

**CHALLENGES IN INTEGRATING MEMES, NETWORKS, AND THE NOOSPHERE:  
META-THEORIZING THE MACRO/MICRO AND INDIVIDUAL/RELATIONAL DIVIDES**

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*Abstract*

The rapid evolution of a mediated and networked world has dissolved or distorted many of the traditional boundaries of space and time in regard to human communication. This raises the question of whether traditional social theories have the capacity to account for these evolving social processes. This issue is examined with the intent of suggesting a selected set of theoretical and meta-theoretical models that may assist with the integration and heuristic development of a coherent theoretical framework within which the mediated geospatial diffusion of information can be understood. The paper ends with a set of tentative empirical propositions derived from these theories, with the hope that they can serve to stimulate more comprehensive and contemporary model development.

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The meta-theoretical perspective known as *reductionism* broadly envisions the world as a set of Matryoshka dolls, in which each successive higher macro level of observation contains within it a more microscopic homunculus entity. The world is comprised of hierarchical elements. Chaos theory would hold that each level has as much, and similar structures of, complexity. At the level of everyday human behavior, this hierarch is understandable as the physical elements, comprised as they are of particles and molecules operating in space and time (physics), which comprise organic molecules and organisms (biology), which have evolved into human individuals (psychology) interacting (linguistics, communication) in groups and societies (sociology), governmental systems (political science), and cultures (anthropology) in various spatial arrangements (geography). At each level of this micro-macro hierarchy, scholarly disciplines have made progress at theorizing the nature of these processes. Among the most vexing problems of peering into the nested nature of this hierarchy, however, is how to conceptually and methodologically model the translation of information from one level of the hierarchy to the next. Understanding the “scale politics of spatiality” and the “scale politics of communication” (Adams, 1996) will usher in enormous challenges, both theoretically and methodologically.

The www and the technologies of mapping it are growing faster than the ability to understand their profound and variegated effects. Communication theories are evolving rapidly, but not as rapidly as the technologies themselves. For example, there are increasingly promising developments in the application of online and www-based data-mining in the understanding of social groupings (Chau & Xu, 2008; Li & Wu, 2010; Papacharissi, 2009; Perez et al., 2010; Subrahmanyam, 2008; Sui, 2010; Worboys, 2010; Zook, 2010), disease vectors (e.g., Balcan et al., 2010; Chute, 2008; Collier et al., 2006; Collier et al., 2008; Hu et al., 2008; Madan et al., 2010; Van den Broeck et al., 2011; Vasquez-Prokopec et al., 2010), natural disasters (e.g., Procopio & Procopio, 2007; White, 2010), disaster response (e.g., Comfort, 2010), protest and crowd formation (e.g., Caverlee, 2010; Earl & Kimport, 2008), militias and hate-based groups (e.g., Brown, 2009; Freilich & Pridemore, 2005), and terrorist networks (e.g., Chau & Xu, 2007; Chen et al., 2008; Ellis, 2008; Elovici, et al., 2008; Fienberg, 2008; Qin et al., 2007; Reid, 2011; Reid & Chen, 2007a, 2007b; Seib & Janbek, 2011; Shahar, 2008; Sun et al., 2008; Trujillo et al., 2008; Xu & Chen, 2008; Xu & Zhang, 2008; Yilmazel et al., 2008). Even these developments, however, appear largely method-driven rather than theory-driven. Consequently, there is a need for theories that can be cast at relatively broad conceptual levels to accommodate the rapid changes brought about by changing communication media and the data-mining methods providing insights into these processes. Past theories may provide important bridges to span understanding with technology.

Developments in information and communication technologies (ICTs) and new media (e.g., convergence and social media) have begun to present both possibilities and problems in bridging the micro with the macro, and the individual with the group level of understanding the human condition, particularly in mapping the *sine qua non* of human interaction: *communication*. The world is awash in the messages that comprise communication, and unlike the previous 50,000 years of human linguistic evolution, many of these messages are now being recorded in digital formats. There is no shortage of data on human communication, but there are, as yet, few efficient, consensually accepted, approaches to conceptualizing and analyzing

such massive arrays of information (Cannataro & Talia, 2003; e Cunha & Rego, 2010; Lazer et al., 2009; Ramakrishnan & Grama, 1999; Yang & Wu, 2006). Although it is now technologically possible to passively monitor a variety of human communication activities at the individual level (e.g., Kim, McFee, Olguín, Waber & Pentland, 2012; Olguín, Waber, Kim, Koji, & Pentland, 2009; Pentland, 2012), most of the technological sources of communication currently reflect more collective processes, at the dyadic, group, institutional, and mass-communication levels of diffusion.

Among the challenges of coping with this deluge of data is identifying the unit of analysis. Many statistical and analytic approaches are largely coupled to *point-based* or *individual-level* data, such as an individual's score or coordinate in a 1-, 2-, or 3-dimensional graph. Increasingly, however, it seems that the relevant units of analysis will involve *link-based* data, in which it is the *coupled* or *relational-level* data-points of individuals in dyads, groups, and larger-scale organizations (e.g., organizations, social movements, societies, states, nations, etc.). Every "message" is both an individual point, but to the extent it is received and/or responded to, it is also a link, which means it is at that point a shared set of points or coordinates.

To a large extent, statistical procedures have become highly sophisticated in analyzing each of these levels separately, but the ability to map one level of analysis onto the other is still indeterminate. A growing consensus is that *social network* approaches to analyzing and understanding human behavior and communication are necessary (Barabási, 2002, 2010; Breese, 2011; Cao, 2010; Carrasco et al., 2008; Chau & Xu, 2008; Chen et al., 2011; Crandall et al., 2010; Dodds et al., 2003; Erickson, 2010; Granovetter, 1973; Harlow et al., 2012; Kempe & Tardos, 2003; Kennedy & Weimann, 2011; Kumar et al., 2010; Lews et al., 2011; Lewis, 2009; McAdam, 2003; Monge & Contractor, 1998; Newman et al., 2006; Papacharissi, 2009; Passy, 2003; Perez et al., 2010; Plickert, et al., 2007; Rainie & Wellman, 2012; Shekhar & Oliver, 2010; Singh et al., 2010; Snow et al., 2004; Suh et al., 2010; Sui, 2010; Tillema et al., 2010; Watts, 2003, 2004; Watts & Dodds, 2007; Watts, Dodds & Newman, 2002; Worboys, 2010; Wu et al., 2010).

This paper seeks to introduce a few theoretical approaches that provide promising avenues for bridging micro with macro domains of activity. It is intended only as a stimulus for discussion of issues related to these mapping issues. That is, in addition to mapping individuals in space and time, and mapping relationships in space and time, it is important to map both "individuals-in-space-and-time" *onto* "relationships-in-space-and-time." Some of the theories and topical locales of such maps are sketched below.

### **Some Relevant Meta-Theoretical Perspectives**

There are thousands of theories and models that could be identified with potential relevance to organizing scientific knowledge about the geospatial diffusion of ideas in cyberspace. What follows is a selective synopsis of several models or theories that appear to provide particularly relevant lenses or explanatory metaphors into the mediated diffusion of ideas.

## General Systems Theory (GST) & Social Networks Theory (SNT)

A host of related laws and principles arise from the self-organizing and systemic processes involved when entities link in through information. Developments in the realm of social networks (Barabási, 2002, 2010) have led to an emerging meta-theory of network dynamics. Some of the core assumptions derive from classic information (e.g., Cherry, 1957; Pierce, 1961; Shannon & Weaver, 1964; von Foerster, 1953; Wiener, 1948) and general systems theory (e.g., von Bertalanffy, 1968, 1975; Wilden, 1980). C. Stohl and M. Stohl (2007; M. Stohl, 2008) have articulated certain assumptions about the nature of networks, including: (a) Networks are *message systems*, and as such, function as sense-making, role-identification, and inspiration; (b) networks are multiplex (i.e., multifunctional), historically and situationally grounded message systems that reflect and maintain their developmental roots; (c) networks are multi-level, multi-jurisdictional “temporary, dynamic, emergent, adaptive, entrepreneurial, and flexible structures” (p. 106) that can defy hierarchical and linear top-down organizational structure; (d) Boundary specification needs to distinguish between *networking* (i.e., being able to interact within and between network elements) and *network control* (i.e., executive-level coordination, membership selection and exclusion, operational activation and direction, etc.); and (d) networks can be local, global, heterogenous or homophilous, or any combination of these facets.

Other axioms and conceptual definitions relevant to networks can be articulated, including:

- *Structure*: Function follows form, and form is not random.
- *Emergence*: systems evolve toward a state of relative homeostasis (“a network property is emergent if it changes by a factor of 10 as a consequence of a dynamic network achieving stability....This is the impetus behind online social networks that begin with nothing, and end up with millions of subscribers” (Lewis, 2009, p. 19-20).
- *Dynamism*: Structure evolves due to system properties and processes.
- *Autonomy/Self-determination*: Networks emerge from voluntary (bottom-up/horizontal) linkages among elements more than causal (antecedent or distal) or hierarchical (top-down) forces.
- *Entropy & Adaptation*: Initial configurations of systems decay, or must adapt by absorption and utilization of resources from outside the system.
- *Evolution*: The topology (structure) of systems changes through natural selection processes (i.e., “Darwinian” forces).
- *Power*: “The power of a *node* is proportional to its degree ( $n$  of links connecting it to the network) influence (link values); and *betweenness* or *closeness*; the power of a *network* is proportional to the  $n$  and strength of its nodes and links” (Lewis, 2009, p. 21).
- *Stability*: The stability of a system can be mapped by rates and directions of change in trajectory or oscillations.
- *Nonsummativity*: Any system produces properties different from the mere sum of its parts.
- *Equifinality*: Any given path may end up in any of many different endpoints.
- *Multifinality*: Many different paths may end up in the same (or a given) end point.

### **Actor-Network Theory (ANT)**

Developed through a variety of sources (e.g., Callon, 1987; Law, 1992; Latour, 1986), ANT proposes that there is no fundamental difference between individual humans and the technological devices and systems that are both products of, and producers of, human activity. The heterogeneous and evolving interactions among both human and technological *actors* form relationships that have the capacity to *translate* previous states of a system into new forms of the system. Collective actions, or *actants*, translate the information of a system into new collective actions. Power is therefore fundamentally a distributed process, and society is inherently not a sum of static entities. “Social structure is not a noun but a verb” (Law, 1992, p. 385). That technologies can themselves be understood as actors themselves can be understood in the context of how a social medium is a product of human action, but also a constrainer of human action, as subsequent human behavior becomes adapted to the form and function of that technology. Twitter constrains human messages to a specified number of characters, and teleconferencing constrains interaction to the 2-dimensional immediacy of the camera angle. Such *prescriptions* permit individuals to make their own *inscriptions*, or unique individual marks by inputting their own messages into the actant, and the resulting data stream of translation can then be *punctualized* by members of that or other actants as they utilize these resources in mobilizing further activity. To date, ANT has been used to analyze a variety of activities, such as technology adoption and diffusion (e.g., Elgali & Kalman, 2010), Twitter network applications (Gonçalves & Figueiredo, 2009; Potts & Jones, 2011), disaster response (Potts, 2009), political state theory (Passoth & Rowland, 2010), corporate and crisis communication (Luoma-aho & Paloviita, 2010), the climate change debate (Besel, 2011), and have the potential to be integrated with other theories, such as agent-based models (Goldstone & Janssen, 2005).

### **Social Identity Theory (SIT)**

People need to belong to groups (Leary & Baumeister, 1995; Leary & Cox, 2008). Social identity theory (Turner & Reynolds, 2001) proposes that there is a continuum between acting as and for oneself, as opposed to acting as a member of, and for, a group to which one belongs or aspires. This continuum between the *interpersonal* and the *intergroup* levels leads individuals to sometimes act primarily in reference to self, and at other times in reference to the group. The shift from personal to group identity is what enables group and collective action, but it also tends to elicit a variety of perceptual and behavioral reactions as actors shift from “I” and “me” to a “we” and “us” emphasis.

Social Identity Theory (SIT) proposes that individuals derive valuable self-concept (identity) from the groups to which they belong, and that groups vary in their relative status value for such identities. In general, people are motivated to enhance their identities, and therefore, to either seek better group membership, through gaining membership to higher valence groups (mobility), or through strategies that derogate other groups’ status (conflict), or enhancing the status of the actor’s existing group membership (creativity) (Reid, Giles, & Abrams, 2004). Whereas social mobility and creativity strategies tend to reinforce the status

quo, it is the conflict or competitive strategies that tend to be reflected in media and message production that would be more radical in its implications (Reid et al., 2004).

These identities function as a cybernetic control mechanism, invoking dissonance-reduction as a process of guiding behavior (Hogg et al., 1995, p. 257). Individuals incorporate these identity processes and their group memberships into their calculation of rational decision-making. The distinctions between these two forms of rationality (Gupta, 2001, 2008) can often lead to individuals seeking various strategies to enhance their group membership vis-à-vis other groups. So, for example, members of outgroups tend to be perceived as relatively homogenous, and minority group members can accentuate the homogeneity of their own group's members, in an effort to invoke stereotypes that facilitate hierarchical judgments of relative merits and the status of group memberships (Brown, 2000). The salience of a person's group membership becomes linked to commitment to that group (Hogg et al., 1995), and subsequently elicits and is reinforced by fundamental yet often competing motives to (a) enhance both personal and group identity; (b) maximize a "difference motive, even at the expense of absolute ingroup gain" (Brown, 2000, p. 747); and (c) constructing group prototypes and perceptions "as a dynamic balance between competing cognitive pulls to minimize intracategory differences and to maximize intercategory differences" (Hogg et al., 1995, p. 261). Further, SIT anticipates that as the density and homogeneity of group ties increases, (a) members' group identity salience and importance increase, and (b) the greater the pressure is to achieve consistency between self and group identity (McFarland & Pals, 2005, p. 292). One of the obvious outcomes of these processes is that "the bias for one's group (favoritism) and the denigration of others in outgroups (discrimination) is pervasive, implicit, and easily triggered (Korte, 2006, p. 170).

SIT and some of its close theoretical relatives have been used to understand hate groups (Douglas et al., 2005, p. 73), immigrant acculturation activities (Grant, 2008), virtual communities (Shen et al., 2010), flaming in intergroup email (Douglas & McGarty, 2001), and would seem broadly compatible with certain models of terrorism, in which the need to diminish the status of other groups facilitates the enhancement of personal identity through the perception of external "existential threat" from competing groups (Gupta, 2001, 2008) and the use of terrorism as a way to send a collective message (Fischer et al., 2010).

### **Diffusion of Innovations (DIT) Theory**

At the macro theoretical level, the primary role of the internet is the diffusion of information, which can be understood by two interrelated sets of theoretical traditions—network theory and diffusion of innovations. *Network theory* is a context-independent approach to understanding interactions at a purely structural level (C. Stohl & M. Stohl, 2007; M. Stohl, 2008). Sources of information (nodes) distribute information to and from other nodes, marking a path (links), which represent *relational-level* data. The greater the number of nodes, and the greater the number of inter-linkages among them, the denser and more integrated the network is.

A *diffusion* “is a special type of communication in which the messages are about a new idea” (Rogers, 2003, p. 6). The diffusion process, therefore, involves communicating an idea “through certain channels over time among the members of a social system” (Rogers, 2003, p. 5). An *innovation* is “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers, 2003, p. 12). There are distinguishable models (Meade & Islam, 2006), paradigms (Earl, 2010; Greenhalgh et al., 2005), and theoretical limitations (Lundblad, 2003) of diffusion of innovations (DI) research, although its core concepts are relatively similar across disciplines and applications (Smith, 2004). A number of propositions of DI theory are listed in the Appendix.

“A communication network consists of interconnected individuals who are linked by patterned flows of information” (Rogers & Kincaid, 1981, p. 75). A broad array of developments have identified network roles (e.g., liaison, gate-keeper, etc.), actor-level constructs (e.g., degree, range or diversity, centrality, etc.), and network-level constructs (e.g., multiplexity, strength, stability, etc.) that define relationships, groups, and institutions (Carrasco et al., 2008; Monge & Contractor, 2001; Watts, 2004). Social networks are influenced, mapped, and enabled by both geospatial factors (e.g., proximity, mobility patterns, etc.) and media connectivity factors (Walther & Bazarova, 2008). Several illustrative principles of networks suggest the potential for this framework to illumine the dynamics of social movements. First, certain *power laws* predict system behavior at macro levels (e.g., Li, 1992; Wu et al., 2010). For example, research confirms that despite (and perhaps in part because of) media connectivity, people’s actual geospatial patterns of movement and communication across the course of a typical day are highly predictable *en masse* (Shaw & Yu, 2009; Song, Qu, Blumm, & Barabási, 2010; Yin, Shaw, & Yu, 2011). Second, the *small world hypothesis* speculates that despite over six billion people on the planet, most people are only a few links apart from one another (Dodds, Muhamad, & Watts, 2003).

Third, the *strength of weak ties hypothesis* (Granovetter, 1973) speculates that weak ties are generally more influential to social and relationship outcomes than strong ties. Fourth, various studies of complex systems indicate *threshold and cascade* effects that may reflect the nature of system changes resulting from relatively small interim changes. So, for example, diffusions of ideas appear to be regulated by threshold effects in which people adopt new ideas or join emerging groups only when a certain percentage of their peers or the population have joined (Kurzban, 2004). These incremental steps can occur in logarithmic forms that appear dramatic (or catastrophic) at the macro level (Gupta, 2001). Some research indicates “global cascades can only occur when the influence network exhibits a ‘critical mass’ of early adopters, ... who adopt after they are exposed to a single adopting neighbor” or peer (Watts & Dodds, 2007). Such changes are often masked because peers often engage in *preference falsification*, in which they misrepresent their views due to perceived social pressure, until a sufficient threshold of peers has adopted the actual preferred position (Kuran, 1989, 1995). Thus, the relative anonymity and mass access to new media may significantly alter the need of a population to engage in preference falsification, and the extent to which preference falsification can be interpreted by any given individual seeking to gauge the views of peers in a social milieu.

The implication of these five patterns (power laws, small world, weak ties, threshold effects, preference falsification) is that ideas have the potential to spread extensively from relatively isolated beginnings in people's relatively predictable patterns of social life. Network theory directs attention to factors that often appear small in isolation, but have large systemic effects (e.g., Taleb & Blyth, 2011). Communication processes are central to both perspectives, but in the network perspective, the power of communication is in its distributed systemic force. Research on a particular type of diffusion has illustrated the value of network perspectives—the spread of terrorist ideology and activity (Chen et al., 2008; Kennedy & Weimann, 2011; Stohl & Stohl, 2007).

### **CMC Competence**

In order to understand such processes, ultimately a more micro theoretical approach is also needed, which can be broadly conceptualized through a computer-mediated communication (CMC) model of individual user competence. Computer-mediated communication (CMC) theories and research have been proffered to account for individual and contextual factors affecting the selection (van den Hooff et al., 2005; Walther & Bazarova, 2008) and competence of CMC (e.g., Spitzberg, 2006).

CMC competence refers to the appropriate and effective use of information technologies (Spitzberg, 2000, 2006, 2009a, 2009b; Spitzberg & Cupach, 1984, 2002). The conceptually integrative model of computer-mediated communication (CMC) competence consists of five basic components (Spitzberg, 2006). People are more likely to be competent users of CMC to the extent they are (a) motivated, (b) knowledgeable, and (c) skilled within a given (d) context of usage, which produce relatively favorable or unfavorable (e) outcomes. Specifically, in the context of the spread of influence in the WWW, a person who is (a) more motivated to generate, use, and distribute information, (b) who is more knowledgeable about the technologies and the topic(s) involved, (c) who is more skilled at actually using such technologies in the process of communicating, and (d) has more facile contextual incentives and fewer contextual delimitations, is more likely to (e) succeed in influencing the diffusion of information via the internet.

Motivations for CMC use will vary from user to user, and context to context. Research message processing (e.g., uncertainty reduction theory; Berger, 2010; Roskos-Ewoldsen & Roskos-Ewoldsen 2010) indicates that people are motivated to reduce their uncertainty regarding events in their environments. Research on universal values (e.g., Fontaine et al., 2008; Schwartz, 2007; Schwartz et al., 2001) provides potential linguistic vocabularies for the particular weighting of such events. Knowledge of CMC will depend on educational, socioeconomic, accessibility, exposure, and peer influences. Skills will be honed through modeling, usage and feedback processes, and reinforced by outcomes of such usage. The context of CMC involves a variety of factors, including the need for privacy, velocity, emotional content, persuasiveness, presence, and exposure of messages. The outcome of CMC use will both depend on the motivations, as well as provide an index of the competence (i.e., appropriateness and effectiveness) of the application of messages within the medium.

Seeking ways of integrating these micro and macro theoretical perspectives, in the cause of understanding geospatial and sequential processes of internet diffusion of information, holds promise in revealing the true nature of internet influences. Integration of the more micro theory of CMC competence and the more macro theory of diffusion of innovations will seek a model capable of incorporating other mid-range theories of CMC use (e.g., Walther, 2010) and intergroup communication (e.g., Ellis, 2010; Gupta, 2001; Soliz & Giles, 2010; Turner, 1990). Such a model thereby seeks to accommodate the micro-macro divide of theory construction, and provide a heuristic framework for moving the interdisciplinary study of communication in cyberspace, in real space. To fulfill the potential of such an integrative model will require extensive data across multiple domains, as well as sophisticated methods for their analyses.

### **Framing Theory**

Bateson (1987) pointed out that many (if not all) forms of communication are paradoxically related to their context. The context, broadly speaking, is necessary for understanding the meaning of the message(s) enacted within that context—sarcasm can only be understood as such by the subtle cues of the nonverbal expression, the relationship history of the participants, and the features of the actual situation. Yet, the messages also *constitute* the context, which is paradoxical: the picture is not supposed to be able to be the frame—the frame is supposed to contextualize what is contained within, rather than be part of the painting itself. This concern with how messages and communication are demarcated and commented upon by context led Bateson to be concerned with frames, and how they include, exclude, provide taken-for-granted premises of understanding, and meta-communicate about their contents. This interest was later taken up extensively by Goffman (1974) in *Frame Analysis*, in which he examines how situations are “built up in accordance with principles of organization which govern events—at least social ones—and our subjective involvement in them” (pp. 10-11). All communicative activity is undertaken by participants who perceive “the rules or premises of a primary framework, whether social or natural,” which “correspond in some sense to the way in which an aspect of the activity itself is organized” (p. 247). These frameworks are represented in the activity itself, but also reflected in the cognition of the actors, and help all those concerned understand “what it is that is going on” so that interactants can “fit their actions to this understanding and ordinarily find that the ongoing world supports this fitting” (p. 247).

Since these formulations, framing theory has evolved into the study of how the structuring and design of communication can frame certain issues in ways that function tactically, strategically, and persuasively. Broadly, “framing refers to the process by which people develop a particular conceptualization of an issue or reorient their thinking about an issue” (Chong & Druckman, 2007). Framing theory tends to be interested in a variety of specific types of message frames. For example, one of the more studied frames is referred to as the loss-frame or gain-frame. Persuasive message campaigns on the environment can be framed in terms of loss (e.g., “Conserve energy or else the terrorists will hold our country hostage and global warming will destroy our environment”) or gain frames (e.g., “Energy conservation will make our country strong and independent, and provide for a more livable and enjoyable environment”). These frames contextualize subsequent data or “facts” by giving them a fear- or

a reward-based meaning. There is also a related interest in symmetrical forms of frames, often in regard to risk aversion cognitive heuristics. A proposed tax policy can be described as “very fairly allowing a tax reduction on 90% of citizens” or as “vastly and unfairly increasing taxes on the upper 10% of citizens.” The “data” of these claims is the same, but the messages are framed differently in their implications.

Frames are generally identified by locating a particular attitude of interest, and systematically and empirically identifying linguistic or symbolic markers of positions regarding this attitude. These markers can then be studied in existing corpuses of communication, or experimentally manipulated to investigate the relative influence of different frames. Frames can reflect biases of existing media (Chong & Druckman, 2007), rhetorical strategies of framing, counter-framing, and reframing employed by social movements (Hunt & Benford, 2004; Snow, 2004), and the relative subjective value of various ideological political perspectives (Berejekian, 1997). When various factions of a debate or marketplace engage in distinct frames, it can mark such ideologies, and provide a site for investigating how various types of frames succeed in the context of such competing narratives and positions (Chong & Druckman, 2007).

### **Contexts of Meta-Theoretical and Meta-Methodological Integration**

There are innumerable spaces in which scholars are seeking progress in integrating the macro-micro and individual and relational divides. Some of the areas that are currently making inroads in mapping cyber-space to realspace include: **disease vectors and vaccination concerns** (Balcan et al., 2010; Barrett et al., 2010; Bo karlsson, 2010; Chute, 2008; Collier et al., 2006; Collier et al., 2008; de Hoog et al., 2007; Gherseti & Odén, 2011; Little et al., 2003; Madan et al., 2002; Nan & Madden, in press; Van den Broeck et al., 2011; Vaughan, 2010; Vazquez-Prokopec et al., 2010; Wallace & Ache, 2009; Zeng et al., 2007), **disaster response and management** (Ashish et al., 2008; Beck & Kropp, 2011; de Hoog et al., 2007; Johnson et al., 2011; Monmonier, 1997; Procopio & Procopio, 2007; Sattler et al., 2011; Schafer et al., 2007; White, 2010), **risk communication** (specifically, climate change and global warming: Alexander, 2009; An et al., 2012; Boykoff, 2007a, 2007b, 2007c; Brossard et al., 2004; Choi, 2012; Corbett & Durfee, 2004; Elmer, 2006; Foust et al., 2012; Hmielowski et al., 2012; Lassen et al., 2011; Li, 2007; McComas & Shanahan, 1999; Myers et al., 2012; Roessler & Schultz, 2012; Rolfe-Redding et al., 2012; Russill, 2008; Schuldt et al., 2011; Smith, 2005; Young & Dugas, 2011), **terrorism mapping** (e.g., Bobeica et al., 2008; Chau & Xu, 2008; Chen et al., 2008a, Chen et al., 2008b, Chen et al., 2008c; Ellis, 2008; Elovici et al., 2008; Fienberg, 2008; Fischer et al., 2010; Harrison et al., 2008; Hoffman, 2005; Hu et al., 2008; Jarvis et al., 2004; Qin et al., 2007a, Qin et al., 2007b, Qin et al., 2008; Reid & Chen, 2007a, 2007b, 2008; Salem et al., 2008; Seib & Janbek, 2011; Seo & Sycara, 2008; Shahar, 2008; Silke, 2008; Sinai, 2008; Skillicorn, 2008; Stohl, 2008; Stohl & Stohl, 2007; Sun et al., 2008; Trujillo & Jackson, 2008; van Wilsem, 2011; Xu & Chen, 2008; Xu & Zhang, 2008); **militia group mapping** (e.g., Abbasi & Chen, 2008; Brown, 2009; Chau & Xu, 2007; Douglas et al., 2005; Freilich & Pridemore, 2005; Gawron et al., 2012; Gerstenfeld et al., 2003; O’Brien & Haider-Markel, 1998; Pitcavage, 2001; Qin et al., 2008; Reid, 2011; Slone & Reinard, 2001; van Willsem, 2011; Weeber & Rodenheaver, 2003; Wright, 2009); and **social movements**

(e.g., Adams, 1996; Andersson et al., 2010; Bartholet, 2011; Carty, 2010; Caverlee, 2010; Cottle, 2011; Daoudi, 2011; Diani, 2000; Downing, 2008; Earl, 2010; Earl & Kimport, 2008; Elkink, 2011; El-Mahdi, 2009; Elson et al., 2012; Etling et al., 2010; Gaertner \* Iuzzini, 2005; Gerodimos, 2012; Goldstone & Janssen, 2005; Grant, 2008; Hahn & Gonchar, 1980; Harlow & Harp, 2012; Hoffman, 2005; Howard & Hussain, 2011; Hwang et al., 2006; Johnson et al., 2011; Kuran, 1989, 1995; Kurzman, 2004, 2011; Lee et al., 2011; Leets & Bowers, 1999; Luck, 2011; McAdam, 2003; Meyer, 2004; Mische, 2003; Mitchell, 2004; Morozov, 2011; Oliver & Myers, 2003; Postmes & Brunsting, 2002; Rohlinger & Brown, 2009; Snow et al., 2004; Soule, 2004; Stein, 2009; Strodthoff et al., 1985; Taleb & Blyth, 2011; Taylor & Van Dyke, 2004; Van Laer, 2010; Van Laer & Van Aelst, 2010; Young, 2009; & Zimbra et al., 2010).

The sheer diversity of such theories and their varying historical multidisciplinary roots represents a fundamental challenge to their meta-theoretical integration. The primary value of good meta-theory, however, is precisely the extent to which theory can be generated and advanced (Turner, 1985, 1990). What follows is a speculative array of propositions that were directly or indirectly derived from the theories identified as relevant to the geospatial diffusion of ideas through cyberspace.

### **Tentative Propositional Perambulations**

The following represent some of the key terms or concepts that populated the theories reviewed. These terms are subsequently employed in speculating about potential empirical propositions about the geospatial diffusion of ideas in cyberspace.

#### **Definitions:**

- **Actor:** Any person, actant (ANT) or technology that can generate (produce), receive (store, record), and/or interpret (translate) information (messages)
- **Agent:** A spokesperson for a network or system (ANT)
- **Actant:** a set of actors acting or functioning as a coordinated whole (ANT)
- **Network:** An interdependent set of roles, functions, agents, and actors traceable through systemic interactions (ANT, GST)
- **Messages:** inscriptions (ANT) or information (GST), which may be iconic, gestural, symbolic, cartographic, or any combination of sensory stimuli or inputs.
- **Stability:** durable chronological consistency of coherence and meaningful pattern (ANT), or resistance to unpredictable oscillations of trajectory (GST)
- **Organization:** the juxtaposition and pattern of interdependence among actors in a system or network (ANT)
- **Mobilizing:** the process of exposing, enlisting, investing, recruiting, or enrolling (ANT) the involvement of others in adopting, mimicking, or participating with a given network (ANT) or system (GST) function or program
- **Socialization:** the process of establishing and enculturating actor(s) into existing network roles and/or scripts (ANT)
- **Translation:** The moderation or mediation of messages with the deletion or addition of information or frame of interpretation (ANT)

- **Diffusion:** Communication of messages about a new idea (whether about an actor or concept) [without translation—ANT)
- **Convergence:** The extent to which the actors of a network or system co-orient, coordinate, and agree with a set of translations and/or messages (ANT)
- **Alignment:** The extent to which actors or networks share a common or mutual history or ontogenesis
- **Coordination:** The extent to which system elements, or actors, have adopted a common set of roles, conventions, scripts, codifications, procedures, rules, or culture in functioning (ANT)
- **Punctualization:** The extent to which the structure and function of a network or system is hidden (i.e., taken-for-granted, or “black-boxed”), such that only inputs and outputs are noticeable to most of those who use or interact with the system.
- **Power:** Influence and organization are relational products—no power is possessed by a singular actor or network, as no influence can be transmitted without the facilitation of other actor/networks.
- **Rhetorical valence (RV):** A message is rhetorical to the extent it has persuasive potential, and it has valence to the extent that this potential is directed toward a particular cognitive, emotional, or behavioral outcome.
- **Network Proximity:** “Communication proximity” is “the degree to which two individuals in a network have personal communication networks that overlap” (Rogers & Kincaid, 1981, p. 129)

Given these basic constructs, it is important to frame certain grounding assumptions that may bridge many of these theories. These grounding assumptions have empirical implications, but for the most part, represent claims that can be considered axiomatic—that is, foundational for the subsequent development of empirical predictions.

#### **Axioms:**

A<sub>1</sub>: There is no necessary ontological distinction between persons and technologies.

Where humans have motivations, devices have functions and affordances, and uses to which those affordances are put. A predator drone may carry infrared sensors and crop recognition software, or telescopes and ordinance. Different constructs for different affordances.

Equifinality permits a given device to be used in the service of multiple human motivations. A surveillance drone may nevertheless be programmed to crash into person as well as fire ordinance at that person. Although devices may not explicitly “program” actors, the extent of punctualization and organization of actors by devices can be understood by everyone who depends upon the language of a given software (e.g., PowerPoint, Word) or device (laptop, wireless device, etc.). The language of actor interaction becomes programmed by the device’s functions, especially as interdependence increases.

A<sub>2</sub>: Actors and networks vary in media usage (production, transmission, consumption, and translation)

Some actor/networks communicate messages to only a few other actor/networks, and other actor/networks communicate with very large numbers of other actor/networks.

A<sub>3</sub>: All social processes are a product of actor effects + network (linkage) effects.

As with power and influence, all social processes result from chained or linked processes. There can be no influence without the relationship with other elements of a system. Latour (1986) postulates the paradox of power as “not something one can possess—indeed it must be treated as a consequence rather than a cause of action,” because “when you simply *have power – in potentia* – nothing happens and you are powerless; when you *exert power – in actu* – others are performing the action and not you” (pp. 264-265). In any distributed sense, then, power is merely a summary of collective action rather than individual action. The reversing of cause and consequence is illustrated by Latour’s (1986) claim that “society is not what holds us together, it is what is held together” (p. 276).

A<sub>4</sub>: All actors in a network (or system) are interdependent.

Systems cohere or converge only to the extent that elements of the system coordinate their activities and functions for the alignment of the network over time. To the extent that elements of the system fail to converge, those elements (e.g., actors) will be ostracized, de-resourced, or otherwise delimited in relation to the system.

A<sub>5</sub>: Actor/network competence mediates effects of message content(s).

Actors and networks vary in their competence (i.e., appropriateness and effectiveness) of message content, form, and media selections (Spitzberg, 2006). Highly factual or functionally important information may be possessed by an actor or network, but if not communicated competently to other actors and networks, it will be limited in its persuasiveness.

A<sub>6</sub>: Actor/networks may produce significant communication content, but have few links or consuming agents.

A<sub>7</sub>: Actor/networks may produce significant communication content, but it may be significantly translated by liaisons or intermediary actor/networks in reaching other audiences.

A<sub>8</sub>: Actor/networks may produce significant communication content, but have minimal rhetorical valence.

A<sub>9</sub>: The influence of any actor/network’s communication will be a function of the rhetorical valence of the message(s), the competence of the agents through which such messages

are translated, and the number and integration of actor/networks exposed or linked to the actor/network.

- A<sub>10</sub>: Actors are subjectively aware of their relative status in (a) their network (i.e., group), and (b) their network's relative status among other networks (groups) and supra-networks (i.e., institutions) (SIT)
- A<sub>11</sub>: Actors seek to (a) confirm and/or (b) enhance their relative status based on the valence of these subjective judgments (SIT)
- A<sub>12</sub>: **Moral Dilemmas:** Rational motivation represents a moral dilemma reflecting a dialectic between self-utility and group-utility rationalities (Gupta)
- A<sub>13</sub>: **Terrorism Group Composition:** Social movements are comprised of three types of primary actors: (a) mercenaries (motivated by self-utility), (b) true believers (motivated by group-utility), and (c) captive participants (motivated by the high costs of non-compliance) (Gupta)

### Working Propositions

Given these axioms, the following section proposes some preliminary architectural elements for a theory of geospatial idea diffusion in mediated contexts. At this juncture, it still fails certain tests of internal consistency and deductive coherence. Furthermore, it is far from a comprehensive or fully explanatory theory for such processes. Nevertheless, these propositions serve as a preliminary theoretical venture into the still nascent and rapidly evolving noosphere of a networked world.

### Individual Competence in a Networked World

- P<sub>14</sub>: **Network Adoption & Individual Adoption:** "An individual is more likely to adopt an innovation if more of the individuals in her personal network have adopted previously" (Rogers & Kincaid, 1981, p. 233)
- P<sub>15</sub>: **Motivation:** "Change agents' success in securing the adoption of innovations by clients is positively related to the extent of change agent effort in contacting clients" (Rogers, 2003, p. 373)
- P<sub>16</sub>: **Knowledge:** "Change agents' success in securing the adoption of innovations by clients is positively related to empathy with clients" (Rogers, 2003, p. 377)
- P<sub>17</sub>: **Dominance & Ontologies:** The greater the proportional representation of dominant ontologies by agents (i.e., supra-system convergence), the more marginalized (i.e., powerless) the minority actor/network ontologies (SIT)

- P<sub>18</sub>: **Dominance & Competence:** The power of dominant ontologies and their agents are moderated by the competence and network integration of those network agents.
- P<sub>19</sub>: **Dominance & Ontologies:** The greater the proportional representation of dominant ontologies by agents (i.e., supra-system convergence), the more marginalized (i.e., powerless) the minority actor/network ontologies (SIT)
- P<sub>20</sub>: **Dominance & Competence:** The power of dominant ontologies and their agents are moderated by the competence and network integration of those network agents.
- P<sub>21</sub>: **Actor/Network Potential Influence:** Potential influence = (Message<sub>RV</sub> × Agent<sub>competence</sub>) × (N<sub>Actors</sub> × N<sub>Actor links</sub>), or the rhetorical valence of a message multiplied by the competence of its translator(s) or conduits, and this is multiplied by the product of the number of actors receiving it and those actors' collective linkages to other actors or networks.
- P<sub>22</sub>: **Actual influence** = T<sub>3</sub> message RV replication – T<sub>1</sub> baseline attitude, belief, or behavioral RV, after actor/network message RV at T<sub>2</sub>.

There has been influence to the extent that a system changes its rhetorical valence in regard to any given topic between Time 1 and Time 3, given the communication of message(s) convergent with the direction of change by an actor or network at Time 2. For example, if the Republican population of a region is 75% inclined to vote for the Republican candidate at Time 1, and the Democratic campaign issues a series of negative attack ads at Time 2, and the Republican population measures at only 65% of inclination to vote for their candidate at Time 3, then the Democratic campaign network has a power effect of 10%.

- P<sub>23</sub>: **Uses & Gratifications:** Actors' uses and gratifications of media are a product of existing content and media access, competence and dominant group ontologies (i.e., the affordance of the media content that can facilitate group valence) (SIT, uses & gratifications theory)
- P<sub>24</sub>: **Homophily & Competence:** Homophilous communication is positively related to communication effectiveness (competence) (Rogers & Kincaid, 1981, p. 127)
- P<sub>25</sub>: **Opinion Leaders & Mass Media:** "Opinion leaders have greater exposure to mass media than their followers" (Rogers, 2003, p. 316)
- P<sub>26</sub>: **Opinion Leaders & Influence:** "Opinion leaders have greater contact with change agents than their followers" (Rogers, 2003, p. 317)
- P<sub>26</sub>: **Opinion Leaders & Participation:** "Opinion leaders have greater social participation than their followers" (Rogers, 2003, p. 317)

- P<sub>27</sub>: **Opinion Leaders & Innovation:** “Opinion leaders are more innovative than their followers” (Rogers, 2003, p. 318)
- P<sub>28</sub>: **Influentials & Diffusion:** Influentials are [slightly more] disproportionately likely to influence diffusion cascades in systems (Watts & Dodds, 2007)
- P<sub>29</sub>: **Influentials & Diffusion:** Influentials are less likely to influence diffusion cascades than the potential of the network to be influenced—i.e., the amount of the system that must change before a given member will change [i.e., threshold rules] (Watts & Dodds, 2007)
- P<sub>30</sub>: **Change Agents & Opinion Leaders:** “Change agents’ success in securing the adoption of innovations by clients is positively related to the extent that he or she works through opinion leaders” (Rogers, 2003, p. 388)
- P<sub>31</sub>: **Proximity & Influence:** “The degree of proximity in communication dyads is positively related to their potential for behavior change on the part of the dyadic partners” (Rogers & Kincaid, 1981, p. 132)
- P<sub>32</sub>: **Network Bridging & Group Identification:** The more an actor bridges networks rather than is central to networks, the weaker and less stable that actor’s identification with the group (McFarland & Pals, 2005)
- P<sub>33</sub>: **Identification & Network Characteristics:** The greater an actor’s network cohesiveness, density, size, and status, the stronger and more stable that actor’s identification with the group (McFarland & Pals, 2005)

### Structural Influences of Networks

- P<sub>34</sub>: **Identity salience:** “The more strongly committed a person is to an identity—in terms of both interactional [i.e., the number of roles or extensivity connected with an identity] and affective [i.e., the importance of those connected roles], the higher the level of identity salience will be” (Hogg et al., 1995, p. 258)
- P<sub>35</sub>: **Identity & Group (Dis)Preference:** Group membership motivates actor perceptions of actor’s own group’s positive valence [favoritism] and depersonalization and derogation of out-groups’ members [discrimination], and extent of distance and difference of outgroups from actor’s own group.
- P<sub>36</sub>: **Group Similarity & Group Identity:** “The stronger the similarities within the group and the differences between groups, the stronger the identity of the group” (Korte, 2006, 170) (SIT)

- P<sub>37</sub>: **Outgroup Similarity:** “Outgroup members are seen as more similar to each other than are ingroup members” (Brown, 2000, p. 750) (SIT)
- P<sub>38</sub>: **Identity & Homogeneity:** “In general, high identifiers tend to see both ingroups *and* outgroups as more homogeneous than low identifiers, particularly if the intergroup context is salient” (Brown, 2000, p. 751) (SIT)
- P<sub>39</sub>: **Homophily & Linkage:** “Individuals tend to be linked to others who are ... relatively homophilous in social characteristics” (Rogers, 2003, p. 341)
- P<sub>40</sub>: **Homophily & Interaction Frequency:** Idea exchange frequency is positively related to homophily (Rogers & Kincaid, 1981, p. 127)
- P<sub>41</sub>: **Homophily & Stability:** “Homophilous links are more stable than heterophilous links” (Rogers & Kincaid, 1981, p. 316)
- P<sub>42</sub>: **Simple vs. Multiplex Links:** Multiplex relations have more mutual influence than simple relations (Rogers & Kincaid, 1981, p. 132)
- P<sub>43</sub>: **Proximity & Stability:** “Spatially proximate links are more stable” (Rogers & Kincaid, 1981, p. 316)
- P<sub>44</sub>: **Reciprocity & Stability:** “Reciprocated links are more stable” (Rogers & Kincaid, 1981, p. 316)
- P<sub>45</sub>: **Ascribed vs. Achieved Links:** “Links representing ascribed, rather than achieved, interpersonal relationships (such as kinship links) are more stable” (Rogers & Kincaid, 1981, p. 316)
- P<sub>46</sub>: **Instrumental vs. Relational Stability:** “Communication networks based on instrumental content are more stable than networks based on friendship” (Rogers & Kincaid, 1981, p. 322)
- P<sub>47</sub>: **Multiplexity & Stability:** “Multiplexity is positively related to stability in network links” (Rogers & Kincaid, 1981, p. 322)
- P<sub>48</sub>: **Tabooness:** “Tabooness is related to less connectedness and to weaker tie strength (less communication proximity)” (Rogers & Kincaid, 1981, p. 323)
- P<sub>49</sub>: **Connectedness & Size:** “Clique connectedness is inversely related to clique size” (Rogers & Kincaid, 1981, p. 139)

- P<sub>50</sub>: **Diffusion Curve:** “Adopter distributions follow a bell-shaped curve over time and approach normality” (Rogers, 2003, p. 275)
- P<sub>51</sub>: **Global Diffusion Cascades:** If a global cascade does not occur (i.e., “when sufficiently many early adopters are connected to each other that their subnetwork ‘percolates’ throughout the entire influence network”), only local cascades of influence can occur subsequently (Watts & Dodds, 2007, p. 445). [“The *critical mass* occurs at the point at which enough individuals in a system have adopted an innovation so that the innovation’s further rate of adoption becomes self-sustaining” (Rogers, 2003, p. 343)]
- P<sub>52</sub>: **Diffusion Thresholds:** “A *threshold* is the number of other individuals who must be engaged in an activity before a given individual will join that activity... In the case of the diffusion of an innovation, a threshold is reached when an individual is convinced to adopt as the result of knowing that some minimum number of other individuals in the individual’s personal communication network have adopted and are satisfied with the innovation” (Rogers, 2003, p. 355)

### Network Competence

- P<sub>53</sub>: **Power & Conservatism:** “Dominant groups strive to maintain the status quo while minority groups seek positive identification on attributes different from the dominant group” (Korte, 2006, p. 170) (SIT)
- P<sub>54</sub>: **Identification & Participation:** “A strong identification with a collectivity makes participation on behalf of that collectivity more likely” (Hunt & Benford, 2004, p. 437)
- P<sub>55</sub>: **Diffusion & Weak Ties:** “The informational strength of communication links is inversely related to the degree (1) of proximity, and (2) of homophily in the dyad. Or, in other words, information reaches a larger number of individuals, and transverse a greater social distance, when passed through weak ties rather than strong” (Rogers & Kincaid, 1981, p. 243)
- P<sub>56</sub>: **Proximity & Diffusion:** “The degree of proximity in communication dyads is negatively related to their information-exchange potential” [i.e., based on the strength of weak ties] (Rogers & Kincaid, 1981, p. 131)
- P<sub>57</sub>: **Heterophily & Diffusion:** The degree of heterophily in communication dyads is positively related to their information-exchange potential” [i.e., based on the strength of weak ties] (Rogers & Kincaid, 1981, p. 131)
- P<sub>58</sub>: **Network Integration & Diffusion:** Network integration is negatively related to information-exchange potential (Rogers & Kincaid, 1981, p. 132) [“individual integration,

the degree to which the members of a focal individual's personal communication network are linked to each other," p. 225)

P<sub>59</sub>: **Integration & Influence:** "Individual connectedness is positively related to individual behavioral change" and "individual integration is positively related to individual behavioral change" (Rogers & Kincaid, 1981, p. 226)

P<sub>60</sub>: **Diversity & Influence:** "Individual diversity is positively related to individual behavioral change" (Rogers & Kincaid, 1981, p. 226)

P<sub>61</sub>: **Network Norms & Innovation:** "When a social system's norms favor change, opinion leaders are more innovative, but when the system's norms do not favor change, opinion leaders are not especially innovative" (Rogers, 2003, p. 318)

### Intergroup Conflict

P<sub>62</sub>: **Threat & Group Action:** Competing groups pursue intergroup competitive actions proportional to the extent of (a) intergroup differentiation between "us" and "them, and (b) the existential threat potential interpreted in the competing group (Gupta).

P<sub>63</sub>: **Intergroup Competition Intervention:** The more that interventions (a) de-radicalize true-believers, (b) prosecute mercenaries, and (c) protect and secure basic needs for captive participants (Gupta)

P<sub>64</sub>: **Decategorization & Common Identity Models:** The more that interventions (a) personalize/humanize members of the competing groups, (b) persuasively employ multiple dimensions of interpretation of members of the competing groups that cut across the existing competing interpretive dimensions, (c) persuasively employ new or multiple relevant boundary definitions of the competing groups, or (d) persuasively focus on typicality of the members of the competing groups, the more intergroup conflict is reduced (Brown, 2000, p. 752)

### Conclusion

Geo-spatial mapping has increasingly accommodated 3-dimensional graphic techniques (e.g., Shaw et al., 2008; Shaw & Yu, 2009; Yin et al., 2011). The individual-level point data of a message with a particular semantic content produces various forms of data such as frequency and density of occurrence in a geo-spatial locale. This content may reveal consistent patterns over time and space, thereby revealing individual patterns, and perhaps larger scale patterns such as the tendencies and agent-based constraints illustrative of travel patterns or availability of communications technologies and mobility. To the extent such patterns reveal correspondences across individuals in time and space, it may be possible to identify such collective functions such as home-to-work-to-home dynamics of urban lifestyle. To the extent

that such point data can be linked as relational data, social movements, organizational life, and fundamental aspects of power, influence, and homophilous association can be mapped in space and time. New metrics will be required, along with new distributional assumptions and forms of statistical inference. Scaling the hierarchy from the physical to the social, from the individual to the collective, and from cyberspace to realspace will remain a fundamental challenge to the relationship between information and social life.

SELECTED BIBLIOGRAPHY

- |                                    |   |
|------------------------------------|---|
| *ANT: ACTOR-NETWORK THEORY         | *FT: FRAMING THEORY                                       |
| *BNW: 'BRAVE NEW WORLD'            | <del>BRAVE NEW WORLD</del> <del>BOUNDED RATIONALITY</del> |
| *CC: CLIMATE CHANGE MAPPING        | *MT: META-THEORY  |
| *DR: DISASTER RESPONSE             | *SA: SEMANTIC ANALYSIS                                    |
| *DI: DIFFUSION OF INNOVATIONS      | *SIT: SITUATED IDENTITY THEORY                            |
| *DV: DISEASE VECTORS & VACCINATION | *SM: SOCIAL MOVEMENTS                                     |
| *EM: ELECTORAL MAPPING             | *SN: SOCIAL NETWORK                                       |
|                                    | *TM: TERRORISM MAPPING                                    |

*MG; *TM	Abbasi, A., & Chen, H. (2008). Analysis of affect intensities in extremist group forums. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 285-308). New York, NY: Springer.
*BNW	Adams, Paul C. (2010). <i>Geographies of media and communication: A critical introduction</i> . Malden, MA: Wiley-Blackwell.
*BNW	Adams, PC (2010) A taxonomy for communication geography. <i>Progress in Human Geography</i> , 35(1): 37-57.
*SM	Adams, P. C. (1996). Protest and the scale of politics of telecommunications. <i>Political Geography</i> , 15, 419-441.
*CC	Alexander, R. J. (2009). <i>Framing discourse on the environment: A critical discourse approach</i> . New York, NY: Routledge.
*BNW	Altaweel, M. R., Alessa, L. N., & Kliskey, A. D. (2010). Visualizing situational data: Applying information fusion for detecting social-ecological events. <i>Social Science Computer Review</i> , 28(4), 497-514. doi:10.1177/0894439309360837
*BNW	An, Jisun, Cha, Meeyoung, Gummadi, Krishna, & Crowcroft, Jon. (2011, July). Media landscape in Twitter: A world of new conventions and political diversity. <i>Proceedings of the Fifth International AAAI Conference on Weblogs and Social Media</i> (pp. 18-25). Barcelona, Catalonia, Spain. Menlo Park, CA: AAAI Press, Menlo Park, California.
*CC	An, L., Tsou, M-T., Wandersee, S., Gupta, D. K., Spitzberg, B. H., & Gawron, M. (2012, February). <i>Who is concerned about climate change? Evidence from space-time analysis</i> . Paper submitted to the American Association of Geographers Conference, New York, NY.
*SM	Anderson, L (2011) Demystifying the Arab Spring: Parsing the differences between Tunisia, Egypt, and Libya. <i>Foreign Affairs</i> , 90(3): 2-7.
*SM	Andersson, Matilda, Gillespie, Marie, & Mackay, Hugh. (2010). Mapping digital diasporas @ BBC World Service: Users and uses of the Persian and Arabic websites. <i>Middle East Journal of Culture and Communication</i> , 3, 256-278.
*DI, *BNW	Andrés, Luis, Cuberes, David, Diouf, Mame, & Serebrisky, Tomás. (2010). The diffusion of the internet: A cross-country analysis. <i>Telecommunications Policy</i> , 34, 323-340.

*BNW, *SA	Arpinar, I. Budak, Sheth, Amit, & Ramakrishnan, Cartic, Usery, Lynn, Azami, Molly, & Kwan, Mei-Po. (2006). Geospatial ontology development and semantic analytics. <i>Transactions in GIS, 10</i> (4), 551-575.
*DR	Ashish, N., Eguchi, R., Hegde, R., Huyck, C., Kalashnikov, D., Mehrotra, S., Smyth, P., & Venkatasubramanian, N. (2008). Situational awareness technologies for disaster response. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 517-544). New York, NY: Springer.
*SIT	Attrill, A., & Jalil, R. (2011). Revealing only the superficial me: Exploring categorical self-disclosure online. <i>Computers In Human Behavior, 27</i> (5), 1634-1642. doi:10.1016/j.chb.2011.02.001
*BNW	Bai, X. (2011). Predicting consumer sentiments from online text. <i>Decision Support Systems, 50</i> , 732-742.
*DV	Balcan, D., Gonçalves, B., Hu, H., Ramasco, J. J., Colizza, V., & Vespignani, A. (2010). Modeling the spatial spread of infectious diseases: The global epidemic and mobility computational model. <i>Journal of Computational Science, 1</i> , 132-145.
*SN	Barabási, A-L. (2002). <i>Linked: The new science of networks</i> . Cambridge, MA: Perseus.
*SN	Barabási, A-L. (2010). <i>Bursts: The hidden pattern behind everything we do</i> . New York, NY: Dutton.
*DV	Barrett, C., Bisset, K., Leidig, J., Marathe, A., & Marathe, M. (2010). An integrated modeling environment to study the coevolution of networks, individual behavior, and epidemics. <i>AI Magazine, 31</i> (1), 75-87.
*SM	Bartholet, J (2011) Young, angry, and wired. <i>National Geographic, 220</i> (1): 102-107.
	Bateson, G. (1987). <i>Steps to an ecology of mind</i> . Northvale, NJ: Jason Aronson.
*SIT	Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. <i>Psychological Bulletin, 117</i> , 497-529.
*DR	Beck, Gerald, & Kropp, Dordula. (2011). Infrastructures of risk: A mapping approach towards controversies on risk. <i>Journal of Risk Research, 14</i> , 1-16.
*BNW	Bell, Gordon, Hey, Tony, & Szalay, Alex (2009). Beyond the data deluge. <i>Science, 323</i> , 1297-1298.
*FT	Berejekian, Jeffrey. (1997). The gains debate: Framing state choice. <i>American Political Science Review, 91</i> , 789-805.
*DI	Blaut, J. M. (1977). Two views of diffusion. <i>Annals of the Association of American Geographers, 67</i> , 3443-349.
*SM	Blight, G and Pulham, S (2011, July 12) Arab spring: An interactive timeline of Middle East protests. <i>The Guardian</i> , retrieved August 4, 2011: <a href="http://www.guardian.co.uk/world/interactive/2011/mar/22/middle-east-protest-interactive-timeline">http://www.guardian.co.uk/world/interactive/2011/mar/22/middle-east-protest-interactive-timeline</a>
*DV	Bo karlsson, Michael. (2010). Participatory journalism and crisis communications:

	A Swedish case study of Swine flu coverage. <i>Observatorio Journal</i> , 4, 201-220.
*TM	Bobeca, M., Jéral, J-P., Garcia, T., & Best, C. (2008). A quantitative analysis of "root causes of conflict." In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 115-140). New York, NY: Springer.
*BNW	Bollen, Johan, Mao, Huina, & Zeng, Xiaojun. (2011). Twitter mood predicts the stock market. <i>Journal of Computational Science</i> , 2, 1-8.
*MT	Bostrom, R. N. (2003). Theories, data, and communication research. <i>Communication Monographs</i> , 70, 275-294.
*CC	Boykoff, M. T. (2007a). Flogging a dead norm? Newspaper coverage of anthropogenic climate change in the United States and United Kingdom from 2003 to 2006. <i>Area</i> , 39, 1-12.
*CC	Boykoff, M. T. (2007b). From convergence to contention: United States mass media representations of anthropogenic climate change science. <i>Transactions of the Institute of British Geographers</i> , 32, 477-489.
*BNW	Brasch, W. M. (2005). Fool's Gold in the Nation's Data-Mining Programs. <i>Social Science Computer Review</i> , 23(4), 401-428. doi:10.1177/0894439305278869
*SN, *SM	Breese, Elizabeth Butler. (2011). Mapping the variety of public spheres. <i>Communication Theory</i> , 21, 130-149.
*BNW	Brier, A., & Hopp, B. (2011). Computer assisted text analysis in the social sciences. <i>Quality &amp; Quantity: International Journal Of Methodology</i> , 45(1), 103-128. doi:10.1007/s11135-010-9350-8
*CC	Brossard, D., Shanahan, J., & McComas, K. (2004). Are issue-cycles culturally constructed? A comparison of French and American coverage of global climate change. <i>Mass Communication &amp; Society</i> , 7, 359-377.
*MG	Brown, C. (2009). WWW.HATE.COM: White supremacist discourse on the internet and the construction of Whiteness ideology. <i>Howard Journal of Communication</i> , 20, 189-208.
*DI	Brown, L. A. (1969). Diffusion of innovation: A macroview. <i>Economic Development and Cultural Change</i> , 17(2), 189-211.
*SIT	Brown, Rupert. (2000). Social identity theory: Past achievements, current problems and future challenges. <i>European Journal of Social Psychology</i> , 30, 745-778.
*MT	Buckley, W. (Ed.). (1968). <i>Modern systems research for the behavioral scientist: A sourcebook</i> . Chicago, IL: Aldine.
*MT	Bugental, D B (2000) Acquisition of the algorithms of social life: A domain-based approach. <i>Psychological Bulletin</i> , 126(2), 187-219.
*BNW	Cannataro, Mario, & Talia, Domenico. (2003). The knowledge grid: Designing, building, and implementing an architecture for distributed knowledge discovery. <i>Communications of the ACM</i> , 46, 89-93.
*BNW, *SN	Cao, L. (2010). In-depth behavior understanding and use: The behavior informatics approach. <i>Information Sciences</i> , 180(17), 3067-3085. doi:10.1016/j.ins.2010.03.02

*SN	Carrasco, Juan Antonio, Hogan, Bernie, Wellman, Barry, & Miller, Eric J. (2008). Agency in social activity interactions: The role of social networks in time and space. <i>Tijdschrift voor Economische en Sociale Geografie</i> , 99 (5), 562-583.
*SM	Carty, V. (2010). New information communication technologies and grassroots mobilization. <i>Information, Communication and Society</i> , 13(2): 155-173.
*BNW, *SM	Caverlee, J. (2010, December). <i>Toward web-scale geo-semantic crowd discovery</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting, University of California, Santa Barbara.
*BNW	Chandler, Alfred D., Jr., & Cortada, J. W. (Eds.). (2000). <i>A nation transformed by information: How information has shaped the United States from colonial times to the present</i> . New York: Oxford.
*MG	Chau, M., & Xu, J. (2007). Mining communities and their relationships in blogs: A study of online hate groups. <i>International Journal of Human-Computer Studies</i> , 65, 57-70. doi:10.1016/j.ijhcs.2006.08.009
*SM, *SN	Chau, M., & Xu, J. (2008). Using web mining and social network analysis to study the emergence of cyber communities in blogs. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 473-494). New York, NY: Springer.
*TM	Chen, H., Chung, W, Qin, J., Reid, E., Sageman, M., & Weimann, G. (2008, April). Uncovering the dark web: A case study of Jihad on the web. <i>Journal of the American Society for Information Science and Technology</i> , 59, 1347-1359. DOI: 10.1002/asi.20838
*TM	Chen, H., Qin, J., Reid, E., Zhou, Y., & Sageman, M. (2008). Case study of jihad on the web: A web mining approach. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 221-236). New York, NY: Springer.
*TM	Chen, H., Reid, E., Sinai, J., Silke, A., & Ganor, B. (Eds.). (2008). <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> . New York, NY: Springer.
*BNW, *SN	Chen, Jie, Shaw, Shih-Lung, Yu, Hongbo, Lu, Feng, Chai, Yanwei, & Jia, Qinglei. (2011). Exploratory data analysis of activity diary data: A space-time GIS approach. <i>Journal of Transport Geography</i> , 19, 394-404.
*MT	Cherry, C. (1957). <i>On human communication: A review, a survey, and a criticism</i> . New York, NY: M.I.T. and John Wiley & Sons.
*CC	Choi, J. (2012, May). <i>The competition between frames and counterframes in the U.S. media's social construction of global warming</i> . Paper presented at the International Communication Association, Phoenix, AZ.
*FT	Chong, D., & Druckman, J. N. (2007). Framing theory. <i>Annual Review of Political Science</i> , 10, 103-126.
*MT	Chow, S.L. (1992). Acceptance of a theory: Justification or rhetoric? <i>Journal for the Theory of Social Behaviour</i> , 22, 447-474.
*DV	Chute, C. G. (2008). Biosurveillance, classification, and semantic health technologies. <i>Journal of the American Medical Informatics Association</i> , 15,

	172-173.
*DV	Collier, N., Doan, S., Kawazoe, A., Goodwin, R. M., Conway, M., Tateno, Y., Ngo, Q-H., Dien, D., Kawtrakul, A., Takeuchi, K., Shigematsu, M., & Taniguchi, K. (2008). BioCaster: Detecting public health rumors, with a web-based text mining system. <i>Bioinformatics</i> , 15;24(24), 2940-2941.
*DV	Collier, N., Kawazoe, A., Jin, L., Shigematsu, M., Dien, D., Barrero, R. A., Takeuchi, K., & Kawtrakul, A. (2006). A multilingual ontology for infectious disease surveillance: Rationale, design and challenges. <i>Language Resources &amp; Evaluation</i> , 40, 405-413.
*SM	Comfort, L. K. (2010, December). <i>Social network interaction among nested sets in dynamic contexts: Disaster operations as a laboratory for social change</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting, University of California, Santa Barbara.
*DI	Compeau, Deborah R., Meisher, Darren B., & Higgins, Christopher A. (2007). From prediction to explanation: Reconceptualizing and extending the perceived characteristics of innovating. <i>Journal of the Association for Information Systems</i> , 8(8), 409-439.
*CC	Corbett, J. B., & Durfee, J. L. (2004). Testing public (un)certainly of science: Media representations of global warming. <i>Science Communication</i> , 26, 129-151.
*MT, *DI, *SIT	Corman, Stephen R., Kuhn, T, McPhee, Robert D., & Dooley, KJ (2002). Studying complex discursive systems: Centering resonance analysis of communication. <i>Human Communication Research</i> , 28(2), 157-206.
*SM	Cottle, S (2011) Media and the Arab uprisings of 2011: Research notes. <i>Journalism</i> , 12(5): 647-659.
*SN, *BNW	Crandall, David J., Backstrom, Lars, Cosley, Dan, Suri, Siddharth, Huttenlocher, Daniel & Kleinberg, Jon. (2010) Inferring social ties from geographic coincidences. <i>Proceedings of the National Academy of Sciences</i> , 107(52): 22436-22441.
*MT, *SN, *SIT	Cupples, J. (2010, December). <i>Relational ontologies, power relations and media convergence</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting, University of California, Santa Barbara.
*SA	Dagan, I, Lee, L and Pereira, FCN (1999) Similarity-based models of word co-occurrence probabilities. <i>Machine Learning</i> , 34, 43-69.
*SM	Daoudi, Anissa. (2011). Globalization, computer-mediated communications and the rise of e-Arabic. <i>Middle East Journal of Culture and Communication</i> , 4, 146-163.
*DV, *DR	de Hoog, N., Stroebe, W., & de Wit, J. B. F. (2007). The impact of vulnerability to and severity of a health risk on processing and acceptance of fear-arousing communications: A meta-analysis. <i>Review of General Psychology</i> , 11, 258-285.
*SIT	Denissen, J. J. A., Penke, L., Schmitt, D. P., & van Aken, M. A. G. (2008). Self-esteem reactions to social interactions: Evidence for sociometer mechanisms across days, people, and nations. <i>Journal of Personality and Social Psychology</i> , 95, 181-196.

*SM	Diani, M. (2000). Social movement networks: Virtual and real. <i>Information, Communication and Society</i> , 3(3): 386-401.
*BNW	Dienes, I. (2012). A meta study of 26 “how much information” studies: Sine qua nonns and solutions. <i>International Journal of Communication</i> , 6, 874-906.
*SN, *BNW	Dodds, Peter Sheridan, Muhamad, Roby & Watts, Duncan J. (2003) An experimental study of search in global social networks. <i>Science</i> , 301(5634), 827-829.
*SIT,	Douglas, K. M., & McGarty, C. (2001). Identifiability and self-presentation: Computer-mediated communication and intergroup interaction. <i>British Journal of Social Psychology</i> , 40, 399-416.
*MG	Douglas, K. M., McGarty, C., Bliuc, A-M., & Lala, G. (2005). Understanding cyberhate: Social competition and social creativity in online White supremacist groups. <i>Social Science Computer Review</i> , 23, 68-76.
*SM	Downing, J (2008) Social movement theories and alternative media: An evaluation and critique. <i>Communication, Culture and Critique</i> , 1(1), 40-50.
*BNW, *DI	Duncan, S. S. (1974). The isolation of scientific discovery: Indifference and resistance to a new idea. <i>Science Studies</i> , 4 (2), 109-134.
*MT	e Cunha, Miguel Pina, & Rego, Arménio. (2010). Complexity, simplicity, simplicity. <i>European Management Journal</i> , 28, 85-94.
*SM	Earl, J. (2010). The dynamics of protest-related diffusion on the web. <i>Information, Communication and Society</i> , 13(2): 209-225.
*SM	Earl, J., & Kimport, K. (2008). The targets of online protest: State and private targets of four online protest tactics. <i>Information, Communication &amp; Society</i> , 11, 449-472.
*DI, *SM	Elkink, Johan A. (2011). The international diffusion of democracy. <i>Comparative Political Studies</i> , 44(12), 1651-1674.
*TM	Ellis, J. O., III. (2008). Countering terrorism with knowledge. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 141-156). New York, NY: Springer.
*SM	El-Mahdi, R (2009) Enough! Egypt’s quest for democracy. <i>Comparative Political Studies</i> , 42(8): 1011-1039.
*CC	Elmer, G. (2006). Mapping the cyber-stakeholders: U.S. Energy policy on the web. <i>Communication Review</i> , 9, 297-320.
*TM	Elovici, Y., Shapira, B., Last, M., Zaafrany, O., Friedman, M., Schneider, M., & Kandel, A. (2008). Content-based detection of terrorists browsing the web using an advanced terror detection system (ATDS). In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 365-384). New York, NY: Springer.
*SM	Elson, Sara Beth, Yeung, Douglas, Roshan, Parisa, Bohandy, S. R., & Nader, Alireza. (2012). <i>Using social media to gauge Iranian public opinion and mood after the 2009 election</i> . Santa Monica, CA: Rand/National Security Research Division.
*SN,	Erickson, Ingrid. (2010) Geography and community: New forms of interaction

*BNW	among people and places. <i>American Behavioral Scientist</i> , 53(8), 1194-1207.
*SM	Etling, B., Kelly, J., Faris, R., & Palfrey, J. (2010). Mapping the Arabic blogosphere: Politics and dissent online. <i>New Media and Society</i> , 12(8), 1225-1243.
*TM	Fienberg, S. E. (2008). Homeland insecurity: Data mining, privacy, disclosure, limitation, and the hunt for terrorists. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 197-220). New York, NY: Springer.
*SA	Figueiredo, Fábio, Rocha, Leonardo, Couto, Thierson, Salles, Thiago, Gonçalves, Marcos André, & Meira, Wagner, Jr. (2011). Word co-occurrence features for text classification. <i>Information Systems</i> , 36, 843-858.
*TM	Fischer, Peter, Fischer, Julia K., Weisweiler, Silke, & Frey, Dieter. (2010). Terrorism as collective communication: The collective communication model of terrorism (CCMT). <i>Social and Personality Psychology Compass</i> , 4, 692-703.
*SIT	Fiske, S.T. & Yamamoto, M. (2005). Coping with rejection: Core social motives across cultures. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), <i>The social outcast: Ostracism, social exclusion, rejection, and bullying</i> (pp. 185-198). New York, NY, US: Psychology Press.
*DI, *SN, *SIT	Flache, A., & Macy, M. W. (2011). Local convergence and global diversity: From interpersonal to social influence. <i>Journal of Conflict Resolution</i> , 55(6), 970-995.
*MT, *SIT	Fontaine, J. R. J., Poortinga, Y. H., Delbecke, L., & Schwartz, S. H. (2008). Structural equivalence of the values domain across cultures: Distinguishing sampling fluctuations from meaningful variation. <i>Journal of Cross-Cultural Psychology</i> , 39, 345-365.
*BNW, *SA	Fortunati, Leopold. (2009). Old and new media, old emotion. In L. Fortunati & J. Vincent (Eds.), <i>Electronic emotion: The mediation of emotion via information and communication technologies</i> (pp. 35-62). Bern, Switzerland: Peter Lang.
*CC	Foust, C. R., Bradley, S., Ben-Hamoo, S., & Polonitza, B. (2012, Feb). <i>The relationship between political ideology and climate change: An exploratory survey and analysis</i> . Paper presented at the Western States Communication Association Conference, Albuquerque, NM.
*MG	Freilich, J. D., & Pridemore, W. A. (2005). A reassessment of state-level covariates of militia groups. <i>Behavioral Sciences and the Law</i> , 23, 527-546.
*SM	Gaertner, L., & Iuzzini, J. (2005). Rejection and entitativity: A synergistic model of mass violence. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), <i>The social outcast: Ostracism, social exclusion, rejection, and bullying</i> (pp. 307-320). New York, NY, US: Psychology Press.
*MT, *BNW	Gale, Stephen. (1972) Some formal properties of Hägerstrand's model of spatial interactions. <i>Journal of Regional Science</i> , 12(2), 199-217.
*SA	Galitsky, B, de la Rosa, J-L. and Kovalerchuk, B (2011) Discovering common outcomes of agents' communicative actions in various domains. <i>Knowledge-Based Systems</i> , 24(2), 210-229.
*SA	Galitsky, B. (2006). Reasoning about attitudes of complaining customers.

	<i>Knowledge-Based Systems, 19, 592-615.</i>
*SA	Galitsky, B. A., & Kuznetsov, S. O. (2008). Learning communicative actions of conflicting human agents. <i>Journal of Experimental &amp; Theoretical Artificial Intelligence, 20, 277-317.</i>
*MT	Gandy, Oscar H., Jr. (1993). <i>The panoptic sort: A political economy of personal information.</i> Boulder, CO: Westview.
*MG, *SA	Gawron, J. M., Gupta, D., Stephens, K., Tsou, M-H., Spitzberg, B. H., & Li, A. (2012, June). <i>Using group membership markers for group identification in web texts.</i> Paper presented at the Sixth International AAAI Conference on Weblogs and Social Media Conference, Dublin, Ireland.
*SIT	Geer, J., & MacDonald, G. (2010). An update of the empirical case for the need to belong. <i>Journal of Individual Psychology, 66, 93-115.</i>
*SM	Gerodimos, Roman. (2012). Online youth civic attitudes and the limits of civic consumerism: The emerging challenge to the internet's democratic potential. <i>Information, Communication &amp; Society, 15, 217-245.</i>
*MG	Gerstenfeld, P. B., Grant, D. R., & Chiang, C-P. (2003). Hate online: A content analysis of extremist internet sites. <i>Analyses of Social Issues and Public Policy, 3, 29-44.</i>
*DV	Ghersetti, M., & Odén, T. A. (2011). Top marks: How the media got Swedes to vaccinate against swine flu. <i>Observatorio (OBS*) Journal, 5(2), 111-134.</i>
*MT	Gilman, D. (1992). What's a theory to do...with seeing? or some empirical considerations for observation and theory. <i>British Journal for the Philosophy of Science, 43, 287-309.</i>
*MT, *BNW	Gleick, James. (2011). <i>The information.</i> New York: Pantheon.
*FT	Goffman, E. (1974). <i>Frame analysis: An essay on the organization of experience.</i> Cambridge, MA: Harvard University Press.
*SM, *SN	Goldstone, Robert L., & Janssen, Marco A. (2005). Computational models of collective action. <i>Trends in Cognitive Sciences, 9, 424-430.</i>
*ANT	Gonçalves, Fernando Abreu, & Figueiredo, José. (2009). Organising competences: Actor-network theory in virtual settings. <i>International Journal of Networking and Virtual Organizations, 6, 22-35.</i>
*BNW	González, Marta C., Hidalgo, César A., & Barabási, Albert-László. (2008). Understanding individual human mobility patterns. <i>Nature, 453, 779-782.</i>
*SA, *EM	González-Bailón, Sandra, Banchs, Rafael E., & Kaltenbrunner, Andreas. (2012). Emotions, public opinion, and U.S. presidential approval rates: A5-year analysis of online political discussions. <i>Human Communication Research, 38, 121-143.</i>
*MT, *SN	Granovetter, Mark S. (1973) The strength of weak ties. <i>American Journal of Sociology, 78(6), 1360-1380.</i>
*SM, *SIT	Grant, Peter R. (2008). The protest intentions of skilled immigrants with credentialing problems: A test of a model integrating relative deprivation theory with social identity theory. <i>British Journal of Social Psychology, 47,</i>

	687-705.
*DI	Greenhalgh, T, Robert, G, Macfarlane, F, Bate, P, Kyriakidou, O and Peacock, R (2005) Storylines of research in diffusion of innovation: A meta-narrative approach to systematic review. <i>Social Science and Medicine</i> , 61(2), 417-430.
*SA	Grefenstette, G (1994) <i>Explorations in automatic thesaurus discovery</i> . New York, NY: Springer.
*SA, *DI	Guo, Shesen, Zhang, Ganzhou, & Zhai, Run. (2010). A potential way of enquiry into human curiosity. <i>British Journal of Educational Technology</i> , 41, E48-E52.
*TM, *SIT	Gupta, Dipak K. (2001) <i>Path to Collective Madness: A Study In Social Order and Political Pathology</i> . Westport, CT: Praeger.
*TM, *SM, *SIT	Gupta, DK (2008) <i>Understanding Terrorism and Political Violence: The Life Cycle of Birth, Growth, Transformation and Demise</i> . New York: Routledge.
*MT, *BNW	Hägerstrand, Torsten. (1966) Aspects of the spatial structure of social communication and the diffusion of information. <i>Papers in Regional Science</i> , 16(1), 27-42.
*MT, *BNW, *DI	Hägerstrand, Torsten. (1967). <i>Innovation diffusion as a spatial process</i> . Chicago: University of Chicago.
*MT, *BNW	Hägerstrand, Torsten. (1970) What about people in regional science? <i>Papers in Regional Science</i> , 24(1), 7-24.
*SM	Hahn, Dan F., & Gonchar, R. M. (1980). Social movement theory: A dead end. <i>Communication Quarterly</i> , 28, 60-64.
*BNW	Hand, D. J. (2000). Data mining: New challenges for statisticians. <i>Social Science Computer Review</i> , 18(4), 442.
*SM, *SN	Harlow, Summer, & Harp, Dustin. (2012). Collective action on the web: A cross-cultural study of social networking sites and online and offline activism in the United States and Latin America. <i>Information, Communication &amp; Society</i> , 15, 196-216.
*TM	Harrison, SJ, Todd, Z and Lawton, R (2008) Talk about terrorism and the media: Communicating with the conduit metaphor. <i>Communication, Culture and Critique</i> , 1(4), 378-395.
*SIT	Hewstone, M. (1993). Models of crossed categorization and intergroup relations. <i>Journal of Personality and Social Psychology</i> , 64, 779-793.
*CC	Hmielowski, J. D., Feldman, L. M., Meyers, T., & Leiserowitz, A. (2012, May). <i>An attack on science?: Media use, trust in scientists, and perceptions about global warming</i> . Paper presented at the International Communication Association, Phoenix, AZ.
*BNW	Ho, Y., Chung, Y., & Lau, K. (2010). Unfolding large-scale marketing data. <i>International Journal Of Research In Marketing</i> , doi:10.1016/j.ijresmar.2009.12.009
*SM, *TM	Hoffman, D. (2005). Violent events as narrative blocs: The disarmament at Bo, Sierra Leone. <i>Anthropological Quarterly</i> , 78, 329-353.

*SIT	Hogg, Michael A., Terry, Deborah J., & White, Katherine M. (1995). A tale of two theories: A critical comparison of identity theory with social identity theory. <i>Social Psychology Quarterly</i> , 58, 255-269.
*BNW	Hong, Seoyoung, & Kim, Jinwoo. (2004). Architectural criteria for website evaluation – conceptual framework and empirical validation. <i>Behaviour &amp; Information Technology</i> , 23, 337-357.
*SM	Howard, Philip N., & Hussain, Muzammil M. (2011) The upheavals in Egypt and Tunisia: The role of digital media. <i>Journal of Democracy</i> , 22(3): 35-48.
*TM	Hu, X., Zhang, X., Wu, D., Zhou, X., & Rumm, P. (2008). Text mining the biomedical literature for identification of potential virus/bacterium as bio-terrorism weapons. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 385-406). New York, NY: Springer.
*BNW, *MT	Huang, Chun-Yao, & Chen, Hau-Ning. (2010). Global digital divide: A dynamic analysis based on the Bass model. <i>Journal of Public Policy &amp; Marketing</i> , 29(2), 248-264.
*SIT	Hunt, S. A., & Benford, R. D. (2004). Collective identity, solidarity, and commitment. In D. A. Snow, S. A. Soule, & H. Kriesi (Eds.), <i>The Blackwell companion to social movements</i> (pp. 433-457). Malden, MA: Blackwell.
*DI	Hurt, H. Thomas, Joseph, Katherine, & Cook, Chester D. (1977). Scales for the measurement of innovativeness. <i>Human Communication Research</i> , 4, 58-65.
*SM	Hwang, Hyunseo, Schmierbach, M., Paek, Hye-Jin, Zuniga, de Homero Gil, & Shah, Dhavan. (2006). Media dissociation, internet use, and antiwar political participation: A case study of political dissent and action against the war in Iraq. <i>Mass Communication &amp; Society</i> , 9(4), 461-483.
*BNW	Internet World Stats. (2011) Internet usage in the Middle East. <a href="http://www.internetworldstats.com/stats5.htm">http://www.internetworldstats.com/stats5.htm</a> . Retrieved July 4, 2011.
*TM	Jarvis, Peter A., Lunt, Teresa F., & Myers, Karen L. (2004). Identifying terrorist activity with AI plan recognition technology. <i>Proceedings of the AAIA</i> (pp. 858-863). Menlo Park: AAAI Press.
*SM	Jensen, RJ (2006) Analyzing social movement rhetoric. <i>Rhetoric Review</i> , 25(4), 372-375.
*BNW	Johnson, B. D., Dunlap, E., & Benoit, E. (2010). Organizing “mountains of words” for data analysis, both qualitative and quantitative. <i>Substance Use &amp; Misuse</i> , 45(5), 648-670. doi:10.3109/10826081003594757
*BNW, *SN, *SM, *DR	Johnson, David, Zagorecki, Adam, Gelman, Joshua M., & Comfort, Louise K. (2011). Improved situational awareness in emergence management through automated data analysis and modeling. <i>Journal of Homeland Security and Emergency Management</i> , 8, doi: 10.2202/1547-7355.1873.
*MT	Johnson, Genevieve Marie, & Kulpa, Anastasia. (2007). Dimensions of online behavior: Toward a user typology. <i>CyberPsychology &amp; Behavior</i> , 10, 773-779.
*BNW, *MT	Jones, Quenton, Grandhi, Sukeshini A., Karam, Samer, Whittaker, Steve, Zhou, Changqing & Terveen, Loren. (2007) Geographic ‘place’ and ‘community

	information' preferences. <i>Computer Supported Cooperative Work</i> , 17(2-3), 137-167.
*MT	Kajtazi, Miranda, & Haftor, Darek M. (2011). Exploring the notion of information: A proposal for a multifaceted understanding. <i>TripleC</i> , 9, 305-315.
*MT	Kast, Fremont E., & Rosenzweig, James E. (1972). General systems theory: Applications for organization and management. <i>Academy of Management Theory</i> , 15, 447-465.
*SN, *DI	Kempe, D., Kleinberg, J., & Tardos, É. (2003, August). <i>Maximizing the spread of influence through a social network</i> . Proceedings of the 9th ACM Special Interest Group on Knowledge Discovery and Data Mining International Conference on Knowledge Discovery and Data Mining, Washington, DC.
*SN, *MT	Kennedy, J and Weimann, G (2011) The strength of weak ties. <i>Terrorism and Political Violence</i> , 23(2), 201-212.
	Kenny, D. A., & Ledermann, T. (2010). Detecting, measuring, and testing dyadic patterns in the actor-partner interdependence model. <i>Journal of Family Psychology</i> , 24(3), 359-366.
	Kim, T., McFee, E., Olguin, D. O., Waber, B., & Pentland, A. S. (2012). Sociometric badges: Using senso technology to capture new forms of collaboration. <i>Journal of Organizational Behavior</i> , 33, 412-427.
*MT	Kock, N. (2009). Information systems theorizing based on evolutionary psychology: An interdisciplinary review and theory integration framework. <i>MIS Quarterly</i> , 33, 395-418.
*SIT	Korte, Russell F. (2006). A review of social identity theory with implications for training and development. <i>Journal of European Industrial Training</i> , 31, 166-130.
*DI, *SN, *SIT	Kozinets, RV, de Valck, K, Wojnicki, AC and Wilner, SJS (2010) Networked narratives: Understanding word-of-mouth marketing in online communities. <i>Journal of Marketing</i> , 74(2), 71-89.
*SN, *DI	Kumar, Ravi, Novak, Jasmine, & Tomkins, Andrew. (2010). Structure and evolution of online social networks. In P. S. Yu, J. Han, & C. Faloutsos (Eds.), <i>Link mining: Models, algorithms, and applications</i> (337-357). New York, NY: Springer Science+Business Media.
*SM	Kuran, T (1989) Sparks and prairie fires: A theory of unanticipated political revolution. <i>Public Choice</i> , 61(1), 41-74.
*SM	Kuran, T (1995) The inevitability of future revolutionary surprises. <i>American Journal of Sociology</i> , 100(6), 1528-1551.
*SM	Kurzman, C. (2004). Can understanding undermine explanation? The confused experience of revolution. <i>Philosophy of the Social Sciences</i> , 34(3), 328-351.
*SM	Ladhani, N. (2011, Winter). Occupy social media. <i>Social Policy</i> , 83. Available: <a href="http://www.socialpolicy.org/index.php/component/content/article/4-latest-issue/503-occupy-social-media">http://www.socialpolicy.org/index.php/component/content/article/4-latest-issue/503-occupy-social-media</a>
*CC	Lassen, Inger, Horsbøl, Anders, Bonnen, Kersten, & Pedersen, Anne Grethe Julius. (2011). Climate change discourses and citizen participation: A case study of

	the discursive construction of citizenship in two public events. <i>Environmental Communication</i> , 5, 411-427.
	Latour, Bruno. (1986). The powers of association. In J. Law (Ed.), <i>Power, action and belief: A new sociology of knowledge</i> (Sociological Review Monograph 32, pp. 264-280). London: Routledge & Kegan Paul.
*ANT	Law, John. (1992). Notes on the theory of the actor-network: Ordering, strategy, and heterogeneity. <i>Systems Practice</i> , 5, 379-393.
*BNW	Lazer, David, Pentland, Alex, Adamic, Lada, Aral, Sinan, Barabási, Albert-László, et al. (2009). Computational social science. <i>Science</i> , 323, 721-723.
*SIT, *SM	Leary, M. R., & Cox, C. B. (2008). Belongingness motivation: A mainspring of social action. In J. Y. Shah & W. L. Gardner (Eds.), <i>Handbook of motivation science</i> (pp. 27-40). New York, NY: Guilford.
*SA	Lee, L (1997) <i>Similarity-Based Approaches to Natural Language Processing</i> . PhD thesis, Harvard University.
*SA, *SN, *MT	Lee, L (1999, June) Measures of distributional similarity. In <i>Proceedings of the 37th Annual Meeting of the Association for Computational Linguistics on Computational Linguistics</i> . San Francisco: Morgan Kaufmann, pp. 25-32.
*DI, *SM, *SN	Lee, R., Wakamiya, S., & Sumiya, K. (2011). Discovery of unusual regional social activities using geo-tagged microblogs. <i>World Wide Web</i> , 14, 321-349.
*SA, *SN, *MT	Lee, S, Kim, JH and Rosen, D (2009) A semantic network and categorical content analysis of internet and online media research. <i>The Open Communication Journal</i> , 3, 15-28.
*SA, *BNW	Leetaru, Kalev Hannes. (2012). <i>Data mining methods for the content analyst: An introduction to the computational analysis of content</i> . New York, NY: Routledge.
*SM	Leets, L., & Bowers, P. J. (1999). Loud and angry voices: The insidious influence. <i>Communication Monographs</i> , 66, 325-340.
*SN	Lewis, Kevin, Gonzalez, Marco, & Kaufman, Jason. (2011). Social selection and peer influence in an online social network. <i>PNAS Early Edition</i> . Available: <a href="http://www.pnas.org/cgi/doi/10.1073/pnas.1109739109">www.pnas.org/cgi/doi/10.1073/pnas.1109739109</a> .
*MT	Lewis, Kevin, Kaufman, Jason, & Christakis, Nicholas. (2008). The taste for privacy: An analysis of college student privacy settings in an online network. <i>Journal of Computer-Mediated Communication</i> , 14, 79-100.
*SN, *MT	Lewis, Ted. (2009). <i>Network science: Theory and applications</i> . New York: Wiley.
*SA,	Li, Nan & Wu, Desheng Dash. (2010) Using text mining and sentiment analysis for online forums hotspot detection and forecast. <i>Decision Support Systems</i> , 48(2), 354-368.
*SA	Li, W (1992) Random texts exhibit Zipf's-law-like word frequency distribution. <i>IEEE Transactions on Information Theory</i> , 38: 1842-1845.
*CC	Li, Z. (2007). Media performance and global policy making: A comparative study of press coverage on global warming. Unpublished dissertation, University of

	Pennsylvania.
*SA, *SN	Lin, D (1998a, July) An information-theoretic definition of similarity. In <i>Proceedings of the Fifteenth International Conference on Machine Learning</i> . San Francisco: Morgan Kaufmann, pp. 296–304.
*SA	Lin, D (1998b) Automatic retrieval and clustering of similar words. In <i>ACL '98 proceedings of the 36th annual meeting of the Association for Computational Linguistics and 17th international conference on computational linguistics</i> (Vol. 2). Stroudsburg, PA: Association for Computational Linguistics, , pp. 768–774.
*SM, *SN, *SIT	Little, Miles, Jordens, Christopher F. C., & Sayers, Emma-Jane. (2003). Discourse communities and the discourse of experience. <i>Health: An interdisciplinary Journal for the Social Study of Health, Illness and Medicine</i> , 7(1), 73-86.
*SM	Luck, T (2011, August 4) With Arab Spring in full bloom, Jordan’s jihadists look to turn new leaf. <i>Jordan Times</i> online. Retrieved August 7, 2011; <a href="http://www.jordantimes.com/?news=40119">http://www.jordantimes.com/?news=40119</a>
*DI	Lundblad, JP (2003) A review and critique of Rogers’ diffusion of innovation theory as it applies to organizations. <i>Organization Development Journal</i> , 21(4), 50-64.
*ANT	Luoma-Aho, Vilma, & Paloviita, Ari. (2010). Actor-networking stakeholder theory for today’s corporate communications. <i>Corporate Communications: An International Journal</i> , 15, 49-67.
*DV	Madan, A., Cebrian, M., Lazer, D., & Pentland, A. (2020). Social sensing for epidemiological behavior change. <i>UbiComp</i> , 10, 291-300. ACM 978-1-60558-843-8/10/09
*BNW	Manson, SM (1981) Land use in the southern Yucatán peninsular region of Mexico: Scenarios of population and institutional change. <i>Computers, Environment and Urban Systems</i> , 30, 230-253.
*SM, *DI	Marquette, J.F. (1981). A logistic diffusion model of political mobilization. <i>Political Behavior</i> , 3, 7-30.
*SM	Massaro, Vanessa A., & Mullaney, Emma Gaalaas. (2011). The war on teenage terrorists. <i>City</i> , 15 (5), 591-604.
*SN	Matsumura, N., & Sasaki, Y. (2007). Human influence network for understanding leadership behavior. <i>International Journal of Knowledge-based and Intelligent Engineering Systems</i> , 11, 291-300.
*SN, *SM	McAdam, D. (2003). Beyond structural analysis: Toward a more dynamic understanding of social movements. In M. Diani & D. McAdam (Eds.), <i>Social movements and networks: Relational approaches to collective action</i> (pp. 281-298). New York, NY: Oxford.
*CC	McComas, K., & Shanahan, J. (1999). Telling stories about global climate change: Measuring the impact of narratives on issue cycles. <i>Communication Research</i> , 26, 30-57.
*SIT, *SN	McFarland, Daniel, & Pals, Heili. (2005). Motives and contexts of identity change: A case for network effects. <i>Social Psychology Quarterly</i> , 68, 289-315.

*BNW	McKenna, K. Y. A., & Bargh, J. A. (2000). Plan 9 from cyberspace: The implications of the internet for personality and social psychology. <i>Personality and Social Psychology Review</i> , 4(1), 47-75.
*DI	Meade, N., & Islam, T. (2006) Modeling and forecasting the diffusion of innovation – A 25-year review. <i>International Journal of Forecasting</i> , 22, 519-525. doi:10.1016/j.ijforecast.2006.01.005
*BNW, *SN	Meeks, WL and Dasgupta, S (2004) Geospatial information utility: An estimation of the relevance of geospatial information to users. <i>Decision Support Systems</i> , 38, 47-63. DOI: 10.116/S0167-9236(03)000076-9
*SM	Meyer, DS (2004) Protest and political opportunities. <i>Annual Review of Sociology</i> , 30, 125-145. DOI: 10.1146/annurev.soc.30.012703.110545
*SM	Mische, A. (2003). Cross-talk in movements: Reconceiving the culture-network link. In M. Diani & D. McAdam (Eds.), <i>Social movements and networks: Relational approaches to collective action</i> (pp. 258-280). New York, NY: Oxford.
*SM	Mitchell, GR (2004) Public argument action research and the learning curve of new social movements. <i>Argumentation and Advocacy</i> , 40, 209-225.
*SN	Monge, PR and Contractor, NS (1998) Emergence of communication networks. In FM Jablin and LL Putnam (eds), <i>Handbook of organizational communication</i> (2 <sup>nd</sup> ed., pp. 440-502) Thousand Oaks, CA: Sage.
*DR	Monmonier, M. (1997). <i>Cartographies of danger: Mapping hazards in America</i> . Chicago: University of Chicago.
*SM	Morozov, E (2011) Technology's role in revolution: Internet freedom and political oppression. <i>The Futurist</i> , 45(4): 18-21.
*SIT	Mullen, B., Migdal, M. J., & Hewstone, M. (2001). Crossed categorization versus simple categorization and intergroup evaluations: A meta-analysis. <i>European Journal of Social Psychology</i> , 31, 721-736.
*SM	Murphy, Emma C. (2006) Agency and space: The political impact of information technologies in the Gulf Arab states. <i>Third World Quarterly</i> , 27, 1059-1083. DOI: 10.1080/01436590600850376
*CC	Myers, T., Nisbet, M. C., Maibach, E., & Leiserowitz, A. (2012, May). <i>Hope or anger? Framing and emotions in the climate change debate</i> . Paper presented at the International Communication Association, Phoenix, AZ.
*DV	Nan, X., & Madden, K. (in press). HPV vaccine information in the blogosphere: How positive and negative blogs influence vaccine-related risk perceptions, attitudes, and behavioral intentions. <i>Health Communication</i> .
*SA	Nebot, V., & Berlanga, R. (2012). Finding association rules in semantic web data. <i>Knowledge-Based Systems</i> , 25(1), 51-62. doi:10.1016/j.knosys.2011.05.009
*BNW	Neuman, W. R., Park, Y. J., & Panek, E. (2012). Tracking the flow of information into the home: Empirical assessment of the digital revolution in the United States, 1960-2005. <i>International Journal of Communication</i> , 6, 1022-1041.
*SN	Newman, M., Barabási, A.-L., & Watts, D. J. (Eds.). (2006). <i>The structure and dynamics of networks</i> . Princeton, NJ: Princeton University Press.

*BNW	Northedge, L (2011, March) First steps. <i>The World Today</i> , 67(3), 4-7.
*DI, *SM	Novemsky, Nathan, & Kahneman, Daniel. (2005). The boundaries of loss aversion. <i>Journal of Marketing Research</i> , 42(2), 119-128.
*MG	O'Brien, S. P., & Haider-Markel, D. P. (1998). Fueling the fire: Social and political correlates of citizen militia activity. <i>Social Science Quarterly</i> , 79, 456-465.
*SA	Ohsawa, Y, Soma, H and Matsuo, Y (2002, May) <i>Featuring web communities based on word co-occurrence structure of communications</i> . ACM, 11th International WWW Conference, Honolulu, HI.
	Olguín, D. O., Waber, B. N., Kim, T., Mohan, A., & Pentland, A. (2009). Sensible organizations: Technology and methodology for automatically measuring organizational behavior. <i>IEEE Transactions on Systems, Man, and Cybernetics—Part B: Cybernetics</i> , 39(1), 43-55.
*SM, *SN	Oliver, Pamela E., & Myers, Daniel J. (2003). Networks, diffusion, and cycles of collective action. In M. Diani & D. McAdam (Eds.), <i>Social movements and networks: Relational approaches to collective action</i> (pp. 173-205). New York, NY: Oxford.
*MT	Osgood, CE (1969) On the whys and wherefores of E, P, and A. <i>Journal of Personality and Social Psychology</i> , 12, 194-199.
*SN	Papacharissi, Z. (2009). The virtual geographies of social networks: A comparative analysis of Facebook, LinkedIn and ASmallWorld. <i>New Media and Society</i> , 11, 199-220.
*DI	Parr, D. A. (2008, June). <i>Innovation diffusion in geographic information science research</i> . Unpublished Masters Thesis, Texas State University—San Marcos, TX.
*ANT	Passoth, Jan-Hendrik., & Rowland, Nicholas J. (2010). Actor-network state: Integrating actor-network theory and state theory. <i>International Sociology</i> , 25, 818-841.
*SN	Passy, F. (2003). Social networks matter. But how? In M. Diani & D. McAdam (Eds.), <i>Social movements and networks: Relational approaches to collective action</i> (pp. 21-48). New York, NY: Oxford.
*MT	Pavitt, C. (2004). Theory-data interaction from the standpoint of scientific realism: A reaction to Bostrom. <i>Communication Monographs</i> , 71, 333-342.
*SA	Pennebaker, J. W., Mehl, M. R., & Niederhoffer, K. G. (2003). Psychological aspects of natural language use: Our words, our selves. <i>Annual Review of Psychology</i> , 54, 547-577.
	Pentland, A. S. (2012). The new science of building great teams. <i>Harvard Business Review</i> , 90(4), 60-70.
*SN	Perez, C., Birregah, B., Lemercier, M., Corpel, A., Laclemece, P., & Chatelet, E. (2010, December). <i>A new framework to define familiar strangers in online social networks: Spacio-temporal challenges</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting, University of California, Santa Barbara.
*SIT,	Petronio, S. (2002). <i>Boundaries of privacy: Dialectics of disclosure</i> . Albany, NY: State

*MT	University of New York Press.
*BNW, *SA	Petrović, Saša, Osborne, Miles, & Lavrenko, Victor. (2010). Streaming first story detection with application to Twitter. <i>Proceedings of the HLT '10 Human Language Technologies: The 2010 Annual Conference of the North American Chapter of the Association for Computational Linguistics</i> (pp. 181-189). Stroudsburg, PA: Association for Computational Linguistics.
*EM	Pew Research Center. (2012, April 23). <i>How the media covered the 2012 primary campaign</i> . Washington DC: Author. <a href="http://www.journalism.org/analysis_report/romney_report">http://www.journalism.org/analysis_report/romney_report</a>
*SN, *MT	Phillips, M., & Spitzberg, B. H. (in press). Social network surveillance and obsessive relational intrusion. In K. B. Wright & L. M. Webb (Eds.), <i>CMC in personal relationships</i> (pp. 344-367). New York, NY: Peter Lang.
*MT	Pierce, J. R. (1961). <i>Symbols, signals, and noise: The nature and process of communication</i> . New York, NY: Harper & Brothers.
*MG	Pitcavage, M. (2001). Camouflage and conspiracy: The militia movement from Ruby Ridge to Y2K. <i>American Behavioral Scientist</i> , 44, 957-981.
*SN, *SIT, *MT	Plickert, Gabriele, Côté, Rochelle R., & Wellman, Barry. (2007) It's not who you know, it's how you know them: Who exchanges what with whom? <i>Social Networks</i> , 29, 405-429.
*BNS, *MT	Pontius, RG, Jr., Boersma, W, Castella, J-C, Clarke, K, de Nijs, T, Dietzel, C, Duan, Z, Fotsing, E, Goldstein, N, Kok, K, Koomen, E, Lippitt, CD, McConnell, W, Mohd Sood, A, Pijanowski, B, Pithadia, S, Sweeney, S, Trung, TN, Veldkamp, AT and Verburg, PH (2008) Comparing the input, output, and validation maps for several models of land change. <i>The Annals of Regional Science</i> , 42, 11-47.
*BNS, *MT	Pontius, RG, Jr., Thontteh, O and Chen, H (2008) Components of information for multiple resolution comparison between maps that share a real variable. <i>Environmental and Ecological Statistics</i> , 15, 111-142.
*MT	Popper, K. (1980). Science: Conjectures and refutations. In E. D. Klemke, R. Hollinger, & A. D. Kline (Eds.), <i>Introductory readings in the philosophy of science</i> (pp. 19-34). Buffalo, NY: Prometheus.
*BNS, *MT	Porter, Constance Elise. (2004). A typology of virtual communities: A multi-disciplinary foundation for future research. <i>Journal of Computer-Mediated Communication</i> , 10. <a href="http://jcmc.indiana.edu/vol10/issue1/porter.html">http://jcmc.indiana.edu/vol10/issue1/porter.html</a>
*SM, *DI	Postmes, Tom, & Brunsting, S. (2002). Collective action in the age of the internet: Mass communication and online mobilization. <i>Social Science Computer Review</i> , 20 (3)290-301.
*ANT	Potts, Liza. (2009). Using actor network theory to trace and improve multimodal communication design. <i>Technical Communication Quarterly</i> , 18, 281-301.
*SN, *BNS	Potts, Liza, & Jones, Dave. (2011). Contextualizing experiences: Tracing the relationships between people and technologies in the social web. <i>Journal of Business and Technical Communication</i> , 25, 338-358.
*DR	Procopio, C. H., & Procopio, S. T. (2007). Do you know what it means to miss New Orleans? Internet communication, geographic community, and social capital

	in crisis. <i>Journal of Applied Communication Research</i> , 35, 67-87.
*TM	Qin, J, Zhou, Y, Reid, E, Lai, G and Chen, H (2007) Analyzing terror campaigns on the internet: Technical sophistication, content richness, and web interactivity. <i>International Journal of Human-Computer Studies</i> , 65, 71-84. doi:10.1016/j.ijhcs.2006.08.012
*TM, *MG	Qin, J., Zhou, Y., Reid, E., & Chen, H. (2008). Studying global extremist organizations' internet presence using the dark web attribute system: A three region comparison study. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 237-266). New York, NY: Springer.
*TM	Qin, J., Zhou, Y., Reid, E., Lai, G., & Chen, H. (2007). Analyzing terror campaigns on the internet: Technical sophistication, content richness, and web interactivity. <i>International Journal of Human-Computer Studies</i> , 65, 71-84. doi:10.1016/j.ijhcs.2006.08.012
*BNW, *SA, *SN	Rahwan, I, Sonenberg, L, Jennings, NR and McBurney, P (2007) Stratum: A methodology for designing heuristic agent negotiation strategies. <i>Applied Artificial Intelligence</i> , 21, 489-527. DOI: 10.1080/08839510701408971
*SN	Rainie, Lee, & Wellman, Barry. (2012). <i>Networked: The new social operating system</i> . Cambridge, MA: MIT Press.
*BNW	Ramakrishnan, N., & Grama, A. Y. (1999, August). Data mining: From serendipity to science. <i>Computer</i> , , 34-37.
*SM, *TM, *MG	Reid, E. F. (2011, June). <i>Discovering online radicalization narratives: Mapping the diffusion of ideas</i> . Workshop on Mapping Ideas: Discovery and Information Landscapes, San Diego, CA.
*SM, *TM	Reid, E. F., & Chen, H. (2007a). Internet-savvy U.S. and Middle Eastern extremist groups. <i>Mobilization: An International Quarterly Review</i> , 12, 177-192.
*TM	Reid, E. F., & Chen, H. (2007b). Mapping the contemporary terrorism research domain. <i>International Journal of Human-Computer Studies</i> , 65, 42-56. doi:10.1016/j.ijhcs.2006.08.006
*TM	Reid, E., & Chen, H. (2008). Domain mapping of contemporary terrorism research. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 3-26). New York, NY: Springer.
*SIT, *MT	Reid, Scott A., & Giles, Howard. (2005). Intergroup relations: Its linguistic and communicative parameters. <i>Group Processes &amp; Intergroup Relations</i> , 8 (3), 211-214. DOI: 10.1177/1368430205053938
	Reid, Scott A., Giles, Howard, & Abrams, Jessica R. (2004). A social identity model of media usage and effects. <i>Zeitschrift für Medienpsychologie</i> , 16 (N.F. 4) 1, 17-25.
*CC, *MT	Rentfrow, P. J. (2010). Statewide differences in personality: Toward a psychological geography of the United States. <i>American Psychologist</i> , 65(6), 548-558.
*CC,	Roessler, P, & Schultz, A. (2012, May). <i>The spiral of silence and the internet:</i>

*DI, *MT	<i>Selection of online content and the perception of the public.</i> Paper presented at the International Communication Association, Phoenix, AZ.
*DI	Rogers, Everett. M. (2003) <i>Diffusion of innovations</i> (5 <sup>th</sup> ed.). New York: Free Press.
*DI	Rogers, Everett. M., & Kincaid, D. L. (1981) <i>Communication networks: Toward a new paradigm for research.</i> New York: Free Press.
*SM	Rohlinger, D. A., & Brown, J. (2009). Democracy, action, and the internet after 9/11. <i>American Behavioral Scientist</i> , 53(1), 133-150.
*CC	Rolfe-Redding, J, Maibach, E., Feldman, L. M., & Leiserowitz, A. (2012, May). <i>Republicans and climate change: An audience analysis of predictors for belief and policy preferences.</i> Paper presented at the International Communication Association, Phoenix, AZ.
*CC	Russill, C. (2008). Tipping point forewarnings in climate change communication: Some implications of an emerging trend. <i>Environmental Communication</i> , 2, 133-153.
*BNW	Saldarini, Robert A., & DeRobertis, Eugene M. (2003). The impact of technology induced anonymity on communications and ethics: New challenges for IT pedagogy. <i>Journal of Information Technology Impact</i> , 3(1), 3-10.
*TM	Salem, A., Reid, E., & Chen, H. (2008). Content analysis of Jihadi extremist groups' videos. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 267-284). New York, NY: Springer.
*DR	Sattler, David N., Larpenteur, Katy, & Shipley, Gayle. (2011). Active shooter on campus: Evaluating text and e-mail warning message effectiveness. <i>Journal of Homeland Security and Emergency Management</i> , 8. Doi: 10.2202/1547-7355.1826.
*DR	Schafer, Wendy A., Ganoë, C. H., & Carroll, John M. (2007). Supporting community emergency management planning through geocollaboration software architecture. <i>Computer Supported Cooperative Work</i> , 16, 501-537.
*CC	Schuldt, J. P., Konrath, S. H., & Schwarz, N. (2011). "Global warming" or "climate change"? Whether the planet is warming depends on question wording. <i>Public Opinion Quarterly</i> , 75, 115-124.
*TM	Seib, P., & Janbek, D. M. (2011). <i>Global terrorism and new media: The post-Al Qaeda generation.</i> New York: Routledge.
*TM, *MG	Seo, Y-W., & Sycara, K. (2008). Addressing insider threat through cost-sensitive document classification. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 451-472). New York, NY: Springer.
*TM, *MG	Shahar, Y. (2008). Toward a target-specific-method of threat assessment. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 157-174). New York, NY: Springer.
*MT, *DI	Shannon, C. E., & Weaver, W. (1964). <i>The mathematical theory of communication.</i> Urbana, IL: University of Illinois Press.

*BNW, *MT	Shaw, Shih-Lung, Yu, Hongbo, & Bombom, Leonard S. (2008). A space-time GIS approach to exploring large individual-based spatiotemporal datasets. <i>Transactions in GIS</i> , 12(4), 425-441.
*BNW, *MT	Shaw, S-L and Yu, H (2009) A GIS-based time-geographic approach of studying individual activities and interactions in a hybrid physical-virtual space. <i>Journal of Transport Geography</i> , 17, 141-149.
*BNW, *SN, *MT	Shekhar, S., & Oliver, D. (2010, December). <i>Computational modeling of spatio-temporal social networks: A time-aggregated graph approach</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting, University of California, Santa Barbara.
*SIT, *SN	Shen, K. N., Yu, A. Y., & Khalifa, M. (2010). Knowledge contribution in virtual communities: Accounting for multiple dimensions of social presence through social identity. <i>Behavior &amp; Information Technology</i> , 29(4), 334-348.
**TM	Silke, A. (2008). Research on terrorism: A review of the impact of 9/11 and the global war on terrorism. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 27-50). New York, NY: Springer.
*TM	Sinai, J. (2008). Resolving a terrorist insurgency by addressing its root causes. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 101-114). New York, NY: Springer.
*SN	Singh, V. K., Gao, M., & Jain, R. (2010, October). <i>Social pixels: Genesis and evaluation</i> . Paper presented at the ACM Multimedia 2010 Conference (pp. 481-490), Firenze, IT.
*SA, *TM	Skillicorn, D. B. (2008). Individual and collective analysis of anomalies in message traffic. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 425-450). New York, NY: Springer.
*MG	Slone, Oscar, & Reinard, John. (2001, February). <i>Mapping the extent of the hate group network</i> . Paper presented at the Western States Communication Association, Coeur d'Alene, ID.
*CC	Smith, J. (2005). Dangerous news: Media decision making about climate change risk. <i>Risk Analysis</i> , 25, 1471-1482.
*DI	Smith, William. (2004). Ev Rogers: Helping to build a modern synthesis of social change. <i>Journal of Health Communication</i> , 9, 139-142.
*FT, *SA	Snow, D. A. (2004). Framing processes, ideology, and discursive fields. In D. A. Snow, S. A. Soule, & H. Kriesi (Eds.), <i>The Blackwell companion to social movements</i> (pp. 380-412). Malden, MA: Blackwell.
*SM, *SN	Snow, D. A., Soule, S. A., & Kriesi, H. (2004). Mapping the terrain. In D. A. Snow, S. A. Soule, & H. Kriesi (Eds.), <i>The Blackwell companion to social movements</i> (pp. 3-16). Malden, MA: Blackwell.
*BNW	Song, C, Qu, Z, Blumm, N and Barabási, A-L (2010) Limits of predictability in human mobility. <i>Science</i> , 327, 1018-1021. DOI: 10.1126/science.1177170

*DI	Song, Jaeki, & Zahedi Fatemeh "Mariam". (2005). A theoretical approach to web design in e-commerce: A belief reinforcement model. <i>Management Science</i> , 51, 1219-1235.
*DI, *SM	Soule, Sarah A. (2004). Diffusion processes within and across movements. In D. A. Snow, S. A. Soule, & H. Kriesi (Eds.), <i>The Blackwell companion to social movements</i> (pp. 294-310). Malden, MA: Blackwell.
*MT	Spitzberg, B. H. (2000). What is good communication? <i>Journal of the Association for Communication Administration</i> , 29, 103-119.
*MT	Spitzberg, B. H. (2006). Toward a theory of computer-mediated communication competence. <i>Journal of Computer-Mediated Communication</i> , 11, 629-666.
*MT	Spitzberg, B. H. (2009a). Axioms for a theory of intercultural communication competence [invited article, Japanese Association of Communication and English Teachers]. <i>Annual Review of English Learning and Teaching</i> , No.14, 69-81.
*MT	Spitzberg, B. H., Tsou, M-H., An, L., Gupta, D. K., & Gawron, J. M. (2012, May). <i>The map is not which territory?: Speculating on the geo-spatial diffusion of ideas in the Arab Spring of 2011</i> . Paper presented at the International Communication Association Conference, Phoenix, AZ.
*MT	Spitzberg, BH (2006) Toward a theory of computer-mediated communication competence. <i>Journal of Computer-Mediated Communication</i> , 11, 629-666.
*SM	Stein, L. (2009). Social movement web use in theory and practice: A content analysis of US movement websites. <i>New Media and Society</i> , 11(5): 749-771. DOI: 10.1177/1461444809105350
*MT	Stephens, KK (2011) The successive use of information and communication technologies at work. <i>Communication Theory</i> , 17, 486-507. DOI: 10.1111/j.1468-2885.2007.00308.x
*TM, *SN	Stohl, C and Stohl, M (2007) Networks of terror: Theoretical assumptions and pragmatic consequences. <i>Communication Theory</i> , 17, 93-124.
*TM	Stohl, M. (2008). Networks, terrorists and criminals: The implications for community policing. <i>Crime, Law and Social Change</i> , 50, 59-72.
*SM	Strodthoff, GG, Hawkins, RP and Schoenfeld, AC (1985) Media roles in a social movement: A model of ideology diffusion. <i>Journal of Communication</i> , 35, 134-153.
*SN	Subrahmanyam, K., Reich, S. M., Waechter, N., & Espinoza, G.. (2008). Online and offline social networks: Use of social networking sites by emerging adults. <i>Journal of Applied Developmental Psychology</i> , 29, 420-433.
*SN,	Suh, Bongwon, Hong, Lichan, Pirolli, Peter, & Chi, Ed. H. (2010). <i>Want to be retweeted? Large scale analytics on factors impacting retweet in Twitter network</i> . Second International IEEE International Conference on Social Computing, 177-184.
*SN, *BNW	Sui, D. (2010, December). <i>A geographic conceptual framework for understanding the spatio-temporal constraints on social networks</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting,

	University of California, Santa Barbara.
*TM	Sun, Z., Ee-Peng, L., Chang, K., Suryanto, M. A., & Gunaratna, R. K. (2008). Document selection for extracting entity and relationship instances of terrorist events. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 309-346). New York, NY: Springer.
*BNW, *SN	Takhteyev, Yuri, Gruzd, Anatoliy, & Wellman, Barry. (2011). <i>Geography of Twitter networks</i> . DOI: 10.1016/j.socnet.2011.05.006
*SM, *SN, *MT	Taleb, NN and Blyth, M (2011) The black swan of Cairo: How suppressing volatility makes the world less predictable and more dangerous. <i>Foreign Affairs</i> , 90(3): 33-39.
*SM	Taylor, V., & Van Dyke, N. (2004). "Get up, stand up": Tactical repertoires of social movements. In D. A. Snow, S. A. Soule, & H. Kriesi (Eds.), <i>The Blackwell companion to social movements</i> (pp. 262-293). Malden, MA: Blackwell.
*MT, *CC	Thatcher, Sherry M. B., & Patel, Pankaj, C. (2011). Demographic faultlines: A meta-analysis of the literature. <i>Journal of Applied Psychology</i> . Online: doi: 10.1037/a0024167
*SM	<i>The Economist</i> . (2011, July 16) 400 (8742): 47-49.
*BNW, *DI	Thompson, G. N., Estabrooks, C. A., & Degner, L. F. (2006). Clarifying the concepts in knowledge transfer: A literature review. <i>Journal of Advanced Nursing</i> , 53, 691-701.
*SN	Tillema, T, Dijst, M and Schwanen, T (2010) Face-to-face and electronic communications in maintaining social networks: The influence of geographical and relational distance and of information content. <i>New Media and Society</i> , 12, 965-983. DOI: 10.1177/1461444809353011
*TM	Trujillo, H. R., & Jackson, B. A. (2008). Identifying and exploiting group learning patterns for counterterrorism. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 175-196). New York, NY: Springer.
*MT, *SA	Tsou, M-H., An, L., Wandersee, S., Kim, I-H., Spitzberg, B. H., Gupta, D., Gawron, J. M., Smith, J., Lee, T-H. (2011). Mapping ideas from cyberspace to realspace: Visualizing hidden geospatial fingerprints on web information landscapes. <i>Annals of the Association of American Geographers</i> .
	Turner, J.H. (1985). In defense of positivism. <i>Sociological Theory</i> , 3, 24-30.
	Turner, J.H. (1990). The misuse and use of metatheory. <i>Sociological Forum</i> , 5, 37-53.
*SIT	Turner, John C., & Reynolds, Katherin J. (2001). The social identity perspective in intergroup relations: Theories, themes, and controversies. In R. Brown & S. L. Gaertner (Eds.), <i>Blackwell handbook of social psychology: Intergroup processes</i> (pp.133-152). Oxford, England: Blackwell.
*SA, *DV	Van den Broeck, W., Giannini, C., Gonçalves, B., Quaggiotto, M., Colizza, V., & Vespignani, A. (2011). The GLEaMviz computational tool, a publicly available software to explore realistic epidemic spreading scenarios at the global scale. <i>BMC Infectious Diseases</i> , 11, 3-14.

*DI, *MT	van den Hooff, B., Groot, J., & de Jonge, S. (2005). Situational influences on the use of communication technologies: A meta-analysis and exploratory study. <i>Journal of Business Communication</i> , 41, 4-27.
*SM	Van Laer, J. (2010). Activists online and offline: The internet as an information channel for protest demonstrations. <i>Mobilization: An International Journal</i> , 15, 347-366.
*SM	Van Laer, J., & Van Aelst, P. (2010). Internet and social movement action repertoires: Opportunities and limitations. <i>Information, Communication and Society</i> , 13, 1146-1171. DOI: 10.1080/1369118100368307
*TM, *MG	van Wilsem, Johan. (2011). Worlds tied together? Online and non-domestic routine activities and their impact on digital and traditional threat victimization. <i>European Journal of Criminology</i> , 8, 115-127.
*DV	Vaughan, L. (2010, December). <i>The promise and challenges of social media in public health and medicine</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting, University of California, Santa Barbara.
*DV	Vazquez-Prokopec, G. M., Stoddard, S. T., Paz-Soldan, V., Morrison, A. C., Elder, J. P., Kochel, T. J., Scott, T. W., & Kitron, U. (2010, December). <i>Using human movement data to derive dengue virus transmission networks</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting, University of California, Santa Barbara.
*SA	Vincent, J., & Forunati, L. (Eds.). (2009). <i>Electronic emotion: The mediation of emotion via information and communication technologies</i> . Oxford: Peter Lang.
*DI	Vishwanath, Arun, & Chen, Hao. (2011). Towards a comprehensive understanding of the innovation-decision process. <i>The diffusion of innovations: A communication science perspective</i> (pp. 9-32). New York, NY: Peter Lang.
*MT	von Bertalanffy, L. (1968). <i>General system theory: Foundations, development, applications</i> (Rev'd ed.). New York, NY: George Braziller.
*MT	von Bertalanffy, L. (1975). <i>Perspectives on general systems theory</i> . New York, NY: George Braziller.
*MT	Von Foerster, H. (Ed.). (1953). <i>Cybernetics: Circular causal and feedback mechanisms in biological and social systems</i> . New York, NY: Josiah Macy, Jr. Foundation.
*DV	Wallace, Lorraine S., & Ache, Kevin A. (2009). Hear all about it: Nightly television news coverage of cervical cancer vaccination in the United States. <i>Journal of Lower Genital Tract Disease</i> , 13, 154-158.
*MT, *SN	Walther, Joseph B. & Bazarova, Natalya N. (2008) Validation and application of electronic propinquity theory to computer-mediated communication in groups. <i>Communication Research</i> , 35, 622-645.
*SN, *MT	Watts, Duncan J. (2003). <i>Six degrees: The science of a connected age</i> . New York, NY: W. W. Norton.
*SN,	Watts, Duncan J. (2004) The "new" science of networks. <i>Annual Review of</i>

*MT	<i>Sociology</i> , 30, 243-270. DOI: 10.1146/annurev.soc.30.020404.104342
*SN, *MT	Watts, Duncan J., & Dodds, Peter S. (2007) Influentials, networks, and public opinion formation. <i>Journal of Consumer Research</i> , 34, 441-458.
*SN, *MT, *SIT	Watts, Duncan J., Dodds, Peter S., & Newman, M. E. J. (2002). Identity and search in social networks. <i>Science</i> , 296, 1302-1305.
*MG	Weeber, S. C., & Rodeheaver, D. G. (2003). Militias at the millennium: A test of Smelser's theory of collective behavior. <i>Sociological Quarterly</i> , 44, 181-204.
*MT	Weiner, N. (1948). <i>Cybernetics: Or control and communication in the animal and machine</i> . New York: John Wiley & Sons.
*DR	White, C. (2010, December). <i>Social media and meta-networks for crisis mapping: Collaboratively building spatial data for situation awareness in disaster response and recovery management</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting, University of California, Santa Barbara.
*MT	Wilden, A. (1980). <i>System and structure: Essays in communication and exchange</i> (2 <sup>nd</sup> ed.). New York, NY: Tavistock.
*DV, *MT	Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. <i>Health Education &amp; Behavior</i> , 27, 591-615.
*SN	Worboys, M. (2010, December). <i>Responsive social networks</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting, University of California, Santa Barbara.
*MG	Wright, S. A. (2009). Strategic framing of racial-nationalism in North America and Europe: An analysis of a burgeoning transnational network. <i>Terrorism and Political Violence</i> , 21, 189-210.
*DI	Wu, & Lederer, A. (2009). A meta-analysis of the role of environment-based voluntariness in information technology acceptance. <i>MIS Quarterly</i> , 33, 419-A9.
*MT, *SN	Wu, Ye, Zhou, Changsong, Xiao, Jinghua, Kurths, Jürgen, & Schellnhuber, Joachim. (2010). Evidence for a bimodal distribution in human communication. <i>PNAS</i> , 107, 18803-18808.
*TM	Xu, J., & Chen, H. (2008). The topology of dark networks. <i>Communications of the ACM</i> , 51(10), 58-65.
*TM	Xu, S., & Zhang, J. (2008). Data distortion methods and metrics in a terrorist analysis system. In H. Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 347-364). New York, NY: Springer.
*BNW	Yang, Qiang, & Wu, Xindong (2006). 10 challenging problems in data mining research. <i>International Journal of Information Technology &amp; Decision Making</i> , 5(4), 597-604.
*SA	Yilmazel, O., Symonenko, S., Balasubramanian, N. & Liddy, E. D. (2008). Leveraging one-class SVM and semantic analysis to detect anomalous content. In H.

	Chen, E. Reid, J. Sinai, A. Silke, & B. Ganor (Eds.), <i>Terrorism informatics: Knowledge management and data mining for homeland security</i> (pp. 407-424). New York, NY: Springer.
*DI, *SN	Yin, L, Shaw, S-L and Yu, H (2011) Potential effects of ICT on face-to-face meeting opportunities: A GIS-based time-geographic exploratory approach. <i>Journal of Transport Geography</i> , 19, 422-433. DOI: 10.1016/j.jrrangeo.2010.09.007
*DI, *SM	Young, H. Peyton. (2009). Innovation diffusion in heterogeneous populations: Contagion, social influence, and social learning. <i>American Economic Review</i> , 99(5), 1899-1924.
*CC	Young, N., & Dugas, E. (2011). Representations of climate change in Canadian national print media: The banalization of global warming. <i>Canadian Review of Sociology</i> , 48, 1-22.
*DV, *SA	Zeng, Qing T., Tse, Tony, Givita, Guy, Keselman, Alla, Crowell, Jon, Browne, Allen C., Goryachev, Sergey, & Ngo, Long. (2007). Term identification methods for consumer health vocabulary development. <i>Journal of Medical Internet Research</i> , 9. doi: 10.2196/jmir.9.1.e4
*SA	Zhitomirsky-Geffet, M and Dagan, I (2009) Bootstrapping distributional feature vector quality. <i>Computational Linguistics</i> , 35, 435–461.
*SM	Zimbra, D, Abbasi, A and Chen, H (2010) A cyber-archaeology approach to social movement research: Framework and case study. <i>Journal of Computer-Mediated Communication</i> , 16, 48-70. DOI: 10.1111/j.1083-6101.2010.01531.x
*SN	Zook, M. (2010, December). <i>The constraints and benefits of space and time in digital social networks</i> . Paper presented at the Spatio-Temporal Constraints on Social Networks Specialist Meeting, University of California, Santa Barbara.