# Online Astroturfing: A Theoretical Perspective

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## ABSTRACT

Online astroturfing refers to coordinated campaigns where messages supporting a specific agenda are distributed via the Internet. These messages employ deception to create the appearance of being generated by an independent entity. In other words, astroturfing occurs when people are hired to present certain beliefs or opinions on behalf of their employer through various communication channels. The key component of astroturfing is the creation of false impressions that a particular idea or opinion has widespread support. Although the concept of astroturfing in traditional media outlets has been studied, online astroturfing has not been investigated intensively by IS scholars. This study develops a theoretically-based definition of online astroturfing from an IS perspective and discusses its key attributes. Online astroturfing campaigns may ultimately have a substantial influence on both Internet users and society. Thus a clear understanding of its characteristics, techniques and usage can provide valuable insights for both practitioners and scholars.

## Keywords (Required)

Internet, astroturfing, deception, persuasion.

## INTRODUCTION

Internet users who seek to gain knowledge on a particular subject or gauge support for various opinions frequently search the web for references. It is common for web references to contain both factual information and a comments section where web page viewers can post their individual opinions. The volume of information available through Internet resources is growing rapidly and most computer-savvy people consider the Internet a primary source of reliable information. Facilitated by powerful search engines, Internet users have access to a broad spectrum of opinions regarding popular issues, even those opinions with sparse support.

From a social psychology perspective, an individual's beliefs on a particular subject are often influenced by others' beliefs (Kelman 1958). Therefore, the beliefs of Internet users are likely to be influenced by the information and opinions provided by other Internet users. Additionally, some Internet users have begun to doubt the veracity of information released by organizations and public authorities. As a result, many users have turned to alternative information sources such as social networks, blogs, and other forms of interactive online communication, which they believe are more authentic (Quandt 2012).

Peer-provided information has been extensively used in the e-commerce domain. It is normal practice for Internet users to view product reviews and feedback from other consumers when contemplating an unfamiliar purchase. Poor reviews and feedback ratings will likely have a negative impact on intentions to buy a particular product while positive reviews and feedback may provide confidence in a particular purchase (Chen et al. 2008; Dellarocas et al. 2007; Hu et al. 2006; Senecal et al. 2004). The same effects can often be observed in relation to political figures during election cycles. The reputation of a particular candidate may be severely tarnished by undesirable media coverage or social network discussions (Ratkiewicz et al. 2011a). Accordingly, the opinions of potential voters may be weakened or changed completely as a result of unfavorable media coverage and damning social commentary, while other candidates, organizations, agendas, and opinions may gain favor with voters.

Unfortunately, some of the information received from the Internet is falsified to manipulate the reader's opinions (Cho et al. 2011; Cox et al. 2008; Daniels 2009; Mackie 2009; MacKinnon 2011; Stajano et al. 2011). In many cases this falsified

information is crafted to appear as if it was posted by autonomous Internet users when it was, in fact, released by paid agents of parties with an interest in spreading a particular message. This type of activity is referred to as astroturfing, which entails the imitating or faking of popular grassroots opinions or behaviors (Hoggan 2009; McNutt 2010). The term comes from the brand name "AstroTurf", which is a synthetic grass used on sports fields.

The concept of astroturfing is not new in the non-digital world. This perception management technique has been used in politics, public relations, and marketing for years. However, the Internet has provided convenient opportunities for users to post opinions in an anonymous fashion. Communicating anonymously on the Internet provides users with a sense of security much like talking to others in a completely dark room in which nobody can see each other (McKenna et al. 2000). This cloak of anonymity provides an opportunity for users to pretend they are someone else, thus making the Internet an ideal platform for astroturfing. With the rapid growth of online outlets, astroturfing can be used to spread information throughout the digital world via online forums, comments, blogs, and social networks (Mustafaraj et al. 2010; Ratkiewicz et al. 2011a; Ratkiewicz et al. 2011b). There is evidence suggesting that some large organizations are using online astroturfing through public relation firms to create posts that discredit their critics (Greenwald et al. 2005; Norman 2004). Other organizations utilized paid individuals to propagate favorable images online (MacKinnon 2011).

Although the utilization of online astroturfing has been studied in the fields of sociology (McNutt et al. 2007) and political science (Mattingly 2006), it has not received much attention from IS scholars. The examination of the phenomenon in other fields does not address online astroturfing as a socio-technical strategy, its potential impacts on business technology investments, or its potential impact on the entire Internet. Online astroturfing may be leveraged as a vehicle to enhance deceitful positive image or damage targets' reputations through false claims. Additionally, if not controlled, it may undermine the veracity of genuine information resources and diminish the value of Internet interactive technologies. Thus, online astroturfing has specific implications for the IS discipline with a focus in the cyber security realm. The purpose of this study is to define online astroturfing from an IS theoretical perspective and to discuss its critical attributes. This discussion of its traits provides valuable insights to IS scholars and practitioners and serves as a catalyst for future research endeavors.

## ONLINE ASTROTURFING

The term "astroturfing" was used by Senator Lloyd Bentsen to describe " the artificial grassroots campaigns created by public relations (PR) firms" (Stauber 2002). Organizations that engage in astroturfing activities usually hire public relations or lobbying firms to simulate grassroots campaigns (McNutt 2010). In other words, astroturfing occurs when groups of people are hired to present certain beliefs or opinions, which these people do not really possess, through various communication channels. In most cases, the hired groups and individuals support arguments or claims  for their employer's favor while challenging critics and denying adverse claims (Cho et al. 2011). If successful, astroturfing creates falsified impressions among decision makers or the general public and achieves the goal of persuasion. Traditionally, the scope and influence of astroturfing are limited by the strength of financial support behind the effort since hiring public relation firms to generate and disseminate these false messages can be costly (Hoggan 2009). Therefore, Lyon and Maxwell (2004) describe astroturfing as "a form of costly state falsification".

Traditional astroturfing has primarily targeted decision and policy makers. Examples include: a massive public health campaign suggesting people use disposable cups in order to prevent the spread of disease from shared metal cups (Lee 2010), a group of "grassroots" lobbyists posting messages in support of the General Mining Act of 1872 while being funded by corporate sponsors who have strong interests in maintaining the provisions of that Act (Lyon et al. 2004), a leaked memo from a US oil industry organization indicating its plan to deploy thousands of employees to protest proposed climate change legislation (Mackenzie et al. 2009).

While traditional astroturfing was effective in certain domains, the Internet has fundamentally changed the rules of social communication. Since it is difficult to authenticate an individual online, it has become easy to create false identities and advocate a belief or opinion while posing as a group of spontaneous individuals. Additionally, as noted by Stajano and Wilson (2011) online communication and social networks allow a single individual to create multiple aliases to give others the impression that there are many people sharing a same opinion. Namelyastroturfers strive to create the falsified impression that the given ideas or opinions are held by a large portion of the population. The combination of anonymity (McKenna et al. 2000) and interactivity (Morris et al. 1996)  enabled by the Internet communication paradigm has provided a technical platform and opportunity for astroturfing. Web-based systems can be exploited in a variety of ways to achieve the desired result: a single professional blogger can control several distinct blogs; a person can create different profiles on social networks; users can post reviews and comments on many e-commerce and political sites. The scope and gravity of these deceptive online actions are increasing as compared to traditional astroturfing (Tumasjan et al. 2010).

Online astroturfing has become a tool of choice because it typically costs less and influences more (Mackie 2009). The fraudulent perceptions disseminated through astroturfing can be classified as both identity-based and message-based according to Hancock's (2007) taxonomy of deception. Astroturf messages falsely represent the identities of the poster and also deliver deceptive or misleading information. Therefore, we define online astroturfing as *the dissemination of deceptive opinions by imposters posing as autonomous individuals on the Internet with the intent of promoting a specific agenda*.

We posit that despite the low cost of posting messages online, initiating an effective astroturfing campaign requires substantial human capital, ample computational resources, and a strategic management protocol. Within these parameters, the astroturfing messages can be falsified or genuine; the targets are determined by the purpose of the campaign; the motivation may be political, commercial or military; the communication method may be one-way or interactive; and the communication process may be automated or human controlled.

## MOTIVATIONS

Motivations for astroturfing are based on the benefits derived from manipulating the opinions of message receivers. In the public relations industry, online astroturfing is referred to as a third party manipulation technique (Mackie 2009). Several prominent examples of astroturfing in business and politics have been documented in both academic and popular literature. Wal-Mart hired a public relations firm to reinforce its favorable public image and discredit critics (Daniels 2009). The firm launched two websites in 2006: www.forwalmart.com and www.paidcritics.com. The first website was used to propagate the positive contributions of Wal-Mart to working families while the second one was used to discredit critics of Wal-Mart by asserting that they were "paid critics". IBM and some other large corporations openly encourage employees to blog in favor of their employers and against competitors (Cox et al. 2008). Mustafaraj and Metaxas (2010) found concrete evidence of online astroturfing via Twitter during the Massachusetts senate race between Martha Coakley and Scott Brown. To smear one of the candidates, perpetrators leveraged several Twitter accounts and generated hundreds of tweets in a brief period, thus reaching a wide audience and potentially influencing the election outcome. On both the Amazon and Barnes & Noble websites, fake positive reviews have been discovered , intending to influence the purchase decisions of customers to benefit multiple parties including vendors, publishers, and authors (Hu et al. 2011). While astroturfing is often associated with business and politics, it has also been used for national strategic and tactical purposes. After the terrorist attacks of 9/11, the Office of Strategic Influence was created within the Pentagon for the purpose of "flooding targeted areas with information". Even though this particular office only existed for a short time, similar operations are still employed by the Pentagon to praise the military operations (Pfister 2011).

## METHODS

Online astroturfing activities can be initiated by automated systems or human operators. However, Jakobsson (2012) notes that automation techniques are required to reach an effective scale. Once information from an astroturfing campaign is disseminated, many legitimate users may fall victim to the scheme and begin propagating the counterfeit information (Ratkiewicz et al. 2011b). As a result, the effect of the astroturfing campaign is amplified. Several recent publications highlight automated astroturfing activities conducted via Twitter. Chu et al (2010) examined Twitter users by classifying them as human, bot or cyborg. In contrast to other online social networks, Twitter allows the use of bots or automated programs that can post tweets when the account owners are absent. Cyborgs are a combination of human and automated actors and are further classified as either bot-assisted humans or human-assisted bots. The ability to employ cyborgs blurs the lines between humans and bots for astroturfing activities. Metaxas and Mustafaraj (2010) and Ratkiewicz et al. (2011b) have discussed different techniques that can be used to detect automated astroturfing accounts on Twitter. We posit that despite the potential for cyborgs, bots on social networks should be readily distinguishable from genuine Internet users because their message traffic is typically unidirectional and they cannot intelligently interact with other users. On the other hand, astroturfing campaigns employing a large number of human operators are possible with sufficient financial support and strategic management (MacKinnon 2011). Professional astroturfers can advocate their employer's opinions anywhere through user-generated content without using automated tools. They can also infiltrate microblogs, social networks, chatrooms, and comment sections of targeted websites. Compared to automated mechanisms, human astroturfers may be characterized as less efficient, but potentially more effective. While human astroturfers are, in fact, autonomous individuals, they are not spontaneous as the opinions they espouse are designated by their employers. However, the messages they post are carefully tailored to the specific environment they have infiltrated thus providing them with the ability to adapt quickly as conditions change. Human astroturfers are also able to interact with legitimate Internet users thereby making their messages more convincing. We theorize that without sufficient knowledge of astroturfing techniques, typical Internet users can be easily deceived by this method. As stated by Mackie (2009), "the Internet is vulnerable to astroturfing by the powerful and wealthy".

**MECHANISMS FOR EFFECTIVE ASTROTURFING**

The previous sections discussed the motivation for online astroturfing and the ways astroturfed messages are disseminated through the Internet. Although many scholars believe online astroturfing is effective and difficult for users to detect (Chu et al. 2010; Hu et al. 2011; Mustafaraj et al. 2010; Ratkiewicz et al. 2011b), the mechanisms behind successful online astroturfing have not been directly investigated. How does online astroturfing change the readers' minds? What makes users believe some online astroturfing messages while doubting others? In this section we explore the mechanisms behind effective online astroturfing and present propositions based on existing theoretical foundations.

From a social psychology perspective, the influence created by online astroturfing is consistent with informational social influence or social proof (Cialdini 2001b). Informational social influence is exerted when a subject accepts information from other people as evidence to be weighed when forming one's own judgment (Deutsch et al. 1955). The application of social proof is to "use peer power whenever it is available" (Cialdini 2001a). According to Deutsch and Gerard (1955), the effect of informational social influence will be most salient when people are ambiguous about subjects or situations. Therefore, when Internet users are uncertain about a particular subject, they may seek and accept information provided by other users on the Internet. However, the manner in which readers process information must also be considered. The Elaboration Likelihood Model (Cacioppo et al. 1986; Petty et al. 1996) suggests that in a central route, people tend to examine the content of the persuasive message very carefully, while in a peripheral route, people do not process the actual argument of the message through cognitive effort but rely on other characteristics of the message which are more assessable and obvious. Petty and Cacioppo (1986) contend that when people are highly motivated and willing to process the message, they will scrutinize the persuasive argumentation carefully. In this case, a strong argument is more efficient than a weak argument. However, when people are unmotivated they tend to rely on simple cues in the message such as the conviction or passion conveyed by the poster. Thus, the decision to rely on the strength of argument, peripheral cues, or both is highly dependent on the receiver's level of involvement.

In online astroturfing, the goal of the message sender is to convince the receiver that the message content is a heartfelt, rational, and defensible opinion held by a social peer. Ultimately, the message sender seeks to either alter the receiver's opinion or create doubts about a particular viewpoint through a coordinated campaign of deceptive information dissemination. Therefore, the effect of online astroturfing can be defined as the degree to which an astroturfing campaign alters the receiver's opinion or level of conviction regarding a particular subject. Based on a synthesis of the Elaboration Likelihood Model and informational social influence theory (Cialdini 2001b), we contend that the effects of online asturtorfing are related to four important mechanisms: multiple sources (Harkins et al. 1981b, 1987), uncertainty (Wooten et al. 1998), perceived similarities (Cialdini 2001a), and receivers' motivations (Cacioppo et al. 1986; Metzger 2007).

*Multiple Source Effect*

Multiple source effect was first identified by Harkins and Petty (1981a). In their experiment, they found that the subject groups receiving multiple arguments from multiple sources were most persuaded when compared to other groups; the subject groups receiving a single argument from multiple sources were less persuaded; and the subject groups receiving multiple arguments from a single source were least persuaded. Their study indicated that both the number of sources and the number of arguments play important roles in persuasion. Later, Harkins and Petty (1987) conducted another experiment to investigate the reasons why multiple sources enhance processing. The results of their study are consistent with the previous research and showed that multiple sources enhance message processing due to recipients' perceptions that arguments from different sources are more likely to be viewed as different perspectives provided by different individuals. In the context of the online environment, most user-generated content has little or no verifiable identity attached to it and instead arbitrary identifiers such as screen names or IP addresses are used. Thus, from a technical perspective, it is quite easy for an online astroturfer to mask himself or herself through different identities and users are likely to perceive these identities as independent information sources. Accordingly Internet users are likely to believe the information is being provided by a number of different users. This leads to the following is proposed.

        **Proposition 1: The number of information sources influences the effect of online astroturfing.**

*Receivers' uncertainty*

Intuitively, if users are uncertain about a particular subject, they are more likely to be influenced by the information provided by others. In this case, informational social influence can be used to change or vacillate the receiver's opinions (Wooten et al. 1998). Conversely, if one is very knowledgeable or experienced regarding a particular subject, he or she will be less likely to accept others' thoughts or opinions (Deutsch et al. 1955). In political or advertisement campaigns, individuals who are uncertain about the candidate or product are likely to be vulnerable to online astroturfing. Therefore we believe that the message receivers' uncertainty is a major factor in astroturfing effectiveness and the following is proposed.

**Proposition 2: Uncertainty influences the effect of online astroturfing.**

*Perceived Similarities*

Similarity is another key factor in informational social influence. If the information receiver perceives himself or herself as similar to the sender, the receiver is more likely to be influenced or adopt the opinions embodied in the message. Sometimes the similarities of peers can be even more compelling than the message itself (Cialdini 2001a). In contrast, if a product review is written from the perspective of a vendor or manufacturer, the potential consumer will be less likely to be influenced by this advocated opinion. Cialdini (2001a) contends that "influence is often best exerted horizontally rather than vertically". The premise of peer power is that it has to come, or appear to come, from a peer. On the Internet, astroturfers do not have any connection with information receivers, but they are adept at making messages sound as if they are generated by someone similar to the receiver. To enhance the social influence created by online astroturfing, Kinniburgh and Denning (2006) suggest a strategy of supporting "homegrown" blogs that do not appear to be written by an authoritative figure. Thus, even though the spatial and social distance between information senders and receivers is large, the technology can be manipulated to shorten the psychological distance and allow information receivers to perceive astroturfers as peers. Accordingly, the following is proposed.

**Proposition 3: Perceived similarities influence the effect of online astroturfing.**

*Levels of involvement*

Based on the previously discussed tenets of the Elaboration Likelihood Model (Cacioppo et al. 1986; Petty et al. 1996), motivation or level of involvement is a critical factor in a user's decision to either critically analyze data or rely on perceptive cues. Metzger (2007) found that Internet information seekers with high motivation will likely evaluate opinions carefully based on the quality of the information while low motivation information seekers will look to salient cues. Internet users are similar to other information seekers in that they are more likely to use central route processing when motivated. Conversely, when motivation or ability to judge the quality and trustworthiness of online sources is low Internet users will likely rely on peripheral or heuristic processing. Therefore, we believe that levels of involvement will act as a moderator on the effect of online astroturfing and the following is proposed.

**Proposition 4: Level of involvement moderates the effect of online astroturfing.**

**LIMITATIONS AND CONCLUSION**

The perfect online astroturfing campaign relies on both skillful deceivers and vulnerable receivers. It is a powerful weapon used to launch asymmetric attacks designed to deceive innocent voters, consumers, and other information seekers. With comparatively modest resources, an online astroturfing campaign is able to generate substantial social influence over a target. The nature of Internet communication makes it relatively difficult to collect and examine data from astroturfing activities. Although techniques have been developed to detect online astroturfing (Ratkiewicz et al. 2011a; Ratkiewicz et al. 2011b), they are only effective on certain kinds of automated astroturfing systems and specific media. Once a user's opinion has been influenced it is almost impossible to restore the opinion to the pre-influence state. Additionally, once an astroturfing campaign gains traction, the fraudulent information will likely be redistributed by the manipulated users and become indistinguishable from other user-generated content. Thus, Ratkiewicz et al (2011b) suggest that identifying and terminating online astroturfing at the initiation stage is critical.

In the present study we defined online astroturfing as the dissemination of deceptive opinions by imposters posing as autonomous individuals on the Internet with the intention of promoting a specific agenda. It can be motived by political, business, or military agendas and initiated by automated mechanisms or human actors. Additionally, we examined the theoretical underpinnings of related research to identify the attributes of online astroturfing. Finally, we developed a set of propositions based on the theoretical foundations to serve as the basis for future research. This study contributes to the limited body of knowledge related to online astroturfing by identifying four key concepts that are likely to influence the effectiveness of this tactic and have implications for both general IS research and specific areas of cyber security research such as perception management and protection of information resources. These key concepts include the multiple source effect, receiver uncertainty, perceived similarities between the sender and receiver, and the level of the receiver's involvement. However, our discussion regarding the effective attributes of online astroturfing may not be conclusive and should be supplemented by further investigation. We contend that the escalation of astroturfing activity could have a profound effect on the credibility of all Internet information resources and this study provides additional insights on attributes and mechanisms behind this phenomenon, which are of interest to the scholarly community, policy makers, and practitioners.

## REFERENCES

1. Cacioppo, J.T., Petty, R.E., Kao, C.F., and Rodriguez, R. "Central and peripheral routes to persuasion: An individual difference perspective," *Journal of Personality and Social Psychology* (51:5) 1986, p 1032.
2. Chen, Y., and Xie, J. "Online consumer review: Word-of-mouth as a new element of marketing communication mix," *Management science* (54:3) 2008, pp 477-491.
3. Cho, C., Martens, M., Kim, H., and Rodrigue, M. "Astroturfing Global Warming: It Isn't Always Greener on the Other Side of the Fence," *Journal of Business Ethics* (104:4), 2011/12/01 2011, pp 571-587.
4. Chu, Z., Gianvecchio, S., Wang, H., and Jajodia, S. "Who is tweeting on twitter: human, bot, or cyborg?," Proceedings of the 26th Annual Computer Security Applications Conference, ACM, 2010, pp. 21-30.
5. Cialdini, R.B. "Harnessing the science of persuasion," *Harvard Business Review* (79:9) 2001a, pp 72-81.
6. Cialdini, R.B. *Influence: Science and practice* Allyn and Bacon Boston, MA, 2001b.
7. Cox, J.L., Martinez, E.R., and Quinlan, K.B. "Blogs and the corporation: managing the risk, reaping the benefits," *The Journal of Business Strategy* (29:3) 2008, pp 4-12.
8. Daniels, J. "Cloaked websites: propaganda, cyber-racism and epistemology in the digital era," *New Media & Society* (11:5), August 1, 2009 2009, pp 659-683.
9. Dellarocas, C., Zhang, X.M., and Awad, N.F. "Exploring the value of online product reviews in forecasting sales: The case of motion pictures," *Journal of Interactive Marketing* (21:4) 2007, pp 23-45.
10. Deutsch, M., and Gerard, H.B. "A study of normative and informational social influences upon individual judgment," *The journal of abnormal and social psychology* (51:3) 1955, p 629.
11. Greenwald, R., Gilliam, J., Smith, D., Tully, K., Gordon, C.M., Cheek, D., Brock, J., Florio, R., Frizzell, J., and Cronkite, W. *Wal-Mart: The high cost of low price* Disinformation Company, 2005.
12. Hancock, J.T. "Digital deception," *Oxford handbook of internet psychology*) 2007, pp 289-301.
13. Harkins, S.G., and Petty, R.E. "The multiple source effect in persuasion," *Personality and Social Psychology Bulletin* (7:4) 1981a, p 627.
14. Harkins, S.G., and Petty, R.E. "The Multiple Source Effect in Persuasion The Effects of Distraction," *Personality and Social Psychology Bulletin* (7:4) 1981b, pp 627-635.
15. Harkins, S.G., and Petty, R.E. "Information utility and the multiple source effect," *Journal of personality and social psychology* (52:2) 1987, p 260.
16. Hoggan, J. *Climate cover-up: The crusade to deny global warming* Greystone Books, 2009.
17. Hu, N., Liu, L., and Sambamurthy, V. "Fraud detection in online consumer reviews," *Decision Support Systems* (50:3) 2011, pp 614-626.
18. Hu, N., Pavlou, P.A., and Zhang, J. "Can online reviews reveal a product's true quality?: empirical findings and analytical modeling of Online word-of-mouth communication," Proceedings of the 7th ACM conference on Electronic commerce, ACM, 2006, pp. 324-330.
19. Jakobsson, M. *The Death of the Internet* Wiley-IEEE Computer Society Press, 2012.
20. Kelman, H.C. "Compliance, identification, and internalization: Three processes of attitude change," *The Journal of Conflict Resolution* (2:1) 1958, pp 51-60.
21. Lee, C.W. "The roots of astroturfing,") 2010.
22. Lyon, T.P., and Maxwell, J.W. "Astroturf: Interest Group Lobbying and Corporate Strategy," *Journal of Economics & Management Strategy* (13:4) 2004, pp 561-597.
23. Mackenzie, K., and Pickard, J. "Lobbying memo splits US oil industry," in: *Financial Times*, London (UK), United Kingdom, London (UK), 2009, p. 1.
24. Mackie, G. "Astroturfing Infotopia," *Theoria: A Journal of Social & Political Theory* (56:119) 2009, pp 30-56.
25. MacKinnon, R. "CHINA'S "NETWORKED AUTHORITARIANISM"," *Journal of Democracy* (22:2) 2011, pp 32-46.
26. Mattingly, J.E. "Radar Screens, Astroturf, and Dirty Work: A Qualitative Exploration of Structure and Process in Corporate Political Action," *Business and Society Review* (111:2) 2006, pp 193-221.
27. McKenna, K.Y.A., and Bargh, J.A. "Plan 9 from cyberspace: The implications of the Internet for personality and social psychology," *Personality and social psychology review* (4:1) 2000, pp 57-75.
28. McNutt, J., and Boland, K. "Astroturf, technology and the future of community mobilization: Implications for nonprofit theory," *J. Soc. & Soc. Welfare* (34) 2007, p 165.
29. McNutt, J.G. "Researching Advocacy Groups: Internet Sources for Research about Public Interest Groups and Social Movement Organizations," *Journal of Policy Practice* (9:3-4) 2010, pp 308-312.
30. Metzger, M.J. "Making sense of credibility on the Web: Models for evaluating online information and recommendations for future research," *Journal of the American Society for Information Science and Technology* (58:13) 2007, pp 2078-2091.

31.  Morris, M., and Ogan, C. "The Internet as Mass Medium," *Journal of Computer-Mediated Communication* (1:4) 1996, pp 0-0.
32.  Mustafaraj, E., and Metaxas, P. "From obscurity to prominence in minutes: Political speech and real-time search,") 2010.
33.  Norman, A. *The Case Against Wal-Mart* Brigantine Media, 2004.
34.  Petty, R.E., and Cacioppo, J.T. *Attitudes and persuasion: Classic and contemporary approaches* Westview Press, 1996.
35.  Pfister, D.S. "THE LOGOS OF THE BLOGOSPHERE: FLOODING THE ZONE, INVENTION, AND ATTENTION IN THE LOTT IMBROGLIO," American Forensic Association, 2011, pp. 141-162.
36.  Quandt, T. "What's left of trust in a network society? An evolutionary model and critical discussion of trust and societal communication," *European Journal of Communication* (27:1), March 1, 2012 2012, pp 7-21.
37.  Ratkiewicz, J., Conover, M., Meiss, M., Gonçalves, B., Flammini, A., and Menczer, F. "Detecting and tracking political abuse in social media," *Proc. of ICWSM*) 2011a.
38.  Ratkiewicz, J., Conover, M., Meiss, M., Gonçalves, B., Patil, S., Flammini, A., and Menczer, F. "Truthy: mapping the spread of astroturf in microblog streams," in: *Proceedings of the 20th international conference companion on World wide web*, ACM, Hyderabad, India, 2011b, pp. 249-252.
39.  Senecal, S., and Nantel, J. "The influence of online product recommendations on consumers' online choices," *Journal of Retailing* (80:2) 2004, pp 159-169.
40.  Stajano, F., and Wilson, P. "Understanding scam victims: seven principles for systems security," *Commun. ACM* (54:3) 2011, pp 70-75.
41.  Stauber, J. "Toxic Sludge Is Good For You: Lies, Damn Lies And The Public Relations Industry Author: John Stauber, Sheldon Rampton, Pub,") 2002.
42.  Tumasjan, A., Sprenger, T.O., Sandner, P.G., and Welpe, I.M. "Predicting elections with twitter: What 140 characters reveal about political sentiment," Proceedings of the fourth international aaai conference on weblogs and social media, 2010, pp. 178-185.
43.  Wooten, D.B., and Reed II, A. "Informational influence and the ambiguity of product experience: Order effects on the weighting of evidence," *Journal of Consumer Psychology; Journal of Consumer Psychology*) 1998.