarding new media as instruments of cultural change turned out to be prophetic and has stood the test of time. For example, he stated that all media are extensions of human discourses and sites of human interactions. They are also change agents, for they are technological manifestations of the human world in the form of video and sound (e.g., television). The TV is not merely an entertainment medium; it may appear to act as a visual aid to the external

world, but it can also fashion human behavior and influence the way we think. It does this quite effectively while people are watching TV in the privacy of their homes. In other words, it is a *social technology*, par excellence.

By extension we can argue that social media, in the form of social networking sites, play a similar role and are sites of social discourse and instruments of social transformation. But they do represent a fundamental attribute not encountered before because social media users are not passive consumers but active change agents. That is, unlike in the traditional media culture, social media users are both content producers and active initiators of change. Thus, they act more like *digital avatars* shaping the social media landscape.

Social Media Structure – A Socio-cultural Perspective

For our purposes, we can describe social media in terms of their communication structures and user configuration and participation in a socially constructed environment. There are indeed certain social roles that social media users assume. Members of online communities are active Internet contributors who expend time and creative effort outside their professional routines to produce what Kozinets et al. (2010) call “network narratives.” Their roles are varied and diverse. For example, they are information initiators and recipients, consumers, producers, critics, and participants within the social media culture. In other words, users voluntarily devote time and effort to developing and sustaining social media content and configuration. Users contribute to the content because of the need to communicate, gather information, and express their ideas. As a result, *user-generated*

content, a key phrase in social media vocabulary, creates value for the ecosystem of social media as a whole. Social media platforms (Facebook, Twitter, etc.) reinforce the interaction between users through different forms of user-generated cultural content (e.g., text, photos, and videos) that have become key drivers of people's opinion formation and value judgments (Wilson, Gosling, and Graham 2012). Socially speaking, ties between individuals are also generated through such content production and sharing.

According to Christakis and Fowler (2009), the Internet "facilitates interactive multimedia and many-to-many communication"; therefore, it shifts the one-to-many communication of traditional media to many-to-many. Consumers are no longer passive recipients of what is produced for them but are now involved in the process of content generation for social sharing. Unlike traditional mass media such as television and magazines, which deliver content controlled and manufactured by producers without audience input in the construction and sharing of content, social media platforms treat content producers and consumers as collaborative entities, for they do create value jointly (Peñaloza and Venkatesh 2006). Of course, sometimes the users do generate content independently. This user-generated content is a key to understanding social media platforms that constitute a medium for consumers as initiators of content production. For corporations, on the other hand, this is a great way of promoting their brands since consumers perceive consumer-generated content as more reliable than company-generated content. Additionally, consumers gain agency as they contribute to social media content.

In sum, it is important to emphasize that consumers are both *content providers* and *data generators* for social media platforms (van Dijck 2009). That is, when consumers create content, they become a rich data source for companies, which can then mine the data for commercial purposes.

Digital Persona/Avatar – The Social Persona in the Information Age

Damer (1997) describes avatars as follows: “Avatars . . . focus on what people do inside (the) virtual worlds . . . navigating through the worlds, and learning digital etiquette and social interaction skills.” Meadows (2009) draws upon some literature in development psychology and explains how, as children begin to get socialized with their peers and elders, they begin to acquire a social character that drives their behavior in many settings, especially in the digital arena. Many such interactions involve using computers, mobile phones, and other Internet-based devices. By extension, one can argue that the world of social media presents itself as an appropriate venue for new forms of interactive social behavior not envisioned in traditional media culture.

The construction of digital consumer persona is a foundational concept in the current technological discourse (Clarke 1994; Solove 2004). Primarily this has to do with “digital dossiers” that can be generalized to any digital configuration about the individual, whether self-generated or other-generated. Digital dossiers are information banks and involve different aspects of personal data – the production of dossier information, dossier database

construction, and dossier updating as well as dossier availability for others to share or take a peek into.

Digital persona/avatar issues become even more complicated given that social media are not limited geographically; the information individuals post can be accessed instantaneously and acted upon globally.

With current technology, many companies and online/offline government agencies are able to construct databases about individuals. Take for example, Amazon. Not only does the company have past records of customer purchases, they can easily construct consumer profiles based on patterns of expenditures, types of products purchased, credit card information, online histories, credit-worthiness, and other personal information. Later, they utilize the customer information to create personalized marketing strategies. Given that consumers continue to provide information to social media sites through IP addresses, it follows that user information can be stored and mined. Additionally, consumers as social media users need to formally sign social media platform agreements (i.e., terms of use) in order to gain further entry into the sites. These data mining practices of social media platforms introduce privacy concerns (Venkatesh 2016a).

In order to fully understand the digital persona in the context of social media, we will address some issues pertaining to social media platforms and structure.

Social Media Platforms and Consumer Content Generation

Social media platforms are dynamic objects adjusted through users' needs and owners' objectives, and also in reaction to competing platforms and the larger technological and economic infrastructure. On social media platforms such as Twitter and Reddit, users can post information and create streams while platform owners may adjust their programming (algorithms and interfaces) to affect data traffic (van Dijck 2013). Platforms gain economic value through marketing activities. It is important to understand the effect of socioeconomic and technological underpinnings of the relationships between social media platforms, users, and marketers. User practices such as *sharing*, *liking*, and *friending* create specific technological and economic meanings in social media networks. Although the definition of social media implies that platforms allow people to have relational connections, different platforms provide different communication patterns and opportunities.

Social Media Brands – A Social Discourse

In contrast to traditional media, social media provide continuous, detailed feedback via their participation in online communities, contribute to new product ideas and engage in brand-related conversation enabling better brand positioning based on real-time data. Companies can also use social media for brand promotion. However, according to Fournier and Avery (2011), unlike traditional media structure – where the consumer is a mere recipient of company information and images – the social media user is very much in charge of content management. Therefore, in order to succeed in the social media world, brands attempt to

manage user presence differently. Hoffman and Novak (2012) propose an effective system to motivate consumers on social medium platforms that would take into consideration consumers' subjective well-being and their fundamental needs and motives in the context of social media engagement.

An important topic in this context relates to consumers and their brand preferences (Singh and Sonnenburg 2012). One issue that brand management attempts to understand is why people use social media. This can be addressed in the context of their basic needs for autonomy, competence and relatedness, intrinsic and external motivations, and well-being perceptions. Results show that motivations differentially drive social media goal pursuit, and users with different primary social media goals differ in perceptions of well-being. Using these results, Singh and Sonnenberg (2012) develop a testable, theoretical, brand-oriented framework. They take into consideration social media goals defined by two higher-order dimensions that contrast the primary focus of the online interaction with the primary direction of the online interaction. This framework may be useful in developing further understanding of the relationship between users' social media behaviors and subjective well-being in the context of their fundamental needs and motives. Thus, Singh and Sonnenburg argue that consumers participate in social media through the vehicle of brand storytelling; they play an active role in brand marketing through storytelling that focuses on their brand experiences, both positive and negative. The basic concept is experiencing empathy for the brand and engaging in reinterpretation of brand stories. The authors call

this improvisational performance. They use the Dove company sites on Facebook and YouTube as an example of this.

Social Media Consumption – A Theoretical Integration

The foregoing discussion in this chapter is an attempt to conceptualize the consumer in the context of social media environment with a specific focus on consumer dynamics. As discussed above, Jenkins refers to these developments as the emergence of “convergence culture” (Jenkins 2006). In this final section, we would like to propose how social media are integrated into consumption practices. We identify several levels of integration. The levels vary according to the specific institutional/group-oriented conditions and user dispositions. Here are examples of social media integration measures or indicators that are pertinent to our discussion:

- Social media are dominated by different consumer/demographic groups (e.g., adults/children, men/women, and other group members)
- User skills develop naturally as well as by practice and engagement
- Social media participation is interest specific and at the same time a contagion
- Familiarity with social media is both intuitive and involves active participation, but may not require formal training
- School/work/social-cultural groups, based on the situation, may play a major role

- Social media characteristics include: communication patterns, user-generated content, information-storage medium, entertainment medium, instant messaging, social learning
- A very important aspect of social media is that it fosters a culture of socialization
- No longer a passing fad, social media are considered a necessity in this information age
- Of course, one realizes too much technology can negatively impact social life, although it varies with contexts and social groupings

The above indicators should help researchers develop appropriate hypotheses and identify topics for further investigation. We will now elaborate on some key ideas.

As social technologies, social media represent cultural phenomena that reflect a number of different characteristics based on specific social relationships (family, friends, consumer segments, and professional associates). In other words, although social media platforms are a technological phenomenon, users employ them to build social networks and to interact with others. Thus, social media serve different purposes.

In the context of active social involvement there are a few aspects of social media that are worthy of note. First, they allow for instant communication. Thus, they are very effective as networking tools. They also allow users to create personal presence, and are a very powerful medium for establishing social connections near and far. They can be used to convert offline relationships to online ones and online relationships to offline. Social media allow groups to

come together and share their opinions and their interests. Content generation and sharing are major characteristics of social media. One can also engage in political discourse and comment on current events and happenings. There is also an opportunity to gather political intelligence.

This is particularly important as consumers share consumption experiences and are able to project their opinions on media sites. That is, as consumers, social media users can become publicly active and express their opinions and preferences. They are sometimes critical of companies and their products, and their opinions can easily be shared with other members. Thus, the opportunity to create social content can have both positive and critically constructive overtones. Opinions are expressed, and other social media users either agree or disagree or remain neutral.

Depending on the specific social media platform, communication strategies vary based on the nature of the social media vehicle (Wang, Yu, and Wei 2012). On the positive side, social media represent a high degree of user friendliness and a spirit of community formation. For example, Facebook is very effective as a community network (Wilson et al. 2012). Twitter is for blogs. Professional contacts can be established on LinkedIn. YouTube is a very useful tool for archiving and sharing information and visual material. In other words, different social media play different roles and can be effective in different ways based on their purpose and impact. Unlike traditional media, social media are built around frequent/constant updates. Since customers use social media regularly and frequently, i.e., several times during the day, their expectations are also tied to novelty of information and currency. Many consumers use

mobile devices consistently, and the social media outlets take this into consideration. At the same time, companies try to coordinate social media with traditional media.

Many organizations use social media effectively to advertise their products and gather information about users and their views on various subjects. While companies have a prominent brand presence on, say, Facebook, they are not really *selling*. It is all about providing information and augmenting their brand presence. Yes, they deliver product information, but they are careful not to act aggressively. This, indeed, is an interesting conundrum in social media culture where companies appear to be guarded. Maybe this is because the medium is still new and experimental. Typically, companies do show a lot of activity on their timeline tab. There may be several posts from their customers, but customer complaints are handled separately via email.

Conclusions

In the foregoing, we provided an analysis of user/consumer issues concerning social media. It was directed towards a conceptual analysis of the social character of the consumer and his or her digital persona. Certainly, this is an emerging field and promises much potential for future inquiry. To conclude, the transformation from human connectedness to automated connectivity occurs as social activities are translated into technological codes. The interplay among social media users, platforms, companies, and regulatory parties creates the medium of communication. Therefore, this medium enables the consumer in social media to become *a participant and an active agent* who connects with friends and colleagues as well as

acquaintances and strangers in an effort to engage as a *social persona* or *digital avatar* in this emerging global scene. Much potential exists to explore digital interactions in the social media arena across consumer segments and different demographic and socio-cultural groups.

ESSAY 2: CONSUMER TIES AND SOCIAL MEDIA CONSUMER CULTURE IN SOCIAL MEDIA NETWORKS

Introduction

Social media have emerged as a new paradigm in the cultural landscape with the promise of gaining greater access to information and the diffusion of information. Digital technologies of social media networks provide opportunities for individuals who are becoming key players in the socially constituted offline world. This essay explores *consumer ties* in social media networks. Studying social media markets as institutional contexts, we can analyze the production and consumption of the content and structure because social media as a market is an essential location for the expression and production of cultural groups and social relations. Although the study of social networks dates back several decades, the recent rise of social media has opened up new ways to study the complex web of networks in the fast-changing cultures of connectivity and new structures of consumer ties. In social network theory, social, cultural, and demographic characteristics are the drivers of influence. However, in social media, where users are limited in terms of their identity and social and cultural cues, the question of whether the traditional offline notion of social network ties (e.g., strong ties) is still effective becomes debatable (Xu et al. 2014). Some have argued that weak ties may be collectively more influential than strong ties in online environments (Bakshy et al. 2012, 526). These new tie strength dynamics in social media networks have significant implications for the study of consumer culture.

In this essay, the first goal is to understand consumer ties by analyzing the user-level structure and content by applying social network theory to social media discourse. Structure refers to the “identifiable patterns of nodes and ties in a network” while content is “the resources available in a network (e.g., information)” (Borgatti and Foster 2003, Kane et al. 2014, 277). The second goal is to examine platform-level structure and content to explain the consumer dynamics of social media. Finally, the third goal is to analyze the implications of these approaches in the study of social media culture.

While prior research looked at *consumer ties* in the context of marketing (e.g., Choi and Bell 2011; Cova, Pace, and Skålén 2015; Risselada, Verhoef, and Bijmolt 2013), *social networks* (e.g., Chen, Fay, and Wang 2011; De Vries, Gensler, and Leeflang 2012; Figueiredo and Scaraboto 2016; Kozinets et al. 2010; Kozinets, Patterson, and Ashman 2016; Marion 2010; Moe and Trusov 2011; Möller and Svahn 2003; Schau and Gilly 2003), and *virtual market behavior and social media* (e.g., Chen et al. 2011; Denegri-Knott and Molesworth 2010; Gandini 2016; Moe and Trusov 2011; Murray 2015), our contributions is to advance some fundamental issues concerning consumer ties in the context of social media networks.

The research questions this paper intends to answer are:

1. How do user-level structure and content affect the strength of consumer ties in the context of social media networks?
2. How do platform-level structure and content affect the strength of consumer ties in the context of social media networks?

3. How do the above issues advance our understanding of consumer culture in the context of social media networks?

To answer these questions, I develop a framework based on a combination of cultural and structural approaches. In our cultural approach, I use user-generated content and social capital theory, and in our structural/social networks approach, I utilize strength of ties. I conclude by proposing a framework that demonstrates the underpinnings of social media market culture (Table 1).

Using our framework, I first find that user structure and content help us explicate the nature of strength of ties in social media networks. Specifically, for user-level structure, all users in a social media network are important sources of information; therefore, they are likely to become influential on others' idea formation. Moreover, for user-level content, by changing the notion of trust and emotional bonds, weak ties become more influential.

Second, I identify the effects of tie strength and platform-level structure and user-generated content in explaining the dynamics of social media culture. In social media culture, social ties are formed through user-generated content. Users fulfill their need for information, entertainment, mood management and self-expression by generating and sharing content. Platforms such as Facebook and Twitter reinforce sharing of more content with multiple audiences in social networks since they have economic value to gain from the users. With the increase in the volume of shared content, privacy, protection of the content and content ownership are gaining attention.

Lastly, these developments in the social media culture have implications to the study of consumer culture and market behaviors. For example, this new form of social media culture is generated by the *technological advancements* of networks while *norms, practices, and meanings* stem from the complex relationships between social actors in social media (i.e., platforms, users, companies; (van Dijck and Poell 2013). In the social media context, *strong ties* lose their traditional meaning and weak ties can influence individuals because they gain a certain level of emotional bonding through consumer generated content. That is, social media act as a catalyzer for the rise of brand communities and brand publics, which enable information flow and influence.

Social Media and Social Network Theory

The multi-layered concept of social media can be defined as “a set of online tools that supports social interaction between users” (Hansen et al. 2011, 2). Social media are communication platforms based on digital technology and a cultural medium of communication shaping human behaviors (van Dijck 2012; Louie and Venkatesh 2013). The way individuals communicate with each other in social media networks is formed within a complex interplay between social practices and technological infrastructure (Hansen et al. 2011). This paper intends to understand social media networks focusing on the user and content relationships.

Social Media and User-generated Content

Users are active internet contributors who put in a certain amount of creative effort, which is formed outside of professional routines and platforms (van Dijck 2009). They are recipients, consumers, producers, and participants of social media culture who are considered amateurs and citizens as well as professionals and practitioners. In other words, users voluntarily devote their time and effort to develop and sustain the content in social media. Users contribute to the content because of the need to communicate, gather information, and express themselves. As a result, user-generated content creates value for the ecosystem of social media as a whole (van Dijck and Nieborg 2009). Platforms reinforce the interaction between users through the generated cultural content (e.g., text, photos, and videos). This content is essential in people's opinion formation and value judgments. Ties between individuals are also generated through this content.

Social Networks and Strength of Ties

A social network is "a finite set or sets of actors and the relation or relations defined on them" (Wasserman and Faust 1994, 20). These relationships between *actors* are called *ties*. This research aims to provide an understanding of consumer ties in social media networks (e.g., Facebook). The key feature of social networks is their relational information. Therefore, social network analysis is a useful tool to examine relational market phenomena and interactions such as consumer-consumer communications.

Strength of a tie is defined by emotional intensity, intimacy, and reciprocity of a relationship (Granovetter 1973). Granovetter's conception of a strong tie is characterized by the importance the person attaches to the tie, the frequency of interaction, and the duration of the tie. In this regard, strong ties require more frequent interaction (Weimann 1983).

It seems intuitive to think that strong ties are better at transmitting information than weak ties, but Granovetter (1973) rather paradoxically shows that weak ties do play a very crucial role in transmitting information, specially, in non-redundant information by connecting groups. Granovetter's findings imply that while weak ties are less efficient than strong ties in transmitting information *within* groups, they are key in transmitting information *between* groups (1973).

Prior research has shown that weak ties can be critical in the diffusion of ideas and public information (Granovetter 1973). Weak ties play an essential role in the diffusion of innovations because peripheral actors with weak ties are structurally beneficial; those ties provide non-redundant information compared to strong ties (Granovetter 1973; Rogers 1995). Non-redundant information is generated through actors with bridging positions. Burt (2004) illustrates how peripheral actors with weak ties connect two otherwise disconnected groups and how this process results in social capital.

Social Networks and Social Capital

Social capital refers to accumulated resources through relationships among members of a community (Bourdieu 1986; Coleman 1988a; Ellison, Steinfield, and Lampe 2011a). Social

media networks enhance embedded resources for users that are needed for social capital. This happens in two ways: First, diverse knowledge is generated through weak ties (i.e., through friends' friends), and the actors (either individual customers or firms) bridge two otherwise disconnected groups. This notion is also called *bridging social capital* (Ellison et al., 2011; Putnam, 2000) Bridging actors connect people to more distant acquaintances in different groups and tend to create broader identities and wider reciprocity rather than a narrow grouping (Putnam 2000; Tierney 2013). The second way social media networks enhance embedded resources is through *bonding social capital*, which reflects support from close-knit relationships. For Putnam (2000), bonding social capital is formed around strong ties such as family and friends. It tends to emphasize homogeneous groups.

Both Putnam (2000) defines trust as a key concept of social capital. On one hand, trust is very relevant to social capital concept, which emphasizes "the way in which networks give access to resources" (Steinfeld, Ellison, and Lampe 2008, 63) . It plays an important role in accessing benefits of social networks such as knowledge. On the other hand, some relationships operate well with minimal trust. For example, the social interaction in social media communities represent *brand publics* (Arvidsson and Caliandro 2016). This interaction and sharing is what Belk (2013) addresses as pseudo sharing of ideas and experiences with no expectation of reciprocity and contradicts with the accepted understanding of the relationship between trust and social capital.

In traditional social networks, there is the expectation of exchange for mutual benefit, which is called reciprocity. Reciprocity points to one's willingness to return favors. In dyadic

relationships, directional relations yield mutual dyads only if both actors in a pair of actors, choose the other on the relation. In brand publics such as Twitter hashtags, there is no reciprocation expectation to build a community. Information flow and norms build social capital in networks. Next, our framework will explain the underpinnings of consumer ties on social media networks.

Consumer Ties in Social Media Networks - A Framework

In order to have a better understanding of why weak ties are stronger in social media networks, it is essential to consider the novel characteristics of social media that affect the underlying assumptions of social network theories. This research intends to provide a framework that summarizes these effects. The value of social networks can be explained by looking at the *content* that flows through the networks and the *structure* of these networks. Here, content refers to “resources available in a network (e.g., information)” and structure is the “identifiable patterns of nodes and ties in a network” (Borgatti and Foster 2003; Kane et al. 2014, 277). The proposed framework shown in Table 1 identifies the influence of social media on the user practices that shape social ties between actors by explaining the relationship between *user-level* and *platform-level structure and content*.

Social Media User: Content Production and Consumption in Social Media Networks

In social media, social media community members both produce and consume content. To investigate the social media environment that facilitates this dual role, first social media context as a market must be explained. Building on Karababa and Kjeldgaard (2014) and

Ballantyne and Varey (2006), this research suggests that in social media networks, consumers co-create value with the brand. The group administrators and the other consumers, who are members of the groups, can be considered as volunteers because of their contribution to branding in consumer-generated brand communities (e.g., company groups on Facebook). These brand volunteers follow oppositional loyalty, which is a result of consciousness of kind, and they are 'prosumers' due to their collaborative branding approaches. These consumer volunteers are the key actors of collaborative branding efforts since marketing practices take place in the communal brand co-creation of content (Cova et al. 2015, 2015; Cutcher 2010; Muniz Jr and Schau 2005).

User and Content

Users contribute to the content because of the need to communicate, gather information, and express themselves. They voluntarily devote their time and effort to develop and sustain the content in social media. As a result, user-generated content creates value for the ecosystem of social media as a whole. Platforms reinforce the interaction between users through the generated cultural content (e.g., texts, photos, and videos). This content is essential in people's opinion formation and value judgments. Ties between individuals are also generated through this content.

Social media influence individuals' lives and the ways they communicate with each other. Individuals share their ideas, values, and tastes through social media platforms (Christakis and Fowler 2009). The Internet "facilitates interactive multimedia and many-to-many

communication;” therefore, it shifts the one-to-many communication of traditional media to many-to-many (Hoffman and Novak 1996, 50). Consumers are no longer passive recipients of what is produced for them but are now involved in the process of content generation. Unlike traditional media such as television and radio, which broadcast content by producers without providing a medium to construct and share content, in social media platforms producers and consumers are not separate entities and they create value jointly (Peñaloza and Venkatesh 2006; Vargo and Lusch 2004). This is what counts as user-generated content, which is a key to understanding social media platforms.

Users engage in social connections with user-generated content with the motivations of “fulfilling information, entertainment, and mood management needs” (Shao 2009, 17). Moreover, they benefit from accessing different resources through their ties (Kane et al. 2014). Users create content in order to express themselves by “constructing a digital self, projecting a digital likeness, digitally associating as a new form of possession, and reorganizing linear narrative structures” (Schau and Gilly 2003, 394). Online communication “reduces the impact of social cues” and “supports a wider range of participants and participation” (Vilpponen, Winter, and Sundqvist 2006, 68). This results in sharing more content with multiple audiences. Yet, the issues of sharing, privacy, and ownership are becoming debatable (van Dijck 2013).

User and Structure

Users as actors in a social network benefit from their structural positions, which is called structural capital. Social media platforms offer opportunities to analyze the importance of these positions from different perspectives by providing “equal and accurate information about the network structure” (Kane et al. 2014, 282). In addition, van Dijck (2012) argues that platforms have an economic value that they gain from the users; therefore, the number of connections (i.e., friends, ties) is more important than the quality and depth of relationships.

Grabowicz et al. (2012) show that new types of social media functions such as *following* and *retweeting* reinforce the weakness of strong ties and the strength of weak and intermediate ties. Thus, socially weak ties that are connecting different groups are important for diffusing innovations similar to “what they observe for the links with retweets that concentrate with high probability in the links between dissimilar groups or intermediary links” (Grabowicz et al. 2012, 5). In addition, weak ties are “crucial for maintaining the network’s structural integrity, but strong ties play an important role in maintaining local communities” and “both weak and strong ties are ineffective, however, when it comes to information transfer, given that most news in the real simulations reach an individual for the first time through ties of intermediate strength” (Onnela et al. 2007, 7336). Hence, all members of the network are considered important sources of information (Vilpponen et al. 2006).

Social Media Platform: Social Media Platform Effects on Consumer Ties

Social media platforms are dynamic objects that are adjusted through users' needs and owners' objectives, but also in reaction to competing platforms and the larger technological and economic infrastructure through which they develop (Feenberg 2009). On social media platforms such as Twitter and Reddit, users can post information and create streams, and platform owners may adjust their programming (algorithms and interfaces) to affect data traffic. Platforms gain economic value through consumer marketing activities. It is important to understand the effect of socioeconomic and technological underpinnings of the relationships between social media platforms, users, and marketers.

User practices such as sharing, liking, and friending are creating specific technological and economic meanings in social media networks. Different platforms provide different communication styles even though they allow people to have relational connections. For example, Facebook friends are different from followers in Twitter. In addition, in different social media platforms, users seek distinct styles of "connectedness, self-presentation, and taste performance" due to the differences in their architecture (van Dijck 2012; Papacharissi 2009). For instance, in YouTube, which is a video-sharing social media platform, users represent themselves through videos whereas, in Wikipedia, which is a collaborative encyclopedia, individuals contribute to cumulative written knowledge. This process is part of a larger political and ideological information control debate and affects how privacy, sharing, and transparency are managed in social media.

Social media networks have different control mechanisms. For example, social media platforms can restrict who can “create, edit, read, invite, share and respond to” others (Hansen et al. 2011, 15). As Venkatesh (2016b) notes, due to the semi-public nature of social media, there are possible privacy concerns coming into play. For example, ‘what kind of information social media platforms (e.g., Facebook) collect’ and ‘how users manage or delete information about themselves’ reflect some consumer privacy concerns.

Users have a number of roles in the social media environment; therefore, user agency appears as an important and complex construct. It is hard to define where the users stand in the continuum between producers and consumers. van Dijck (2009, 44) indicates that participation is different from active contribution to user-generated content: “Over 80 percent of all users are in fact passive recipients of content,” whereas only 13 percent of the users are active creators that are “actually producing and uploading content such as weblogs, videos, or photos.”

Platform and Content

Platforms can determine the types of content to be embedded in a profile, how this represents offline identity, and how the information spreads in the network (Kane et al. 2014). In addition, users behave in a similar way because of the similarity in the content they generate (Kane et al. 2014). This may result in redundant information flow in the network, which reinforces adoption of complex innovations (Centola 2011). Social media platforms have the power to control and manipulate the shared content. As van Dijck puts it, “users are

locked into a flow and they tend to click on content preselected by platforms and reaffirmed by their friends' clicking behavior" (van Dijck 2012, 204). Therefore, platforms such as Facebook cultivate weak ties.

Platform and Structure

Social media platforms enable individuals to have more friendship ties than real life, and they determine the nature of these ties (Kane et al. 2014). Facebook *friends* are mostly acquaintances with weak ties that accrue over time because refusals of friend requests are uncommon (boyd 2006; Hampton 2007). These weak ties are more important in increasing flow of information about their activities outside the organizational system because of their high frequency. Moreover, "weak ties make an important contribution to the probability of information flow by virtue of their number" (Friedkin 1982, 284). Therefore, individuals are exposed to the information by weak ties more than strong ties. Bakshy et al. (2012, 526) argue that due to this increased exposure to new information in social media, "weak ties are collectively more influential than strong ties" because "in online environments the low cost of disseminating information fosters diffusion dynamics that are different from situations where adoption carries high cost."

Implications of Social Media Networks for the Study of Consumer Ties

In social media networks, consumers interact with each other, build communities, and share opinions. This new notion of communication has potential differences from traditional offline human interaction. The connected media with its numerous new cultural forms, such

as tweets and posts, enable individuals to access various sources simultaneously, which would have been impossible in the pre-Internet era. As a result, social media culture emerges with new behavioral codes and values.

The notion of friendship in social media networks is different from traditional offline networks. In the context of social media, the terms *friends* and *friending* do not express the strength of the relationship between individuals. Both a close relationship with high intimacy and a relationship with a total stranger can be called a *friend*. For example, the term 'followers' has a connotation from neutral groups to devotees and believers, but in the context of social media, it changed its meaning to the number of people who follow your tweet stream. In traditional offline networks, people who are well connected are known to be individuals whose connections have higher quality and status rather than quantity. Since most of the contacts in social media networks are connected with weak ties, they have an undebatable power in social media networks when compared to traditional in-person contacts (Trusov et al. 2010). It is also important to note that some of the online communication takes place with the same family and friends who are connected to the individual in person and by phone (Boase et al. 2006). This shows that individuals use the Internet to complement their offline relationships. Here, social media platforms act as bridges between online and offline connectivity (Hampton 2007).

In social media networks, defining boundaries of ownership in social media is becoming harder because who owns user-generated content is still an unanswered question (Tierney 2013). In addition, social media sharing becomes the norm and what is considered as private

and public is debatable. For example, Facebook's interface allows users to be connected but partly disguises their mechanisms for sharing user data with other parties. Yet, imposing sharing as a social value influences cultural practices. On the other hand, users encounter the same content streams in social media networks, which results in exposure to redundant information. Then, how do these practices affect tie strength, information flow, and influence in social media networks?

Social media create a reflection of the formative aspects of communication media in shaping cultural and political structures. Research across different disciplines suggests that these structures are linked to broader trends in changing patterns of friendship, where the modes of engagement with media environments are more individualized and flexible. Similarly, Wellman's notion of 'networked individualism' points out the growth of a form of sociability around networks that are displacing traditional forms of communities (2001). In online networks, ties can lose their organic connection to a particular locality; they are being replaced by a more strategic selection of contacts and ties based on interests and values (Thompson 2003).

This research examines how social media have become an online layer that shapes individuals' lives and affects human interaction at both the individual and societal levels. This online layer consists of platforms that provide a place to facilitate human interaction at both the individual and community levels. Hence, the shift from offering channels of networked communication to 'networked sociality' becomes very important (Castells 2007;

Manovich 2009). It allows individuals to communicate through the interactive communication opportunities that social media provide.

Social media consumer culture facilitates a venue for brand publics and brand communities. The concept of “publics,” which refer to a crowd that exists as long as the mediation mechanism such as a newspaper or theater performance operates, is used to define the forms of social interaction on social media (Arvidsson 2013; Bastos, Raimundo, and Travitzki 2013; boyd 2006; Papacharissi 2014; Papacharissi and Oliveira 2012). Tarde (2010, 53) indicates that a public is “purely spiritual collectively, a dispersion of individuals who are physically separated and whose cohesion is entirely mental.” In social media publics, members engage in conversations whereby they share their perspectives and experiences. Social media devices such as Twitter hashtags enable users to launch and continue publics by associating their tweets and posts with a publicly researchable classification like #occupy or #fitbitreport (Papacharissi and Oliveira 2012). Belk (2013, 2015) calls this a pseudo sharing of opinions, perspectives, and experiences without an expectation of reciprocity or the formation of community.

Community practices, which create value, are defined as general knowledge, skills and abilities and cultural consumption in addition to emotional commitments. Muniz Jr and O’Guinn (2001, 30) also indicate that these community practices “interact with one another, function like apprenticeships, and endow participants with cultural capital, and produce a repertoire for insider sharing, generate consumption opportunities, evince brand community vitality, and create value.” Brand communities have strong cultures, complex

rituals, traditions, and behavioral expectations (Muniz Jr and O'Guinn 2001). The consumer narratives that are built around these traditions and rituals, allow consumers to understand each other and share their consumption experiences (Arnould and Price 1993; Veloutsou 2009). In communal settings, sharing stories enhances the bond between the group members (Kozinets et al. 2010).

Three specific online community characteristics in value creation for the members of a community are identified in Seraj (2012). These are goal-driven and quality content (intellectual value), interactive environment for building relationships (social value), and self-governed community culture consistent with its principles (cultural value). Different actors in online markets form social, cultural, and intellectual value. In the context of consumer communities, these values establish consciousness of kind and moral responsibility and sustainability which are key characteristics that a community has (Muniz Jr and O'Guinn 2001; Seraj 2012).

Integrating a relational social networks approach with a cultural approach will bring new insights into consumption behaviors, specifically in relation to social marketing and value creation. Analysis of the value creation in social media consumer networks is important because value networks appear as a crucial component of market value systems (Akaka and Chandler 2011; Chandler and Vargo 2011; Luca, Hibbert, and McDonald 2016). This study contributes to this stream of research by explaining value networks, social capital and structural capital as unique value creation dynamics in social media networks in different markets.

Conclusions

As the discussion and analysis in the present article have indicated, the reformulation of some of the central premises guiding social networks as a perspective for consumption related research generates an essential basis for explaining the total process leading to facilitating meaningful ties between consumers in social media. Drawing from theories of social networks research and social media, this research investigates social media and social networks with a focus on tie strength among actors of social media networks. Since existing theory on social networks is based on traditional offline networks, it is important to understand the nature of social networks, and specifically strength of ties in the social media consumer environment. In social media context, *weak ties* are more influential because they have a certain level of emotional bonds and trust through consumer-generated content and information flow.

The framework I identified explains 1) the impact of user-level structure and content on the strength of consumer ties, 2) the role of strength of ties and platform-level structure and content on the strength of ties, and 3) the implications of above to consumption theory. This framework explores how *users* and *platforms* shape social media consumer culture through structure and content, which are explanatory mechanisms of social networks. As a result, I argue that weak ties gain strength in social networks as cultural motives, communication patterns and practices evolve with social media.

This research has essential contributions. From a research perspective, explanation of consumer tie formation as a joint process of consumers, platforms, content and structure enable researchers to study the underlying mechanisms of networks in social media. From a more applied perspective, our findings highlight the importance of looking at cultural and structural aspects of consumer ties in social media networks when designing institutional strategies.

Table 1: Consumer ties in social media networks framework

		Structure	Content
User	Social Media	<ul style="list-style-type: none"> -The number of connections matter for platforms rather than the quality and depth of relationships. -New types of social media allow personal interactions to occur on internal links to the groups. 	<ul style="list-style-type: none"> -Users engage in social connections with, user-generated content and social ties are formed through user-generated content. -Platforms reinforce sharing of more content with multiple audiences.
	Social Network Theory	<ul style="list-style-type: none"> -Users benefit from their structural positions -New information go preferentially through weak ties. 	<ul style="list-style-type: none"> -Access different resources through their ties. -By changing notion of trust and emotional bonds, weak ties become more influential.
	Social Media Consumer Environment	<ul style="list-style-type: none"> -Structural capital: Consumers benefit from being in particular positions. -Consumers become opinion leaders who are influential on opinion formation of others. -All members of the network are considered as important sources of information. 	<ul style="list-style-type: none"> -Consumer generated content: Opinion leaders are a result of both the structure of the network and the content they generate. -Access to resources: Consumers have access to different resources such as information about a particular product or service through their relational ties. -Weak ties gain trust with their shared content and become more effective in consumers' opinion formation.
Platform	Social Media	<ul style="list-style-type: none"> -Social media platforms enable individuals to have more friendship ties than real life. -Online friends are mostly acquaintances with weak ties. 	<ul style="list-style-type: none"> -Platform power and control on shared content. -Users are locked into a flow and click on content, organized by platforms and reaffirmed by their friends clicking behavior.
	Social Network Theory	<ul style="list-style-type: none"> -Platforms can determine the nature of ties established on the platform. -Platforms enable high exposure by weak ties. 	<ul style="list-style-type: none"> -User similarity (i.e., homophily) results in redundant flow of content. -Platforms propagate weak ties and contrive strong ties.
	Social Media Consumer Environment	<ul style="list-style-type: none"> -Network influence on consumers: Consumers behave similarly because they are being exposed to the same content in social media platforms. -Weak ties (e.g., online friends) are collectively more influential than strong ties (e.g., family members) due to low cost of disseminating information in social media. -Platforms provide equal and accurate information about the network structure. 	<ul style="list-style-type: none"> -Consumer idea formation is affected by their weak ties and they make an important contribution to the information flow by virtue of their number. -Social media platforms have economic value they gain from consumer-generated content. -The issues of sharing, privacy, content protection and content ownership are becoming debatable.

ESSAY 3: CONSUMER COMMUNITIES IN SOCIAL MEDIA

Introduction

This research presents a perspective of cultural dynamics in consumer communities in social media by specifically examining the meanings behind their everyday practices and patterns in their relationships through social media networks. Additionally, an in-depth analysis of structural patterns in consumption relationships that take place in social media facilitates a unique setting and a good starting point to help us explicate the strength of consumer ties. Although the study of social networks dates back to several decades, the recent rise of social media has opened up new ways to study the complex web of networks in the fast changing cultures of connectivity and new structures of consumer ties. Moreover, recent research suggests we should take a closer look at social media that facilitate and enhance networks of individuals (Christakis and Fowler 2009; van Dijck 2013).

In the marketing literature, social networks have been analyzed (Brown and Reingen 1987; Iyengar, Van den Bulte, and Valente 2011), but only limited attention has been paid to social networks in the context of social media (Kozinets et al. 2010; Schweidel and Moe 2014), tie strength (Risselada et al. 2013), and social capital/trust (Mathwick, Wiertz, and Ruyter 2008). In order to explain the complex cultural interplay in social media networks that affect relationships of individuals and ties that bind them, a cultural approach together with a social networks approach is employed to reach a thorough understanding of how consumer ties evolve in social media networks.

Utilizing a multi-method approach, first, this paper advances the theory on consumer ties by identifying three emerging categories *motivating empowerment*, *friendly rivalry* and *trust, share* as underlying mechanisms of consumer ties in social media communities. Second, results reveal different structural properties such as negative homophily, reciprocity and triads as important drivers of consumer engagement in consumer communities. Third, a negative relationship between tie strength and gender homophily has been found. By focusing on cultural and structural aspects of consumer ties, this research provides a unique framework to explain the dynamics of consumer ties in social media.

Part 1: Culture of Fitness Motivation Communities on Social Media

Prior literature have explored consumer communities (Celsi, Rose, and Leigh 1993; McGrath, Sherry, and Heisley 1993), brand communities (Muniz Jr and O'Guinn 2001; Muniz Jr and Schau 2005; Schau, Muñoz Jr, and Arnould 2009) and consumer vs. company/marketer generated consumer communities in social media (Goh, Heng, and Lin 2013; Lee, Kim, and Kim 2011; Sung et al. 2010). In addition, social capital (Coleman 1988b; Ellison et al. 2014; Lin 2001; Putnam 2000); and trust (Brodie et al. 2013; Morgan and Hunt 1994) have been investigated in various consumer contexts, however, not much attention has been out on how these concepts are shaped in social networks of fitness motivation communities in social media. Therefore, this research aims to analyze consumer experiences to uncover various layers of cultural meanings in consumer practices in social contexts (Fournier 1998; Holt 1995). Explaining the ties between consumers in consumer communities is essential to

understand the value of the consumer-to-consumer ties which is crucial in building consumer engagement in consumer communities (Cova 1997, 21).

Consumer Communities

A community is defined as small and homogeneous or heterogeneous groups tied with familial and emotional bonds (Tönnies 1887). Contemporary theory on communities emphasize the complexity of communities such as extending beyond geographic boundaries, heterogeneity of individuals in a community, the evolving nature of communities (Thompson, Arnould, and Giesler 2013). Shared commonalities in communities can be listed as a sense of belonging or consciousness of kind, having common goals, interests, norms and moral responsibility, and shared practices such as rituals and routines. These commonalities result in consumer engagement in the community (Muniz Jr and O'Guinn 2001; Thomas, Price, and Schau 2013).

As Arnould and Price (1993) discuss collective belonging is important in communities. Collective belonging refers to "the degree to which communities embrace solidarity and togetherness (communitas)." (Thomas et al. 2013) Individuals experience both individual and collective sense of belonging in communities and these are essential for the continuation of the community. Thomas et al. (2013) further emphasize the importance of sense of belonging to the community and importance of shared social relationships that creates shared collective meanings. The authors further suggest that the sense of belonging is created and co-constructed in the collective practices in the community (Blanchard and

Markus 2002; Hardy, Lawrence, and Grant 2005; Schau et al. 2009). Additionally, focus, duration, appeal, access, dispersion, marketplace orientation, structure of resource dependency, collective belonging, and heterogeneity are important dimensions of consumer communities (Thomas et al. 2013).

Consumer research adds to the community literature by explaining communities centered on products, brands, and consumption. Different types of consumption have been examined, for example, subcultures of consumption (Schouten and McAlexander 1995), brand communities (Muniz Jr and O'Guinn 2001), and tribes (Cova and Cova 2002). Prior literature addressed consumer communities from various perspectives. Muniz Jr. and Schau (2005) investigate cultural co-production activities around market-mediated products in a brand community that centered on Apple Newton, which was discontinued by Apple. Furthermore, McAlexander et al. (2014) examine experience-based communities; specifically they point out importance of geo-temporal concentrations and richness of social context. They also show how marketers can strengthen brand communities by enhancing shared consumer experiences that alter dynamic characteristics of brand communities. In addition to these, community research in marketing focuses on lifestyle based communities (Goulding and Saren 2009), opposition ideology based communities (Thompson, Rindfleisch, and Arsel 2006), brand communities (Martin, Schouten, and McAlexander 2006; Muniz Jr and O'Guinn 2001; Muniz Jr and Schau 2005), or online communities (Seraj 2012; Szmigin and Reppel 2004).

Brand Communities

Brand communities have been investigated extensively in marketing literature (Algesheimer, Dholakia, and Herrmann 2005; Kozinets et al. 2010; McAlexander, Schouten, and Koenig 2002; Muniz Jr and O'Guinn 2001; Muniz Jr and Schau 2005; Schau et al. 2009; Thompson and Sinha 2008). A brand community is a "a specialized, non-geographically bound community, based on a structured set of social relationships among users of a brand." (Muniz Jr and O'Guinn 2001, 412). Brand communities have powerful cultures, replete with complex rituals, traditions, and behavioral expectations (Muniz Jr and O'Guinn 2001). These concepts converge to create value and therefore engagement, loyalty, and sustainability for community members. The components of a community are consciousness of kind (fear of not belonging), moral responsibility and rituals and traditions (Muniz Jr and O'Guinn 2001).

Schau et al. (2009) analyze how brand community practices create value. They define community practices such as general knowledge, skills and abilities and cultural consumption in addition to emotional commitments. The authors also indicate that these community practices "interact with one another, function like apprenticeships, and endow participants with cultural capital, and produce a repertoire for insider sharing, generate consumption opportunities, evince brand community vitality, and create value." Brand communities have strong cultures, complex rituals, traditions, and behavioral expectations (Muniz Jr and O'Guinn 2001). The consumer narratives that are built around these traditions and rituals, allow consumers to understand each other and share their consumption experiences (Arnould and Price 1993). In communal settings, sharing stories enhances the

bond between the group members (Celsi et al. 1993; Kozinets et al. 2010; Muniz Jr and O'Guinn 2001).

Kozinets et al. (2010) explore word of mouth (WOM) strategies in online markets. They identify four communication strategies, which are evaluation, embracing, endorsement and explanation. These are influenced by the communicator narrative, communications forum, norms and nature of the marketing promotion. The tension between commercial and communal motives plays an essential role in the marketing message formation.

Seraj (2012) identifies three specific online community characteristics in value creation for the members of a community goal driven and quality content (intellectual value), interactive environment for building relationships (social value), and self-governed community culture consistent with its principles (cultural value). Different actors in online markets form social, cultural, and intellectual value. In the context of consumer communities, these values establish consciousness of kind and moral responsibility and sustainability which are key characteristics that a community has (Muniz Jr and O'Guinn 2001; Seraj 2012, 20).

Analyzing user-generated content is important to explain the value creation in online markets. Network value appears as a crucial component of value systems in online markets. This study proposes to contribute to this stream of research by explaining trust and social capital as unique value creation dynamics in fitness motivation communities of Facebook.

Brand Publics

The concept of “publics” is used to define the forms of social interaction on social media (Arvidsson 2013; Bastos et al. 2013; boyd 2006; Papacharissi 2014; Papacharissi and Oliveira 2012). Tarde has introduced the concept of publics, which refer to a crowd that exists as long as the mediation mechanism operate such as a newspaper or theater performance. In social media publics, members engage in conversations in which they share their perspectives and experiences. Social media devices such as Twitter hashtags enable users to launch and continue publics by associating their tweets and posts with a publicly researchable classification like #occupy or #fitbitreport (Papacharissi and Oliveira 2012). As mentioned in the earlier essay, Belk (2013) calls this a pseudo sharing of opinions, perspectives and experiences without an expectation of reciprocity or the formation of community. Arvidsson and Caliandro (2016, 730) suggest, “the possibility of re-mediation without interaction leads to two important characteristics of social media publics.” Re-mediation without interaction constitutes an environment in which the orientation is on sharing of personal views or perspectives (Papacharissi 2012). Therefore, social media publics may develop shared meanings that appear from pseudo sharing of private affects instead of communication among participants.

Social Capital in Communities and Publics

Social capital is an important outcome of consumer community engagement. Social capital also refers to the support and economic benefits. In the consumer communities literature, there have been several references to social capital (Arnould and Thompson 2005; Holt

2002). For example, aspects of social capital is seen in transient communities that are based on consumption and shared interests (Cova and Cova 2002; Kozinets 2002; Nelson and Otnes 2005). In their work on virtual communities, Mathwick, Wiertz, and Ruyter (2008) indicate that social capital is composed of normative influences of voluntarism, reciprocity and social trust. These three effects have been discussed in a variety of studies (Bourdieu 1986; Putnam 1993; Stolle 2001). Online and offline brand communities (McAlexander et al. 2014; Muniz Jr and O'Guinn 2001; Muniz Jr and Schau 2005) exhibit elements of social capital. I seek to extend this literature by developing an understanding of social capital in social media fitness motivation community context.

Consumer Engagement

Consumer engagement is at the heart of consumer communities. It can be defined as “the intensity of an individual’s participation in and connection with an organization’s offerings and/or organizational activities, which either the customer or the organization initiate.” (Vivek, Beatty, and Morgan 2012, 127). For (Hollebeek, Glynn, and Brodie 2014, 6), customer brand engagement is “the level of a customer's motivational, brand-related and context dependent state of mind characterized by specific levels of cognitive, emotional and behavioral activity in brand interactions.”

Vivek et al. (2012) provide a framework of consumer engagement on focus, basis of value and outcomes. Consumer engagement has cognitive, emotional, behavioral and social elements as well as it has value, trust, affective commitment, word of mouth, loyalty and

brand community involvement as potential consequences (Schamari and Schaefer 2015; Vivek et al. 2012). In their paper, Weinberg et al. (2013) investigate community collaboration in the socially networked marketplace. Knowledge sharing, empowerment, ownership and coordination are essential in how social media can facilitate collaborative community through expressive individuality. The authors argue that social media can facilitate collaborative community, which has a key role in business. Expressive individuality refers to a high degree of individuality in a community, which is beneficial for both the firm and the individual (Weinberg et al. 2013). Especially, because social media create the opportunity for individuals to express themselves and share information about themselves, their thoughts, feelings, behaviors, beliefs, attitudes and preferences. This information sharing strengthens the connection between the consumers and between the consumers and the firm. Additionally, Peters et al. (2013) introduce a framework that content, social interaction, network structure and motives are the drivers of marketing action in social media. This research intends to advance social media literature in the consumer community context, by explaining social and cultural underpinnings through consumer content and network structure.

Method-1

This research aims to explore, analyze and understand cultural dynamics of consumer practices in social media networks. My research approach is twofold: first is qualitative and uses the Fitbit groups on Facebook as a context to explicate the underlying mechanisms of consumer relationships in fitness motivation groups. Second approach is a social networks

approach to explicate the effect of social network characteristics (i.e., centrality, homophily, triadic structures) on network formation. This section begins with restating the research questions for both methods that guide this dissertation. Next, I will explain my empirical context, Fitbit groups on Facebook as a consumer network. After I detail my data collection methods, I will conclude this part with a section that exemplifies the data analysis processes.

In order to unpack the cultural underpinnings of tie strength between consumers in social media networks, an interpretive approach together with a social networks approach will be employed. A growing body of recent work developed the core idea that networks and culture are mutually constitutive and deserve deeper analytic consideration in light of one another (Pachucki and Breiger 2010). Social network analysis provides useful techniques to identify structural system that underlies social media networks and an interpretive cultural approach grants us access to cultural categories and systems of meanings that are constituted in social media networks, how consumers have their own language, symbols and value systems, etc.

Incorporating social network theory when examining formation of consumer networks is important because we can visualize and assess the complex relationships that emerge in ethnographic narratives about social networks (White and Johansen 2005). Although combining qualitative and quantitative approaches may result in difficulties due to the different epistemological positions, one method can compensate for the relative weaknesses of the other (Brewer and Hunter 1989; Domínguez and Hollstein 2014; Flick 2002). Network

analysis can complement ethnography by deepening it through testing hypotheses about phenomena (White and Johansen 2005). The methodology used in this essay is as follows:

1. Data Collection and Data Analysis: Interpretive methodology
 - a. Ethnographic field study (Geertz 1994; Schouten and McAlexander 1995)
 - i. Ethnographic content analysis (Altheide 1987)
 - ii. Netnography (Kozinets 2010)
2. Data Collection and Data Analysis: Social Network Analysis (Wasserman and Faust 1996)
 - a. Exponential Random Graph Models (Lusher, Koskinen, and Robins 2012)

The Empirical Context: Fitbit Groups on Facebook

This research explores different mechanisms of consumer communities in the empirical context of fitness communities on Facebook, specifically Fitbit groups. Fitbit is a company that is founded in 2007 and produces fitness activity trackers using sensors and wearable technology designed to help people achieve their fitness goals. In their mission statement, they state that they aim to empower and inspire a healthy living and a more active life. The emergence of fitness trackers and wearable technologies (e.g., Fitbit) and smart watches (e.g., Apple watch, Samsung Galaxy Gear and Pebble watch) have changed the ways consumers experience fitness and fitness related products. Users of fitness trackers such as Fitbit track body movements, the number of steps, calories, sleep hours and pulse rate with devices that consumers can attach to their bodies (i.e., bracelets). Facebook Fitbit groups

that this research analyzes are consumer-generated communities. In these communities, consumers post their daily achievements and interact with each other, therefore, these communities constitute a great context to explicate fitness culture and network formation of consumer fitness networks.

Research Design

Interpretive Methodology

An interpretive methodology will be used to examine the research questions:

- How is user/consumer-generated content constructed in social media? Specifically, how do consumers engage with each other in consumer communities?

There are several reasons why an interpretive approach is appropriate for this study. First, an interpretive methodology will provide access to cultural categories and will show us how consumer engagement takes place in social media. Consumer communities have their own languages, symbols and value systems, and an ethnographic approach is necessary to capture these cultural categories and unpack their meanings. Second, an interpretive methodology is necessary to analyze the complex and intuitive processes of consumer engagement. Close observation and inquiry of how and what kind of content is generated by consumers is necessary to relate practice with higher-level cultural categories.

This study incorporates an ethnographic field study as the mode of data collection. Contemporary meaning of ethnography refers to in-depth empirical research involving (participant) observation, interviews, and artifacts.

The ethnographic field study involves ethnographic content analysis, long interviews and participant observation. The ethnographic content analysis has been conducted on fitness motivation communities on Facebook. In-depth interviews with four members of fitness motivation communities on Facebook have been conducted. Data analysis employs the grounded theory method as described by (Strauss and Corbin 1998). Emerging themes and categories that arise from the data will be the main method of investigation.

Data Collection

Ethnographic research methods are used in the interpretation and analysis of sociocultural phenomena though data collected in observations, interviews, and documentation (Corbin and Strauss 2008). Ethnography is a well-established approach that has been extensively used in the study of cultures and communities (Geertz 2000; Kates 2002; Kozinets 2001; Muniz Jr and O'Guinn 2001; Schouten and McAlexander 1995). The use of ethnography in marketing research is growing and can be seen in examining topics such as brands (Fournier 1998), brand communities (Schau et al. 2009), subcultures (Kozinets 2001; Schouten and McAlexander 1995), buyer and seller behavior (Belk, Sherry Jr, and Wallendorf 1988), acculturation (Peñaloza 1994; Peñaloza and Gilly 1999) and consumer identity (Luedicke, Thompson, and Giesler 2010).

Ethnography is a holistic research approach that is built on the assumption that a system's properties cannot be accurately understood independent of each other. This ethnography is a mixture of ethnographic content analysis of user generated data, interviews, and observation. In order to gain an understanding of how consumer ties and consumer engagement are formed in consumer communities in social media, this study looks to collect data using ethnographic research methods, which include user-generated data using the ethnographic content analysis method (Altheide 1987). Ethnographic content analysis: Fitbit pals community's user generated content have been analyzed comparatively as cultural texts that are rooted in cultural routines and practices (Fairclough 2002). In analyzing the cultural texts, 'constant comparative' method of data analysis has been used (Glaser and Strauss 1967).

The long interview: The long interview is an essential method in qualitative research for data collection and analysis. Long interviews will follow (McCracken 1988) for semi-structured interviews. Each session starts with ice breaking questions. As the interview continues, guided questions are asked to uncover information about the cultural routines, practices in the community as well as the respondent's relationships with the other members. The interview protocol outlines the specific themes and questions that are explored through ethnography. Typed transcripts of each interview are prepared for data analysis by the researcher.

Participant observation: Netnography is an approach to participant observational online research that follows certain procedures and rules (Kozinets 2001, 2010). Online participant

observation aims to capture social interactions. The setting for observations studies is the Facebook community. I spent four years at various Facebook fitness communities and observed consumers as they make posts, comment and like each other's posts and interact with each other. My field notes focus on the daily posts, interactions other group members, and on online artifacts (e.g., photos) and field notes are used to cross validate interview texts.

Data Set and Data Analysis

The data set consists of verbatim transcriptions of in-depth interviews and the textual netnographic data collected and saved from Facebook group posts. The informants are assigned pseudonyms to protect their anonymity. In this section, I analyze user generated content data that are gathered from publicly available Facebook data of a fitness motivation group community Fitbit pals. NodeXL software was used to import the data from Facebook and NVivo 10.0 was utilized for content analysis.

For the content analysis, as of April 2018, approximately 10,000 unique content of Facebook posts produced by more than 800 members are used. There are around 7500 unique dyadic relationships between group members. The majority of the netnographic data is textual however; there are my own field notes, cultural material such as photos, videos and discussion forum posts. This part highlights how this textual data analysis has been conducted in this dissertation.

Initial themes that emerged after unrestricted open coding are fitness motivation, Fitbit interface, running, Fitbit problems, newbie, socialization, goal setting, rewards, self-

monitoring, and sharing, public commitment, cooperation and pairing-up. Axial coding (develop a category/construct by specifying the conditions that give rise to it, the context, the action/interaction strategies by which it is carried out, and the outcome of these strategies). The themes that emerge at this level of analysis are motivating empowerment, body, beauty and fitness, friendly rivalry, train, trust, share and self-expression. In selective coding process, researcher moves up to a higher level of abstraction by specifying relationships across constructs. The codes that come up at this level are trust and social capital, which are in line with the theory. Trust has been a crucial aspect of consumer relationships. From a marketing point of view, trust is at the heart of successfully established long-term oriented relationships (Anderson and Narus 1990). In addition, it has been identified as an important consequence of consumer engagement (Brodie et al. 2013; Hollebeek 2011; Luis Casaló, Carlos Flavián, and Miguel Guinalú 2007; Peters et al. 2013).

Results and Discussion

Social media fitness communities not only affect how individuals consume fitness but also change the production and consumption processes of wearable technologies through changing fitness culture as it deeply transforms consumption practices. Understanding cultural underpinnings of social media fitness communities (e.g., Fitbit pals), this part of essay 3 aims to answer the following research questions: “How is user/consumer-generated content constructed in social media (e.g., Facebook)?”, “What are the cultural underpinnings of consumer ties?” and “How is consumer engagement constructed in consumer communities?”

In this dissertation, consumer is used in the context of social media participatory culture. This work regards all consumers as active in their agency and creativity in production of meanings, identities, communities, rituals, and even material culture (Cova, Kozinets, and Shankar 2012; Ilhan 2011). This essay unfolds these meanings, collective identities, communities and rituals in the fitness culture using social media fitness groups as a context.

In brand communities, members seek out social relationships with their peers who share similar interests. As Muniz Jr and O'Guinn (2001) suggest, a brand community helps the members to feel connected to each other and separate themselves from the other brands. This is because they use and love the same brands. In addition, social capital is the resources through relationships among people (Coleman 1988b; Ellison, Steinfield, and Lampe 2011b). Understanding social capital can be helpful to grasp the nature and scope of the ties between individuals and communities (Mathwick et al. 2008). As sources of social capital, this dissertation identifies two emerging themes: motivating empowerment, train, trust and share.

Motivating Empowerment. Personal quantification of energy use and tracking exercise helps us have access to more information about our behavior. More than one in five US adults use some form of personal health tracking device (Fox and Duggan 2013) and there will be 485 million wearable computing devices in the market by 2018 (Flood 2013).

Personal quantification or quantified self is becoming an increasingly common phenomenon, yet little empirical work has explored how such measurement affects consumers. Recent

research argues that measuring how much people do can decrease enjoyment and continued engagement even though it increases how much an activity consumers do, because it focuses on external benefits of an activity (Etkin 2016); however, I demonstrate that engaging in fitness community activities such as posting about fitness achievements via Fitbit creates a feeling of accomplishment and conforming to group norms. Here is a verbatim quote from a Fitbit community member:

“Hello Fitbitters! I was thinking we could try to increase our steps every day for a week by 100 or 500 steps, I understand we all have different levels of fitness and availability to achieve this, so don't beat yourself if you cannot increase it by more than a 100, this is only an idea for motivation. I was thinking we could start tomorrow, or Monday. If anyone would like to add something else to this idea, you are more than welcome. Remember, this is not a competition to see who can do more, just a motivation to move more :)” (Ella)

As evident from the above quote, Fitbit community is a source for motivation for its members. Some consumers are looking for workout partners to track each other's progress not by physically working out together but monitoring the steps taken each day via social media (e.g., Fitbit smart phone app). This leads us to the next emerging theme, which is friendly rivalry.

Friendly Rivalry. Recent research suggests that consumers feel inhibited from engaging in hedonic activities alone especially when these activities are observable by others because they anticipate negative inferences from others about their social connectedness (Ratner and Hamilton 2015). Our results revealed that social media communities compensate for this lack of connectedness feeling and serves as a companion to the individuals during fitness

activity. Additionally, engagement with the fitness community results in a “friendly rivalry” between the members of the community:

“Today's assignment. Step off. Try to beat your partners step count. Friendly taunting and goading is encouraged :)” (John)

“Here are my workouts partner Steven :-) today was good! Haven't done 20k in a while! 14hr shift at work and T25 when I got home 😊” (Miranda)

“Yeah totally!! We [referring to co-workers] are always comparing steps, it's the best! (Matt)

Analysis of the communication patterns show that competing with others in the social network results in an increased level of work out and sharing these results as a proof of their training. This competition is blended in a positive and encouraging conversation as stated in the above quotes from community members.

Train, trust, share: In social media fitness communities, weak ties can gain influence through emotional bonding and established trust, because social media provides a communication platform for online relationships that enables information flow and influence. Additionally, orienting the content of the posts around a common goal (e.g., walking 10,000 steps a day) increases the level of engagement among the community members.

“Being in a group like this give you a safe place to share feelings that you can't share with most of the people in your life... You get to know these people so well that you share every detail of your life....LOL.....I went to them last September when we lost our dog. I was devastated and I knew they would understand. Just today I posted there about the cruise my husband I recently returned from. People get so comfortable with the group that they post all kinds of details about their life. You almost forget that the world can read wheat you are writing (if they

belong to the site) but it's in those details that you really get to know people and connect.” (Jennifer)

Consumers generate content to express themselves by “constructing a digital self, projecting a digital likeness, ...and reorganizing linear narrative structures” (Schau and Gilly 2003, 394). Hence, trust is constructed in online motivation communities through sharing ideas, which are “digitally associating as a new form of possession (Schau and Gilly 2003, 394). Social media fitness communities create the sense of a family environment in which members of fitness motivation communities trust each other to get the comfort to share not only their fitness achievements, but also personal lives.

Recent research suggest that consumers feel inhibited from engaging in hedonic activities alone especially when these activities are observable by others because they anticipate negative inferences from others about their social connectedness (Ratner and Hamilton 2015). This research reveals that social media communities compensate for this lack of connectedness feeling and serves as a companion to the individuals during fitness activity. In light of the findings of the first part, this essay will continue with the second part, which explores network formation in social media consumer networks.

Part 2: Network Formation in Social Media Networks

The second part of essay 3 provides an in-depth analysis of structural patterns in consumption relationships that take place in social media networks give a unique setting and a good starting point to help us explicate the strength of consumer ties. Recent research suggests we should take a closer look at social media that facilitate and enhance networks of individuals (Christakis and Fowler 2009; Dijck 2012). The effects of network formation and different configurations on consumer ties has not been explored in depth in marketing

literature. This research explains how and why homophily, reciprocity and triads are important in tie formation of consumer networks.

The research questions that this study answers are as follows:

- What is the relationship between network attributes (i.e., reciprocity, homophily, triads) and network formation in social media?
- How do these effects evolve through time?

The findings shed light on the network formation in social media consumer communities. First, the analyses reveal an indirect reciprocity effect in time 1, however this effect changes in time 2 (see Table 4 for 111U). Additionally, the results show that there is a negative gender homophily effect. Finally, the analyses reveal that there are transitive triads in time 2, which confirms our qualitative results in part 1, clarifying that social media communities are close-knit social networks. These findings suggest social processes that regulate participation dynamics in social media consumer communities. In summary, this research contributes to theories of consumer communities by identifying network exchange patterns that results in consumer engagement.

Formation of Social Ties in Social Media Consumer Communities

Reciprocity

For friendship networks, reciprocity is responding to other actor's friendly gestures (Block 2015; Schaefer et al. 2010). Reciprocity together with emotional intensity and intimacy is one of the indicators of strength of a tie (Granovetter 1973). On the Internet, relationships are built on collaboration and sharing of resources (Mathwick et al. 2008). In online communities, individuals create and share information that reflects a desire for reciprocity in the form of information and support from other community members (Bradford, Grier, and Henderson 2017).

In social media communities, we are more likely to reciprocity. This is firstly because the interaction among members is visible to all, therefore consumers might be more willing to return the favor due to the nature of social media communities (Faraj and Johnson 2011; Wasko and Faraj 2000). Second, social media communities have strong norms helping each other (Katz and Rice 2002; Wiertz and de Ruyter 2007). Overall, reciprocity is very important for the community to exist and sustain. Therefore, we formally hypothesize that:

H₁: Social media communities demonstrate a structural network tendency toward reciprocity in time 1 and time 2.

Homophily

Homophily principle proposes that individuals like to associate with other individuals who are like them (Lazarsfeld and Merton 1954; McPherson, Smith-Lovin, and Cook 2001). For

example, friends, spouses, and colleagues tend to be more similar to each other with respect to a variety of dimensions, including race, age, gender, socioeconomic status, and education (Kossinets and Watts 2009). Homophily is essential because it affects friendship, marriage, work, exchange, and advice ties. It limits individuals' social worlds in a way that has important effects on the information they receive, attitudes they form, and their interaction experiences (McPherson et al. 2001).

Previous literature in marketing has also explored homophily in the context of innovation adoption (Goldenberg et al. 2009; Risselada et al. 2013), online communities (Park et al. 2017), and word of mouth (Babić Rosario et al. 2015; Brown and Reingen 1987; Gilly et al. 1998). More importantly, gender homophily has also been examined in relation to compliance, goal attainment and customer satisfaction (Dellande, Gilly, and Graham 2004).

Social influence occurs when an individual adapts the behavior, attitudes, or beliefs of others in the social system. Due to its positive effects on influence and decision-making processes that involve a certain degree of trust, I expect a gender homophily in fitness motivation communities in social media. Therefore, I formally hypothesize that:

H₂: Social media communities demonstrate a structural network tendency toward a gender homophily in both time 1 and time 2.

Triads

The fundamental idea behind social network theory is that both location of a consumer in the network and her influence to others in the network will affect how information and

attitudes will reach through the network of consumers (Brown and Reingen 1987; Wuyts et al. 2010). Given the importance of understanding triadic structures in creating close relationships in social networks, surprisingly, in marketing the studies utilizing triads are limited (Groeger and Buttle 2014; Wuyts et al. 2010). Additionally, besides the recognition of the relevance of higher-order subgroups such as triads, most studies continue to utilize dyads as unit of analysis (Wasserman and Faust 1994).

Sociologists have highlighted that triads are important in considering the influences among network actors because this means that the influence of information flows beyond a dyadic relationship to other consumers ties to that dyad (Wuyts et al. 2010). Specifically, the ties in completely mutual triads, where all ties present among three actors, tend to cater for stable friendships.

In a triad of factors i , j , and h ; a cyclical triad (e.g., triad census 030C) is described as the configuration where a tie from i to j , a tie from j to h , and a tie from h to i is present (Block 2015). Interestingly, in social media cyclical relations are more stable than offline traditional networks because there is less discomfort and stress (Alhazmi, Gokhale, and Doran 2015).

However, by time the communities reach to a structural balance of all three actors being fully connected with positive ties (Heider 2013). Structural balance is found in close-knit networks and densely connected communities where *a friend of a friend is also a friend* (Wuyts et al. 2010). Therefore, I expect to find completely mutual triadic structures in time 2 (See triad census 300 in Table 5) because social media encourage enhanced collaboration,

information transfer, and learning (Camacho, Landsman, and Stremersch 2010). Thus, I formally hypothesize that:

H_{3a}: Social media communities demonstrate a structural social network tendency toward cyclical triadic structures (e.g., 030C) in time 1.

H_{3b}: Social media communities demonstrate a structural social network tendency toward completely mutual triads (e.g., 300) in time 2.

Method-2

Data

The setting for this study is online consumer communities, specifically, fitness communities on Facebook. Longitudinal data are gathered from publicly available Facebook closed group data of a fitness motivation community Fitbit pals in two time periods: (1) 2/1/2014-2/10/2014; and (2) 5/1/2014- 5/10/2014 (see Figure 2 and Figure 3 for network maps).

NodeXL software is used to import the data from Facebook. The data consist of one mode projection of multiple two-mode social networks. The *actors* are individuals who are members of the Facebook group. The *relationship* between the actors is defined with 'liking', which stands for the number of times one actor liked another actor's posts. A post is defined as a status update (only text), photo with or without text, video, and share. The data include one actor attribute, which is gender, coded as (0= female, 1= male).

Data Analysis

Exponential Random Graph models (ERGM) are a class of statistical model for social networks. They account for the presence and absence of network ties to provide a model for network structure (Lusher et al. 2012). For example, ERGMs are statistical models and they permit inferences about whether there are significantly more or less reciprocated ties or triangles than we would expect. In this study, ERGMs were conducted to examine what types of structures (i.e., reciprocity, transitivity, homophily) are more likely to co-occur in Facebook networks. ERGMs use simulation techniques to make inferences about how the hypothesized parameters may form the observed network configurations, by comparing the propensity of a network structure in the observed network to the propensity that would occur at random (Lusher, Kremer, and Robins 2013).

Ergm, sna and network packages in R have been utilized for data analysis and descriptive statistics (Hunter et al. 2008). NodeXL software has been used for social networks maps. The model fits the data when all parameters have t less than 0.10 (Snijders et al. 2006) indicating that the standard error is within a tolerable range. Parameters are significant when the t values are within 1.96 standard errors of the parameters (Robins, Pattison, and Wang 2009).

Network Construction

A tie is defined as Facebook liking between actors (i.e., members of community). Following this procedure, valued, and directed networks were constructed for time 1 and time 2 (see Table 3 for network descriptives). We calculated directional edge weights and created an

adjacency matrix. For time1 and time 2 separately, we ran four different models. The following parameters were included in the ERGMs: indirect reciprocity in the order of $(i \rightarrow j), (j \rightarrow i), (j \rightarrow k)$ (e.g., triad census 111U), gender homophily to test whether males (females) like males (females) posts more, and cyclic triads, to test whether the edges are formed in the order of $\{(i \rightarrow j), (j \rightarrow k), (k \rightarrow i)\}$ (e.g., triad census 030C) where the relationship is defined as liking ties, transitive triads in the form of $\{(i \rightarrow j), (j \rightarrow i), (j \rightarrow k), (k \rightarrow j), (k \rightarrow i), (i \rightarrow k)\}$ (e.g., triad census 300).

Next, I examined whether the fitted models can capture the characteristics of the observed network. Goodness-of-fit tests were conducted to validate how well the ERGMs fit the observed network (Appendix A). Later, a large number of random graphs from the estimated model were generated and evaluated whether these simulated networks resembled the original network in a series of network statistics.

Results and Discussion

The ERGM provided support for our hypotheses (see Table 4 and Table 5). The fitted model includes parameters for edges, reciprocity, homophily (gender), as well as triad census parameters from Table 2. As the goodness-of-fit analysis indicate, our model closely approximates the observed network (Appendix A: Goodness-of-Fit for ERGMs). Three of the four models have converged without any notable issues (Hunter et al. 2008). A parameter can be considered significant when the estimate is at least twice the standard error (Pahor, Škerlavaj, and Dimovski 2008; Su and Contractor 2011).

First, the results show that in time 1 there is a tendency for cyclical triads (e.g., triad census 030C) which supports H_{3a}. Cyclical triads may be common and stable online as compared to offline networks, users on online networks may interact in triadic cycles intentionally, because they may believe that such interactions can improve their popularity (Alhazmi et al. 2015).

Second, the negative gender homophily effect has been found in both time 1 and time 2, which does not support H₂. This might be because consumers in these networks might be attracted to the dissimilar, which is the opposite gender in order to have more opportunities to expand the self (Aron et al. 2006). Similar to collaboration networks, consumers might be forming ties with the opposite gender who have complementary skill sets (Moody 2004). These social interactions among individuals provide complementary advantages to interacting parties.

Finally, the models for time 2 find a positive effect for a closed triadic structure (i.e., triad census 300) (H_{3b}) as stated in Table 5. Triad census 300 is one of the two triadic structures where all the actors are active and all three actors are connected with positive ties (see Table 5). This structure can be a consequence of clustering users with similar interests but also a general “friends of my friends tend to be my friends” tendency (Memic, Husagic-Selman, and Hadziabdic 2011), therefore structural balance is found in these close-knot networks and densely connected communities (Wuyts et al. 2010).

Consequently, the results supported the effects of reciprocity, and a transition from cyclical to completely mutual formation of ties in consumer networks in social media. Building on the prior literature (Christakis and Fowler 2009; Gilly et al. 1998; Goldenberg et al. 2009), our results also show that reciprocity, triads and gender homophily influence the formation of consumer ties, thus, affect consumer engagement in consumer communities.

Future Research Directions

These new insights related to consumers in social media offer several opportunities for future research in the domain of social media, social networks, and consumer communities. First, consumer vs. company generated communities were investigated in terms of their impact on brand engagement (Lee et al. 2011), differences between economic value they create and how they affect purchase behavior (Goh et al. 2013) and their role in sustaining growth of a social media brand community (Ding, Liu, and Zhang 2009). However, not much attention has been put on how social capital and trust are shaped in consumer vs. company/marketer generated consumer/brand communities. The structure of the brand community as a social network provides us important insights about how the social capital and trust is formed. In addition, wearables as a product category - that the brand community is built around- give us the opportunity to explicate unique dynamics of those communities where social capital as it brings motivation and agency to the consumer. future research can explain network formation in company generated versus consumer-generated communities in social media. An investigation of this comparison will add to the understanding of brands

and brand research. In order to understand social media communities thoroughly, company-generated communities should also be explored.

Second, because the purpose of this research is to analyze interactions in online fitness communities, the sample has consciously chosen to be restricted to social media fitness communities. Future research may benefit extending this research to a more diverse set of online communities in terms of topic, size and stage in an online community life cycle. Additionally, there are opportunities to examine the impact of visual elements that play an essential role in online communication. In this research, we focused on written social media communication among consumers. However, it would be interesting to explore the role of visuals (i.e., photographs, videos) in the formation of ties and the strength of ties in social media networks utilizing visual ethnography.

GENERAL DISCUSSION

This research makes important theoretical contributions to the literature on social media, social networks and consumer communities. First, I document how consumers develop a social character and digital personas in social media. Specifically, this research shows that social media facilitates a medium for the consumers to be a participant and an active agent who connects with friends, colleagues, as well as acquaintances and strangers in an effort to engage as a social persona or digital avatar in this emerging global world. This research furthers our understanding on the consumer in the context of social media environment with a specific focus on consumer dynamics.

Second and relatedly, by examining how consumer ties in social media are different from consumer ties in traditional offline consumer communities, this research moves beyond conceptualizing consumer dynamics on social media based on different assumptions of the existing theory built on traditional offline social and cultural networks. Specifically, the findings explain the importance of structural positions of actors in social media networks (e.g., central and peripheral actors), strength of ties among actors in social media networks (e.g., strong and weak ties), and the novel capabilities of social media in network structures. Hence, this research advances our understanding of social media consumer networks by providing a framework to identify the changing dynamics of *strong* and *weak ties* in social media with implications to the consumer culture theory.

Finally, this research extends prior literature consumer communities and consumer ties by explaining i) cultural underpinnings of consumer ties in social media communities; ii) social network formation and consumer ties in social media consumer communities– analysis of social network formation: reciprocity, triadic structures and gender homophily. Building on prior literature (Mathwick et al. 2008; Schau et al. 2009), our results demonstrate that in social media communities motivating empowerment, friendly rivalry, and train, trust and share emerge as important themes. Moreover, by using social network analysis, this research disentangles the effects of triadic structures, homophily and reciprocity on network formation. My findings contribute to the growing literature on the effects of social networks and social media on consumer communities (e.g., Kozinets et al. 2010) by showcasing the increasing importance of triadic structures and gender homophily.

Table 2: Summary of research variables

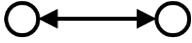
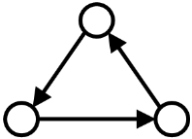
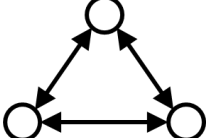
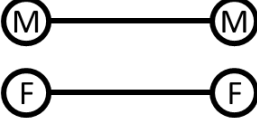
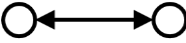
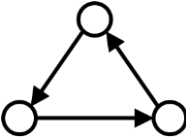
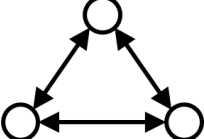

Variable	Network Structures	Definition of variables
Intercept (edges)		This term adds one network statistic equal to the number of edges (i.e. nonzero values) in the network.
Reciprocity (mutual)		In binary ERGMs, equal to the number of pairs of actors i and j for which $(i \rightarrow j)$ and $(j \rightarrow i)$ both exist.
Cyclical Triads (triad census 030C)		030C: $\{(i \rightarrow j), (j \rightarrow k), (k \rightarrow i)\}$
Transitivity (triad census 300)		300: $\{(i \rightarrow j), (j \rightarrow i), (j \rightarrow k), (k \rightarrow j), (k \rightarrow i), (i \rightarrow k)\}$
Homophily (nodematch)		A measure of the degree of similarity between the two nodes in a tie for a specified attribute x . A positive coefficient suggests that patients with the same attribute x are more likely to form a tie. In our model, we include <i>NodeMatch (gender)</i> to control for the impact of gender similarities between dyads.

Table 3: Network descriptives

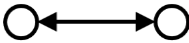
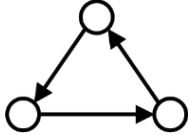
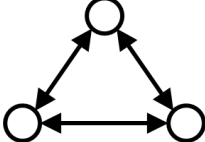
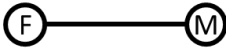
Network Descriptives	Time 1	Time 2
Vertices	256	283
Edges	2419	937
Density	0.03697917	0.01172844
Centralization (Eigenvector)	0.3185409	0.4549833
Centralization (Degree)	0.49631	0.2810378

Table 4: Time 1 exponential random graph model coefficients

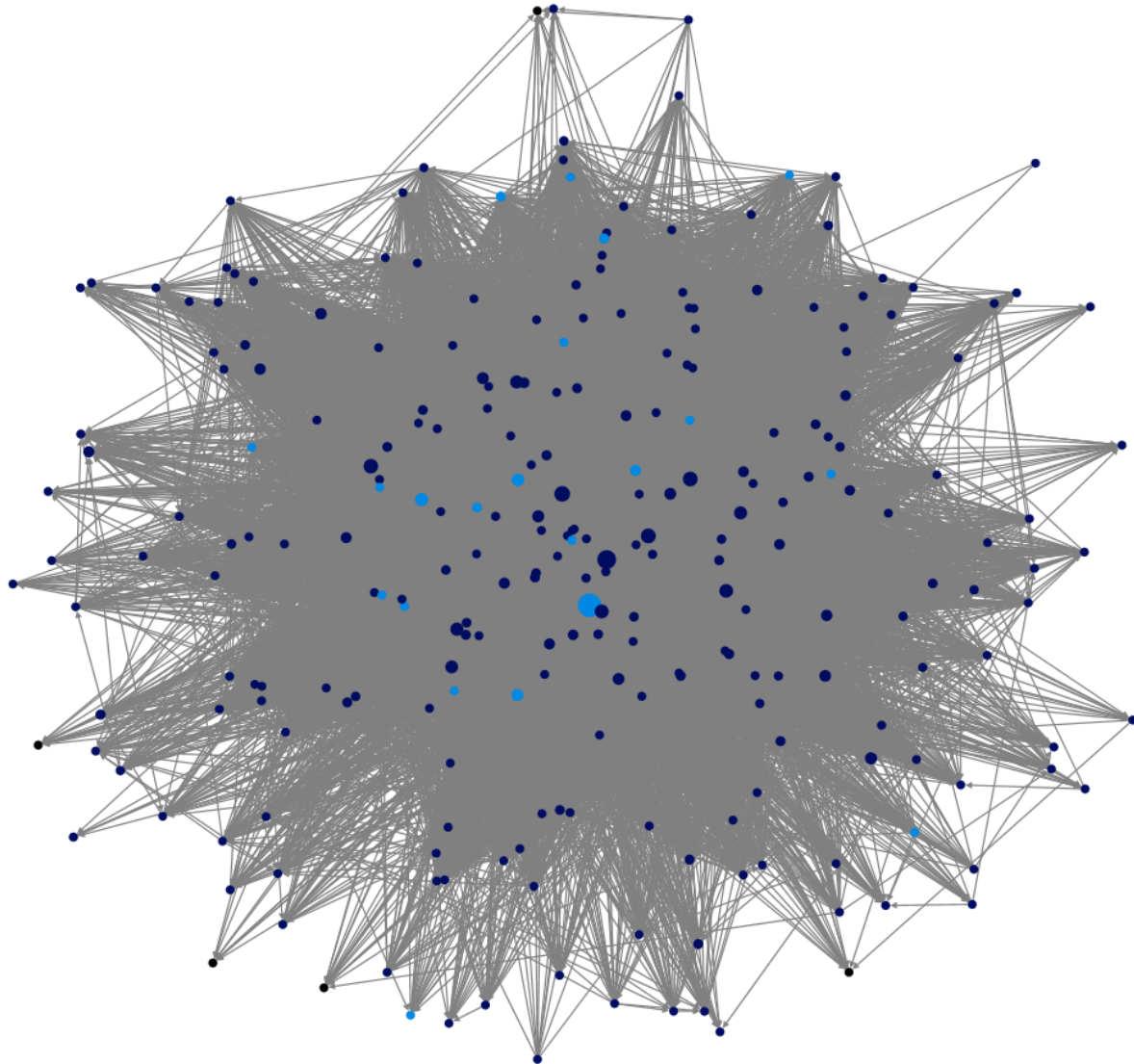
ERGM		Model 1	Model 2
Intercept (edges)		-	-3.05556*** (0.04925)
Reciprocity (mutual)		-	2.13774*** (0.08927)
Triads (triadcensus 030C)		Not a part of Model 1	0.13496 . (0.07762)
Triads (triadcensus 300)		-	Not a part of Model 2
Homophily (nodematch gender)		-	-0.53763*** (0.04443)
AIC		Model 1 did not converge	20336
BIC			20373

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'

Table 5: Time 2 exponential random graph model coefficients

ERGM		Model 1	Model 2
Intercept (edges)		-4.21119*** (0.05779)	-4.26337*** (0.06128)
Reciprocity (mutual)		1.60778*** (0.18022)	2.07612*** (0.18322)
Triads (triadcensus 030C)		Not a part of Model 1	0.99723*** (0.18991)
Triads (triadcensus 300)		66.76884*** (0.65617)	Not a part of Model 2
Homophily (nodematch gender)		-0.39422*** (0.06877)	-0.40064*** (0.07002)
AIC		10512	10483
BIC		10549	10511

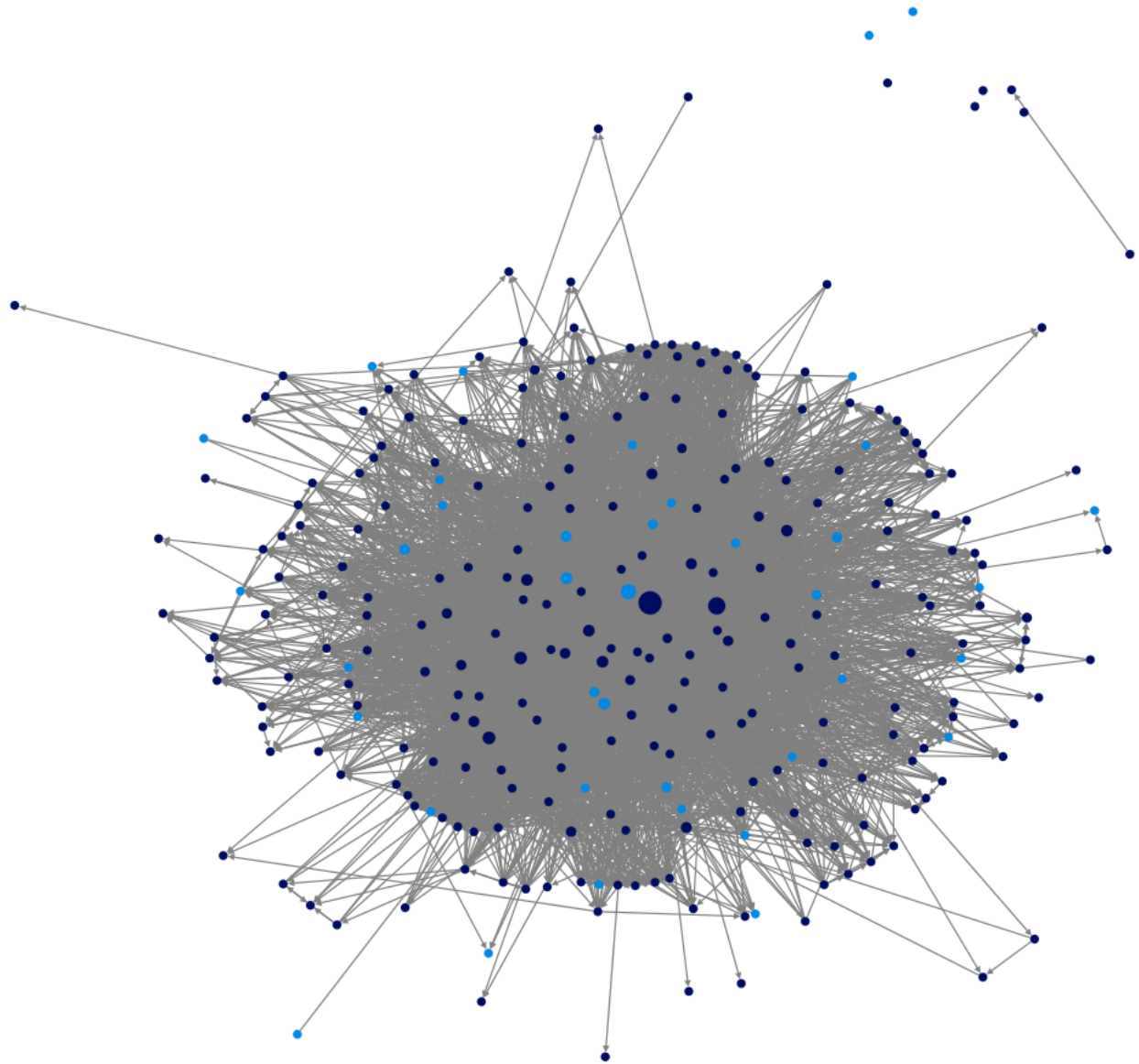
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'



Created with NodeXL Pro (<http://nodexl.codeplex.com>) from the Social Media Research Foundation (<http://www.smrfoundation.org>)

Figure 2: Social network map for Time 1

Dark blue represents female actors and blue represent male actors. Node size represents incoming ties.



Created with NodeXL Pro (<http://nodexl.codeplex.com>) from the Social Media Research Foundation (<http://www.smrfoundation.org>)

Figure 3: Social network map for Time 2

Dark blue represents female actors and blue represent male actors. Node size represents incoming ties.

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APPENDIX A: GOODNESS-OF-FIT FOR ERGMS

Time 1-Model 2

=====
Summary of model fit
=====

Formula: net.time1.like ~ edges + mutual + triadcensus(9) +
nodematch("Gender")

Iterations: 4 out of 20

Monte Carlo MLE Results:

	Estimate	Std. Error	MCMC %	p-value
edges	-3.05556	0.04925	0	<1e-04 ***
mutual	2.13774	0.08927	0	<1e-04 ***
triacdensus.030C	0.13496	0.07762	0	0.0821 .
nodematch.Gender	-0.53763	0.04443	0	<1e-04 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Null Deviance: 90852 on 65536 degrees of freedom
Residual Deviance: 20328 on 65532 degrees of freedom

AIC: 20336 BIC: 20373 (Smaller is better.)

Time 2-Model 1

=====
Summary of model fit
=====

Formula: net.time2.like ~ edges + mutual + triadcensus(15) +
nodematch("Gender")

Iterations: 3 out of 20

Monte Carlo MLE Results:

	Estimate	Std. Error	MCMC %	p-value
edges	-4.21119	0.05779	0	<1e-04 ***
mutual	1.60778	0.18022	0	<1e-04 ***
triadcensus.300	66.76844	0.65617	9	<1e-04 ***
nodematch.Gender	-0.39422	0.06877	0	<1e-04 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Null Deviance: 111027 on 80089 degrees of freedom
Residual Deviance: 10504 on 80085 degrees of freedom

AIC: 10512 BIC: 10549 (Smaller is better.)

Time 2-Model 2

=====
Summary of model fit
=====

Formula: net.time2.like ~ edges + mutual + triadcensus(9)

Iterations: 3 out of 20

Monte Carlo MLE Results:

	Estimate	Std. Error	MCMC %	p-value
edges	-4.56017	0.03577	0	<1e-04 ***
mutual	2.09212	0.18442	0	<1e-04 ***
triadcensus.030C	1.04177	0.19341	0	<1e-04 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Null Deviance: 111027 on 80089 degrees of freedom
Residual Deviance: 10477 on 80086 degrees of freedom

AIC: 10483 BIC: 10511 (Smaller is better.)

Goodness-of-fit diagnostics

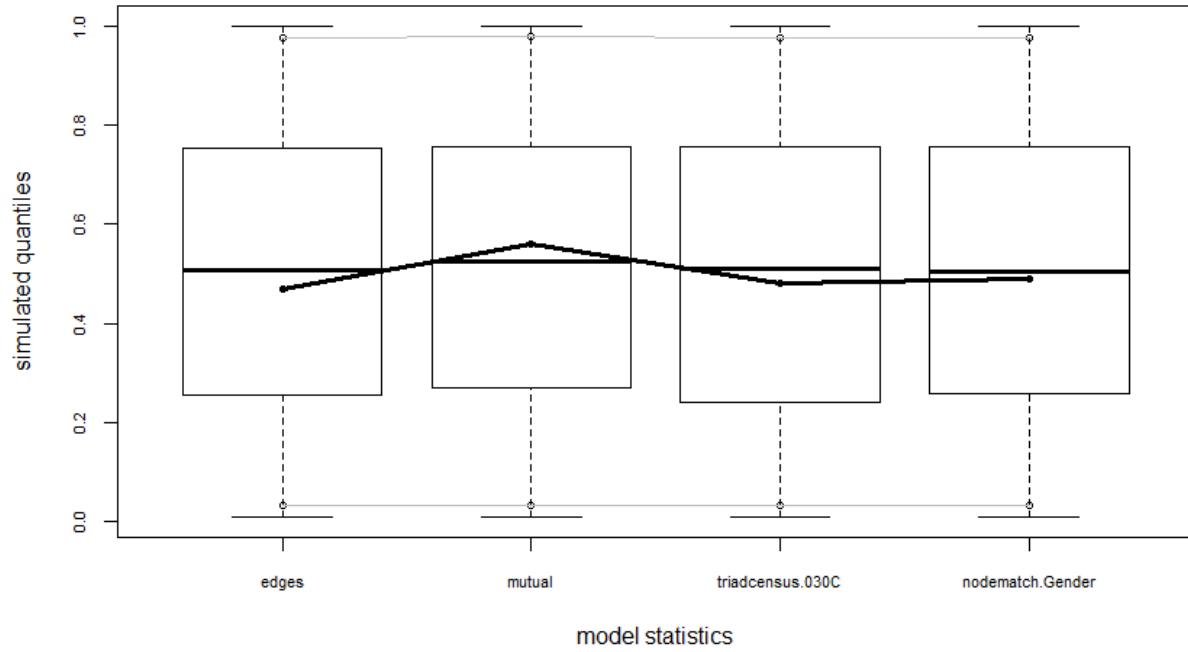


Figure 4: Time 1 Model 2 goodness of fit with model

Goodness-of-fit diagnostics

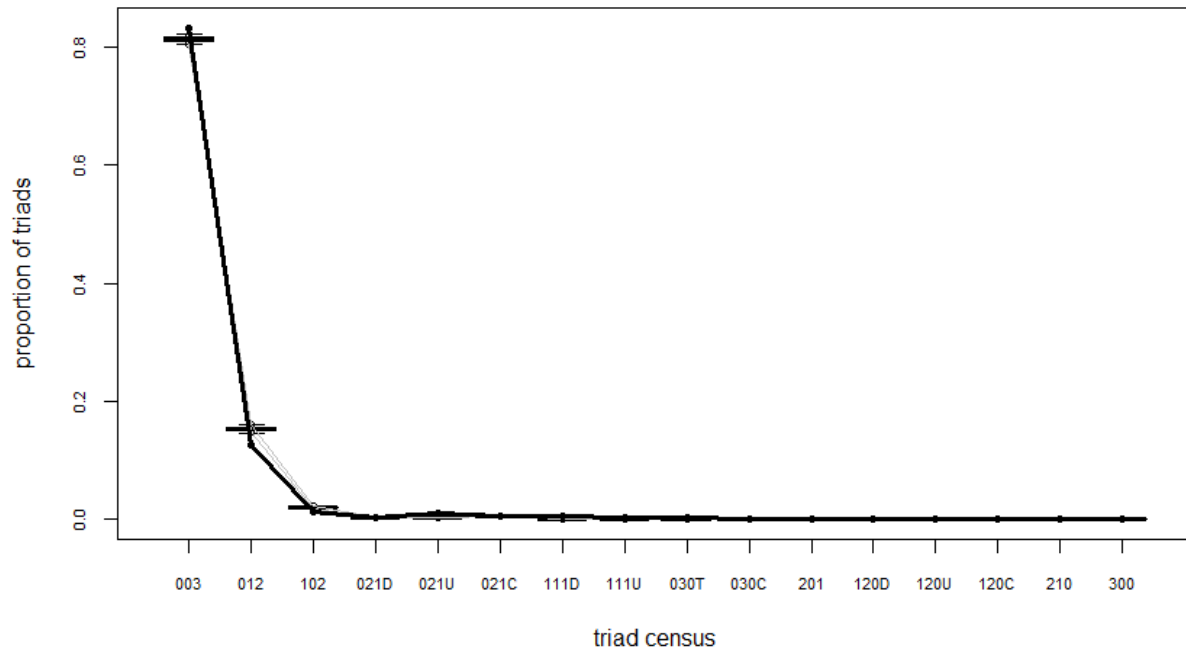


Figure 5: Time 1 Model 2 goodness of fit with triad census

Goodness-of-fit diagnostics

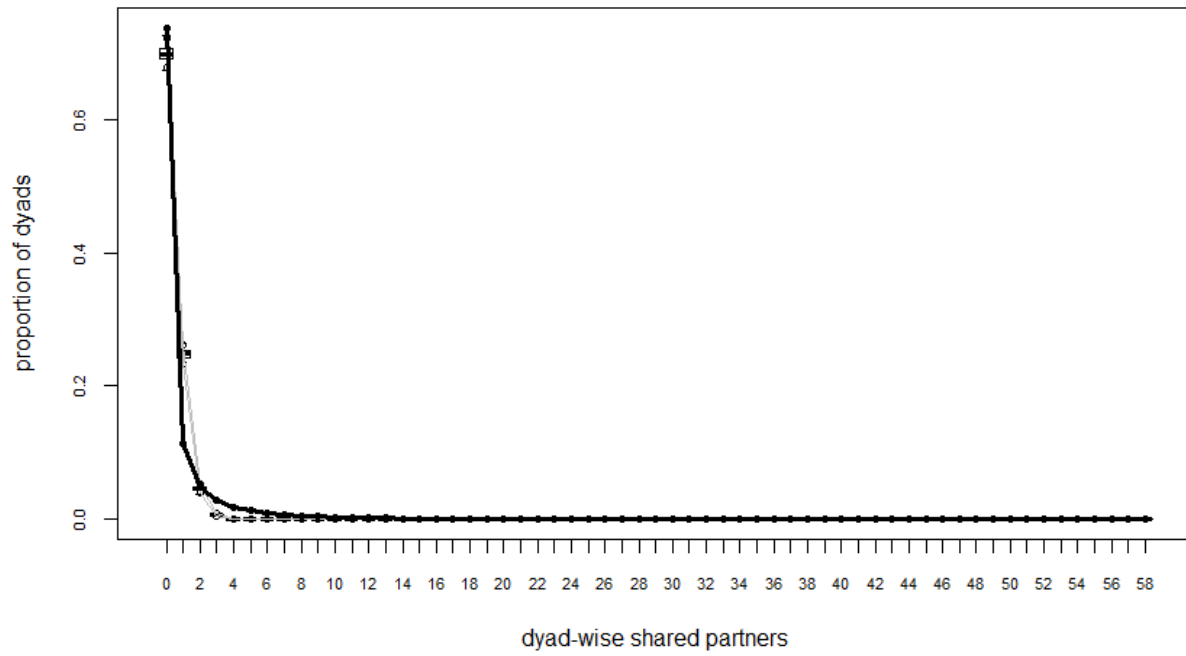


Figure 6: Time 1 Model 2 goodness of fit with dyad-wise shared partners

Goodness-of-fit diagnostics

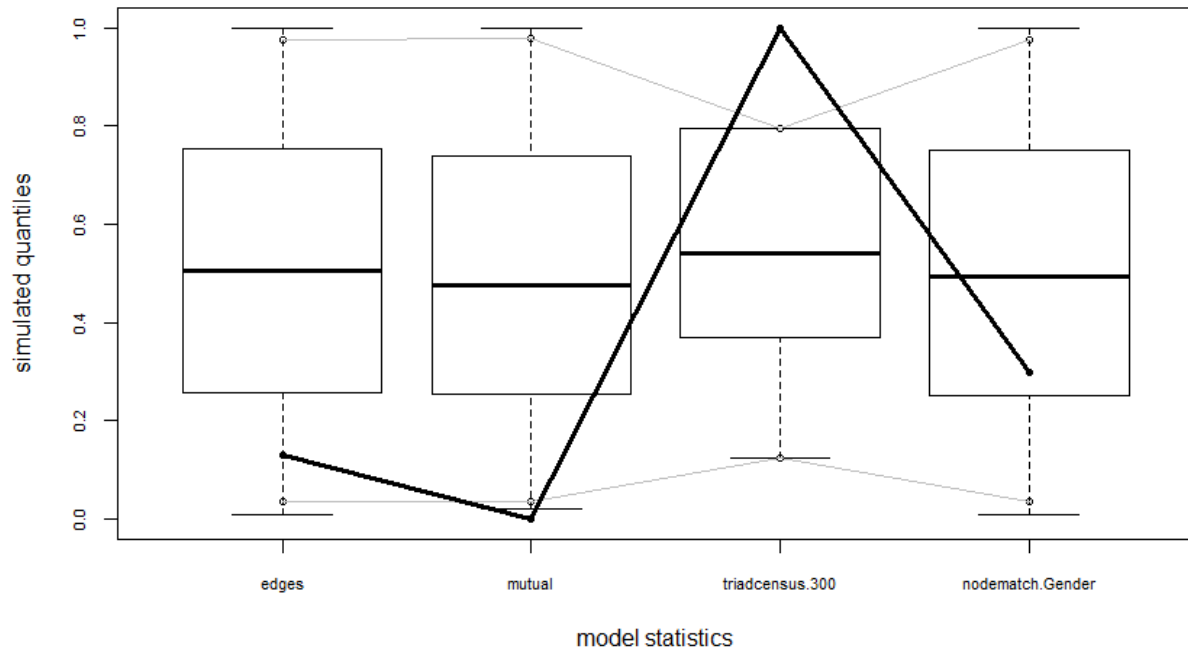


Figure 7: Time 2 Model 1 goodness of fit with model

Goodness-of-fit diagnostics

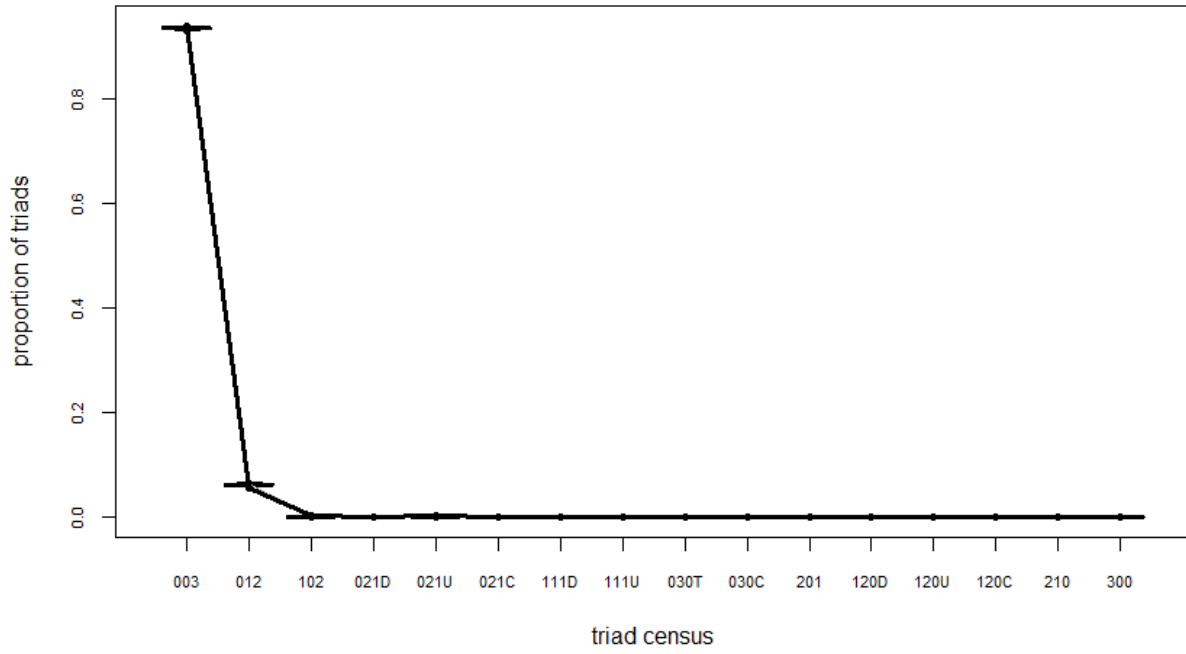


Figure 8: Time 2 Model 1 goodness of fit with triad census

Goodness-of-fit diagnostics

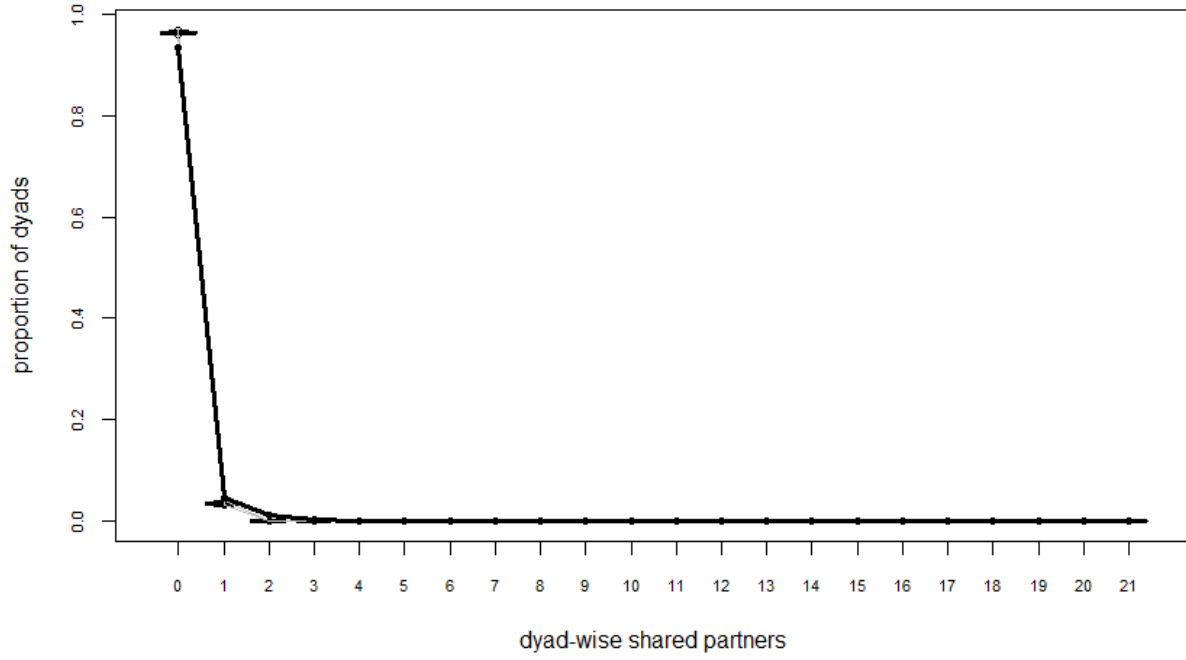


Figure 9: Time 2 Model 1 goodness of fit with dyad-wise shared partners

Goodness-of-fit diagnostics

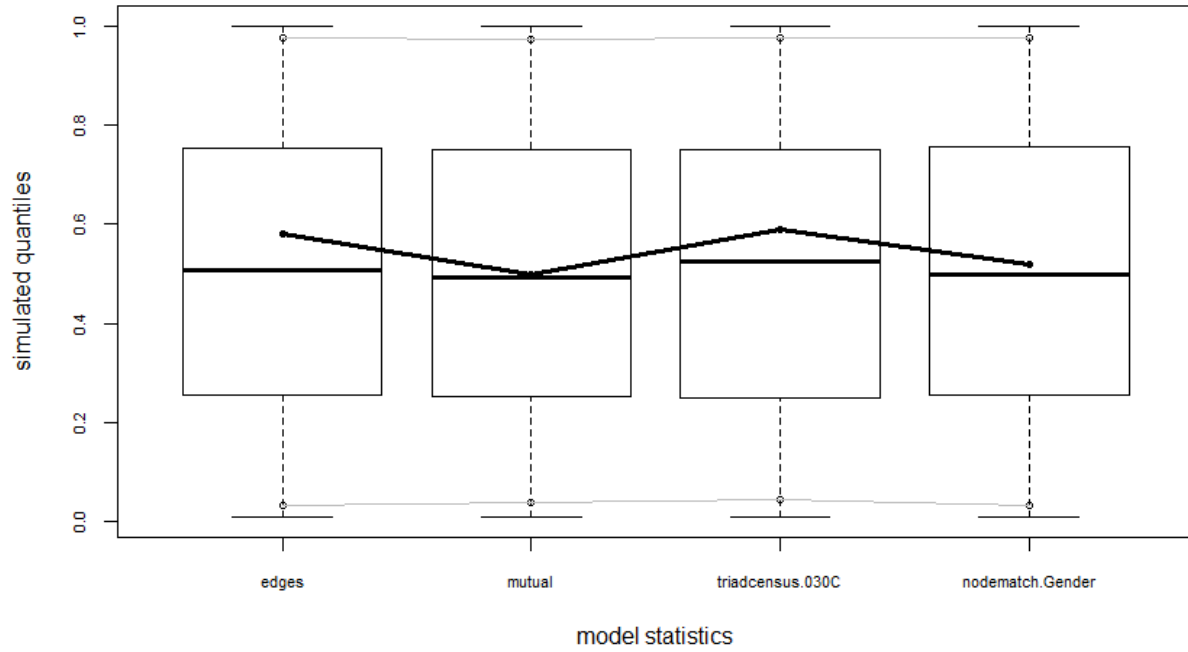


Figure 10: Time 2 Model 2 goodness of fit with model

Goodness-of-fit diagnostics

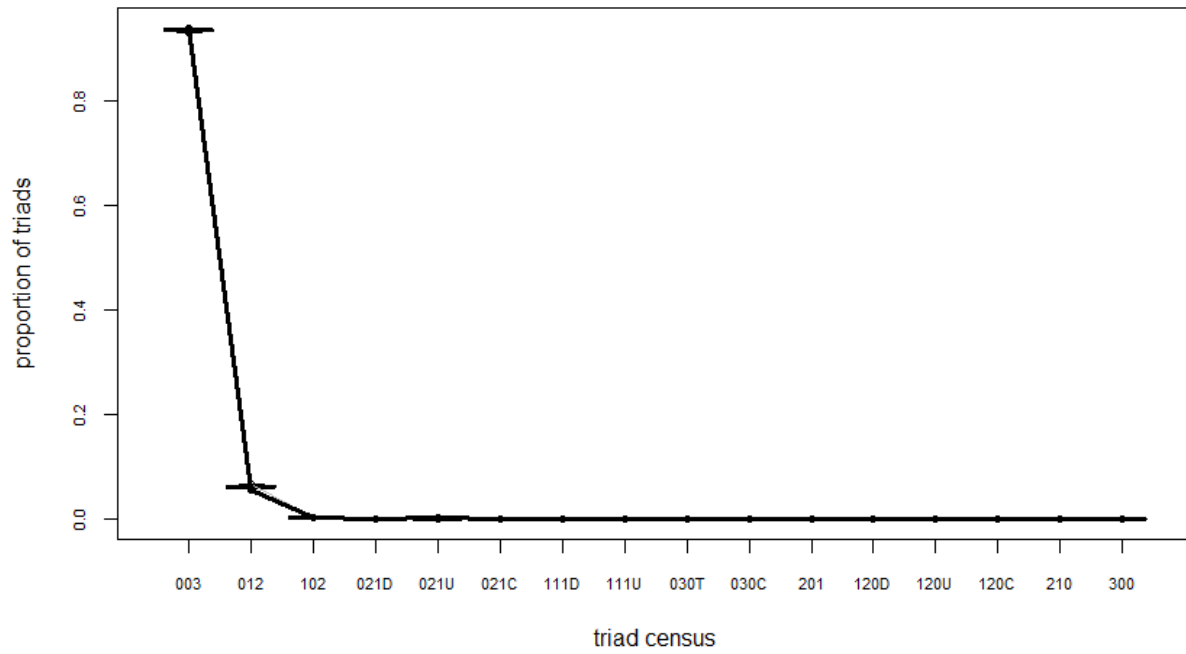


Figure 11: Time 2 Model 2 goodness of fit with triad census

Goodness-of-fit diagnostics

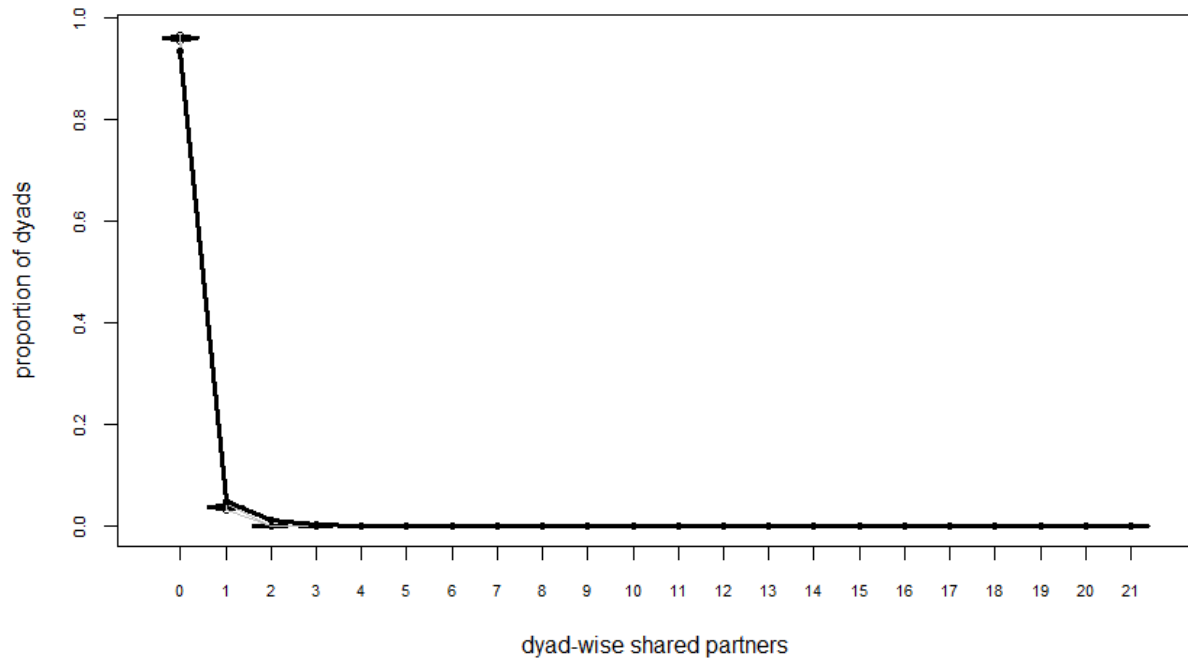


Figure 12: Time 2 Model 2 goodness of fit with dyad-wise shared partners