Application of traditional theories in the age of cyber communication, Meta-analysis study

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Introduction:

With wide range of cyber communication and its applications in media fields; academic researchers questioned applying theoretical bases and how its application be like in digital age. "Communication revolution" or "information explosion" have dramatic effect of giving digital media users much more control over the communication process and the information received. Newspapers have been declining in circulation and readership in addition to online newspapers that are publishing their pages on World Wide Web (WWW). Television is changing from a five-network structure to a cable system with 1800 channels or more. Also, some magazines became online in the form of webzine (Warner et al, 2014).

The more formal definition for cyberspace appears in form of global networks, computer-sustained, multidimensional, artificial, and virtual reality. In common usage today, cyberspace is an inclusive term for WWW, the Internet, electronic mailing lists, discussion groups and forums, chat rooms, interactive multiplayer games, and even e-mail. As a result of this media environment changes, studying cyberspace and its effect on audience raised the question of how to apply media traditional theories while old media meets the new.

Roger Fidle (1997) has presented idea of media-morphosis that helps in understanding these kinds of changes in the media and provides us with an answer to the previous questions. So, this study tried to explore to what extend is old mass media theories are allied to cyberspace communication. The researchers apply meta-analyses approach in collecting, and analyzing data from different studies that carried out the application of old media theories and deal with the cause and effect of media messages on audience.

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Five traditional media theories in the Digital age

The newspaper columnist Walter Lippman (1922) concerned that; media had the power to present images for the public. McCombs and Shaw (1972, 1977) investigated the presidential campaigns and what voters considered to be major salient issues. Two basic assumptions underlie most research on **Agenda-setting**: (1) the *press* and the *media* do not reflect reality; they filter and shape it; (2) media concentration on a few issues and subjects leads the public to perceive those issues as more important than other issues. Bernard Cohen (1963) stated that, the press may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think about.

Cultivation theory was developed to explain effects of television viewing on people's perceptions, attitudes, and values. Original research, by George Gerber and others, supporting cultivation theory is based on comparisons of heavy and light *television* viewers (1993), and the power of image (1992). In response to the criticisms from many mass media researchers, Gerbner and his associates added two concepts, mainstreaming and resonance, these concepts took account of heavy television viewing with different social groups outcomes. For instance, heavy television viewers in both low and high income share the view that fear of crime is a very serious personal problem. Light viewers in the two categories do not share the same view.

Katz and associates (1973), in regards to **Uses and Gratification theory**, see that *mass media* is a mean used by individuals to connect or disconnect themselves with others. They listed 35 needs taken from the literature on the social and psychological functions of the mass media and put them into five categories:

1. Cognitive needs – acquiring information, knowledge, and understanding

2. Affective needs-emotional, pleasure, or aesthetic experience.

3. Personal integrative needs- strengthening credibility, confidence, stability and status.

4. Social integrative needs-strengthening contacts with family, friends, and so on.

5. Tension release needs-escape and diversion.

The diffusion of innovation theory presented by Everett Rogers predicated on the fact that "*mass media* has a significant effect on diffusion of innovations through society, however this effect is not so strong and it's important to figure out which of individual impact, presence of social conditions, or mass media that has the biggest effect". The Diffusion of Innovation theory was affected by means of the development of *Information and Communication Technologies (ICT)*. According to Rogers in the context of adopting an innovation, the adopters are divided into five categories using the normal frequency distribution of taking risks, open for new innovations and adopting them easily: innovators, early adopters, early majority, late majority and laggards (1995).

The knowledge Gap was proposed by Tichenor, Donohue, and Olien (1970) is also one of traditional hypotheses that expressed concern about possible *digital divide* which exists between groups of people divided by gender, race, income, education, and other variables like interest and motivation. The researchers assume knowledge, like wealth, is not distributed equally throughout our society. People who are struggling with financial poverty are also often information-poor. One of the crucial variables in this process identified by several studies is that the gaps that occur because of communication are not limited to knowledge. They can also involve attitudes and behavior. Some communication researchers suggested that the phenomenon be conceptualized as a communication effects gap rather than a knowledge gap. The knowledge gap can also be between the old and young as well as between people of high and low interest in politics.

These five traditional theories highlighted some keywords for media outlets limited to their origin like: press, television, mass communication, information and communication technologies (ICT) and digital divide. New cyber-terminologies will be coded for the purpose of this study.

Research Problem

Based on Roger Fidle (1997) media-metamorphosis, the changes in mass media emerge more rapidly. The dramatic growth of the Internet and cyber communication is predominately taking place theoretically and practically. Fiddler argues that new media do not arise spontaneously and independently; they emerge gradually from metamorphosis of old media.

So, this study aimed at investigating the adaptability of traditional mass media theories to the cyber communication through one question: "Does the existing traditional old media theories such as Agenda setting theory, Cultivation theory, Uses and Gratification theory, Diffusion of Innovation theory and knowledge gap hypotheses will be applicable on the cyber communication?

Operationalization and research concepts

Some operational definitions were determined in collecting research papers relevant for the question of the current meta-analysis study; cyber-space, interpersonal communication hyperlinks or hypertext, virtual (reality, life, community), new media,

1. **Cyberspace communication (2008 – 2020)** refers to the metaphoric space where electronic digital communication takes place. Michael Benedikt (1992) defined it as: "The globally networked, computer sustained, computer accessed, and computer generated, multidimensional, artificial, or virtual reality. (pp. 122-123)."

2. **Interpersonal communication in digital age (2008 - 2009)** refers to understanding the feeling of people by expressing themselves through different digital media channels (Cook, 2005).

3. **Virtual community (2008 – 2009)** is a social network of individuals who interact through specific social media, potentially crossing geographical and political boundaries in order to pursue mutual interests or goals. Some of the most pervasive virtual communities are online communities operating under social networking services. **Virtual reality** (VR) is a simulated experience that can be similar to or completely different from the real world. Applications of virtual reality can include entertainment (i.e., video games) and educational purposes (i.e., medical or military training). Other, distinct types of VR style technology include augmented reality and mixed reality. Currently

standard virtual reality systems use headsets or multi-projected environments to generate realistic images, sounds and other sensations that simulate a user's physical presence in a virtual environment.

4. New media (2006 -2010) refers to all mass media channels from newspapers, television, radio, and blogs to music and podcasts that are delivered digitally. In addition to websites or email to mobile phones and streaming apps is considered new media internet -related form of communication (Chapter 16, 2013)

5. Hypertext (1999 – 2000) documents are interconnected by **hyperlinks**, which are typically activated by a mouse click, keypress set or by touching the screen. Apart from text, the term "hypertext" is also sometimes used to describe tables, images, and other presentational content formats with integrated hyperlinks. Hypertext is one of the key underlying concepts of the World Wide Web, where Web pages are often written in the Hypertext Markup Language (HTML). As implemented on the Web, hypertext enables the easy-to-use publication of information over the Internet.

6. Social networking sites (SNSs) (2008 - 2010) is used by online users for creating relationships with other people who share same interest, background, or real relations. It refers to online platforms where profile or channels can be created; like Facebook, YouTube, Instagram, Twitter, LinkedIn, Snapchat, and Pinterest.

Literature search

From this point, following research studies are collected to find out to what extent five theories can be applied in perusing power of media messages in cyber communication: According to Wang (1999), an experiment study was conducted to investigate the effect of **hyperlinks** on determining salient issue for webpage readers and how online webpage agenda is set with relation to the number of hyperlinks exist. The results showed that use of hyperlinks with a news story is interpreted by online users as an indicator that the story deals with a more important issue than a story without hyperlinks.

According to Myung-ho Yoon (1998), two studies were conducted on Korean students to discover applicability of **agenda setting** theory on online newspaper agenda verses public agenda on salient issue in

Korean economy. His results showed a positive correlation between students' higher media exposure to online newspaper and their greatest agreement similarity between their personal agenda and online newspaper agenda.

According to Baran & Davis (2020), a study conducted in order to look at how the Internet inhabits our world; it is a must to scrutinize social networks as collaborator of generating parallel worldview of one's own reality since role of social media becomes beyond uploading individual pictures and information on Internet. The study focuses on how social **construction of reality** occurs on social media networking sites that reinterprets Gerbner's cultivation theory in an evolved platform. The study revises four eras of communication theory and looks at their possible connection with social media. It examines why cultivation theory, as an opinion forming theory needs to be revived to study social media.

According to Bayraktar & Amca (2012), a study was conducted on different gender and age groups to find out role of cultivation in **real life** (RL) verses **virtual life** (VL) activities. The study concluded that revolutionary entrance of Internet activities changed communication paradigms in regards to cultivation and that people spend considerable time on the Internet to the extent that their perception of the world is shaped by what they see on the Internet more than TV. This online emergence activities created network communities and this virtual life replaced the nature of TV audience as media consumers.

According to Morgan et al. (2010), studied cultivation theory in meta-analysis research on television and the Internet revealed that **new media** made broadcasting more convenient and so, application of theory has more significant importance with Internet than television in heavy viewer consumption.

According to Gross (2009), a scholar who contributed to the creation of cultivation theory, declared that before the Internet, TV was just a story teller machine. However, what TV did back then in terms of constructing assumptions, is implemented by the Internet in the form of **social networks** and raised the on-demand online media consumption.

According to Santos et al. (2009), in the contemporary education technology, a study conducted on Singaporean undergraduates verses Brazilian master program graduates aimed at studying the uses and gratification for both. The study reported that student's motivation for using **social networking sites** (SNSs) to Singaporean students primarily is social interaction and for Brazilians is socialization and discussing studies. While applying uses and gratification theory, there is significant relationship of 42% of students use SNSs to both keep in touch with friends and have fun. According to Haridakis and Hanson (2009), in regards to uses and gratification theory, they found that socially active, young males used **YouTube** as a ready form of entertainment. According to Quan-Haase & Young (2010), there are an additional uses and gratifications obtained from the **Facebook usage** besides sociability and social information includes: killing time, affection, fashion, and share problems.

According to Raacke et al. (2008), when examining **Facebook and MySpace**, the study concluded that the uses and gratification for the users includes keeping in touch with old friends, current friends, posting/looking at pictures, making new friends, and locating old friends. Less commonly reported uses and gratifications included to learn about events, posting social functions, feeling more connected, sharing information about themselves, and about academic and dating purposes.

According to Tufekci (2008), the study demonstrated gender differences on **SNSs usage**, they found that women have more interests in interpersonal relationships online for keeping existing relationships and grooming while men use SNSs for seeking new friends and those who share the same interests. In addition, men have more friends in SNSs than women.

Another ten studies tackling the uses and gratification theory application while studying new media and **cyberspace communication** effect and causes; resulted in the same findings. According to Dogruer et al. (2006) freshman university student's main motivation for using **Facebook** is to learn about their classmates and keep in touch with them but they denied it for dating activities. Also, Clark et al. (2007) found a similar finding in their study of **Facebook** motivation among college

students. They use Facebook to stay in touch with their friends and family. Pempek et al. (2009) found that motivations for using **Facebook** among students are reported as facilitating social relationships with their friends rather than parents and strangers. Ellison et al. (2007), Sheldon (2008, 2008), Joinson (2008), Subrahmanyam et al. (2008), Reich et al. (2012), Tosun (2012) reported that nurturing or maintaining existing relationships has been the most mentioned motivation for using **Facebook**, the seeking new ones also has been a frequently mentioned objective for using Facebook. Other motives that have been sometimes reported include enhancing one's reputation (being cool), avoiding loneliness, keeping tabs on other people, seeing who has joined on Facebook or what they are doing, and entertainment as first important motive.

In general, the most remarkable factors of uses and gratification theory in relation to SNSs were found in three studies as follows by Ancu & Cozma (2009), LaRose & Eastin (2004), and Park, Kee, & Valenzuela (2009). With examining a group of 1,715 college students, the four major uses and gratification factors of **Social networking sites** users to be: socializing, entertainment, self-status seeking, and information. Guardiola et al. (2002) propose a simple model of diffusion of technological innovations with costs to create **social network** threshold model of the diffusion of innovations based on adopter categories.

According to Valente (1996, vol. 18), an individual seeks information at various stages in the innovation-decision process in order to decrease uncertainty about an innovation's expected consequences. Individuals vary in their willingness to take risks in adopting a new idea or product for example the percentage of adaptors and non-adaptors for different **personal networks models**. A few individuals accept the risk of adopting a new idea or product before anyone else while most people are reluctant to adopt this new idea or product and prefer to wait until other people have tried it first.

According to Chang (2010), one of the most influential theories of communication in marketing is the influence of **Twitter** on the e-commerce and its effect on the diffusion of innovation of information and how it is disseminated among targeted audience of social media

consumers. The individual's decision about an innovation is a process that occurs over time consists of five processes; knowledge, persuasion, decision, implementation and confirmation. Process starts with knowledge phase; which a decision-making unit is exposed to the innovation's existence and gains some understanding of how it functions.

According to Rogers, Singhal and Quinland (2009), the diffusion of innovation process typically involves both mass media and **interpersonal communication** channels. However, in today's informatics age, information technologies such as internet and smart phones and especially web 2.0 technologies including social networks like Facebook, represent formidable tools of diffusion, combining aspects of both interpersonal interaction and mass media.

Montanari and Saberi (2010), also try to answer if the structure of online **social networks** favors the spread of all innovations and specify the impact of the structure of a social network on the spread of innovations. The dynamics of this process results in the formation of new norms and institutions and so a great variety of social or technological innovations spread in a population through the network of individual interactions by allowing individuals to interact independently of their physical proximity. From this point of view, a number of studies have tried to model social networks using diffusion of innovations.

Budak, Agrawal and El Abbadi (2012) studies aim to model user behavior automatically determining which users are driven by their local relations and which users are better defined through adopter categories, therefore capturing the complexity of human behavior. While on the other hand, Luu et al. (2012) address the relationship between **social network** properties and diffusion process so incorporate the skewed degree distribution of social networks into macro-level diffusion models. According to Nutley et al. (2002), on the other hand claimed that; routinization of the innovation adoption is no longer seems innovative as the major concern for policy makers and managers is delivering the organizational service with professional patterns.

Knowledge Gap hypothesis is usually used with other previous theories like diffusion of innovation and uses and gratification.

According to Haridakis and Hanson (2009), in regards to knowledge gap, they also found in their study that using **YouTube** mainly is for thrill-seeking and information-seeking.

According to Rogers (1995), in his mixed studies on the diffusion of Innovation and knowledge gap, he stated that after knowledge phase, the persuasion phase forms favorable or unfavorable attitude toward the innovation occurs, in which engagement in activities leads to adoption or rejection. Implementation process occurs when the decision-making unit puts an innovation into use. Process ends with confirmation which occur when decision-making unit seeks reinforcement of an innovation-decision already made, but he/she may reverse this previous decision if exposed to conflicting messages about the innovation.

Method of search

The present research paper traced the meta-analysis concepts from many sources of different databases, including *Broadcasting & electronic Media*, *Cyberpsychology Behavior & Social Network, Media Psychology, Developmental Psychology*, and *Public Opinion quarterly*; in addition to using two big categories of keywords.

The first category of search term includes: cyberspace communication, interpersonal communication in digital age, virtual community, virtual reality, and construction of reality. The second category is related to multimedia, interactivity, new media applications, hypertext, and social networking sites with its usage like Facebook, Twitter, and Myspace.

The search was limited to articles that inspect and measure the cause and effect of cyberspace communication on traditional media channels in order to keep the scope of the study focused on the five mentioned traditional media theories.

Moderator coding

Effect sizes of five traditional media theories were coded on two potential moderators; applicability/inapplicability and match/mismatch of the theory to cyberspace communication keywords which are defined according to some conditions.

Match/mismatch: Papers were coded on the gathered data from new media in comparison to gathering data by using the traditional research methodologies like surveys, observation, or experiment other than digital media data gathering tools like Facebook and Twitter Analytics. This is called media paradigms; (1) social science media paradigm, (2) interpretive media paradigm, and (3) produser media paradigm. Social science media paradigm focuses on human behavior to make construct statements and it is related to studies with quantitative research methodology and traditional methods like content analysis, surveys, and experiments. Interpretive media paradigm focuses on the studies which use qualitative methods and interpret what the context means. Produser media paradigm is also referred to *"Prosumer."* It is the involvement of the audience in creating the content; which mainly found between data gathered from Internet based sites.

Applicability/inapplicable: Papers were coded to examine either the research includes the assumptions of the theories, in which it is used in analyzing the data gathered.

Study	Theory	Cyberspace concepts	Match/ mismatch	Method	Paradigm	Applicability /inapplicable
Rogers (1995)	Diffusion of Innovations Knowledge Gap	Decision Making	3	Analysis	I	1
Valente (1996, vol. 18)	Diffusion of Innovations	Personal network models	3	QA	I	2
Myung-ho Yoon (1998)	Agenda Setting	Online Newspaper	1	Online newspaper	P	1
Wang (1999)	Agenda Setting	Hyperlinks	2	E	SS	1
Guardiola et al. (2002)	Uses and Gratification	Social Networks Usage (SNS)	3	Theory Model	I	1
Nutley et al. (2002)	Diffusion of Innovations	Social Networks Usage (SNS)	3	QA	I	1
LaRose & Eastin (2004)	Uses and Gratification	Social Networks Usage (SNS)	2	Online S	SS	2
Dogruer et al. (2006)	Uses and Gratification	Facebook	2	S	SS	2

Clark et al. (2007)	Uses and Gratification	Facebook	2	S	SS	2
Ellison et al. (2007)	Uses and Gratification	Facebook	2	S	SS	2
Tufekci (2008)	Uses and Gratification	Social Networks Usage (SNS)	2	QA - S	I - SS	2
Raacke et al. (2008)	Uses and Gratification	Facebook & MySpace	2	Online S	SS	2
Joinson (2008)	Uses and Gratification	Facebook	2	Online S	SS	1
Subrahmanyam et al. (2008)	Uses and Gratification	Facebook & MySpace	2	S - Online S	SS	2
Sheldon (2008, 2008)	Uses and Gratification	Facebook	2	S	SS	1
Ancu & Cozma (2009)	Uses and Gratification	Social Networks Usage (SNS)	2	Online S	SS	1
Gross (2009)	Cultivation	Social Networks Usage (SNS)	3	Theory Analysis	I	1
Haridakis and Hanson (2009)	Uses and Gratification Knowledge Gap	You-tube	2	S	SS	1
Santos et al. (2009)	Uses and Gratification	Social Networks Usage (SNS)	2	S - Int	SS	2
Park, Kee, & Valenzuela (2009)	Uses and Gratification	Social Networks Usage (SNS)	2	Online S	SS	2
Pempek et al. (2009)	Uses and Gratification	Facebook	2	Online S	SS	2
Quinland (2009)	Diffusion of Innovations	Facebook - interpersonal communication	3	Analysis	I	1
Chang (2010)	Diffusion of Innovations	Twitter - Hashtag	3	Theory model	I	1
Montanari and Saberi (2010)	Diffusion of Innovations	Social Networks Usage (SNS)	3	Theory model	I	1
Morgan et al. (2010)	Cultivation	New Media	2	CA - S	SS	2

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Quan-Haase & Young (2010)	Uses and Gratification	Facebook – Instant messages	2	S - Int	SS	1
Budak, Agrawal & El Abbadi (2012)	Diffusion of Innovations	Social Networks Usage (SNS)	3	Testing Models	I	1
Bayraktar & Amca (2012)	Cultivation	Virtual Reality	2	Online S	SS	2
Luu et al. (2012)	Uses and Gratification	Facebook	3	Theory Analysis	I	1
Reich et al. (2012)	Uses and Gratification	Facebook	2	S	SS	2
Tosun (2012)	Uses and Gratification	Facebook	2	S	SS	2
Aruguete (2017)	Agenda Setting	New Media	1	Analysis	P	2
Bodine (2018)	Uses and Gratification	Digital Media	2	S	SS	2
Baran & Davis (2020)	Cultivation	Virtual Reality	3	Analysis	I	1

Table: Summary of Included Studies - Match/mismatch and Applicability/inapplicable
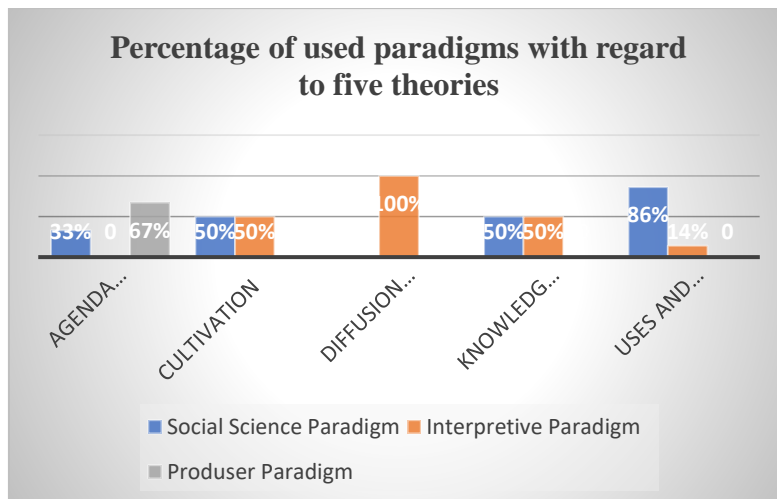
Note:

Match/Mismatch 1= data gathered from social media platform, Match/Mismatch 2= data gathered from research methodologies, Match/Mismatch 3= not data gathering - CA= Content analysis, S= Survey, E= Experiment, Int. = Interviews, QA= Qualitative Analysis – SS= Social Science Paradigm, I= Interpretive media Paradigm, P= Produser media Paradigm - Applicability/inapplicable 1= Applying the use of theory assumption, Applicability/inapplicable 2= Not applying the use of theory assumption.

Findings

Social Science Paradigm

29%

71%

■ Using Theory Assumption

Produser Paradigm
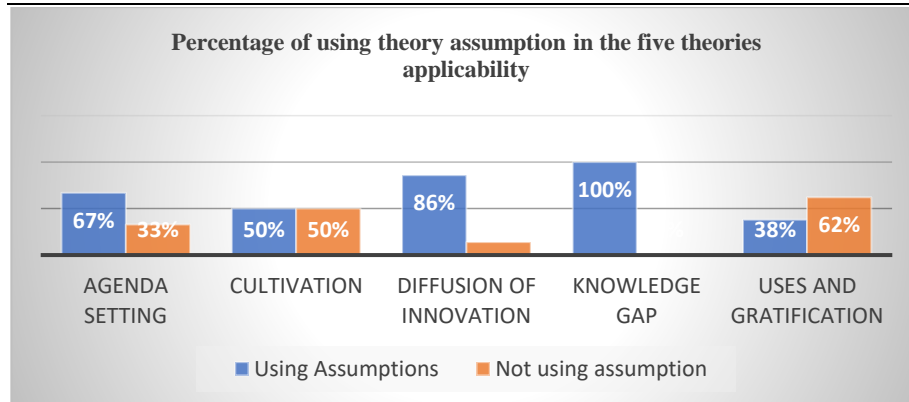
50%   50%

■ Using Theory Assumptio n
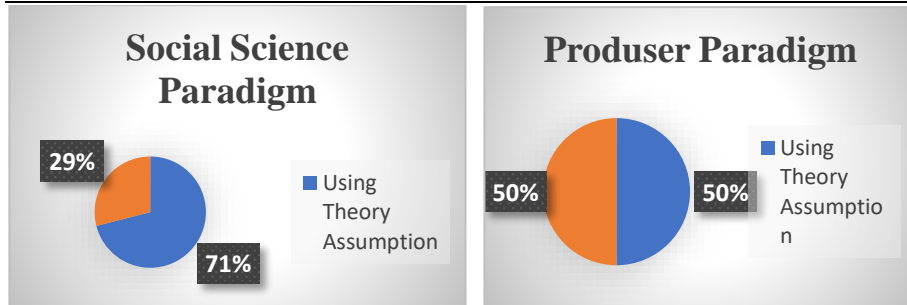
Results found that 71% of studies used Social Science media Paradigm (SS) either in surveys, experiments, or interviews, but didn't used theory assumption. Hence, only 29% of the total studies using SS is applying the theory assumption to this study paradigm. On the other hand, half of the coded researches are using data gathered with new media platforms.

Percentage of used paradigms with regard to five theories

33% 0 67%   50% 50%   100%   50% 50%   86% 14% 0

AGENDA...   CULTIVATION   DIFFUSION...   KNOWLEDG...   USES AND...

■ Social Science Paradigm   ■ Interpretive Paradigm
■ Produser Paradigm

Eighty-two percent of studies, using Interpretive Paradigm (I), are including theory assumption. Most of studies that used I paradigm apply "Diffusion of innovation" theory and "Knowledge Gap" hypothesis. On the other hand, produser (P) paradigm is mostly appearing with Uses and gratification theory.

Percentage of using theory assumption in the five theories applicability

AGENDA SETTING — 67% / 33%
CULTIVATION — 50% / 50%
DIFFUSION OF INNOVATION — 86%
KNOWLEDGE GAP — 100%
USES AND GRATIFICATION — 38% / 62%

■ Using Assumptions ■ Not using assumption

Applicability of the five theories is related to usage of the theories assumption while analyzing data gathered for the purpose of new media and cyberspace communication research. The most noticeable about the coded studies, that 62% of total studies that used Uses and gratification theory aren't including assumptions of the theory, but most of the time relay on analyzing the gathered data and its relation to the channel/audience studied.

Discussion

Analyzing previous studies indicates that the concept of media-morphosis was totally correct that the traditional media has been transformed to digital media and accordingly the application of the traditional media theories on cyber communication is valid. It is true that some other researches were done on Cyber communication according to the different nature of the new social media platforms. Individuals are totally relying on the social networks as an essential part of their daily lives, and as digital media is gradually replacing the traditional media, old traditional media theories is progressively adapting to the new digital environment and its application.

Katz (1959) suggested that the field might save itself by turning to the question "What do people do with the media?" Individuals have considerably different uses and gratifications; they take and share messages with different shape and content and so interact. This also means that uses and gratifications approach is confirmed and it can be occurring in the new media orientation in various ways.

Although, diffusion of innovation and knowledge gap were used intensively as traditional media theories, applications on digital media showed their applicability for cyber communication. As many sites that appear to be helpful and neutral sources of information are actually run by businesses trying to sell products. Many online news sites are now blurring the distinction between editorial content and advertising, a distinction that has long been a fundamental rule of journalism.

As McCombs and Shaw (1993) stated in their paper about the evolution of agenda setting with rapid change of communication nature; "the continuing and growing validity is remarkable." Related issue that has been introduced in some studies is the concept of credibility has been a long-standing issue in mass communication research among the new media, even more than traditional media. The Internet raises issue of the accuracy, reliability, and adequacy of information. Chat rooms and multiplayer games raise questions of whether people are who they appear to be. The push for speed on the Internet may make even a major news organization release information without checking it out carefully.

Finally, we can conclude that old traditional theories are developing to deal with Internet. And most of the researches on cyber communication has been using the old traditional media theories with the integration of digital concepts such as interactivity, hypertext, and multimedia.

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